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Boston Globe
November 25, 1985

How much fluoride is too much?

EPA would boost amount allowed in water; critics see dangers

By David L. Chandler
Globe Staff

(See [photocopy of article](#))

The Environmental Protection Agency has stirred the hornet's nest of fluoridation by seeking to double the maximum allowable amount of the mineral in the nation's water supply - a move that is drawing sharp criticism as a possible health hazard.

"I don't think the law really allows them to do this," says Jackie Warren, a lawyer with the Natural Resources Defense Council, which plans to sue the EPA to stop the change. "They're changing the standard for reasons that have nothing to do with science."

Even the EPA says the change is being made directly in response to pressure from areas that complained about the costs of removing excessive fluoride from their water supplies.

Final hearings on the rule change on Dec. 18 in Washington may side-step the controversy altogether - even though there is a formidable array of opposition, including the EPA's own scientific and legal experts, an advisory panel hired to study the question for the agency and a panel of scientists who examined it for the Surgeon General's office.

While these and other groups favor a much stricter limit, the hearings as now planned will deal only with the costs and technologies involved in meeting the proposed standard - not whether it's a good idea.

At the center of the debate is fluorosis, or fluoride poisoning, which can, all sides agree cause permanent brown stains on the teeth, and in higher doses can cause skeletal changes that sometimes resemble arthritis. No one disputes the fact that these effects occur; disagreements center on how serious the effects are, and how much fluoride it takes to cause these problems.

The American Dental Association, for example, is against any restriction on the amount of fluoride in water. "There's no evidence that fluoride at the levels found in this country causes any health problems," says Lisa Watson, a spokesperson for the ADA. "Fluorosis is a cosmetic effect rather than a health effect."

On the other hand, Robert Carton, a scientist in the toxic substances division of the EPA, says there is evidence showing "you can get crippling skeletal fluorosis" from the amount of fluoride that would be permitted under the proposed rules.

Some of this evidence, ironically, was included in the EPA's own report on the proposed change, published in the Federal Register on Nov. 14, which stated: "The EPA agrees with the Surgeon General that crippling fluorosis is an adverse health effect that results from an intake of fluoride of 20 milligrams a day." Elsewhere in the same report, the EPA cites a study of water consumption showing that at least 1 percent of the population would get that much fluoride from water that meets the proposed fluoride limit.

"This whole thing is politics," says Carton. "You're not talking science at all." He contends that passage of the more lenient standard would damage the agency's reputation. As president of the union representing the agency's professional staff, he detailed his objections in a letter sent last week to EPA administrator Lee Thomas.

"There's in my mind, almost a suppression of science going on," adds Warren of the Natural Resources Defense Council, who is also a member of the EPA's advisory council on drinking water standards. She says that "I've never seen scientific evidence discounted and refused to be looked at the way they're doing with fluoride."

First described in 1902

Fluorosis was first described in 1902 by Colorado Springs dentist Frederick McKay, who noticed poermanent dark markings on the teeth of some of his patients. He also noticed that these patients seemed

to have fewer cavities than others.

It took decades to establish that the cause of both effects was a high concentration of fluoride that occurred naturally in the local drinking water. But in those initial observations McKay had already seen both the benefits and the dangers of the two-edged sword of fluoridated water.

Ever since the mid-1940s, when the US Public Health Service began to recommend the addition of fluoride to public water supplies as a decay-preventing measure, that policy has aroused both passionate advocacy and fierce opposition.

But many studies over the years have confirmed the resulting improvement in dental health. Dr. Daniel Bernstein of Boston University Medical Center has conducted several studies on the effects of fluoride, and says there is a consistent 80 percent reduction in cavities.

The Environmental Protection Agency, paradoxically, both advocates and prohibits fluoride, depending on its concentration.

The agency endorses the chemical additive in the concentrations recommended by the American Dental Assn. - 1 part per million, or ppm, as a way of fostering dental health. But the new regulation would only prohibit concentrations of more than 4 ppm.

Areas such as South Carolina and many parts of the Southwest that have a high natural fluoride level are lobbying hard for the change - South Carolina, in fact, brought suit against the EPA to force the change - since de-fluoridation is a very expensive process. According to federal estimates, in some areas it could cost up to \$110 per person per year to meet the 2 ppm standard recommended by the EPA's advisory council.

Fluoride occurs naturally in virtually all groundwater, in widely varying amounts. Even in areas with the amount recommended by the ADA, a certain percentage of fluorosis will occur. And according to a study reported in the Journal of the American Dental Assn., 20 percent of the population will suffer from "moderate to severe" mottling of teeth in areas with 2.5 ppm of fluoride - just above the present interim EPA standard, but well within the proposed limit.

Surgeon General's report

The EPA justifies the proposed 4 ppm limit by citing a report by the US Surgeon General in 1982, which stated that fluorosis was not an adverse health effect. Critics charge that this is a case of semantics and that mottled teeth can cause severe psychological problems and lowered self-esteem.

And according to many researchers, there are also much more serious health effects likely at such high concentrations. The Environmental Defense Council says the EPA has evidence that water with 4 ppm of fluoride, which would meet the proposed standard, has led to skeletal fluorosis.

Many experts point out that the net effect of multiple sources of fluoride - water, food and drink, anticavity toothpaste or rinse, even air pollution from such industries as aluminum smelting - is that the limits should be lowered rather than raised.

Carton says that much more research is needed, and the ADA does not dispute that: "I'd never say that there's enough research about anything," ADA spokesperson Watson says.

Warren puts it more emphatically, saying: "It's not in the public interest at all for possible adverse health effects to be swept under the rug and not looked at."

See also:

- [Natural Resources Defense Council Lawsuit Against EPA](#)
- [Natural Resources Defense Council Legal Brief \(2\)](#) (pdf file) - September 1986
- [Natural Resources Defense Council Legal Brief \(1\)](#) (pdf file) - April 1986
- [EPA Headquarters Union Amicus Brief](#) (pdf file) - September 1986

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