

A New Toxic Chemical Is Lurking in America's Drinking Water

Analysis by [Dr. Joseph Mercola](#)

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STORY AT-A-GLANCE

- › Researchers have identified chloronitramide anion as a new byproduct in chloraminated water, raising concerns due to its structural similarity to known toxic molecules and its consistent presence in tested samples
- › High levels of trihalomethanes (THMs) in drinking water are linked to an increased risk of colorectal cancer in men, particularly affecting the proximal colon
- › Elevated levels of total trihalomethanes (TTHM) and haloacetic acids (HAA5) in drinking water are associated with a higher risk of endometrial cancer, especially for low-grade tumors among women with long-term exposure
- › The presence of chloronitramide anion in America's water supplies highlights the need to reevaluate current water treatment methods and policies due its similarity to other known toxic compounds
- › To safeguard your health, invest in whole-house water filtration systems that remove common contaminants in water, as well as keeping them maintained to provide constant protection

Toxic pollutants continue to be detected in America's drinking water, putting millions of Americans at risk for chronic disease. According to a report from the National Resources Defense Council (NRDC):¹

"Chronic underinvestment has left water infrastructure outdated and on the verge of collapse in many places across the country ...

Lead, per- and polyfluoroalkyl substances known as PFAS, industrial pollution, and agricultural runoff are contaminating the drinking water for hundreds of millions of people – and many don't even know it."

PFAS, also known as forever chemicals, have been linked to different diseases, such as cancer, liver problems, abnormal fetal development and hormone disruption.² Now, the list of pollutants has gotten longer. Researchers have discovered a pollutant so new that its effects on public health haven't been determined yet – chloronitramide anion.

Chloronitramide Anion – A New Byproduct Identified in US Drinking Water

A study published in Science investigated the presence of a previously unidentified byproduct resulting from the decomposition of inorganic chloramines in U.S. drinking water systems. The research focused on chloraminated water, which is a common disinfectant treatment aimed at preventing the growth of harmful microorganisms.³ For context, chloramine is a mixture of chlorine and ammonia.⁴

The study examined 10 chloraminated drinking water systems across the United States, serving more than 113 million people. By analyzing 40 water samples from these chloraminated systems, the researchers discovered "chloronitramide anion" (Cl-N-NO₂⁻), a new byproduct formed during the breakdown of mono- and dichloramines.⁵ It was consistently detected in all tested samples.⁶

The water samples had median concentration of 23 micrograms per liter, with the actual range going as low as 1.3 micrograms per liter to as high as 92 micrograms per liter. Notably, chloronitramide anion was absent in ultrapure water and in drinking water systems that do not use chlorine-based disinfectants, indicating a direct link between chloramine usage and its formation.⁷

While the exact toxicity of chloronitramide anion remains unknown, its structural similarity to other toxic molecules suggests that its prevalence poses significant health implications.⁸ According to a report from NBC News:⁹

"It could take years to figure out whether chloronitramide anion is dangerous – it's never been studied ...

The scientists said they have no hard evidence to suggest that the compound represents a danger, but that it bears similarities to other chemicals of concern. They think it deserves scrutiny because it's been detected so widely."

Now that scientists know what the byproduct is, they're now moving onto the study phase. According to lead author Julian Fairey, "Now, we can go about the hard work of trying to figure out what its toxicological relevance is in our water systems."¹⁰

Chlorinated Water Linked to Higher Colorectal Cancer Risk in Men

In another study, conducted in Sweden, researchers delved into how long-term exposure to trihalomethanes (THMs) in chlorinated drinking water influence the chances of developing colorectal cancer. Researchers aimed to uncover whether elevated levels of these byproducts, commonly found in treated water, could be a significant risk factor for this type of cancer:¹¹

"Although several drinking-water disinfection byproducts are confirmed rodent carcinogens, the evidence in humans for carcinogenicity associated with these byproducts, including colorectal cancer, is still inconclusive."

The study examined 58,672 participants (32,872 men and 25,800 women), drawing data from the Swedish Mammography Cohort and the Cohort of Swedish Men. Participants were monitored over an average period of nearly 17 years, accumulating over 988,000 person-years of data. The focus was on individuals who consumed water from public systems, ensuring that the findings were relevant to typical drinking water sources.¹²

Findings revealed a connection between high THM concentrations (15 micrograms per liter or more) and an increased risk of proximal colon cancer in men. Specifically, exposure at this range puts men at a 59% greater risk compared to those with lower exposure. Interestingly, the study did not observe a similar association in women, indicating that the risk differs based on gender.¹³

The research also highlighted that the proximal part of the colon, the section closest to the small intestine, was particularly affected by THM exposure. The risk for men in this intestinal region was significantly elevated, emphasizing the localized impact of these chemicals within the gut. The findings also align with previous studies cited by the researchers, reinforcing the threat posed by THMs in drinking water.¹⁴

For context, THMs form when chlorine, which is used to disinfect water, reacts with natural organic materials present in the water supply. These chemicals are not just byproducts – they possess DNA-damaging properties, leading to mutations that ultimately lead to cancer. "High THM concentrations in drinking water were associated with increased risk of colorectal cancer in men," the researchers noted.¹⁵

Biologically, THMs are reactive substances. When they enter the body, they interact with cellular components, leading to genotoxicity. This means they damage the genetic information within cells, causing mutations that result in cancer.

Previous animal test studies cited by the researchers have shown that exposure to THMs lead to the formation of aberrant crypts and large-intestine carcinomas, providing a plausible mechanism for how THMs contribute to cancer development in humans.¹⁶

Water Contaminants Increase Endometrial Cancer Risk

In another study, researchers investigated the relationship between certain chemicals found in drinking water and the risk of developing endometrial cancer, which affects the lining of the uterus. Specifically, the team looked at disinfection byproducts (DBPs) like total trihalomethanes (TTHM) and haloacetic acids (HAA5) to determine their impact on endometrial cancer risk.¹⁷

The researchers selected a group of postmenopausal women aged 55 to 69 years from the Iowa Women's Health Study cohort. It included 10,501 women who had been using the same public water supply for over 10 years, ensuring consistent exposure levels to DBPs across the participants.¹⁸

Findings revealed that women with higher average concentrations of DBPs in their drinking water had an increased risk of endometrial cancer, and those in the highest percentile of exposure showed a significant association in risk. This trend was particularly evident for low-grade tumors, which are less aggressive and typically have a better prognosis than high-grade Type I tumors.¹⁹

The study further highlighted that long-term exposure to DBP levels above half the maximum contaminant level (MCL) was linked to higher cancer risk. Women who had been exposed to this specific range for more than median period (16 years) showed a stronger association compared to those with no such exposure.²⁰

Interestingly, the research found no significant link between nitrate levels in the drinking water and the risk of endometrial cancer. Nitrates are common contaminants, especially in agricultural areas, but in this case, they did not influence cancer risk the same way DBPs did. "We did not observe any statistically significant associations or trends across quintiles of dietary nitrate or nitrite," according to the researchers.²¹

DBPs like TTHM and HAA5 contribute to cancer development by disrupting hormonal balances in the body. These chemicals interfere with hormone receptors and hormone homeostasis, leading to increased estrogen levels and decreased progesterone levels. This environment is a known risk factor for endometrial cancer, as it promotes the growth and proliferation of cancerous cells in the uterine lining.²²

The study also noted that some DBPs have been classified as probable human carcinogens due to their ability to bind to hormone receptors and disrupt normal hormonal functions. Animal studies support these findings, showing that ingestion of DBPs lead to infertility, disrupted estrous cycles and elevated estradiol levels, all of which are linked to increased cancer risk.²³

How to Protect Yourself from Toxic Water Contaminants

Modern environmental toxins constantly infiltrate the country's water supply, undermining your cellular energy production and overall health. Contaminants such as heavy metals and pharmaceutical residues disrupt mitochondrial function and pose significant risks to your well-being. And now, the public also has to deal with chloronitramide anion.

Here are effective solutions to shield yourself and your family from water-based environmental threats:

- 1. Install a comprehensive whole-house water filtration system** – Protecting your entire household from toxic water contaminants begins with a robust filtration system.

Available whole-house filtration systems include reverse osmosis, ion exchange and activated carbon block filtration, which eliminate chlorine, THMs, heavy metals and other harmful chemicals in different degrees. Do your due diligence to find out which one is the best for your home at a comfortable price point.

By ensuring that all water entering your home is purified (both drinking and showering water), you're preventing toxins from impairing your cellular energy production.

- 2. Filter both drinking and shower water separately** – While a whole-house filtration system provides broad protection, adding another layer of filtration at the point of use will further enhance safety. Install high-quality reverse osmosis or activated carbon filters on your kitchen taps to ensure that your drinking water is free from residual toxins.

For shower water, use specialized shower filters to remove chlorine and other chemicals that are absorbed through the skin. This dual-filtration approach ensures comprehensive protection for all household water uses.

3. Regularly test and monitor your water quality – Maintaining optimal filtration requires regular assessment of your water quality. Resources such as the Environmental Working Group's Tap Water Database will help identify prevalent contaminants in your area.²⁴

For precise analysis, especially if you rely on well water or live near industrial/agricultural sites, I recommend conducting independent water testing with a laboratory. Regular monitoring allows you to adjust your filtration systems as needed, ensuring continuous protection against emerging water toxins that disrupt cellular functions.

4. Stay informed and upgrade filtration technologies as needed – New water contaminants will always emerge due to the constant intrusion of industrial waste and environmental pollution into our water supply. Staying updated on the latest advancements in water filtration technology will ensure your systems effectively target the most current threats.

5. Maintain and service your filtration systems regularly – To ensure that your water filtration systems operate at peak efficiency, regular maintenance is crucial. Replace filters according to the manufacturer's recommendations and perform routine inspections to identify any signs of wear or malfunction.

Well-maintained systems are more effective at removing contaminants, thereby continuously supporting your mitochondrial function and cellular energy production.

Sources and References

- ¹ NRDC, October 5, 2023
- ² NRDC, April 10, 2024
- ^{3, 5, 6, 7, 8} Science, 21 Nov 2024, Vol 386
- ^{4, 9, 10} NBC News, November 22, 2024
- ^{11, 12, 13, 14, 15, 16} J Natl Cancer Inst., 2023 Aug 8, Vol 115
- ^{17, 18, 19, 20, 21, 22, 23} Environ Health Perspect., 2022 May 27, Vol 130
- ²⁴ EWG's Tap Water Database