

Per- and Polyfluoroalkyl Substances (PFAS) in drinking water

See frequently asked questions and answers.

This fact sheet answers frequently asked questions about the detection of Per- and Polyfluoroalkyl Substances (PFAS) in drinking water. It includes information about a drinking water standard (referred to as a Maximum Contaminant Level, or MCL) for PFAS, finalized by the Massachusetts Department of Environmental Protection (MassDEP) in October 2020.

FAQ

What are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals manufactured and used in a variety of consumer products and industries throughout the world. Two of these PFAS chemicals, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), have been the most extensively produced and studied. They have been used to make carpets, clothing, fabrics for furniture, paper packaging for food, and other materials (e.g., cookware) that are resistant to water, grease or stains. They are also used in aqueous firefighting foam and in a number of industrial processes. Because these chemicals have been used in an array of consumer products, most people have been exposed to them.

Many PFAS are no longer being produced in this country; the largest manufacturer completely stopped PFOA/PFOS production in 2002. PFAS are still being produced in other countries and may be imported into the US in limited quantities. The US Environmental Protection Agency (EPA) and the PFAS industry launched the PFOA Stewardship Program in 2006 to work toward ending the production of PFOA and other PFAS.

While consumer products and food are a large source of exposure for most people, drinking water can be an additional source in those communities where these chemicals have contaminated water supplies. Such contamination is typically localized and associated with a specific facility, (e.g. an industrial facility where these chemicals were produced or used to manufacture other products or where firefighting foam was used).

How are PFAS regulated?

In October 2020, MassDEP finalized an MCL for PFAS in drinking water of 20 nanograms per liter (ng/L) or parts per trillion (ppt). MassDEP's MCL applies to six PFAS, including PFOA, PFOS, perfluorohexane sulfonate (PFHxS), perfluorononanoic acid (PFNA), and perfluoroheptanoic acid (PFHpA) and perfluorodecanoic acid (PFDA). The MCL is an enforceable standard, set at a level that is safe to drink for an entire lifetime.

There are currently no established federal regulatory limits for PFAS in drinking water.

How can PFAS affect my health?

There are many gaps in the current scientific literature, but it is believed that PFAS may affect human health. Some of the research about health effects of PFAS is based on animal studies, and scientists are still unsure of the difference between how animals and humans respond to PFAS. PFAS exposure has been associated with changes in liver and kidney function, changes in thyroid hormone and cholesterol levels, and immune system effects. PFOA and PFOS have also been shown to cause developmental effects to fetuses during pregnancy.

It's important to keep in mind that the likelihood of experiencing health effects associated with PFAS depends on the amount of PFAS that a person has been exposed to. It's also important to keep in mind that health effects associated with PFAS are not specific to just PFAS – they can also be caused by many other factors. As a result, it is not possible to link a person's drinking water exposure to PFAS with any former, current, or future health effects. If you have specific health concerns, you should consult with your medical provider.

Can PFAS cause cancer?

There is no conclusive evidence that PFAS cause cancer, though several animal and human studies have identified a possible link between them. The EPA reports there is suggestive evidence that PFOA and PFOS can increase the risk of cancer. Both the EPA and the National Toxicology Program are continuing research on the cancer potential of PFAS.

If I drank water above the MassDEP MCL would it harm my health?

Drinking water at a level above MassDEP's MCL does not necessarily mean that you have been harmed or will get sick. This is because the MCL is based on a level that is safe to drink for an entire lifetime. By convention, a value such as the MCL is designed to overestimate exposure and ensure that sensitive individuals are protected. For example, the MCL assumes that individuals drink only contaminated water and are also exposed to PFAS from sources beyond drinking water, such as food. Several safety factors are additionally applied to account for the differences between animals and humans and the differences from one human to another human. Under this scenario, a risk would be expected only if an individual continuously drinks only contaminated water at a level significantly higher than the MCL.

What should I do to limit exposure?

The most important thing you can do if PFAS have been identified in your drinking water is to limit exposure, and stop drinking the water. PFAS are found at low levels in the environment, consumer products, and food, so it is nearly impossible to eliminate all exposure. If PFAS contamination has been identified in your drinking water, there are several ways to limit your exposure such as drinking and cooking with bottled water that has been tested and found free of PFAS, and using pre-mixed baby formula, or PFAS-free bottled water for reconstituting powdered formula. Routine showering and bathing are not significant sources of exposure.

Are there any special measures I should take if I am pregnant?

If there is PFAS in your drinking water, you should limit your exposure, as discussed above. Otherwise, it is not necessary to take any additional measures during your pregnancy.¹ In some studies, women exposed to PFAS before they became pregnant experienced elevated blood pressure, and in some cases pre-eclampsia when pregnant. However, it is not uncommon for women to experience elevated blood pressure during pregnancy, even when there's no known exposure to PFAS. As such, you should continue with your regular doctor's visits during pregnancy, which should include monitoring your blood pressure.²

Is it safe for me to continue to breastfeed if PFAS have been detected in my drinking water?

The US Centers for Disease Control and Prevention/Agency for Toxic Substances and Disease Registry (CDC/ATSDR) recommends nursing mothers continue to breastfeed. Based on current science, the many benefits of breastfeeding outweigh the risks to infants who may be exposed to PFAS in breastmilk.^{1,2} If you have concerns, you should consult with your medical care provider.

Will I/my child still be protected by vaccines if we have been exposed to PFAS?

Although several studies have found that the body's immune response to some vaccinations might be slightly diminished by PFAS, there is no evidence that exposure to PFAS reduces the effectiveness of vaccines, or increases the risk of diseases that vaccines prevent. Thus, both you and your child should still be protected by vaccines, and should follow the normal, vaccination schedule recommended by your or your child's medical provider.²

References

¹Pediatric Environmental Health Specialty Unit (2021) "PEHSU Grand Rounds – Per- and Polyfluoroalkyl Substances (PFAS): What Clinicians Need to Know." Available at: [PEHSU National Classroom \(pehsuclassroom.net\)](https://pehsuclassroom.net)

²Agency for Toxic Substances and Disease Registry (2019). "An Overview of the Science and Guidance for Clinicians on Per- and Polyfluoroalkyl Substances (PFAS)". Available at: [ATSDR PFAS Clinical Guidance \(cdc.gov\)](https://www.cdc.gov/atSDR/pfas/)