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TOXIC EXPOSURES

Babies Whose Mothers Drank Fluoridated Water During Pregnancy Scored Lower in Problem-Solving

A major Columbia University study of more than 2,500 children found that prenatal exposure to fluoridated water at levels close to current U.S. recommendations was linked to lower scores on tests that measure their ability to think logically and solve problems in new situations. The effects were most pronounced in children assessed before age 7.

by **Brenda Baletti, Ph.D.**

SEPTEMBER 3, 2026

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Babies whose mothers drank fluoridated water during pregnancy at and slightly below concentrations currently recommended by U.S. public health agencies scored lower on tests that measure fluid cognition — the ability to think logically and solve problems in new situations.

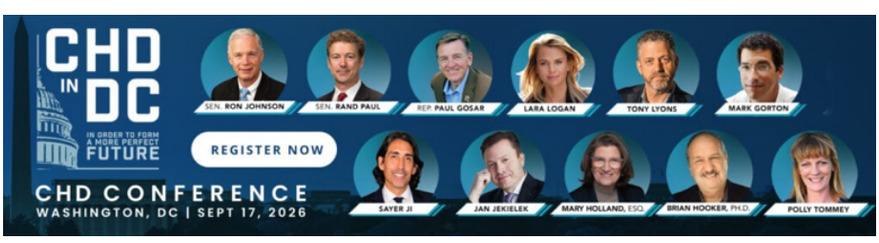
Fluid cognition is considered the "**cornerstone of human cognition**, both during development and in adulthood."

A **new study** led by Columbia University researchers found that prenatal fluoride exposure resulted in reduced fluid cognition at levels as low as 0.675 milligrams per liter (mg/L).

That's slightly below the U.S. Public Health Service's recommended concentration of 0.7 mg/L for **fluoridated drinking water** and far below the U.S. Environmental Protection Agency's (EPA) maximum contaminant level of 4 mg/L and the World Health Organization's guideline of 1.5 mg/L, according to the study.

The study, funded by the National Institutes of Health (NIH) and accepted for publication in the **American Journal of Epidemiology**, analyzed outcomes among 2,514 children born between 2006 and 2019 at 17 sites spanning 23 U.S. states that are part of the Environmental influences on Child Health Cohort (**ECHO**).

The authors concluded that more research is needed to identify the risky prenatal, postnatal and childhood window when **fluoride exposure** can harm cognitive development.



Higher fluoride linked to lower fluid cognition

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To estimate prenatal water fluoride exposure, the researchers linked publicly available drinking water fluoride measurements to residential address information collected during pregnancy. The study focused only on fluoride from drinking water and did not account for any other sources.

The researchers then compared estimated fluoride intake with children's cognitive abilities, evaluated using the **NIH Toolbox Cognition Battery**.

Researchers separately examined "fluid cognition," which included measures of cognitive flexibility, inhibitory control, attention and memory, and "crystallized cognition," assessed through a vocabulary test.

Crystallized cognition is "the breadth and depth of knowledge, vocabulary, and verbal skill a person has acquired through education, experience, and cultural exposure — what has been learned and can be retrieved and applied later."

The children whose mothers were exposed to higher fluoride levels during pregnancy tended to score lower on the fluid cognition tests.

They found children's cognition was affected when mothers were exposed to water fluoride levels at and above 0.675 mg/L, or 675 micrograms per liter. That's below the federally recommended level for water fluoridation.

They also found that every 500 microgram-per-liter increase in water fluoride was linked to an average 3.36-point drop in IQ.

The outcomes were substantially worse among children whose cognitive abilities were assessed before age 7. Their IQ scores dropped up to 13.5 points for the same increase in water fluoride content.

The researchers cautioned, however, that the apparent difference by age requires further study.

"This study adds to a large body of work that looks at how early exposure to environmental contaminants may be associated with the development of the thinking and learning processes that are important for children's developmental outcomes," co-senior author Amy Margolis, Ph.D., of The Ohio State University College of Medicine said in a **Columbia University press release** about the study.

"Continuing to study fluoride and other exposures will be integral in best supporting children's environmental health and well-being."

Malin and Thiessen both noted that a limitation of the study was that they didn't measure individual fluoride intake. Because intake can vary across individuals, failure to measure individual exposure can lead to exposure misclassification.

"Despite this, the authors still observed quite sizable associations between prenatal public water fluoride exposure and child fluid cognition, particularly for children younger than 7," Malin said.

"Nevertheless, true associations between prenatal fluoride exposure and child cognition may in fact be larger than what this study was able to detect," she added. "Future individual-level research will be needed to further investigate that question."

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Findings add to evidence in contested court ruling

Water fluoridation in the U.S. has been a political flashpoint since a **landmark 2024 federal court ruling** concluded that current levels of fluoride added to water at 0.7 mg/L posed a risk to children's health. The ruling directed the EPA to regulate the chemical under the **Toxic Substances Control Act**.

The ruling was largely based on the federal **National Toxicology Program**'s (NTP) six-year assessment of all existing literature on fluoride and neurotoxicity, along with testimony from leading experts at top universities across the world who study the issue.

The NTP concluded that water fluoridation at 1.5 mg/L was linked to lower IQ in children. It also found that people exposed to water fluoridation below 1.5 mg/L could have high fluoride levels in their systems, in part because people can be exposed to fluoride from other sources and/or may drink different amounts of water.

The NTP researchers said their findings about water fluoridation and neurotoxicity were based on studies of water fluoridation at or above current U.S. fluoridation levels.

The groups that sued the EPA also argued that EPA regulations for other toxic chemicals don't allow exposure at known toxicity levels. For other chemicals, exposure is allowed only at levels that are at least 10 times the known toxic exposure level to ensure safety.

An appeals court later **overturned the fluoride verdict** on a procedural issue, but the court did not disagree with the lower court ruling that fluoridation at current levels poses an unreasonable risk to human **health**.

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The **American Dental Association**, **mainstream media** and others have attempted to publicly discount the NTP's findings, arguing that its data were weak at current levels, or that studies showing the neurological effects of water fluoridation happened in other countries that weren't similar to the U.S.

The new Columbia University study — conducted in the U.S. at current fluoridation levels — confirmed the NTP's conclusions and offered findings in line with other recent studies in the U.S.

Ashley Malin, Ph.D., assistant professor of epidemiology at the University of Florida's College of Medicine, and lead author of a U.S. study that linked **fluoride exposure during pregnancy to neurobehavioral problems** in children, told **The Defender** that the Columbia University study is "significant" because it includes a relatively recent cohort of children from multiple U.S. states.

She said the findings were consistent with other major cohort studies in Mexico and Canada that observed an inverse association between early life fluoride exposure and non-verbal IQ.

Kathleen Thiessen, Ph.D., who co-authored the 2006 **National Research Council study on fluoride toxicity**, also said the study was consistent with many recent findings.

"Importantly, they see an adverse effect at lower levels of water fluoride than many previous studies have used, and these are U.S. children," she said.

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Brenda Baletti, Ph.D.
Brenda Baletti, Ph.D., is a senior reporter for The Defender. She wrote and taught about capitalism and politics for 10 years in the writing program at Duke University. She holds a Ph.D. in human geography from the University of North Carolina at Chapel Hill and a master's from the University of Texas at Austin.

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BarbaraCharis
4 days ago

Amazing! The National Institute of Health (NIH) states the damage that fluoride is doing to lower children"s IQs, inhibitory control, attention, memory, etc. However, the truth of the matter is,: the toxic substances in drugs and vaccines...do the same thing and more to children's brain in the more than 70 injections they are receiving now. These shots contain Items like aluminum sulfate, thimerosal (mercury), polysorbate80, formaldehyde, carbolic acid, ethanol, neomycin, detergent, msg, etc. When the only things, which belong in the bloodstream are nutrients from healthy food...these items are going to break down the organs, glands and every cell. Contact your Representatives; Tell them, It is time to rescind The National Childhood Vaccine Injury Act of 1986, which removed the vaccine manufacturers liability for injuries and deaths. Taxpayers have been paying all the bills for injuries and deaths for too long, while the industry simply raked in the bucks.

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Beatrice → BarbaraCharis
3 days ago

I would need to look at the study to form any opinion but based on the article, it seems ridiculous to single out fluoride while many other threats to cognition exist. The use of technology from an early age also affects cognition, comprehension, social and verbal skills. As you point out, poor nutrition, drugs and vaccines also contribute. My goodness, how would anyone design a study in this toxic stew we are living in?

2 0 Reply Share ›

BarbaraCharis → Beatrice
3 days ago

I f people want to be healthy, they have to work on the project themselves. I don't depend on anyone else, because the right information is hard to find. Most doctors aren't shining examples of health. One has to look for people who are healthy...and follow their example. In 1980, I met the healthiest 50 year old man I had ever seen. He looked no older than 30. He had all his hair, no gray, no glasses and he had a 28" waist. He liked to enter physique contests...and he would beat out 20 to 30 year olds. His health was excellent...and i found out that he followed Dr Norman Walker's information, since he was 16 years old. Dr. Walker is the author of 10 books on health.

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Beatrice → BarbaraCharis
3 days ago

I agree. The number of deaths resulting from recent hospital procedures/surgeries is terribly frightening. Look at what happened in TN recently to those patients who are now paralyzed. Another woman's 49 year old daughter died from gall bladder surgery and the details revealing the profit driven negligence is unbelievable. Those are just two stories that should frighten anyone enough to avoid doctors if they value their own life. People want and need to believe that technology has improved the quality of services we receive but I don't agree with that at all. I think it has created learned helplessness and made people lazy minded- including doctors.

1 0 Reply Share ›

BarbaraCharis → Beatrice
3 days ago

You've got it right! People need to realize that prevention is best...Don't get sick and put your life into jeopardy with the health-lowering treatment in the staph-riddled hospital..It would be the last place I would want to go

1 0 Reply Share ›

Beatrice → BarbaraCharis
3 days ago

My sophomore year in college, my microbiology professor from MIT told the class that the most dangerous place on earth is a hospital and that antibiotics would lead to human extinction. I never forgot her warnings!

1 0 Reply Share ›

BarbaraCharis → Beatrice
2 days ago

When I have visited friends and family in hospitals, it sure turned me off hospitals. I went to see a dear older woman who I had known for 50 years, after she had serious heart surgery. While I was there, her dinner arrived...an aluminum wrapped item that looked like a burrito. Another time, when I went to see another friend, she was served mashed potatoes, gravy and one small chicken leg. Registered Dietitians in hospitals have studied dietary information coming from food industry research designed to sell products. Processed, cooked food has calories, but little nourishment. This is responsible for the weight problems of many Americans.. A craving for more food as there are no nutrients in the food they eat. When people eat food with nutrients, they are satisfied and don't crave more. It took me years to learn, before I was happy with what i weighed.

0 0 Reply Share ›

Beatrice → BarbaraCharis
2 days ago

This morning I watched a couple of British health videos from the 50's. They showed school children playing with two of them being obese and pointed this out to the viewer. They showed an over-doting mother giving her children tons of pastries, cookies, cakes along side of a hearty Shepherd's pie. The son was obese and left the table to turn on the TV and then opened a soda pop. I'm sure you get the point. But I did find it interesting how the British were very concerned about sugar consumption in those days. Maybe the US was too??? The title of that film was something like Friendly Hate (a toxic mother over feeding her children with poison).
Yes, real, non-processed foods are the way to go. I even make my own butter and mayonnaise because I'm tired of needing to read the teeny tiny labels. My butter doesn't have a label :D

1 0 Reply Share ›

Guillermou → BarbaraCharis
3 days ago

Yes, Barbara, real poisons. Also: Fluoride is a very reactive ion and can interact with chlorine under certain conditions. For example, in the presence of moisture, chlorine gas can react with fluoride ions to form chlorine fluoride (ClF), which is a pale yellow, highly reactive, and toxic gas. We know that both chlorine and fluoride can be dangerous.
Chlorine trifluoride is a colorless, toxic, corrosive, and extremely reactive gas used in industrial cleaning and pickling operations in the semiconductor industry, in the processing of nuclear reactor fuel, and other industrial operations. [The reaction with various metals gives chlorides and fluorides; with phosphorus it produces phosphorus trichloride (PCl3) and phosphorus pentafluoride (PF5), and with sulfur it gives sulfur dichloride (SCl2) and sulfur tetrafluoride (SF4).]
Chlorine dioxide (ClF3) also reacts explosively with water, oxidizing it to produce oxygen or, in controlled amounts, oxygen difluoride (OF2), as well as hydrogen fluoride and hydrogen chloride. Metal oxides react to form metal halides and oxygen or oxygen difluoride.
Hypochlorite (ClO_2) is commonly found in treated water. In swimming pools, it is usually introduced as calcium hypochlorite in solid form. After slowly dissolving in water, it releases a solution containing calcium ions (calcium ions) and hypochlorite anions (ClO_2). The anions are oxidizing agents that react with any oxidizable substance present in the water, such as ammonia, bacteria, and pigments. Household bleach is typically a dilute aqueous solution of sodium hypochlorite.

see more

2 0 Reply Share ›

Beatrice → Guillermou
3 days ago

It's important to use a shower filter because of those toxic gases produced while showering. However, recent changes in these filters have reduced flow rates of water that can be extremely annoying!

2 0 Reply Share ›

BarbaraCharis → Beatrice
3 days ago

I used to have a filter, but we got s whole house filtering system now..

1 0 Reply Share ›

Beatrice → BarbaraCharis
3 days ago

whole house is always better but nonetheless, a shower filter is important due to those toxic gases in such a small closed and humid space.

0 0 Reply Share ›

Guillermou → Beatrice
3 days ago

EWG recommends reverse osmosis systems for targeted protection. Installed under the sink, these systems remove a wide range of harmful chemicals by forcing water through a semipermeable membrane and several layers of pre-filtration. Most certified systems can reduce arsenic and nitrate to levels well below recommended health limits, and many also remove hexavalent chromium.
EWG's water filter guide
https://www.ewg.org/tapwater/water-filter-guide.php

• More than 100 million Americans receive tap water with arsenic, nitrate, or chromium-6 at levels exceeding established health safety limits. These chemicals increase the risk of cancer and other diseases.
• These three major contaminants often coexist in groundwater and surface water, especially in states like California, Arizona, and Texas, with high levels of agricultural and industrial activity.
• A study by the Environmental Working Group (EWG) found that filtering arsenic, nitrate, and chromium-6 could help prevent more than 50,000 cancer cases linked to long-term exposure through drinking water.
One of the most effective ways to reduce exposure to water contaminants is to install a whole-house filtration system, ideally combined with a reverse osmosis unit at key taps.
Invest in a high-quality filtration system to reduce your exposure. **-See the link: Filtering Multiple Tap Water Contaminants Could Prevent Over 50,000 Cancer Cases**
https://articles.mercola.com/sites/articles/archive/2025/08/07/tap-water-contaminants-cancer-risk.aspx

0 0 Reply Share ›

Guillermou
4 days ago

FROM ITS INCEPTION, THE FLUORIDATION MOVEMENT WAS SHAPED BY POLITICS AND INDUSTRY INTERESTS. The fluoride used in drinking water is not a purified drug, but an industrial byproduct of the aluminum and phosphate fertilizer industries. It is such a toxic industrial waste that it cannot be discharged into the soil or rivers. At certain concentrations, fluoride is more poisonous than arsenic.
Fluoridation has always been shrouded in the specter of a grand experiment. Entire populations have been exposed to this chemical without their consent. There has rarely been transparency regarding the dosage received and the potential adverse health effects.

Today, a growing number of scientific studies published in peer-reviewed journals link fluoride exposure to serious risks, including ADHD and decreased IQ in children, thyroid and endocrine dysfunction, bone damage, skeletal fluorosis, and other chronic conditions. One would think that this evidence alone should have been enough to halt fluoridation.
Many scientists opposed water fluoridation, but their warnings were silenced by the powerful influence of the medical community and a media committed to and hostile to dissent. **Prenatal fluoride exposure was correlated with increased ADHD symptoms and reduced cognitive performance in three- to four-year-old children, linked to higher levels of fluoride in maternal urine. Another study of Indian children with higher concentrations of fluoride in their urine showed reduced memory and learning performance.**
https://prod-ms-be.lib.mcmaster.ca/server/api/core/bitstreams/ceccac92-0e81-4369-9ff3-

see more

4 0 Reply Share ›

holisticpoet → Guillermou
4 days ago

The sad part is that even if those who perpetuated the use of fluoride did not know the effects of fluoride when they started adding it to the drinking water, they do now and continue to do all they can to keep the population drinking it. How does anyone who understands this look on those who are determining the protocol of adding fluoride to the water as being human? These people are monsters who must be reckoned with if we are going to live a life up to our potential.

5 0 Reply Share ›

Guillermou → holisticpoet
3 days ago edited

Yes, we will all end up poisoned, while the corrupt enjoy nature on a paradise island bought with the money of those who suffer illness and death. To the costs of treating water fluoride, we must add other, even higher expenses: those of treating the diseases it causes. Suffering and wasting taxpayers' money are two shameful realities.
IN FACT, FLUORIDE CAUSES MORE CANCER DEATHS IN HUMANS, AND CAUSES THEM MORE RAPIDLY, THAN ANY OTHER CHEMICAL.. Dr. Dean Burk, PhD. (34 years at the National Cancer Institute)
But Edward Bernays, Sigmund Freud's nephew, who helped introduce smoking to women on behalf of the American Tobacco Company, had a fascinating idea: to promote fluoride as a remedy for cavities by injecting it into drinking water. And just as Bernays got women to smoke with his "liberty torches," he began an aggressive campaign to promote fluoride, thus relieving the phosphate and aluminum industries of damaging lawsuits. Reynolds Aluminum was saved from one of those landmark cases in the 1950s by a fraudulent appeals process, and soon the floodgates opened for fluoride. Thanks to corporate collusion with the military-industrial complex and impressive funding, the government was quick to endorse a practice that hadn't been fully researched or even endorsed by the ADA. Six decades later, however, many American citizens and their communities are willing to argue that this argument isn't about preventing tooth decay, but rather about protecting the lucrative fluoride industry.
"You can get virtually any idea accepted. If doctors are in favor of it, the public is willing to accept it, because a doctor is an authority for most people, regardless of how much they know or don't know..."
http://www.ci.valparaiso.in.us/DocumentCenter/View/3304/FLUORIDE-SUMMARY

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