

# PFAS & Your Health



<https://www.indiegogo.com/projects/inquinamento-pfas-water-pollution-health#/>

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# Your Community

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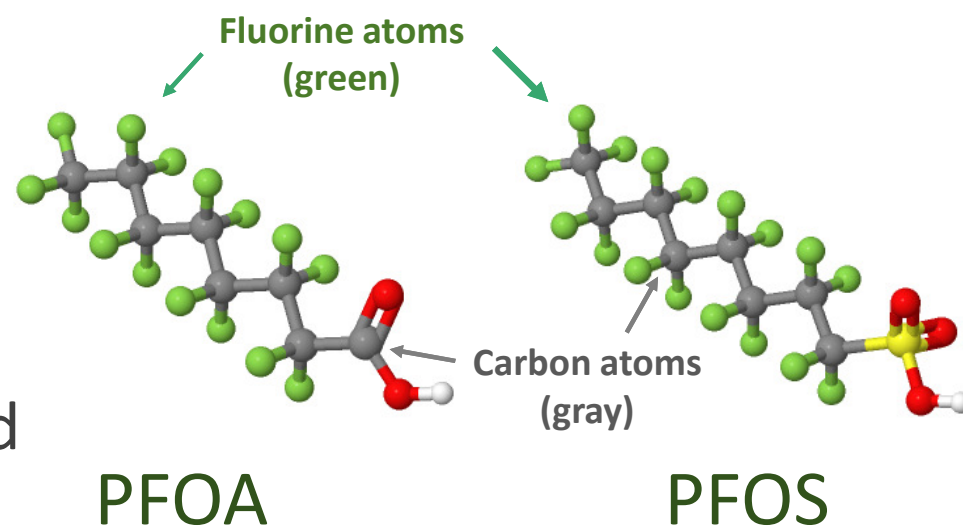
# Deciphering the Chemistry Code

**PFAS:** per- and polyfluoroalkyl substances

- Over 3000 PFAS in commercial use
- At least 5000 PFAS known

Most health information is limited to two specific types of PFAS

- **PFOA:** Perfluorooctanoic acid
- **PFOS:** Perfluorooctane sulfonic acid



# What Happens When You Drink PFAS-Contaminated Water?

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Most, and possibly all, PFAS chemical will be absorbed into your bloodstream

PFOS & PFOA will remain unchanged in your body

- Some other PFAS's will be converted by your body to PFOA

PFAS will stay in your body a long time – years after you drank the water

- Primarily stored in blood, liver, & kidneys



# What About Other Exposures?

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## The air you breathe

- Especially steamy showers & baths
- Some PFAS can be inhaled as vapor – but not likely for PFOA and PFOS
- Any PFAS can be inhaled if dispersed as liquid droplets in air
- Inhaled PFAS will be absorbed but less efficiently than if ingested

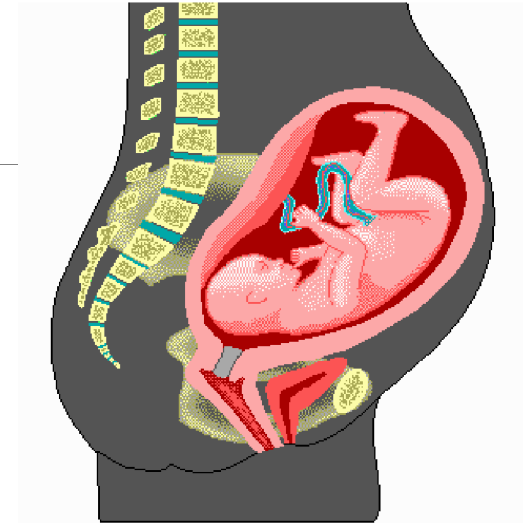
Skin absorption possible but much less than if ingested or inhaled

# Who is Most Vulnerable?

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Pregnant women, unborn fetus, and newborn infant

- Low birth weight
- Preterm birth
- Pregnancy-induced hypertension/pre-eclampsia
- Delayed puberty onset
- Attention deficit/hyperactivity disorder (ADHD)
- Immune response suppression in child



# Cancer Risks

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## International Agency for Research on Cancer (IARC) - World Health Organization

- Classified PFOA as “possibly carcinogenic to humans” (Group 2B)
- Based on limited evidence in humans that it can cause testicular and kidney cancer, and limited evidence in lab animals

## US EPA

- Scientific Advisory Board draft report for PFOA: “suggestive evidence of carcinogenicity, but not sufficient to assess human carcinogenic potential”



# Other Reported Health Risks to Adults

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## Reproduction

- Difficulty becoming pregnant
- Endometriosis

Altered liver function

Chronic kidney disease

Cardiovascular disease

Suppressed immune response

Osteoarthritis



# Federal Drinking Water Regulation

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## Safe Drinking Water Act

- Empowers US EPA to set **standards** for drinking water quality in **public** drinking water supplies
- The US EPA does not have authority to regulate private wells nor does it provide recommended criteria or standards for individual wells
- PFAS contamination of drinking water is not regulated by the US EPA, but PFOA and PFAS have been identified by EPA as priority contaminants

## Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

- Commonly known as Superfund
- PFAS, including PFOA and PFOS, are not listed as CERCLA/Superfund hazardous substances

# Estimating Drinking Water Health Risks for PFOA and PFOS

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US EPA can issue a **Drinking Water Health Advisories** for water contaminants

- Information on health risks of unregulated chemicals to operators and officials responsible for public drinking water
- Estimate health risks with a margin of protection from a lifetime of exposure from drinking water
- Levels are **non-enforceable** and **non-regulatory**

For PFOS and PFOA

- US EPA health advisory level for PFOS/PFOA combined: **70 parts per trillion = 70 ng PFAS/liter water**
- **Michigan adopted the US EPA health advisory level of 70 parts per trillion**
- Estimated based on fetuses during pregnancy and breastfed infants as the most sensitive populations

For more information: <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>

# Individual Risk

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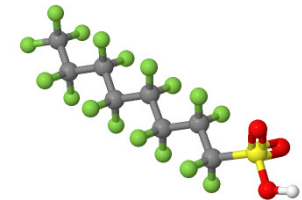
Individual differences impact individual risk

Risk modified by biology

- Species, age, sex, exposure route, health status, lifestyle, pregnancy, and more

Risk modified by chemistry

- Different PFAS's have different toxicities



# Drinking Water should not be Hazardous to your Health

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# Estimating Drinking Water Health Risks for PFOA and PFOS

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## US EPA Drinking Water **Health Advisories**

- Provide information on the health risks of these chemicals to operators and officials who have the primary responsibility for public drinking water
- Levels estimate health risks with a margin of protection from a lifetime of exposure from drinking water
- Levels are **non-enforceable** and **non-regulatory**

## For PFOS and PFOA

- The US EPA health advisory level for PFOS/PFOA combined concentrations is **70 parts per trillion = 70 ng PFAS/liter water**
- **Michigan adopted the US EPA health advisory level of 70 parts per trillion**
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