

More Florida communities are pulling back from fluoride. Here's why

Central Florida Public Media | By Molly Duerig, Joe Mario Pedersen

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Fluoride critics brandish American flags at a Melbourne City Council meeting on January 14, 2025, when council members voted 6-1 to stop adding fluoride to drinking water. Since Melbourne supplies drinking water for several other parts of Brevard County, the decision also affects those areas.



Communities across Central Florida, in recent months, have taken up the question of

whether or not to fluoridate drinking water. Earlier this month, Melbourne joined a growing list of Florida jurisdictions voting to end the practice of fluoridation.

More than 70% of Floridians who get water from community water systems receive fluoridated water, per the Florida Department of Health, and more Central Florida communities are expected to take up the fluoride issue.

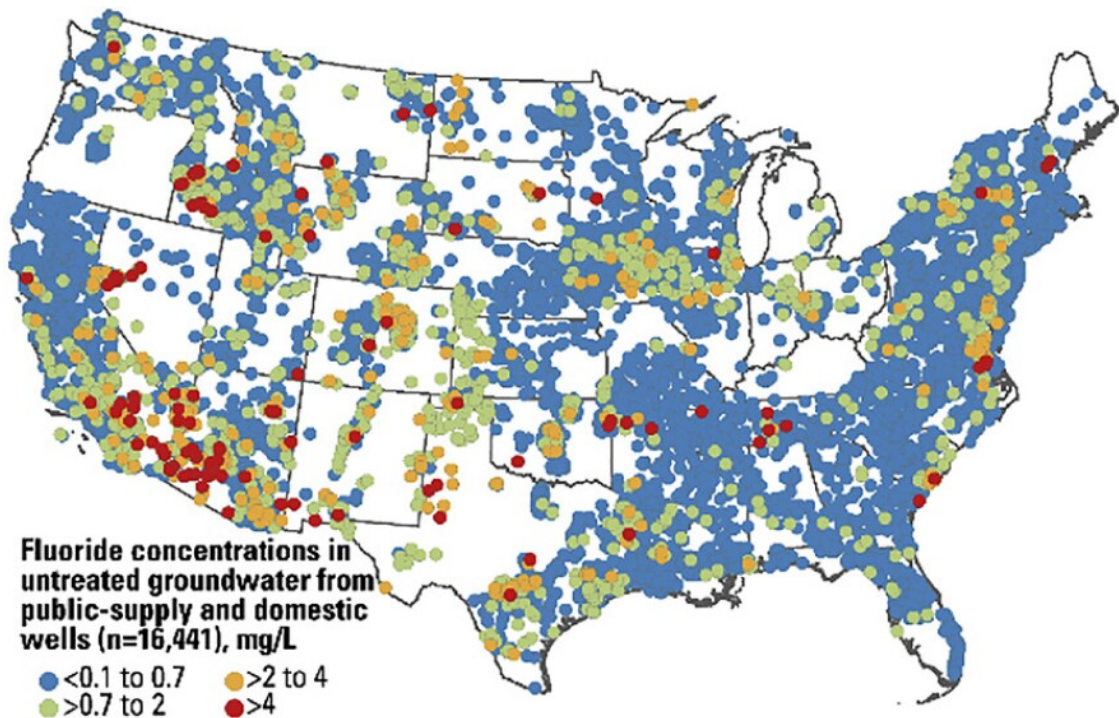
But what does it mean to fluoridate water? How long has the practice been around? And why does adding fluoride to water concern some communities?

What is fluoride?

Fluoride is a naturally occurring mineral found in groundwater, soil, rivers, and lakes, according to the National Library of Medicine.

In the United States, nearly 11% of domestic wells pump water with fluoride concentrations above the 0.7 parts per million (ppm) level currently recommended for drinking water, per a 2020 analysis by the U.S. Geological Survey. One way to envision 0.7 ppm: it's like a little less than one minute every two years, according to one analogy. (0.7 ppm is the same as 0.7 milligrams per liter, or 0.7 mg/L)

Cognitive impacts are associated with higher fluoride exposures starting at 1.5 ppm, a little more than twice as much as the 0.7 ppm amount recommended for drinking water, according to a review of some recent studies.



Credit United States Geological Survey

As seen on the map above, much of the untreated groundwater in the United States contains naturally-occurring fluoride: including in Florida, where natural fluoride levels don't surpass 2 milligrams per liter (2.0 ppm), according to the results of a 2020 USGS study. The Environmental Protection Agency requires public water systems to inform customers if water fluoridation levels reach 2.0 ppm, but domestic wells are not subject to that regulation.

Why do we fluoridate?

Community water fluoridation is the act of adjusting fluoride amounts in drinking water

to a level recommended for cavity prevention, according to the Centers for Disease Control and Prevention.

Evidence shows that fluoride can prevent and even reverse early tooth decay, according to the National Institutes of Health. The road to that understanding is long and begins in 1901 when a dentist in Colorado Springs began noting brown stains on residents' teeth. However, what interested scientists was that people with brown stains were also found to be resistant to tooth decay. Decades later, researchers found that the water contained high concentrations of fluoride, which was determined to be responsible for the brown stains and the resistance to decay.

In 1945, the first large-scale study of fluoridating water was conducted in Grand Rapids, Michigan. After 11 years of observing school children, researchers found a 60% drop in the rate of tooth decay. As a result, fluoridation projects began popping up around the country. Today, water fluoridation projects impact 200 million Americans, according to the National Institute of Dental and Craniofacial Research.



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Periodontist Dr. Lee Sheldon urged against fluoridating water at a recent Melbourne City Council meeting, citing findings from recent research published by JAMA Pediatrics. "I'm a dentist. I can fix a cavity. I can't fix cognitive impairment," Sheldon said.

Why do some people want to end community water fluoridation?

For as long as fluoridation has been going on, there have been skeptics suggesting other harmful effects of fluoride. Through the decades, water fluoridation has been heralded by a majority in the scientific community.

However, President Donald Trump's pick for Health and Human Services Secretary Robert F. Kennedy Junior is anti-fluoride and has talked about ending fluoridation,

sparking renewed attention on the subject.

“That caused a ripple effect,” said Justin Harvey, a Maitland resident who says he started raising concerns to local community leaders about fluoride seven years ago. “We’ve had commissioners say, solely based on that, that is good enough reason for us to take it out.”

At the end of 2024, Florida Surgeon General Joseph Ladapo issued new guidance, discouraging local governments from fluoridating water and going as far as to call it “public health malpractice.” The guidance mentions a number of concerns outlined by studies, including associations between fluoride exposure and ADHD and diminished impulse control in children, as well as reduced IQ.

Those associations are identified in some newly-published science from the National Institutes of Health’s National Toxicology Program: a meta-analysis, or systematic review of *existing* epidemiological studies on fluoride exposure’s potential cognitive impacts on children.

The new science is what a federal judge recently relied upon in his ruling in favor of an anti-fluoridation coalition, which sued the Environmental Protection Agency back in 2017. Now, the EPA must reevaluate its current maximum standards for fluoride and the science behind those standards, per the ruling.

The ruling also took issue with the EPA’s current safety margin for fluoride. In its risk assessment process for chemicals, the EPA establishes a safety margin: a gap between each chemical’s maximum exposure level and hazard level, meaning the point at which known risks appear. The agency’s default safety margin is typically ten, meaning the chemical is assigned a maximum exposure level ten times lower than the hazard level.

For fluoride, though, the safety margin is only twice as high as the recommended drinking water level, 0.7 ppm. At the same time, NTP has found fluoride levels of 1.5 ppm — about twice the recommended amount of fluoride — to have some associations with negative cognitive outcomes.



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Dr. Justin Lieneck, a dentist based in Rockledge, said at a recent Melbourne City Council meeting that he supports community water fluoridation. "Correlation does not equal causation," Lieneck said, in reference to recent studies showing fluoride exposure is associated with cognitive impacts. "There are so many other chemicals found in our water supply ... You cannot attribute one particular mineral to all of these people's other ailments."

The new science informing the court ruling is compelling but has some limitations. Most of the studies included in the meta-analysis were deemed low-quality (52/74), meaning they had a high risk of bias. Also, the studies didn't all use the same methodology: some measured fluoride concentrations in drinking water, but others measured urine samples. Most of the studies reviewed were from China, and none from the United States.

That said, zooming into the handful of high-quality studies there *were* in NTP's review, almost all of those studies found associations between estimated fluoride exposure in children and either reduced IQ or other types of adverse cognitive or neurodevelopmental outcomes.

Fluoride could be harmful, depending on the amount of fluoride exposure. That meta-analysis found that for every 1.0 ppm increase in urinary fluoride, there is a decrease of 1.63 IQ points in children.

What do — and don't — studies tell us about the harms of fluoride?

Much more research would be necessary to establish whether fluoridated drinking water is a primary *cause* of the cognitive impacts observed by some studies — especially because many other factors are already known to contribute to those cognitive impacts.

One study co-authored by a University of Florida researcher is the first of its kind in the U.S. to examine how prenatal fluoride exposure might impact child neurobehavior, according to Assistant Professor of Epidemiology Ashley Malin. The study's findings are

consistent with those from similar studies based in Canada and Mexico.

"We found that higher exposure to fluoride during pregnancy was associated with more neurobehavioral problems in the children by age three," Malin said.

Malin's MADRES study found prenatal fluoride exposures of 1.2 ppm and above were associated with an increased risk of neurobehavioral problems, including ADHD. It did not consider IQ levels.



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Melbourne Mayor Paul Alfrey, center, called for the recent Council discussion on community water fluoridation, prefacing it with his own thoughts: "I think we should cease this practice immediately," Alfrey said. Council members ultimately voted 6-1 that night to stop adding fluoride to the water.

How much fluoride are we actually adding to water? What are we talking about here?

The Department of Health and Human Services recommends a 0.7 ppm concentration of fluoride for drinking water, which is what water utilities will typically add.

Meanwhile, the EPA's enforceable limit for fluoride is 4.0 ppm, meaning that's the maximum amount allowed in public water systems. The EPA also requires systems to notify customers if average fluoride in water levels exceed 2.0 ppm.

With developments in dentistry over the years, is fluoridation still necessary?

Most dentists say yes.

Cavities are a big deal. They're infections that lead straight to the bloodstream. Studies show that in extreme cases, cavities can cause cardiac arrest, heart disease, or even a stroke.

"Fluoridated water will slow (cavities) down," said Dr. Johnny Johnson, president of the American Fluoridation Society and a pediatric dentist. "You will have a lot less cavities and less severe cavities. And through what you're doing, good hygiene, having fluoride in your water, using a fluoridated toothpaste, those are complementary."

Fluoridated water reduces cavities by 25% in children and adults, according to the Centers for Disease Control and Prevention. Studies have also shown schoolchildren living in fluoridated communities have fewer decayed teeth compared to similar children in non-fluoridated communities.

According to the CDC, fluoridation is the most cost-effective way of supplying dental care across all communities regardless of age, education, and income levels.



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Sharing her fluoride concerns at a recent Melbourne City Council meeting, Maija Hahn said in her 29 years of working as an autism specialist, she's learned how vulnerable the special population is to toxins. And her own family's experiences also inform Hahn's perspective: "I come from a dental family; my husband's a dentist. We believed in fluoride," Hahn said. "Our children have fluorosis. Our children also have neurological disabilities."

What the new science does say:

A "statistically significant association between higher fluoride exposure and lower children's IQ scores, showing that the more fluoride a child is exposed to, the more likely that child's IQ will be lower than if they were not exposed," is perhaps the most compelling finding from the meta-analysis by the National Toxicology Program, published in JAMA Pediatrics.

The authors wrote their review finds, "with moderate confidence, that higher estimated fluoride exposures" — specifically, at concentrations above 1.5 ppm — "are consistently associated with lower IQ in children." (Remember, 0.7 ppm is the recommended level for drinking water in the U.S.)

What it doesn't say:

The meta-analysis is definitive in that its findings are not definitive on fluoride's impacts: "More studies are needed to fully understand the potential for lower fluoride exposure to affect children's IQ."

And it's key to remember, the associations found by the studies were at concentrations well above the currently recommended 0.7 ppm for drinking water in the United States. "There were not enough data to determine if 0.7 mg/L of fluoride exposure in drinking water affected children's IQ," according to JAMA's meta-analysis.

Also, "there were few studies, and therefore uncertainty, in the relationship below 1.5 mg/L when fluoride was measured only in drinking water." Remember, the studies were based in a mix of two different approaches: they measured fluoride concentrations in either urine or drinking water.

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