Everything You Need To Know About PFAS (Plus PFOA, PFOS, GenX, PFBS, & More)

At this time, cancer-linked per- and polyfluoroalkyl substances (PFAS), also known as "forever chemicals," are legally allowed to pollute public drinking water supplies in the United States. Testing for these chemicals is not required, nor is removal. Yet, PFAS have been detected in all 50 states and experts estimate 200 million Americans drink (and use) tap water contaminated with toxic PFAS daily. Given the lack of testing and regulations, that's likely a conservative estimate.

On June 15th, 2022 the U.S. EPA released an alarming advisory warning that several PFAS are far more toxic than previously thought and pose severe health risks in water, even at tiny, "near-zero" levels (we've summarized that advisory here). The advisory shrunk existing tap water recommendations for two specific PFAS, PFOA and PFOS, to almost zero; indicating these chemicals are dangerous in tap water at virtually any level. The advisory also introduced recommendations for two additional PFAS, GenX and PFBS, indicating both chemicals pose similar and serious dangers to human health in water.

However, that advisory only offers recommendations, *not* regulations. Therefore, nothing in the advisory can be enforced by law. Meaning PFAS continue to legally poison our public drinking water supplies in all 50 states at this very moment, and without us even recognizing it.

Please note: This guide will be updated with the latest information, advisories, and data regarding PFAS in public drinking water supplies as new information is released.

Guide last updated 6/24/22.

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What Are PFAS?



PFAS are a family of more than 9,000 toxic man-made chemicals that can't be seen, smelled, or tasted. Even without required testing, multiple PFAS have been found in public water supplies (i.e. tap water) from coast to coast and have been linked to cancer, birth defects, thyroid issues, and other health effects (more on that later). Plus, PFAS are nearly indestructible, as they can survive and accumulate in our environment and "build up" in our blood for decades. This is exactly what is happening right now throughout the United States (and beyond our borders), as studies show more than 98% of the U.S. population already have PFAS in their blood.

PFOA & PFOS Are The Two Most Notorious PFAS Plaguing Public Water Supplies

Perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) are two of the most researched and prevalent members of the PFAS family. PFOA, also known as C8, was originally the infamous chemical in Teflon products due to its non-stick properties. And it is still used in many consumer goods today. PFOS, on the other hand, became prevalent in our environment (and water supplies) due to its use in firefighting foam. These chemicals can still be found in food, clothing, furniture, and more today (more on that in a minute).

What Are GenX and PFBS?

Like PFOA and PFOS, GenX and PFBS (perfluorobutanesulfonic acid) are two additional types of PFAS. GenX and PFBS were created as alternatives to PFOA and PFOS to replace their toxic predecessors. However, a report from the U.S. EPA confirmed these chemicals are toxic, too. GenX is associated with harmful effects on the kidney, blood, immune system, liver and development, and linked to an elevated risk of cancer. Meanwhile, PFBS is associated with harmful effects on the thyroid and kidney, reproduction, and development.

PFAS Were First Used To Coat Military Equipment (And Develop The First Atomic Bomb)

PFAS lurking in our public water supplies today, like PFOA, were originally used to coat tanks and military instruments to protect them from the elements. They were even used in the Manhattan Project to build the first atomic bomb. Does that sound like something that's safe to drink?



PFAS were accidentally engineered by scientists in the 1930s. They found the chemicals to be virtually indestructible. And were delighted to realize they had the unique ability to prevent and even repel food, oil, grease, dirt, moisture, and more from sticking to surfaces. Plus, they were heat-resistant. For those reasons, PFAS lurking in our public water supplies today, like PFOA, were originally used to coat tanks and military instruments to protect them from the elements. They were even used in the Manhattan Project to build the first atomic bomb. Does that sound like something that's safe to drink?

Teflon, Scotchgard, And Firefighting Foam (AFFF) Were Created With PFAS

Shortly after they were engineered, chemical companies like 3M and DuPont began using PFAS in consumer goods. PFOA, perhaps the most notorious PFAS, was used in non-stick pots and pans under the brand name Teflon. Another common PFAS, PFOS, was (and is) used in firefighting foam. Today, PFAS are found in all kinds of consumer goods from carpet and fabric to food packaging, household cleaning agents, and clothing. In fact, almost anything that is water-repellent or stain-resistant, from sleeping bags, ski wax, and boots to certain electronics, pesticides, and makeup, may contain PFAS.

PFAS Are Called "Forever Chemicals" Because They May Never Degrade Or Break Down In The Environment Or The Human Body

The bottom line is, PFAS can stay and accumulate in our body, blood, and environment for dozens, hundreds, and even thousands of years.

Given their widespread usage, studies show more than 98% of the U.S. population already have PFAS in their blood, at varying levels. A clear and damning indication of a widespread problem that still lacks widespread solutions.

That's why "Forever chemicals" is just one nickname for this dangerous family of chemicals. The other? "Ticking time bombs." Because they can accumulate (i.e. increase) over time and cause severe health effects years after initial exposure. According to scientists, once they're in your body, there's no way to remove them. In other words, PFAS levels only "build up" with more exposure. You can think of it like this: PFAS are "shockingly toxic" man-made chemicals that man probably can't get rid of. And just by drinking tap water, you may be ingesting even more of them daily.

A Dangerous Combination Of Toxicity & Longevity

Today PFAS are found in our drinking water, food supply, and household products. While companies like DuPont, 3M, and others have stopped using PFOA and PFOS for manufacturing, they're still in our soil, water, air, and homes—and given their longevity, they will be for the foreseeable future. Plus, as our exposure increases, PFAS build up in our bodies and can ultimately lead to the severe health effects outlined below.

PFAS Are Linked To Multiple Types Of Cancer, Thyroid Disease, Elevated Cholesterol, & More



ALARMING HEALTH EFFECTS CONNECTED TO PFAS



Thyroid Disease High Cholesterol Heart Issues Cardiovascular Issues Ulcerative Colitis (IBD) Liver Damage Liver Tumors Kidney and Testicular Cancer Weakened Immune System Irritable Bowel Syndrome (IBS) Hormone Imbalance DNA Damage Increased COVID-19 Symptom Severity And More...

Multiple studies, including the largest epidemiological study ever in human history, found links between PFAS and the following adverse and alarming health effects: Thyroid disease, high

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Additional Dangers To Women & Children



PFAS HEALTH EFFECTS IN WOMEN & CHILDREN



Skeletal Variations (Birth Defects) Low Birthweight Decreased Response to Vaccines Increased Likelihood of Miscarriage High Blood Pressure Preeclampsia During Pregnancy

BABIES EXPOSED PRENATALLY CAN POTENTIALLY HAVE

Higher Risk of Experiencing Obesity Early-Onset Puberty Reduced Fertility Later in Life Plus Other Developmental Issues...

PFAS exposure can be particularly dangerous to pregnant women, infants, and children. Here are just a handful of additional health effects linked to PFAS: Skeletal variations (birth defects), Low birthweight, decreased response to vaccines, potential increased likelihood of miscarriage, High blood pressure, preeclampsia during pregnancy, babies exposed prenatally can potentially have a higher risk of experiencing obesity, early-onset puberty, and reduced fertility later in life, plus, other developmental issues.

How Do PFAS Get Into Our Public Water Supplies?

Contamination is often linked to nearby industrial sites, landfills, airports, and military bases where the chemicals are used or have been used in the past.

Not only are PFAS nearly

indestructible, they are mobile.

They sink into soil and migrate into groundwater and aquifers. They sneak into surface water like streams, rivers, and reservoirs via run-off. And they can remain in public water supplies, even after water has been treated. No matter where, when, or how they are used or released, PFAS can thrive for years, if not decades, and eventually travel miles to poison water supplies and systems that provide drinking water to our homes, schools, and communities.

Contamination Is Widespread & Coated In Controversy

PFAS have been detected in soil and water all over the planet, as well as our blood. Why? Because contamination is virtually everywhere. Scientists have found almost 42,000 potential sources of PFAS that could be polluting our water supplies here in the U.S. Even worse, an EWG analysis shows more than 43 million Americans (and up to 200 million Americans, which is more than half of the population) are being served water right now that exceeds the latest EPA recommendations for PFAS levels. Think about that: Those numbers are only based on existing data available to us, which isn't much given testing isn't required. In other words, contamination is rampant and that's based on limited data and what could be conservative estimates.

Here are just a few recent examples of PFAS contamination here in the United States:

- Between 1951 and 2003, almost 800 tons of PFOA were discharged by DuPont in the 981-mile Ohio River that flows through six U.S. states. This severely contaminated water was served to tens of thousands of Americans. And documentation uncovered by lawyers shows DuPont knew PFOA, the non-stick chemical in Teflon products, was dangerous (and even deadly) to humans. The events surrounding this inspired the 2019 award-winning film 'Dark Waters' starring Mark Ruffalo. You can read more about this catastrophe here. And while DuPont (and other U.S. manufacturers) have phased out PFOA and PFOS since, the poison still persists in our water supplies. In 2021, researchers detected multiple PFAS in the Ohio River in all 20 sites studied.
- Lead wasn't the only contaminant poisoning residents in Flint, as well as the entire state of Michigan.
 PFAS were the "other" contaminants in the state's notorious water crisis. PFAS have been detected at more than 11,000 sites around Michigan.

And according to the Michigan Department of Environment, Great Lakes, and Energy, more than 1.5 million residents have been drinking water contaminated with PFAS.

• A water treatment facility serving more than 60,000 residents in Arizona's second most-populous city,

Tucson, shut down in 2021 because officials found PFAS at more than 143x above recommended EPA levels at the time. Tucson's water director issued a grave warning: "We know the contamination is out there ... (and) we know it's not going away."

- PFAS have been detected or suspected at 679 military sites stretching from California to New York. And the Department of Defense recently revealed water supplies around at least 12 military bases have "shockingly high" levels of PFAS.
- At time of publication, many concerning clusters of drinking water contamination have been reported in major metropolitan areas including New York, Boston, Philadelphia, San Francisco, and Los Angeles. Meanwhile, entire states including Michigan, Alabama, North Carolina, South Carolina, Massachusetts, and several more appear to be battling contamination almost everywhere.
- The latest data from the EWG shows PFAS have been found in public and/or private water supplies in all 50 states.

PFAS, PFOA, & PFOS Are Legally Polluting Water Supplies In All 50 States Right Now



There is no national EPA regulation for PFAS in public water supplies.

In other words, PFAS can (and do) legally pollute our public water supplies. At this time, the EPA doesn't even require public water suppliers to test for them. Meaning the problem is probably far worse than we realize.

Plus, filters at the vast majority of water treatment facilities around the U.S. are not designed to remove PFAS. Meaning if polluted water arrives, it still leaves polluted with PFAS and pours these chemicals into our homes, schools, and communities. In lieu of federal regulations, some states have instituted or proposed their own limits on PFAS in drinking water. But even experts in those states admit that without federal action, the problem will persist.

You may be wondering why PFAS are still legally allowed in drinking water, given their danger. Under the 1976 Toxic Substances Control Act, the EPA can require testing for chemicals only when they've been provided evidence of potential harm. Essentially, chemical companies have the ability to regulate themselves. That's why PFAS, in particular, have such a controversial history. **We, as American citizens, have to prove chemicals are toxic before they can even be tested for, then considered for regulation. And regulation can take years, decades, and even lifetimes to be instituted, if instituted** at all. We are watching this happen in real time with PFAS.

The EPA's 2022 Recommendations

Due to emerging data on adverse health effects, the U.S. EPA invoked new recommended limits for PFAS in 2016. These recommendations established health advisory levels at 70 parts per trillion for PFOA and PFOS in drinking water. Remember, these were only recommendations, not regulations.

On June 15th, 2022 the EPA "rushed' to release an advisory with new, stronger recommendations revealing these chemicals are far more dangerous in water than once thought.

They are even dangerous at "near-zero" levels.

And they added recommendations for two additional PFAS, PFBS and GenX. The bottom line is, the latest science showed previous recommendations set in 2016 were not nearly strong enough to protect public health and PFAS of all kinds, and at almost any level, can hurt us. Yet without required testing, we can't even take the first step to abiding by them. And without required removal, we must question our safety.

The June 2022 advisory established the following interim recommendations:

June 2022 EPA Advisory Recommendations

	Parts Per Trillion (2016)	Parts Per Trillion (2022)
PFOA	70 ppt	.004 ppt
PFOS	70 ppt	.02 ppt
PFBS	None	2,000 ppt
GenX	None	10 ppt

- PFOA: Reduced from 70 parts per trillion to just .004 parts per trillion (ppt).
- PFOS: Reduced from 70 ppt to just .02 ppt.
- PFBS: 2,000 ppt.
- GenX: 10 ppt.

Remember, these are just recommendations, not regulations. Testing isn't even required. And these recommendations can't be enforced by law, so they are easy (and completely legal) to ignore.

New And Alternative PFAS Lack Regulations, Too

As mentioned earlier, there are thousands of PFAS. And because they are man-made chemicals, new ones can be engineered at any time.

As of right now, none are regulated in our drinking water.

While recommendations have been established for the four aforementioned PFAS, what about the thousands of others? And what about any new PFAS? Remember, GenX and PFBS were created as replacements to PFOA and PFOS, and both have been shown to be nearly as dangerous as their predecessors. As you can see, recommendations aren't enough to protect us. And overseeing specific PFAS, rather than all PFAS, leaves room for new dangers to be introduced.

What's Next?

There Is No Simple Or Fast Fix

The EPA said it expects to propose the first-ever national drinking water regulations for PFOA and PFOS by the end of 2022, with a final rule expected in 2023. If regulations were to be approved and instituted, they would be enforceable by law. The problem is, even with regulations, the vast majority of today's water treatment centers do not have the technology and resources to effectively test for, let alone remove, PFAS from water supplies. And given the nature of the advisory, most experts agree: This is likely just the tip of the iceberg.

This concern has spread to the White House, as the government has said that it will make \$1 billion in grants available to utilities to help them address PFAS levels. But even with potential regulations and government funding, questions remain: Will the EPA's regulations be strong enough to protect us? Is \$1B enough to fund this seismic change? How long will change take? Will it be measured in months, years, or decades? What about GenX and PFBS? And what about other PFAS being engineered today? When and how will we be required and equipped to test and remove these toxic chemicals from our public water supplies?

How To Protect Yourself From PFAS In Drinking Water

Typical water filters produced by leading retailers do not remove PFAS from your drinking water. The best thing you can do to proactively protect yourself from these poisonous chemicals is to filter your water with a filtration system certified to remove PFAS. "Certification" is third-party proof that any filter does as it promises.

Clearly Filtered Is Certified To Remove PFASm (Including PFOA, PFOS, GenX, & PFBS)

Our pitcher filter is the one and only pitcher filter certified by the prestigious Water Quality Association to remove PFAS from drinking water. In fact, our breakthrough technology has been tested and proven to remove 9 different types of PFAS, including PFOA, PFOS, GenX, and PFBS to guarantee your protection.

Water Quality Association



CERTIFIED DRINKING WATER TREATMENT UNITS

NSF/ANSI 53 - 2019: Drinking Water Treatment Units - Health Effects

Clearly Filtered, Inc.

23121 Arroyo Vista, Suite B Rancho Santa Margarita, california 92688 United States http://www.ClearlyFiltered.com (http://www.ClearlyFiltered.com)

Product Type: Water Pitcher

Brand Name	Model Number	Flow Rate (GPM)	Replacement Element	Capacity (Gallons)	Reduction Claims
Clearly Filtered	Filtered Water Pitcher	4	Pitcher Filter	100	Perfluorooctane Sulfonate (PFOS), Perfluorooctanoic

The bottom line is, the PFAS already in our soil, air, and water probably aren't going anywhere. Nor are the PFAS in our blood. But you don't need to wait for a solution. And you shouldn't. Protect yourself (and your loved ones) from the dangers of PFAS right now with our breakthrough pitcher filter.

Acid (PFOA)





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Breaking: U.S. EPA Rushes Out Warning To Millions Of Americans — "Shockingly Toxic" PFAS Detected In Tap Water Are Dangerous At Near-Zero Levels

(U.S. Environmental Protection Agency) What You Need To Know EPA advisory: Two cancer-linked "forever chemicals" found in tap water...

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