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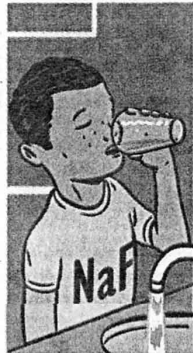
By SHARON BEGLEY

Fluoridation, Cancer:  
Did Researchers Ask  
The Right Questions?

WHEN HEALTH OFFICIALS decided to add fluoride to the water supply of Grand Rapids, Mich., in 1945, they plunged ahead despite the lack of a rigorous, large-scale study of the risks and benefits. And for most of the next 60 years, fluoridation research has gone pretty much like that. It has not been science's finest hour.

Questions about fluoridation have returned with renewed vigor because of allegations of scientific misconduct against a prominent researcher at the Harvard School of Dental Medicine. The Environmental Working Group, an advocacy organization in Washington, charged last

month that Chester Douglass misrepresented an unpublished study about bone cancer and fluoridated tap water. In written testimony to the National Research Council last year, Dr. Douglass said he had found no evidence that fluoridation increased risk of osteosarcoma, a rare bone cancer. But a 2001 study he cited, and oversaw, found that boys who drink fluoridated water have a greater risk of developing the disease. (Dr. Douglass did not respond to requests for comment.)



Jason Schneider

More interesting than what Dr. Douglass said or didn't say, however, is the study he swept under the rug. It was conducted by one of his doctoral students, Elise Bassin. She started with the same raw data as her mentor—139 people with osteosarcoma and 280 healthy "controls"—but saw a way to improve on it. Since most of the 400 people diagnosed in the U.S. each year with osteosarcoma are kids, and since any ill effect of fluoride would likely come when bones are growing most quickly, she focused on the 91 patients who were under 20.

**HER RESULT:** Among boys drinking water with 30% to 99% of the fluoride levels recommended by the U.S. Centers for Disease Control and Prevention, the risk of osteosarcoma was estimated to be five times as great as among boys drinking nonfluoridated water. At 100% or more, the risk was an estimated seven times as high. The association was greatest for boys six to eight.

To be sure, one study proves nothing. Moreover, Dr. Bassin hasn't published her core findings (though in 2004 she and colleagues published a description of their methodologies). As Boston University epidemiologist Richard Clapp says, "Peer review picks up things that even doctoral students at Harvard might miss."

So I asked scientists to read the study. BU's Kenneth Rothman, founding editor of the journal *Epidemiology*, called it "of publishable quality." Zeroing in on young patients, he said, was good science: "If there were an adverse effect of fluoride, it's possible an effect of early exposure would be manifest in the first 20 years of life—but not after." Looking at all ages, in other words, could conceal any link between fluoridation and cancer.

Besides focusing on kids, Dr. Bassin and her colleagues found out where each cancer patient ever lived, and what kind of water they drank when. Other studies have just noted what water a patient was drinking at the time of diagnosis. The problem with that is, you risk classifying someone as drinking nonfluoridated water who in fact drank fluoridated water when it mattered—in childhood. The result is that the osteosarcoma

rates of people drinking fluoridated water might look no different from those of people drinking nonfluoridated. "She did great shoe-leather epidemiology," says William Maas, head of oral health at the CDC and a supporter of fluoridation.

**P**REVIOUS STUDIES have been contradictory. A 1991 animal study by the National Toxicology Program concluded that fluoride might raise the risk of osteosarcoma, but only in male rats, not female. Also in 1991, a scientist at the National Cancer Institute found an "unexplained increase" in osteosarcoma in men under 20 in fluoridated communities. Most human studies, though, provide "no credible evidence for an association between fluoride in drinking water and the risk of cancer," said a 1993 NRC report.

But when you look carefully at the negative studies, you have to wonder. Some investigated a link to all cancers; because osteosarcoma is rare, an increase would be unlikely to show up in that vast sea. Other studies were tiny, or included adults as old as 84, which would wash out effects that target kids. Most categorized osteosarcoma patients as drinking fluoridated or nonfluoridated water based on where they lived at diagnosis, not as kids. Concerned about such lapses, the NRC report called the studies "of limited sensitivity."

Even if fluoridation causes just a few hundred cases of osteosarcoma every year, does the public health benefit justify that risk? "When we started fluoridating water, we thought to get the benefits it would have to get incorporated into the enamel before the tooth erupted," which happens only if you swallow it, says the CDC's Dr. Maas. But that turns out not to be so. Topical fluoride, as in gels and toothpaste, works at least as well.

Most proponents now say fluoridation cuts the rate of tooth decay 18% to 25%. How much is that? Less than one tooth surface. "The absolute impact of 18% or even 25% is low," says Steven Levy of the University of Iowa, who supports fluoridation.

The next authoritative report on fluoridation will be the NRC's. One scientist close to the committee thinks it may be released this fall, months later than expected. "We thought this

was going to be routine," he says. "It wasn't." With fluoridation, it seldom is.

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