

The Fluoride Debate

A Response to
the American Dental Association's Booklet
Fluoridation Facts

*Compiled by Anita Shattuck
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the American Dental Association's Booklet *Fluoridation Facts***

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WELCOME TO THE FLUORIDE DEBATE

In this booklet, *The Fluoride Debate*, we have juxtaposed the arguments presented by the American Dental Association (ADA) with comments from many of the independent scientists who have examined the issue with an open mind. We believe that if people take the time to read and study both sides of the fluoridation debate — especially the science that has emerged over the last ten years — they will be appalled by the practice of putting this known toxic substance into the public drinking water. The benefits have been wildly exaggerated and the risks have been downplayed.

Behind the scenes many dentists acknowledge this situation but the ADA maintains such a stranglehold on the profession that it is dangerous for them to become openly critical of the practice of fluoridation. Even though the ADA is an association, not a governmental agency, it has a great deal of influence on dental matters through its lobbyists in Washington, D.C., and the almost universal and dominant presence of its members on State Dental Boards. These Boards have the power to remove a license from a practicing dentist in the state, and thus can keep dentists "in line" on controversial issues like fluoridation.

We hope that this website will encourage more dentists to break ranks with the ADA and rescue this profession from its short-sighted promotion of this dangerous, unethical and unnecessary practice.

THIS BOOKLET CONTAINS EVIDENCE THAT ...

- Fluoridation is not about "children's teeth". Rather, it is about industry ridding itself of crude hazardous waste products, silicofluorides, for a profit. Silicofluorides are 85 times more toxic than naturally-occurring calcium fluoride.
- Fluoride is more toxic than lead and like lead in minute doses, accumulates in and can be damaging to brain/mind development of children, producing abnormal behavior in animals and reducing IQ in humans, especially in conjunction with deficiencies of key nutrients such as calcium, iodine and vitamins. It can also contribute to many disease processes. Because it is almost as toxic as arsenic, fluoride's ability to play havoc in the human body should surprise no one.
- There is as much, or more, dental decay in fluoridated communities as there is in the non-fluoridated areas; however, the dental costs are higher in fluoridated communities due to [dental fluorosis](#). Drinking fluoridated water may delay decay, but it does not prevent it.
- Dental fluorosis is not simply a "cosmetic effect". Dental fluorosis is the first visible sign of fluoride poisoning. Today there is an increased prevalence of dental fluorosis, ranging from about 15% to 65% in fluoridated areas and 5% to 40% in non-fluoridated areas in North America.
- Environmental Protection Agency (EPA) scientists, after studying all the evidence, concluded that the public water supply should not be used "as a vehicle for disseminating this toxic and prophylactically useless ... substance."
- The Food and Drug Administration (FDA) states that fluoride is not a mineral nutrient; it is a prescription drug. Every prescription drug has side-effects, including fluoride. Fluoride has never received FDA approval and does not meet the legal requirements of safety and effectiveness necessary for such approval. Once this drug is put in the water there is no control over individual dosage.

- The American Dental Association supplement schedule shows that fluoride prescription drugs should not be given to infants under 6 months of age. One cup of water per day for children age 6 months to 3 years matches the supplement controlled dose. Therefore, in fluoridated areas, most children under 3 are getting an overdose of this drug via their drinking water, yet the ADA continues to recommend fluoridation.
- The widespread and uncontrolled use of fluoride in our water, dental products, and foods and beverages (grown and processed in fluoridated communities), is causing pervasive over-exposure to fluoride in the U.S. population. Most developed countries have rejected, stopped, or banned fluoridation because there is no margin of safety.
- Fluoride is not just "one of forty chemicals used to treat water". It is the only chemical added to public drinking water to treat individuals, rather than the water. It is mass medication. This website explains why a good number of leading scientists, doctors, and some dentists are avidly opposed to putting fluoride in our water supply. It also shows that this controversy has existed in the scientific field from the onset.

INTRODUCTION

A Critique of the ADA's Promotion of Fluoridation

Fluoridation is the practice of adding compounds containing fluoride to drinking water to reduce dental decay. In 1945, trials began in three North American cities: Grand Rapids, Michigan; Newburgh, NY and Brantford, Ontario. In 1950, before any of these trials had been completed, mass fluoridation of the public water supplies was enthusiastically endorsed by the United States Public Health Service (USPHS).

Since this time it has received ringing endorsements from successive Surgeon Generals and as recently as October 1999, the Center for Disease Control and Prevention (CDC) described fluoridation as one of the top ten public health achievements of the twentieth century. "Achievements in Public Health, 1900-1999: 'Fluoridation of Drinking Water to Prevent Dental Caries.'" *Mortality and Morbidity Weekly Report*, 48 (41); 933-940, October 22, 1999. (See also a critique of this statement at www.fluoridealert.org).

Approximately 60% of US public drinking water systems are fluoridated. In Europe, where more objective scrutiny of the science has taken place, the practice has almost unanimously been rejected and yet according to statistics collected and published by the World Health Organization (WHO), their children's teeth are just as good, if not better, than those of American children (also see www.whocollab.od.mah.se).

One intriguing and disturbing fact about fluoridation is that over 90% of the agent used in US fluoridation schemes is not pharmaceutical grade sodium fluoride, on which practically all toxicological testing has been performed, but industrial grade hexafluorosilicic acid obtained from the air pollution scrubbing systems of the superphosphate industry (e.g. Cargill Fertilizer). By law, this waste cannot be dumped into the sea but the EPA allows it to be diluted down with our public drinking water. The union representing scientists at the EPA headquarters in Washington, DC has gone on record as opposing this bizarre form of hazardous waste management (See www.fluoridealert.org).

THE ADA'S CRUSADE

For over 50 years the American public has been fed a one-sided diet of inaccurate claims on fluoridation delivered with almost biblical certainty. No organization has done more to promote fluoridation than the American Dental Association (ADA) since they first endorsed the measure in 1950. Ironically, prior to this endorsement they had been very much opposed to the idea. An editorial in the Journal of the American Dental Association in October, 1944 stated:

"We do know that the use of drinking water containing as little as 1.2 to 3.0 parts per million of fluorine will cause such developmental disturbances in bones as osteosclerosis, spondylosis and osteopetrosis, as well as goiter; and we cannot afford to run the risk of producing such serious systemic disturbances in applying what is at present a doubtful procedure"

And they added:

"There is no margin of safety, and that with their present knowledge or lack of knowledge of the chemistry of the subject, the potentialities for harm far outweigh those for good."

The ADA's change of heart in 1950 smacks more of a religious than a scientific conversion, since not one single fluoridation trial had been completed by 1950. Moreover, ADA's promotion ever since smacks more of a religious crusade than a careful and balanced scientific appraisal of the merits and dangers of the practice.

THE ADA BOOKLET

For many years, as part of their "crusade", the ADA has circulated a booklet entitled *Fluoridation Facts*, which gets updated from time to time. This booklet has been very influential. It is circulated to public officials, the media and the general public. To those unfamiliar with the subject it may appear to be a sound scientific defense of fluoridation. To those who are familiar with the literature it reads more like carefully crafted propaganda. In other words, the ADA is not a body that is searching for the truth in this matter, but rather it is an organization whose leadership has endorsed the practice of water fluoridation and their goal is to defend it at all costs. Those costs not only include the health of our children and the bones of the elderly, but the sacrifice of sound scientific reasoning by a professional body and the loss of an individual's rights to informed consent on medical treatment.

The clear message in the ADA text is that fluoridation is grounded in sound scientific research and that those who are opposed to it are "emotional", "fear mongers" and peddlers of "junk science". In their latest booklet they use the phrase "generally accepted scientific knowledge" with slight variations, no less than 20 times in the text. But stating this over and over does not make it true.

Independent scientists who have examined the practice and promotion of fluoridation have been appalled at the poor science involved. For example, Dr. Paul Connett, Professor of Chemistry at St. Lawrence University in Canton, NY, underscores many glaring scientific weaknesses. He lists them as follows:

POOR SCIENCE 1

The early studies conducted in 1945-1955 in the US have been heavily criticized for their poor methodology and poor choice of control communities (De Stefano, 1954; Nessin, 1956; Sutton, 1996).

POOR SCIENCE 2

Once fluoride is in the water it is impossible to control the dose to individuals precisely. A) Some people drink more water than others. B) There are many other sources of fluoride, including: food and beverages processed with fluoridated water; pesticide residues and dental products.

POOR SCIENCE 3

Despite the fact that we are exposed to far more fluoride in 2000 than we were in 1945 (when fluoridation began) the water fluoridation level is still the same 1 ppm, advocated as the optimal level in 1945!

POOR SCIENCE 4

The United States Public Health Service first endorsed fluoridation in 1951, before one single trial had been completed (McClure, 1970)!

POOR SCIENCE 5

The fluoridation program has been very poorly monitored. There has never been a comprehensive analysis of the fluoride levels in the bones of the American people. US Health authorities have no idea how close we are getting to levels that will cause subtle or even serious bone damage.

POOR SCIENCE 6

The Food and Drug Administration (FDA) has never approved the fluoride supplements given to children, which are designed to deliver the same amount of fluoride as fluoridated water (Kelly, 2000).

POOR SCIENCE 7

The chemicals used to fluoridate 90% of water fluoridated in the US are not pharmaceutical grade. Instead, they come from the wet scrubbing systems of the superphosphate fertilizer industry. These chemicals are either hexafluorosilicic acid or its sodium salt. They are contaminated with toxic metals and trace amounts of radioactive isotopes. In other words, the public water supply is being used as a vehicle for hazardous waste management (Glasser, 1999, "It's Pollution, Stupid", www.fluoridealert.org)!

POOR SCIENCE 8

These hazardous wastes have not been tested comprehensively. The chemical usually tested in animal studies is pharmaceutical grade sodium fluoride. The assumption being made is that by the time the waste product used has been diluted, all the hexafluorosilicic acid will have been converted into free fluoride ions and the other toxic and radioactive isotopes will be so dilute that they will cause no harm, even with lifetime exposure. These assumptions have not been examined carefully by scientists, independent of the fluoridation program. (See "50 Reasons to Oppose Fluoridation", www.fluoridealert.org, by Dr. Paul Connett, Professor of Chemistry at St. Lawrence University, Canton, NY).

Some of the earliest opponents of fluoridation were biochemists and at least 14 Nobel Prize winners are among numerous scientists who have expressed their reservations about the practice of fluoridation. Dr. James Sumner, who won the Nobel Prize for his work on enzyme chemistry, had this to say about fluoridation: "We ought to go slowly. Everybody knows fluorine and fluoride are very poisonous substances ... We use them in enzyme chemistry to poison enzymes, those vital agents in the body. That is the reason things are poisoned; because the enzymes are poisoned and that is why animals and plants die."

Last year's (2000) recipient of the Noble Prize for Medicine and Physiology, was Dr. Arvid Carlsson of Sweden. Dr. Carlsson was one of the leading opponents of fluoridation in Sweden and was part of the panel that recommended that the Swedish government reject the practice, which they did in 1971. In her book *The Fluoride Question: Panacea or Poison* Anne-lise Gotzsche quotes Carlsson as follows: "It is not worthwhile to conceal the fact that it is a question of applying a pharmacologically active substance to an entire population" (p.69). Unfortunately, the ADA is not as scrupulous about what it conceals from the American public and its own membership.

HISTORY / ENVIRONMENT

Why would anyone want to put fluoride in the water if it didn't reduce tooth decay? How did this theory get started and who stands to gain by it?

The aluminum, steel and fertilizer industries all produce toxic hazardous waste by-products called silicofluorides, which are much more toxic than lead, almost as toxic as arsenic, and contain some of both. Today, they can only be disposed of in expensive toxic waste dumps. Prior to "fluoridation" these companies spent a fortune disposing of this waste, and paying for damages to livestock and the environment. (See 0-1: "Fluoridation Revisited," by Dr. Murray N. Rothbard, Professor of Economics, University of Nevada, from *The New American*, 12/14/92. Also, see 0-2 and 0-3: copies of various Congressional Records, which speak of the problems that were encountered then, and are still occurring today).

"Alcoa's Vancouver, Washington plant was found guilty of dumping 1,000 to 7,000 pounds of fluoride poison each month into the Columbia River ... The fluoride contaminated the grass and forage and resulted in injury and death to cattle." *Seattle Times*, Dec. 16, 1952.

At Vancouver, disposal of 1,000 to 7,000 pounds of fluoride per month was considered pollution. Yet, if city officials dump as much or more fluoride into municipal water supplies (5,000 pounds a day in San Francisco) it is called a "health measure."

Dr. Edward Groth, III said:

"As a pollutant, fluoride has sufficiently severe effects, and is wide-spread enough, that the American Association for the Advancement of Science named fluoride the third most serious air pollutant in the country, (after SO₂ and ozone) in December 1966. ... Over fifty industries were involved."

"Shortly after the U.S. Public Health Service began promoting the fluoridation of water supplies, they stopped reporting levels of airborne fluorides. ... Perhaps the answer lies in the fact that fluoride is potentially the most expensive pollutant industry has to deal with. ... When industrial plants are required to keep fluoride out of the air, they take the next cheapest route and dump it into the water."

"The question of fluoridation should be carefully evaluated in reference to what is known about fluoride pollution. Fluoride is added to water supplies in amounts far larger than concentrations that are known to be harmful in the air in order to reduce cavities in children's teeth." (See 0-4: "Air Is Fluoridated," Dr. Edward Groth III, former Senior Staff Officer, Environmental Studies Board, National Research Council, Washington D.C.)

F. B. Exner, M.D., F.A.C.R., stated: "The one utterly relentless force behind fluoridation is American 'big industry' and the motive is not profit as such, but fear. Fear of colossal damage suits, and fear that official intervention will begin to mushroom wherever fluoride devastates air, water, soil and all forms of life. Added to this is fear of forfeiting the legally permissible level for dumping fluoride wastes into water supplies which is presently in effect for the specific purpose of accommodating industry." (See 0-5: *Another Fluoride Pollution Bombshell*, Betty G. T. Franklin, Jan. 1968).

"As we approach the close of the first century, history appears to repeat itself, in that environment is again given prominence in the causation of disease involving man's management of the health hazards connected with air pollution, stream pollution, fluoridation (our emphasis) and radiation." Walter L. Bierring, M.D., Past President of American Medical Association, and Director of the State of Iowa Department of Health, *Journal of American Medical Association*, 12/19/59.

Laws controlling the disposal of toxic wastes do not permit the industries creating these fluorides to release them into the environment. However, the "laundering" process of fluoridation allows these same toxins to be spread indiscriminately on lawns and gardens, incorporated into processed foods, and released by the ton into water and air, in sewer effluent and sludge. In other words, their solution to pollution is dilution.

CENSORSHIP

Why would so many health organizations be promoting fluoridation if it were not "safe and effective?"

Follow the Money

After Oscar Ewing, Chief Counsel of the Aluminum Company of America (ALCOA) became head of the United States Public Health Service (USPHS) in 1947, he offered the American Dental Association strong inducements to back fluoridation. To this day the ADA is paid well for endorsements of fluoride products. Grants are awarded to produce studies that will show fluoride is safe. Scientists whose research shows negative effects from fluoride often find it difficult to get their findings published. (See 0-6: "The Difficulty of Research on Fluoridation", Natick Fluoridation Study Committee Report, 9/27/97).

"Dr. Phyllis Mullenix says she lost her job at Harvard's Forsyth (Dental) Research Institute in 1994 after she insisted on publishing research results showing that fluoride adversely affected brain function in test animals. Mullenix had spent 12 years at Forsyth's toxicology department, eleven of them as its chairman." (See 0-7: "Vigorously brushing aside reports of fluoride's dangers," *The Boston Sunday Globe*, Apr. 4, 1999).

"There is clear evidence that promoters have stacked the deck, suppressed evidence, and victimized or smeared those who speak out against the practice" (of fluoridation). (David R. Hill, P.Eng., Professor Emeritus, The University of Calgary, Calgary, Alberta, Canada T2N 1N4, Aug. 1997.) Such tactics would not be necessary if those promoting fluoridation were on secure scientific ground.

"No school, college or independent medical research institution dares to be critical of fluoridation because they receive Public Health research grants. Likewise, no big food, beverage or drug company will dare speak critically of fluoride because they are under the supervision of Food and Drug Administration, a branch of US PHS." (*Fluoridation and Censorship* by H. Petraborg, MD, 9/30/64.)

The USPHS spends millions promoting fluoridation with public funds and have influenced health trade organizations to "come on board" without performing any research of their own. They simply parrot each other's endorsement. Admission that they are mistaken would result in loss of face and legal liability, much like the tobacco industry.

By presenting the results of the original fluoridation experiments incorrectly, the public and many health organizations were led to believe there was a 65% reduction in tooth decay with fluoridation. The Health Department's own statistics, when read correctly, prove that there is only a delay in decay, and that dental bills are actually higher, due to dental fluorosis. (See **Opponent's Response** to [Question 4](#) and [Question 41](#)).

The Washington Bureau editor of *AGD Impact*, the monthly publication of the Academy of General Dentistry, wrote in 1999 that "supporters of fluoridation have had an unwillingness to release any information that would cast fluorides in a negative light," and that organized dentistry "has lost its objectivity — the ability to consider varying viewpoints together with scientific data to reach a sensible conclusion."

According to Section 20 of the *American Dental Association Code of Ethics*, "Dentists' non-participation (in fluoridation promotion) is overt neglect of professional responsibility." In recent years, several dentists who have testified on the anti-fluoridation side have been reprimanded by their state dental officers.

THE FLUORIDE DEBATE

The ADA's *Fluoridation Facts* versus Documented Opposition

In this debate, each question will be presented one at a time, followed by the ADA's short and then long answer, together with their references. The question is then repeated and the Opponent's Response is given along with supporting references. To minimize confusion about who is saying what, you will note that all the ADA comments are given in a special font and references are numbered. The Opponent's Responses are given in regular text, and references are included.

The ADA's choice of questions is not always the best; they repeat themselves, which does make it a bit tiresome in places. They also stray from the topic being discussed, therefore sometimes the Opponent's Response appears to be unrelated to the question at hand, simply due to the need to respond to items addressed in the ADA answers. The ADA's *Fluoridation Facts* can be read online at <http://www.ada.org/consumer/fluoride/facts/ff-menu.html>.

In *The Fluoride Debate*, where the opposition states: "See XXX (a particular document)," it means that part, or all of that document is included in *The Fluoride Debate Documentation* book.

If you would like a copy of both, or either one of these books, they are available in hard copy at just the actual cost of printing, mailing and tax (if California resident).

- *The Fluoride Debate*, 71 pages
- *The Fluoride Debate Documentation*, 201 pages

These books can be ordered by telephoning:
Anita Shattuck, (760) 752-1621.

The Opposition's Response to the ADA's questions has been drawn from a mixture of published scientific data as well as scientific opinion.

BENEFITS

Question 1.

What is fluoride and how does it prevent tooth decay?

ADA's Fluoridation Facts Short Answer

Fluoride is a naturally occurring element that prevents tooth decay systemically when ingested during tooth development and topically when applied to erupted teeth.

ADA's Fluoridation Facts Long Answer

The fluoride ion comes from the element fluorine. Fluorine, the 17th most abundant element in the earth's crust, is a gas and never occurs in its free state in nature. Fluorine exists only in combination with other elements as a fluoride compound. Fluoride compounds are constituents of minerals in rocks and soil. Water passes over rock formations and dissolves the fluoride compounds that are present, creating fluoride ions. The result is that small amounts of soluble fluoride ions are present in all water sources, including the oceans. Fluoride is present to some extent in all foods and beverages, but the concentrations vary widely.¹⁴⁻¹⁶

Simply put, fluoride is obtained in two forms: topical and systemic. Topical fluorides strengthen teeth already present in the mouth. In this method of delivery, fluoride is incorporated into the surface of teeth making them more decay-resistant. Topically applied fluoride provides local protection on the tooth surface. Topical fluorides include toothpaste, mouth rinses and professionally applied fluoride gels and rinses.

Systemic fluorides are those that are ingested into the body and become incorporated into forming tooth structures.

In contrast to topical fluorides, systemic fluorides ingested regularly during the time when teeth are developing are deposited throughout the entire surface and provide longer-lasting protection than those applied topically.¹⁷ Systemic fluorides can also give topical protection because ingested fluoride is present in saliva, which continually bathes the teeth providing a reservoir of fluoride that can be incorporated into the tooth surface to prevent decay. Fluoride also becomes incorporated into dental plaque and facilitates further remineralization.¹⁸ Sources of systemic fluorides include water, dietary fluoride supplements in the forms of tablets, drops or lozenges, and fluoride present in food and beverages.

Researchers have observed fluoride's decay preventive effects through three specific mechanisms:^{19, 20}

1. Fluoride reduces the solubility of enamel in acid by converting hydroxyapatite into less soluble fluorapatite.
2. Fluoride exerts an influence directly on dental plaque by reducing the ability of plaque organisms to produce acid.
3. Fluoride promotes the remineralization or repair of tooth enamel in areas that have been demineralized by acids.

The remineralization effect of fluoride is of prime importance. Fluoride ions in and at the enamel surface result in fortified enamel that is not only more resistant to decay, but enamel that can repair or remineralize early dental decay caused by acids from decay-causing bacteria.^{17, 21-25} Fluoride ions necessary for remineralization are provided by fluoridated water as well as various fluoride products such as toothpaste.

Maximum decay reduction is produced when fluoride is available for incorporation during all stages of tooth formation (systemically) and by topical effect after eruption.

Repeat of Question 1.
What is fluoride and how does it reduce tooth decay?

Opposition's Response

The ADA's answer to the question above leads one to believe that fluoride is something that occurs naturally in water, and that "water fluoridation is the adjustment of the natural fluoride concentration of fluoride-deficient water." One would assume from their statement that some type of natural fluoride is added. This is not the case; only calcium fluoride occurs naturally in water, and it has never been used for fluoridation.

The chemicals used to fluoridate 90% of public drinking water are industrial grade hazardous wastes captured in the air pollution-control scrubber systems of the phosphate fertilizer industry, called silicofluorides. ("Fluorine Recovery in the Fertilizer Industry - A Review," *Phosphorus & Potassium*, No. 103, Sept/Oct 1979.) (Also, see 1-1: "Fluoridation: A Mandate to Dump Toxic Waste in the Name of Public Health", George Glasser, Journalist, St. Petersburg, FL, July 22, 1995.)

These wastes contain a number of toxic contaminants including lead, arsenic, cadmium and even some radioactive isotopes. The phosphate rock mined in Florida for this purpose has also been mined for its uranium content!

If not dumped in our public water supplies, these silicofluorides would have to be neutralized at the highest rated hazardous waste facility at a cost of \$1.40 per gallon. The cost could increase, depending on how much cadmium, lead, uranium, and arsenic are also present. The silicofluorides still contain these heavy metals, and other pollutants, when they are dumped into our water systems. According to Dr. Ludwig Gross, even if these pollutants are so dilute that they meet current regulatory standards, concerns remain about synergistic effects and the toxicity of both the silicofluoride ion and the bare fluoride ion itself.

"The plain fact that fluorine is an insidious poison, harmful, toxic and cumulative in its effects, even when ingested in minimal amount, will remain unchanged no matter how many times it will be repeated in print that fluoridation of water supply is 'safe'." (Dr. Ludwik Gross, Renowned Cancer Research Scientist, in N. Y. Times 3/6/57.)

Journal of the American Medical Association, Sept. 18, 1943, states that fluorides are general protoplasmic poisons — they inhibit enzyme systems, and water containing 1 part per million (ppm) or more fluoride is undesirable. This was the AMA's stand on fluoridation shortly before the U.S. Public Health Service endorsed nationwide fluoridation. (See 1-3).

Fluoride was an industry's menace until Oscar Ewing, an Alcoa Aluminum lawyer, became head of the U.S. Public Health Service in 1947. Alcoa was one of the biggest producers of hazardous fluoride waste at that time. Today, it is the phosphate fertilizer industries.

Under Ewing, the U.S. Public Health Service proceeded to conduct the fluoride experiment on thousands of people without their consent, even though they knew at the time that there was little or no margin of safety between the therapeutic dose and the toxic dose necessary to cause dental fluorosis for children and skeletal fluorosis for lifetime exposure.

Ten years later, by reading the statistics incorrectly they claimed a "65% reduction in tooth decay," and moved on to fluoridate more cities. (See Opponent's Response to [Question 4](#)).

Newburgh and Kingston were two of the original test cities. A recent study by the New York State Department of Health, showed that after nearly 50 years of fluoridation, Newburgh's children have a slightly higher number of cavities than never-fluoridated Kingston. (See 1-5: "New Studies cast doubt on fluoridation benefits," by Bette Hileman, *Chemical & Engineering News*. Vol. 67, No. 19, May 8, 1989).

The chart taken from this study done by Jayanth Kunar, D.D.S., verifies this statement. (See 1-5 A: "Pediatric Dentistry," *NYSJD*, Feb. 1998, pg. 41).

Today there is a great deal of scientific agreement that ingested fluoride does not reduce tooth decay. The largest study of tooth decay in America, by the U.S. National Institute of Dental Research in 1986-1987, showed that there was no significant difference in the decay rates of 39,207 fluoridated, partially fluoridated, and non-fluoridated children, ages 5 to 17, surveyed in the 84-city study. The study cost the U.S. taxpayers \$3,670,000, yet very few Americans are aware the study was ever performed. (See 1-5: "New studies cast doubt on fluoridation benefits." Bette Hileman, *Chemical & Engineering News*, Vol. 67, No. 19, May 8, 1989).

The EPA scientists recently concluded, after reviewing all the evidence, that the public water supply should not be used "as a vehicle for disseminating this toxic and prophylactically useless ... substance." They called for "an immediate halt to the use of the nation's drinking water reservoirs as disposal sites for the toxic waste of the phosphate fertilizer industry." The management of the EPA sides not with their own scientists, but with industry on this issue. (See 1-6: "Why EPA's Headquarters Union of Scientists Opposes Fluoridation", Chapter 280 Vice-President, J. William Hirzy, May 1, 1999).

A 1992 study of dental records for 26,000 children in Tucson, Arizona found that tooth decay increased in children as the natural level of fluoride increased from 0.2 to 0.8 ppm. (See 1-7: *An Analysis of the Causes of Tooth Decay*, Professor Cornelius Steeling, Department of Chemistry, University of Arizona).

Dr. John Colquhoun, Principal Dental Officer, in Auckland, New Zealand's largest city, wrote " ... tooth decay had declined, but there was virtually no difference in tooth decay rates between the fluoridated and non-fluoridated places. Those (statistics) for 1981 showed that in most Health Districts the percentage of 12- and 13-year-old children who were free of tooth decay — that is, had perfect teeth — was greater in the non fluoridated part of the district." (See 1-10: "Why I Changed My Mind About Water Fluoridation," *Perspectives in Biology and Medicine*. 41,1 Autumn 1997, University of Chicago).

In December 1993, a Canadian Dental Association panel concluded that ingested fluoride does not, in fact, prevent tooth decay. (*Canadian Medical Association Journal*, 1993:149.)

Dr. Richard G. Foulkes, a prominent British Columbia physician, while writing a government report in 1973, charges that he was given references which excluded studies already then extant that showed fluoride did not reduce tooth decay and that fluoride causes harm. (See 1-11: "Doctor Who Advocated Fluoridation Now Calls it a Fraud," *Health Freedom News*, July/Aug. 1992).

Boston has been fluoridated since 1978. About 90% of 107 Boston high school students were found to need dental treatment, according to a 1996 unpublished study. That report also estimated that the city's students had four times more untreated cavities than the national average. "City to Launch Battle Against Dental Caries," *Boston Globe*, p. A01, 11/27/99.

There is less tooth decay in the nation as a whole, but decay rates have also dropped in the non-fluoridated areas of the United States, and in Europe where fluoridation of water is rare. The observed world-wide decline in tooth decay over the past four decades has occurred at the same rate in areas that are not fluoridated as in areas that are. (See 1-12: "The Mystery of Declining Tooth Decay", Mark Diesendorf. *Nature*, July 10, 1986, pp. 125-29).

Japan, China, and 98% of Europe have stopped or rejected the addition of fluoride to their public water supplies. ("Special Report," *Chemical and Engineering News*, Aug.1, 1988.)

When the ADA claims that fluoride "prevents tooth decay systemically when ingested during tooth development," it is out of step with most leading dental researchers today who are now admitting that the major benefits of fluoride are accrued topically, not systemically. These authors include: Levine, 1976; Fejerskov, Thylstrup and Larsen, 1981; Carlos, 1983; Featherstone, 1987, 1999, 2000; Margolis and Moreno, 1990; Clark, 1993; Burt, 1994; Shellis and Duckworth, 1994 and Limeback, 1999, 2000.

This point has even been conceded by the Center for Disease Control and Prevention (CDC) in the very same article, which claimed that fluoridation was one of the top ten achievements of the twentieth century.

The CDC states: "Fluoride's caries-preventive properties initially were attributed to changes in enamel during tooth development because of the association between fluoride and cosmetic changes in enamel and a belief that fluoride incorporated into enamel during tooth development would result in a more acid-resistant mineral. However, laboratory and epidemiologic research suggests that fluoride prevents dental caries predominately after eruption of the tooth into the mouth, and its actions primarily are topical for both adults and children." ("Fluoridation of Drinking Water to Prevent Dental Caries," *Achievements in Public Health, 1900-1999*.)

While the CDC acknowledges this point, it does not draw the logical conclusion. If fluoride provides its benefits topically, it makes more sense to apply it in the form of toothpaste, than to put it in the drinking water, where systemic exposure and all the accompanying risks become inevitable. Moreover, by using this method of application, it not only avoids exposing tissues in the body, which do not need fluoride, but it also avoids exposing people who don't want this medication.

Thus the key question both the ADA and the CDC avoid is: Why should we run the risks of exposure of our whole system to fluoride, if the major benefits of fluoride come from topical application?

Question 2.

What is water fluoridation?

ADA's Fluoridation Facts Short Answer

Water fluoridation is the adjustment of the natural fluoride concentration of fluoride-deficient water to the level recommended for optimal dental health.

ADA's Fluoridation Facts Long Answer

Based on extensive research, the United States Public Health Service (USPHS) established the optimum concentration for fluoride in the water in the United States in the range of 0.7 to 1.2 parts per million. This range effectively reduces tooth decay while minimizing the occurrence of dental fluorosis. The optimum level is dependent on the annual average of the maximum daily air temperature in the geographic area.²⁷

One milligram per liter (mg/L) is identical to one part per million (ppm). At 1 ppm, one part of fluoride is diluted in a million parts of water. Large numbers such as a million can be difficult to visualize. While not exact, the following comparisons can be of assistance in comprehending one part per million:

- 1 inch in 16 miles
- 1 minute in 2 year
- 1 cent in \$10,000

**Repeat of Question 2.
What is water fluoridation?**

Opposition's Response

Water fluoridation is the process of adding silicofluorides, or sodium fluoride, to our drinking water. The toxicity chart shows that sodium fluoride is more toxic than lead, and almost as toxic as arsenic. July of 1987, the maximum contaminant level (MCL) allowed in U.S. drinking water for arsenic was 50 parts per billion (ppb), lead was 15 ppb (as of 12/92) and fluoride was recently changed to 4,000 ppb, which is equal to 4ppm. (See 2-1: Is the 1 part per million /L fluoride suggested for water a small amount?, LD50 data., R. E. Gosselin et al, *Clinical Toxicology of Commercial Products*. 5th ed., 1984. Also, "EPA/NSF Standard 60," U.S. EPA Maximum Contaminant Levels (MCL), July 1987).

On December 7, 1992, the new Environment Protection Agency Lead and Copper Rule went into effect. It sets the MCL for lead at 0.015 ppm, with a goal of 0.0 ppm. Fluoride falls into the same high toxicity range as lead, and, like lead, fluoride is an accumulative poison. Nevertheless, the MCL currently set by the Environmental Protection Agency (EPA) (management, not their scientists) for fluoride is now 4.0 ppm — 267 times the permissible lead level. It was changed from 2.0 ppm to 4.0 ppm without any new evidence showing it to be safe at that level. This allowed some water districts to use water supplies that would otherwise be considered too toxic, and allowed fluoridators to claim a greater margin of safety. The ADA states that the "optimum fluoride level" is 1.0 ppm. Even that is 67 times the MCL of lead, and fluoride is the more toxic of the two elements. How could that be considered "a small amount" — or safe?

On May 24, 2000, the EPA proposed stricter rules for arsenic. They wanted to lower the limit on arsenic from 50 ppb to 5 ppb, and environmentalists advocate 3 ppb, saying the agency was accepting unusually high cancer risks if they set it at 5 ppb. (See 2-2: "EPA proposes stricter rules for arsenic levels in water supplies," *San Diego Union Tribune*.)

On Jan. 17, 2001, the EPA ordered that allowable levels of arsenic be reduced by 80%. They had proposed 5 ppb, but settled for 10 ppb. (See 2-3: "EPA Orders Sharp Reduction in Arsenic Levels in Drinking Water," H. Josef Hebert, Associated Press). The EPA's Maximum Contaminant Level Official Goal (MCLG), however, is now 0 ppm for arsenic as well as lead, yet silicofluorides (industrial waste) which contain some of both are still being added to our water supply.

As Michael Connett stated:

"Based upon the National Sanitation Foundation (NSF International) testing data, we can now expect that certain batches of fluoridation chemicals will have arsenic levels that exceed the Maximum Allowable Level of arsenic that a water supplier can add to the water. The NSF admitted as much in its letter to the Florida Department of Health. In its letter, the NSF stated that if the MCL for arsenic was lowered, 'future tests of fluoridation chemicals may result in increased product failures.' As noted above, the NSF has already found samples of fluosilicic acid which add 1.66 parts per billion of arsenic to the water. These samples will now be what the NSF termed 'product failures', i.e., they have too much arsenic in them to add to water."

"The question we now need to ask is: can we rely on the NSF and water treatment companies to detect the "product failures" before they are dumped into our water?"

"The answer: Most likely not."

Since 1992, the NSF has done relatively little testing of fluoridation chemicals. In its letter to the Department of Health, the NSF stated that 'the exact number of laboratory tests performed is not readily available, but these products have been tested more than 100 times.' More than 100 times, however, is barely adequate when

considering the hundreds of thousands of barrels of fluosilicic acid which have been dumped into the water over the past 8 years. (See "Fluoridation & Arsenic: Implications of EPA's New Regulations," Michael Connett, Jan. 19, 2000, www.fluoridealert.org.)

Former Head of EPA's Headquarters Union, Dr. Robert Carton, had this to say about the arsenic/fluoridation issue: "I think the real question is: can anyone knowingly add ANY amount of a carcinogen (to the water supply). The MCL is meant to reduce the amount already existing in the water supply, not to allow more to be added."

The FDA says there is no proof that fluoride is safe or effective, and that it is a drug, not a mineral nutrient. Therefore, water cannot be "fluoride-deficient," as the ADA statement above claims.

Question 3.

Is there a difference in the effectiveness between naturally occurring fluoridated water at optimal fluoride levels and water that has fluoride added to reach the optimal level?

ADA's Fluoridation Facts Short Answer

No. The dental benefits of optimally fluoridated water occur regardless of the fluoride's source.

ADA's Fluoridation Facts Long Answer

Fluoride is present in water as "ions" or electrically charged atoms.²⁷ These ions are the same whether acquired by water as it seeps through rocks and sand or added to the water supply under carefully controlled conditions. When fluoride is added under controlled conditions to fluoride-deficient water, the dental benefits are the same as those obtained from naturally fluoridated water. Fluoridation is merely a supplementation of the naturally occurring fluoride present in all drinking water sources.

Some individuals mistakenly use the term "artificial fluoridation" to imply that the process of water fluoridation is unnatural and that it delivers a foreign substance into a water supply when, in fact, all water sources contain some fluoride. Community water fluoridation is a natural way to improve oral health.²⁸ (Additional discussion on this topic may be found in [Question 32](#).) Prior to the initiation of "adjusted" water fluoridation, several classic epidemiological studies were conducted that compared naturally occurring fluoridated water to fluoride-deficient water. Strikingly low decay rates were found to be associated with the continuous use of water with fluoride content of 1 part per million.⁵

A fluoridation study conducted in the Ontario, Canada, communities of Brantford (optimally fluoridated by adjustment), Stratford (optimally fluoridated naturally) and Sarnia (fluoride-deficient) revealed much lower decay rates in both Brantford and Stratford as compared to nonfluoridated Sarnia. There was no observable difference in decay-reducing effect between the naturally occurring fluoride and adjusted fluoride concentration water supplies, proving that dental benefits were similar regardless of the source of fluoride.²⁹

Repeat of Question 3.

Is there a difference in the effectiveness between naturally occurring fluoridated water at optimal fluoride levels and water that has fluoride added to reach the optimal level?

Opposition's Response

Fluoride, as such, is never added to the water. Only silicofluorides (a hazardous waste containing many toxic pollutants) are used to artificially fluoridate water, and studies have proven that they do not effectively prevent tooth decay, they only delay it. (See opposition's response to [Question 4](#).) Silicofluorides never occur naturally in nature, and they are 85 times more toxic than natural occurring calcium fluoride. Therefore, the effect on the entire body will be different.

This was proven in a study called, "Comparative Toxicity of Fluorine Compounds." After this study was completed, this statement was made: " ... this meant a daily intake of approximately 40 mg/kg of

fluorine from sodium fluoride as compared with 3400 mg/kg from calcium fluoride. Therefore, from the standpoint of lethal concentrations and amount of fluorine necessary to cause growth inhibition, wide differences in toxicity of some of the compounds of fluoride were noted." (See 3-1: *Industrial and Engineering Chemistry*. July 1934, page 797). In other words, industrial waste (sodium fluoride) is 85 times more toxic than natural calcium fluoride. Both of them contain fluoride, but they are totally different compounds. (Also see 3-2).

Calcium is a well-known antidote for fluoride poisoning. When an antidote accompanies a poison, it makes the poison far less toxic to the body. Soft waters to which fluoride is artificially added lack this calcium which is present in most waters that contain natural fluoride.

"The claim that fluoridation is one of 'nature's experiments' is not valid because the salts put into the water supply, sodium fluoride or silicofluorides, are industrial products never found in natural water or in organisms. They are, furthermore, notoriously toxic, sufficiently so to be used as rat poison or insecticide. Calcium fluoride, on the other hand, which is the form commonly found in natural waters, is not toxic enough for such uses." — Dr. C. G. Dobbs, (Ph.D., A.R.C.S.) Bangor, Wales, England.

Question 4.

Is further proof of the effectiveness of water fluoridation needed?

ADA's Fluoridation Facts Short Answer

Overwhelming evidence already exists to prove the effectiveness of water fluoridation.

ADA's Fluoridation Facts Long Answer

The effectiveness of water fluoridation has been documented in scientific literature for well over 50 years. Even before the first community fluoridation program began in 1945, epidemiologic data from the 1930s and 1940s revealed lower decay rates in children consuming naturally occurring fluoridated water compared to children consuming fluoride-deficient water.^{4, 5} Since that time, numerous studies have been done which continue to prove fluoride's effectiveness in decay reduction. Three selected reviews of this work follow.

In 1993, the results of 113 studies in 23 countries were compiled and analyzed.³⁰ (Fifty-nine out of the 113 studies analyzed were conducted in the United States.) This review provided effectiveness data for 66 studies in primary teeth and for 86 studies in permanent teeth. Taken together, the most frequently reported decay reductions observed were:

- 40-49% for primary teeth or baby teeth
- 50-59% for permanent teeth or adult teeth

In a second review of studies conducted from 1976 through 1987,³¹ when data for different age groups were isolated, the decay reduction rates in fluoridated communities were:

- 30-60% in the primary dentition or baby teeth
- 20-40% in the mixed dentition* (aged 8 to 12)
- 15-35% in the permanent dentition or adult teeth (aged 14 to 17)
- 15-35% in the permanent dentition (adults and seniors).

**A mixed dentition is composed of both baby teeth and adult teeth.*

Lastly, a comprehensive analysis of the 50-year history of community water fluoridation in the United States further demonstrated that the inverse relationship between higher fluoride concentration in drinking water and lower levels of dental decay discovered a half-century ago continues to be true today.³²

Additional discussion on this topic may be found in [Question 6](#).

Many well-documented studies have compared the decay rates of children before and after fluoridation in the same community, as well as with children in naturally fluoridated and/or nonfluoridated communities. The earlier studies were conducted at a time when sources of topical fluoride, such as toothpastes, mouthrinses and professionally applied fluoride gels were not available. The results from these early studies were dramatic. Over the years, as sources of topical fluoride became more readily available, the decay reductions observed in these comparative evaluations, although still significant, tapered off. Because of the high geographic mobility of our populations and the widespread use of fluoride toothpastes, supplements and other topical agents, such comparisons are becoming more difficult to conduct.³¹

Nevertheless, recent data continue to demonstrate that decay rates are higher for individuals who reside in nonfluoridated communities than that of individuals living in fluoridated communities.^{30, 33-36} The following paragraphs provide a sample of studies conducted in the subsequent decades on the effectiveness of water fluoridation.

In Grand Rapids, Michigan, the first city in the world to fluoridate its water supply, a 15-year landmark study showed that children who consumed fluoridated water from birth had 50-63% less tooth decay than children who had been examined during the original baseline survey.³⁷

Ten years after fluoridation in Newburgh, New York, 6- to 9-year-olds had 58% less tooth decay than their counterparts in Kingston, New York, which was fluoride-deficient. After 15 years, 13- to 14-year-olds in Newburgh had 70% less decay than the children in Kingston.³⁸

After 14 years of fluoridation in Evanston, Illinois, 14-year-olds had 57% fewer decayed, missing or filled teeth than control groups drinking water low in fluoride.³⁹

In 1983, a study was undertaken in North Wales (Great Britain) to determine if the decay rate of fluoridated Anglesey continued to be lower than that of nonfluoridated Arfon, as had been indicated in a previous survey conducted in 1974. Decay rates of life-long residents in Anglesey aged 5, 12 and 15 were compared with decay rates of similar aged residents in nonfluoridated Arfon. Study results demonstrated that a decline in decay had occurred in both communities since the previous survey in 1974. However, the mean decay rate of the children in fluoridated Anglesey was still 45% lower than that of those living in nonfluoridated Arfon.⁴⁰ These findings indicated a continuing need for fluoridation although decay levels had declined.⁴¹

A controlled study conducted in 1990 demonstrated that average tooth decay experience among school-children who were lifelong residents of communities having low fluoride levels in drinking water was 61-100% higher as compared with tooth decay experience among schoolchildren who were lifelong residents of a community with an optimal level of fluoride in the drinking water.³⁶ In addition, the findings of this study suggest that community water fluoridation still provides significant public health benefits and that dental sealants can play a significant role in preventing tooth decay.

Using data from the dental surveys in 1991-2 and 1993-4, a British study predicted that on average, water fluoridation produces a 44% reduction in tooth decay in 5-year-old children. The study further demonstrated that children in lower socioeconomic groups derive an even greater benefit from water fluoridation with an average 54% reduction in tooth decay. Therefore, children with the greatest dental need benefit the most from water fluoridation.⁴²

In 1993-4, an oral health needs assessment of children in California found that children living in nonfluoridated areas had more tooth decay than those in fluoridated areas.⁴³ Of most concern was the high decay rate affecting young children from low income families. Specifically, children in grades K-3, whose families were lifetime residents of nonfluoridated communities and whose income was below 200% of the Federal Poverty Level, had 39% more decay in their baby teeth when compared to counterparts who were lifetime residents of optimally fluoridated areas.³⁵

**Repeat of Question 4.
Is further proof of the effectiveness of water fluoridation needed?**

Opposition's Response

No, the original studies and many since then have proven that fluoridated water merely delays decay; it does not prevent it.

The belief in fluoride as a tooth decay remedy persists despite the fact that H. Trendley Dean, DDS, its original promoter, admitted 40 years ago under oath, that his data purporting to prove the fluoridation hypothesis were not valid. (H. Trendley Dean: Proceedings, City of Oroville vs. Public Utilities Commission of the State of California, Oroville, California, Oroville, California, October 20-21, 1955.)

From the day the United States Public Health Service (USPHS) completed their original 10-year Newburgh and Kingston (New York) fluoridation experiment, fluoride promoters have repeatedly claimed that fluoride added to drinking water can reduce tooth decay by as much as 60 to 70%. They arrived at that figure by misreading the statistics. This is how they did it:

They ignored the fact that fluoride interferes with proper growth of children's permanent teeth, which causes the teeth to erupt later than normal. Teeth that have not yet erupted cannot decay, therefore, at first (at age 6) the fluoridated Newburgh children had 100% less tooth decay, by age 7 also 100% less, age 8 - 67% less, age 9 - 50% less, and by age 10 - 40% less. Realizing their experiment was going downhill, the USPHS stopped their experiment early, totaled the five reductions shown, then divided by 5 to obtain what they called "an over-all reduction of 70%." Obviously, the only reduction that really counted at that time was the 40% (age 10).

Had the Health Department continued their survey beyond age 10, they would have found that the percentage of reduction continued down hill to 30%, 20%, 0%, and eventually these children had more cavities — not less. The rate of decay is identical, once the children's teeth erupt. (See 4-1: "Fluoridation Benefits — Statistical Illusion." Testimony of Konstantin K. Paluev, Research and Development Engineer, Mar. 6, 1957).

John A. Forst, M.D., a New York public health official, found that after ten years of fluoridation in Newburgh, 63.2% of the school children had decayed teeth compared with fluorine-free Kingston, which had only 41.7% with tooth defects. (See 4-2: statement from John A. Forst, M.D., from The University of the State of New York, Oct. 26, 1954).

Data by Dr. David B. Ast, who was in charge of the fluoridation experiment (Tables, page 319, *Journal American Dental Association*, 1961) shows delay in decay only until age 15. Then Newburgh passes non-fluoridated Kingston in decayed and filled teeth, after 16 years of fluoridation. Newburgh, with a 9% increase in population, added 18% more dentists. Kingston, with 1% increase, dropped 3% of its dentists. (See 4-3: statement and chart).

Journal of American Dental Association (JADA), 1972, 84; 355-367, stated that dentists made 17% more profit in fluoridated areas, as opposed to non-fluoridated areas. There are no cost savings. (See [Cost Effectiveness](#) section).

This "65% less dental decay" is just a statistical illusion. When the Health Department's own statistics are read correctly, they prove that fluoridation merely causes a temporary delay in decay. (See 4-4: *Fluoridation Fallacies — Exposé of Fluoridation Claims Based on Advocates Own Statistics*, by Charles Klint). By ignoring this delay factor, the fluoride promoters have continued reading statistics incorrectly to this day.

The above mentioned 1993-94 California Oral Health Needs Assessment was performed by the Dental Health Foundation (DHF). This foundation was created in 1985 for the sole purpose of promoting statewide fluoridation. As a result, the findings were very biased.

The first-ever independent review of the California Oral Health Needs Assessment of 1993-94 was delivered to the City of Escondido, California, on February 1, 2000. The analysis of the Needs Assessment was performed by the international renowned Senes Oak Ridge Inc., Center for Risk Assessment in Tennessee. (See 4-5: "Review of the California Oral Health Needs Assessment 1993-94," Jan. 31, 2000).

Escondido City Council Member Marie Waldron said the Needs Assessment report was "a classic example of the manipulation of science to prove a case. This study, in effect, compares non-poor children in fluoridated communities, with protective sealants on their teeth, against poor children in Head Start programs in non-fluoridated communities, with no sealants on their teeth."

She went on to say, "This Oral Health Needs Assessment was an intentionally non-published, non peer-reviewed, expensive study that they expected not one of us without a background in science would want to read. So they offered summarizing bullet points and glossy brochures to our Council, and evidently to many others throughout the entire state, as proof that we should convert our precious water supply into a delivery system for special interests, forcing those who cannot afford bottled water to drink industrial-waste fluoride every day of their lives."

The California law to fluoridate was passed on the strength of the final figures of this study, without the DHF ever divulging the details. They claimed that this study proved the children of California desperately needed fluoride in their water. However, it actually proved just the opposite. The study showed that California had only about a quarter as much water fluoridation as the nation as a whole, yet the 15-year-old California children had less tooth decay than the national average. (See 4-6: *San Diego Union Tribune*. Article, Sept. 1, 1999).

Question 5.

What happens if fluoridation is discontinued?

ADA's Fluoridation Facts Short Answer

Dental decay can be expected to increase if water fluoridation in a community is discontinued for one year or more, even if topical products such as fluoride toothpaste and fluoride rinses are widely used.

ADA's Fluoridation Facts Long Answer

The following paragraphs provide a summary of some of the historical studies that have been conducted on the discontinuation of water fluoridation.

Antigo, Wisconsin began water fluoridation in June 1949, and ceased adding fluoride to its water in November 1960. After five and one-half years without optimal levels of fluoride, second-grade children had over 200% more decay, fourth-graders 70% more, and sixth-graders 91% more than those of the same ages in 1960. Residents of Antigo reinstated water fluoridation in October, 1965 on the basis of the severe deterioration of their children's oral health.⁴⁴

Because of a government decision in 1979, fluoridation in the northern Scotland town of Wick was discontinued after eight years. The water was returned to its sub-optimal, naturally occurring fluoride level of 0.02 ppm. Data collected to monitor the oral health of Wick children clearly demonstrated a negative health effect from the discontinuation of water fluoridation. Five years after the cessation of water fluoridation, decay in permanent (adult) teeth had increased 27% and decay in primary (baby) teeth increased 40%. This increase in decay occurred during a period when there had been a reported overall reduction in decay nationally and when fluoride toothpaste had been widely adopted.⁴⁵ These data suggest that decay levels in children can be expected to rise where water fluoridation is interrupted or terminated, even when topical fluoride products are widely used.

In a similar evaluation, the prevalence of decay in 10-year-old children in Stranraer, Scotland, increased after the discontinuation of water fluoridation, resulting in a 115% increase in the mean cost of restorative dental treatment for decay and a 21% increase in the mean cost of all dental treatment. These data support the important role water fluoridation plays in the reduction of dental decay.⁴⁶

A U.S. study of 6- and 7-year-old children who had resided in optimally fluoridated areas and then moved to the nonfluoridated community of Coldwater, Michigan, revealed an 11% increase in decayed, missing or filled tooth surfaces (DMFS) over a 3-year period from the time the children moved. These data reaffirm that relying only on topical forms of fluoride is not an effective or prudent public health practice.^{31, 47} Decay reductions are greatest where water fluoridation is available in addition to topical fluorides, fluoride toothpaste and fluoride rinses.

Finally, a study that reported the relationship between fluoridated water and decay prevalence focused on the city of Galesburg, Illinois, a community whose public water supply contained naturally occurring fluoride at 2.2 ppm.

In 1959, Galesburg switched its community water source to the Mississippi River. This alternative water source provided the citizens of Galesburg a sub-optimal level of fluoride at approximately 0.1 ppm. During the time when the fluoride content was below optimal levels, data revealed a 10% decrease in the number of decay-free 14-year-olds (oldest group observed), and a 38% increase in dental decay. Two years later, in 1961, the water was fluoridated at the recommended level of 1.0 ppm.⁴⁸

Repeat of Question 5. What happens if fluoridation is discontinued?

Opposition's Response

People, animals and plant life will be healthier. (See [Diseases](#) and [History / Environment](#) sections). The ADA (statement above) again gives examples in which they totally ignore the "delay in decay" that occurs due to fluoridation. (See 5-1: *Antigo*, by Harvey Petraborg, M.D., July 14, 1965).

Durham, NC, fluoridated since 1962, had an 11-month cessation of fluoridation between September, 1990, and August, 1991. The purpose of this study was to assess the effects of this break on the development of caries and fluorosis in children."

"It was concluded that while the break had little effect on caries, dental fluorosis is sensitive to even small changes in fluoride exposure from drinking water, and this sensitivity is greater at 1 to 3 years of age than at 4 or 5 years." (J Dent Res 2000 Feb;79(2):761-9, Burt BA, Keels MA, Heller KE, Department of Epidemiology, School of Public Health, University of Michigan, Ann Arbor 48109-2029, USA.) See www.fluoridealert.org.

"Caries levels for the 12-year-olds of both towns significantly decreased during the years 1993-96, following the cessation of water fluoridation. In Spremberg, DMFT fell from 2.36 to 1.45 (38.5%) and in Zittau from 2.47 to 1.96 (20.6%)". (Community Dent Oral Epidemiol 2000 Oct; 28 (5): 382-9, Kunzel W, Fischer T, Lorenz R, Bruhmann, Dental School of Erfurt, Department of Preventive Dentistry, Friedrich-Schiller-University of Jena, Germany.) See www.fluoridealert.org.

Kuopio, Finland was fluoridated in 1959 and discontinued the practice in 1992. "In 1995, a decline in caries was seen in the two older age groups in this nonfluoridated town. In spite of discontinued water fluoridation, no indication of increasing trend of caries could be found in Kuopio." (See 5-2: "Caries frequency in permanent teeth before and after discontinuation of water fluoridation," from Community Dental Oral Epidemiol, 1998: 26).

Cuba was fluoridated in 1973. "In 1997, following the cessation of drinking water fluoridation, in contrast to an expected rise in caries prevalence — there was a significant decrease, DMFT (decayed, missing and filled teeth) from 2.1 to 1.1: DMFS (decayed, missing and filled surfaces) from 3.1 to 1.5, while the percentage of caries-free children of this age group had increased from 4.8 (1973) and 33.3 (1982) up to 55.2%. (See 5-4: "Caries Prevalence after Cessation of Water Fluoridation in La Salud, Cuba," from Caries Research 2000: 34:20-25, by W. Kunzel, T. Fischer).

"The dentists and the World Health Organization (WHO) experts have predicted a very large carries increase (a tide of caries) after a stop of water fluoridation. The analyses of data however, show a significant decrease of dental caries (caries decline) after the stop of water fluoridation in Japan, in the Netherlands, in Prague, in the German Democratic Republic, and in others. Never was an increase of dental caries found after a stop of water fluoridation. Furthermore, many fluoride tablet measures (use of the fluoride tablets) were stopped also. In Graz, Austria for instance, the dental caries of children had increased during the fluoride tablet actions in schools since 1956 and decreased after the stop in 1973." (*Arbeitsgemeinschaft für Alternative Gesundheitspolitik*, by Rudolph Ziegelbecker, Graz, Austria, June 1, 1998.)

Question 6.

Is water fluoridation still an effective method for preventing dental caries?

ADA's Fluoridation Facts Short Answer

Water fluoridation continues to be a very effective method for preventing tooth decay for children, adolescents and adults. Continued assessment, however, is important as the patterns and extent of dental decay change in populations. Although other forms of fluoride are available, persons in nonfluoridated communities continue to demonstrate higher dental decay rates than their counterparts in communities with water fluoridation.

ADA's Fluoridation Facts Long Answer

Numerous recent studies indicate a trend toward decreased decay prevalence in children living in the United States. This trend also has been reported for children in other developed countries. One of several factors that explains these findings is the increased use of fluorides, including water fluoridation and fluoride toothpaste. In studies conducted from 1976 through 1987,³¹ the level of decay reduction achieved through water fluoridation in industrialized countries was:

- 30-60% in the primary dentition or baby teeth
- 20-40% in the mixed dentition* (aged 8 to 12)
- 15-35% in the permanent dentition or adult teeth (aged 14 to 17)
- 15-35% in the permanent dentition (adults and seniors)

**A mixed dentition is composed of both baby teeth and adult teeth.*

Additional discussion on this topic may be found in [Question 4](#).

Community water fluoridation remains the safest, most cost-effective and most equitable method of reducing tooth decay in a community in the United States and in other countries.^{11, 32, 34, 49-52}

A controlled study conducted in 1990 demonstrated that average tooth decay experience among schoolchildren who were lifelong residents of communities having low fluoride levels in drinking water was 61-100% higher as compared with tooth decay experience among schoolchildren who were lifelong residents of a community with an optimal level of fluoride in the drinking water.³⁶

In addition, the findings of this study suggest that community water fluoridation still provides significant public health benefits and that dental sealants can play a significant role in preventing tooth decay.

Baby bottle tooth decay is a severe type of early childhood decay that seriously affects babies and toddlers in some populations. Water fluoridation is highly effective in preventing decay in baby teeth, especially in children from low socioeconomic groups.³³ For very young children, water fluoridation is the only means of prevention that does not require a dental visit or motivation of parents and caregivers.⁵³

In the 1940s, children in communities with optimally fluoridated drinking water had reductions in decay rates of approximately 60% as compared to those living in non-fluoridated communities. At that time, drinking water was the only source of fluoride other than fluoride that occurs naturally in foods.

Recent studies reveal that decay rates are lower in naturally or adjusted fluoridated areas and nonfluoridated areas as well because of the universal availability of fluoride from other sources including food, beverages, dental products and dietary supplements.⁵⁴ Foods and beverages processed in optimally fluoridated cities can contain optimal levels of fluoride. These foods and beverages are consumed not only in the city where processed, but may be distributed to and consumed in non-fluoridated areas.¹¹ This "halo" or "diffusion" effect results in increased fluoride intake by people in nonfluoridated communities, providing them increased protection against dental decay.^{32, 52} As a result of the widespread availability of these various sources of fluoride, the difference between decay rates in fluoridated areas and nonfluoridated areas is somewhat less than several decades ago but still significant.⁵⁵

A British study conducted in 1987 compared the decay scores for 14-year-old children living in South Birmingham, fluoridated since 1964, with those of children the same age living in nonfluoridated Bolton. The two cities had similar social class profiles and similar proportions of unemployed residents and minority groups. The average decayed, missing, and filled tooth score for the children of South Birmingham was 2.26, compared to an average score of 3.79 for children in nonfluoridated Bolton. These scores indicate a statistically significant difference of 40% between the decay rates in the two cities. Because of the similarity in social and demographic factors, the investigators attributed difference in decay experience found in this study to differences in water fluoride level.⁵⁶

In the United States, an epidemiological survey of nearly 40,000 schoolchildren was completed in 1987.⁵⁰ Nearly 50% of the children in the study aged 5 to 17 years were decay-free in their permanent teeth, which was a major change from a similar survey in 1980 in which approximately 37% were decay-free. This dramatic decline in decay rates was attributed primarily to the widespread use of fluoride in community water supplies, toothpastes, supplements and mouthrinses. Although decay rates had declined overall, data also revealed that the decay rate was 25% lower in children with continuous residence in fluoridated communities when the data was adjusted to control for fluoride exposure from supplements and topical treatments.

More recently, data from the Third National Health and Nutrition Examination Survey (NHANES III), conducted from 1988 to 1991, yielded weighted estimates for over 58 million U.S. children. Nearly 55% of the children aged 5 to 17 years had no decay in their permanent teeth.⁵⁷

Additional discussion on this topic may be found in [Question 8](#).

Repeat of Question 6.

Is water fluoridation still an effective method for preventing dental caries?

Opposition's Response

It never has been. (See [Benefits](#) section). A recent study showed that 83% of all caries in North American children are the "pit and fissure" type, which even the proponents admit, aren't preventable by fluoride. They say they are prevented by sealants. (See 10-1 in Alternatives section for details).

"Let me begin by saying that fluorides are most effective in preventing decay on the smooth surfaces of teeth. However, the chewing surfaces of posterior are not smooth. They have crevices and pits and it is our experience that fluorides don't really get access to these pitted areas." (Hearings: "Subcommittee of the Committee on Appropriations, House of Representatives." Mar. 1984. Dr. Loe, Director of the National Institute of Dental Research.)

As far back as 1929, it was an established fact that 95% of decay was in pits and fissures. (See 6-1: The Dental Cosmos, Vol. LXX1, Aug. 1929).

The ADA says (in their statement above): "Baby bottle tooth decay is a severe type of early childhood decay that seriously affects babies in some populations. Water fluoridation is highly effective in

preventing decay in baby teeth." This statement leads the reader to believe that fluoridation prevents baby bottle tooth decay, which it does not. (See 6-2: "Baby Bottle Tooth Decay (BBTD) or Early Childhood Caries," compiled by Maureen Jones, Citizens for Safe Drinking Water).

In California, which at the time was only 15.7% population fluoridated, only 33% of the tested Head Start children (defined as poor children) had "baby bottle tooth decay" (BBTD). In the U.S., which is 56% population fluoridated, 50% of the Head Start children had BBTD. California is doing better without fluoridation. (Summary of Findings of the California Oral Health Needs Assessment of Children, 1993-94.)

Regarding medical statistics: to prevent bias in a study's sample (the children chosen for dental examinations) the sample must be a representative sample of the total population. (See 6-3: Bradford Hill's Principles of Medical Statistics, 20th Edition). In this California study, they broke all the rules. (See 6-4: details by Richard G. Foulkes, B.A., M.D., Sept. 22, 1997).

Question 7.

Is tooth decay still a serious problem?

ADA's Fluoridation Facts Short Answer

Yes. Tooth decay or dental decay is an infectious disease that continues to be a significant oral health problem.

ADA's Fluoridation Facts Long Answer

Tooth decay is, by far, the most common and costly oral health problem in all age groups.⁵⁸ It is one of the principal causes of tooth loss from early childhood through middle age. A dramatic increase in tooth loss occurs among people 35 through 44 years of age. The two leading causes of tooth loss in this age group are dental decay and periodontal diseases.⁸ Decay continues to be problematic for middle-aged and older adults, particularly root decay because of receding gums. In addition to its effects in the mouth, dental decay can affect general well-being by interfering with an individual's ability to eat certain foods and by impacting an individual's emotional and social well-being by causing pain and discomfort. Tooth decay, particularly in the front teeth, can detract from appearance, thus affecting self-esteem.

Despite a decrease in the overall decay experience of U.S. schoolchildren over the past two decades, tooth decay is still a significant oral health problem, especially in certain segments of the population. The 1986-1987 National Institute of Dental Research (NIDR) survey of approximately 40,000 U.S. school children found that 25% of students ages 5 to 17 accounted for 75% of the decay experienced in permanent teeth.⁵⁸ Some of the risk factors that increase an individual's risk for decay are irregular dental visits, deep pits and fissures in the chewing surfaces of teeth, inadequate saliva flow, frequent sugar intake and very high oral bacteria counts.

Additional discussion on this topic may be found in the [Introduction](#), Water Fluoridation's Role in Reducing Dental Decay.

Because dental decay is so common, it mistakenly tends to be regarded as an inevitable part of life. Data from NHANES III collected on adults aged 18 and older revealed that 94% showed evidence of past or present decay in the crowns of teeth, and 22.5% had evidence of root surface decay.⁵⁹

In addition to impacting emotional and social well-being, the consequences of dental disease are reflected in the cost of its treatment. The nation's dental health bill in 1997 was \$50.6 billion.⁶⁰ Again, the goal must be prevention rather than repair. Fluoridation is presently the most cost-effective method for the prevention of tooth decay for residents of a community in the United States.^{61, 62}

**Repeat of Question 7.
Is tooth decay still a serious problem?**

Opposition's Response

There has been a decline in dental decay in the United States in both fluoridated and non-fluoridated areas, as well as in Europe, which is now 98% fluoridation free. It is probably due to improved diet and dental hygiene. Dental decay is still a serious problem, but fluoridation is not the answer.

The ADA states that, "Fluoridation is presently the most cost-effective method for the prevention of tooth decay for all residents of a community." It is not. Dental bills are higher in fluoridated areas than in non-fluoridated areas. (See [Cost Effectiveness](#) section).

**Question 8.
Do adults benefit from fluoridation?**

ADA's Fluoridation Facts Short Answer

Fluoridation plays a protective role against dental decay throughout life, benefiting both children and adults. In fact, inadequate exposure to fluoride places children and adults in the high-risk category for dental decay.

ADA's Fluoridation Facts Long Answer

Fluoride has both a systemic and topical effect and is beneficial to adults in two ways. The first is through the remineralization process in enamel, in which early decay does not enlarge, and can even reverse, because of frequent exposure to small amounts of fluoride. Studies have clearly shown that the availability of topical fluoride in an adult's mouth during the initial formation of decay can not only stop the decay process, but also make the enamel surface more resistant to future acid attacks. Additionally, the presence of systemic fluoride in saliva provides a reservoir of fluoride ions that can be incorporated into the tooth surface to prevent decay.⁶³

Additional discussion on this topic may be found in [Question 1](#).

Another protective benefit for adults is the prevention of root decay. Adults with gumline recession are at risk for root decay because the root surface becomes exposed to decay-causing bacteria in the mouth. Studies have demonstrated that fluoride is incorporated into the structure of the root surface, making it more resistant to decay.^{19, 63-66} In Ontario, Canada, lifelong residents of the naturally fluoridated (1.6 ppm) community of Stratford had significantly lower root decay experience than those living in the matched, but nonfluoridated, community of Woodstock.⁶⁵

People in the United States are living longer and retaining more of their natural teeth than ever before. Because older adults experience more problems with gumline recession, the prevalence of root decay increases with age. A large number of exposed roots or a history of past root decay places an individual in the high risk category for decay.¹²

Data from the 1988-1991 National Health and Nutrition Examination Survey (NHANES III) showed that 22.5% of all adults with natural teeth experienced root decay. This percentage increased markedly with age:

- 1. 18- to 24-year-old age group, only 6.9% experienced root decay*
- 2. 35- to 44-year-old age group, 20.8% experienced root decay*
- 3. 55- to 64-year-old age group, 38.2% showed evidence of root decay*
- 4. over-75 age group, nearly 56% had root decay⁵⁹*

In addition to gumline recession, older adults tend to experience decreased salivary flow, or xerostomia, due to the use of medications or medical conditions.^{67, 68} Inadequate saliva flow places an individual in the high risk category for decay.¹² This decrease in salivary flow can increase the likelihood of dental decay because saliva contains many elements necessary for early decay repair — including fluoride.

There are data to indicate that individuals who have consumed fluoridated water continuously from birth receive the maximum protection against dental decay. However, teeth present in the mouth when exposure to water fluoridation begins also benefit from the topical effects of exposure to fluoride. In 1989, a small study in the state of Washington suggested adults exposed to fluoridated water only during childhood had similar decay rates as adults exposed to fluoridated water only after age 14. This study lends credence to the topical and systemic benefits of water fluoridation. The topical effects are reflected in the decay rates of adults exposed to water fluoridation only after age 14.

The study also demonstrates that the pre-eruptive, systemic effects of fluoridation have lifetime benefits as reflected in the decay rates of adults exposed to fluoridation only during childhood. The same study also noted a 31% reduction of dental disease (based on the average number of decayed or filled tooth surfaces) in adults with a continuous lifetime exposure to fluoridated water as compared to adults with no exposure to water fluoridation.⁶⁴

A Swedish study investigating decay activity among adults in optimal and low fluoride areas revealed that not only was decay experience significantly lower in the optimal fluoride area, but the difference could not be explained by differences in oral bacteria, buffer capacity of saliva or salivary flow. The fluoride concentration in the drinking water was solely responsible for decreased decay rates.⁶⁹

Water fluoridation contributes much more to overall health than simply reducing tooth decay: it prevents needless infection, pain, suffering and loss of teeth; improves the quality of life; and saves vast sums of money in dental treatment costs.¹¹ Additionally, fluoridation conserves natural tooth structure by preventing the need for initial fillings and subsequent replacement fillings.⁷⁰

Repeat of Question 8. Do adults benefit from fluoridation?

Opposition's Response

"Persons suffering from osteosclerosis or other bone diseases and consuming fluoridated water day after day will just be adding to their troubles." (Dr. J. J. Rae, for 20 years associate professor of chemistry and Ph.D. in bio-chemistry and organics, University of Toronto.)

"Little is known about the complex causes of the major chronic diseases which, unlike dental caries, can cause crippling disability or death, and the fear of death, but two generalizations are possible; they are all associated with the disturbances of the metabolism (to which the enzyme-balance is fundamental), and they tend to be accentuated by nervous and emotional stress. Since there is no medical case for increasing the fluoride intake of adults the various professional advisers have not expert status in recommending this, and I cannot see that it is the duty of anyone in the public health service to impose an added burden of fluoride or of anxiety and indignation, upon the metabolism of those whose health they are supposed to protect." (Dr. C. G. Dobbs, (Ph.D., A.R.C.S.) Senior Lecturer (Mycology), University College of North Wales, Bangor, England.)

"My objection to mass fluoridation is its effect on older people." (Dr. M. B. Dymond, Minister of Health, Province of Ontario.)

"We do not consider it to be established beyond reasonable doubt that increasing the fluoride content of public water supplies to one part per million is without risk to adults in the country." (Professor Hugh Sinclair, Lab. Of Human Nutrition, and Professor D. C. Wilson, Institute of Social Medicine, Oxford, England in letter to the British Medical Journal.)

Drs. Howard V. and Margaret C. Smith, Biochemists at the University of Arizona, have made the study of dental fluorosis their life work. Their investigations in naturally fluoridated areas of Arizona have shown that the low incidence of caries in young children in these areas increases sharply after the age of 21. Moreover, the decay of fluorized teeth is exceptionally severe and difficult to repair.

ALTERNATIVES

Question 9.

Are dietary fluoride supplements effective?

ADA's Fluoridation Facts Short Answer

For children who do not live in fluoridated communities, dietary fluoride supplements are an effective alternative to water fluoridation for the prevention of tooth decay.^{51, 71-73}

ADA's Fluoridation Facts Long Answer

Dietary fluoride supplements are available only by prescription and are intended for use by children living in nonfluoridated areas to increase their fluoride exposure so that it is similar to that by children who live in optimally fluoridated areas.⁷⁴

*Dietary fluoride supplements are available in two forms: drops for infants aged six months and up, and chewable tablets for children and adolescents.¹² In order to decrease the risk of dental fluorosis in permanent teeth, fluoride supplements should only be prescribed for children living in nonfluoridated areas. The correct amount of a fluoride supplement is based on the child's age and the existing fluoride level in the drinking water.^{16, 54, 75} Consideration should also be given to the child's risk for decay and to all sources of fluoride exposure for children. (An excellent source of information regarding decay risk assessment and prevention is the American Dental Association's, *Caries Diagnosis and Risk Assessment: A Review of Preventive Strategies and Management*¹²)*

Because fluoride is so widely available, it is recommended that dietary fluoride supplements be used only according to the recommended dosage schedule and after consideration of all sources of fluoride exposure. For optimum benefits, use of supplements should begin at six months of age and be continued daily until the child is at least 16 years old.¹² The current dietary fluoride supplement schedule is shown in Table 1.

The need for compliance over an extended period of time is a major procedural and economic disadvantage of community-based fluoride supplement programs, one that makes them impractical as an alternative to water fluoridation as a public health measure. In a controlled situation, as shown in a study involving children of health professionals, fluoride supplements achieve effectiveness comparable to that of water fluoridation. However, even with this highly educated and motivated group of parents, only half continued to give their children fluoride tablets for the necessary number of years.⁷⁶ Independent reports from several countries, including the United States, have demonstrated that community-wide trials of fluoride supplements in which tablets were distributed for use at home were largely unsuccessful because of poor compliance.⁷⁷

While total costs for the purchase of supplements and administration of a program are small (compared with the initial cost of the installation of water fluoridation equipment), the overall cost of supplements per child is much greater than the per capita cost of community fluoridation.⁶² In addition, community water fluoridation provides decay prevention benefits for the entire population regardless of age, socioeconomic status, educational attainment or other social variables.¹¹ This is particularly important for families who do not have access to regular dental services.

**Repeat of Question 9.
Are dietary fluoride supplements effective?**

Opposition's Response

Swallowing fluoride pills is no more effective than drinking fluoridated water. (See [Benefits](#) section). There is one advantage — the supplements are made with pharmaceutical grade fluoride, therefore are free of the many contaminants found in silicofluorides.

"Fluoride tablets cause dental fluorosis in 64% of the children. (Pebbles 1974). These same tablets if swallowed provide no protection against decay. If they are chewed and dissolved in the mouth, they do appear to reduce tooth decay. The effect is topical." (David Kennedy, DDS, Aug. 31, 1998.)

"It was later learned that this protection against dental decay was primarily due to the reaction of fluoride in the mouth rather than by systemic routes. During the last 10-15 years there has been a further dramatic reduction in dental decay in several western world countries. This reduction has been a further 40-60%, depending on what survey we read, and has applied in areas with or without water fluoridation." (See 9-1: "The Mechanism of Dental Decay," by John D. B. Featherstone, M.Sc., Ph.D., F.N.Z.I.C., from *Nutrition Today*, May/June 1987).

Fluoride is not a food supplement like zinc or iron! "Fluorides are officially classified as dangerous drugs even when added to vitamins and may be purchased only on prescription." (Letter by Dr. William C. Black, M.D., Pediatrician, Oct. 4, 1968.)

**Question 10.
In areas where water fluoridation is not feasible because of engineering constraints, are alternatives to water fluoridation available?**

ADA's Fluoridation Facts Short Answer

Yes. Some countries outside the United States that do not have piped water supplies that can accommodate community water fluoridation have chosen to use salt fluoridation.

ADA's Fluoridation Facts Long Answer

Studies evaluating the effectiveness of salt fluoridation outside the U.S. have concluded that fluoride delivered via salt produces decay reductions similar to that of optimally fluoridated water.⁷⁸ Salt fluoridation is used in over 30 countries, including Switzerland, Columbia, Jamaica, Costa Rica, Mexico, France, Spain and Germany.^{79, 80} Published results of studies in many of these countries show that, for 12-year-old children, the initial level of decay reduction due to salt fluoridation is between 35% and 80%.⁸¹

An advantage of salt fluoridation is that it does not require a centralized piped water system. This is of particular use in many developing countries that do not have such water systems. When both domestic salt and bulk salt (used by commercial bakeries, restaurants, institutions, and industrial food production) is fluoridated, the decay-reducing effect may be comparable to that of water fluoridation over an extended period of time.⁸¹ On the other hand, when only domestic salt is fluoridated, the decay-reducing effect may be diminished.⁷⁸

Salt fluoridation has several disadvantages that do not exist with water fluoridation. Challenges occur with implementation of salt fluoridation when there are multiple sources of drinking water in an area. The natural fluoride level of each source must be determined and, if the level is optimal or excessive, fluoridated salt should not be distributed in that area. Also, salt fluoridation requires refined salt produced with modern technology and technical expertise.⁸² Finally, there is general agreement that a high consumption of sodium is a risk factor for hypertension (high blood pressure).^{83, 84} People who have hypertension or must restrict their salt intake may find salt fluoridation an unacceptable method of receiving fluoride.

Fluoridated milk has been suggested as another alternative to community water fluoridation in countries outside the United States. Studies among small groups of children have demonstrated a decrease in dental decay rates due to consumption of fluoridated milk; however, these studies were not based on large-scale surveys. More research is needed before milk fluoridation can be recommended as an alternative to water or salt fluoridation.⁸⁵ The rationale for adding fluoride to milk is that this method "targets" fluoride directly to children.

Concerns have been raised about decreased widespread benefits due to the slower absorption of fluoride from milk than from water and the considerable number of persons, especially adults, who do not drink milk for various reasons.⁸⁶ The monitoring of fluoride content in milk is technically more difficult than for drinking water because there are many more dairies than communal water supplies. In addition, because fluoridated milk should not be sold in areas having natural or adjusted fluoridation, regulation would be difficult, and established marketing patterns would be disrupted.¹⁷

Additional discussion on this topic may be found in [Question 40](#).

Repeat of Question 10.

In areas where water fluoridation is not feasible because of engineering constraints, are alternatives to water fluoridation available?

Opposition's Response

Yes. Sealants appear to be quite effective. "Fluoride primarily protects the smooth surfaces of teeth, and sealants protect the pits and fissures (grooves), mainly on the chewing surfaces of the back teeth. Although pit and fissure tooth surfaces only comprise about 15% of all permanent tooth surfaces, they were the site of 83% of tooth decay in U.S. children in 1986-87," (See 10-1: "The Oral Health of California's Children," from the California Oral Health Needs Assessment of Children, 1993-94). Proponents of fluoridation made this statement.

"It is estimated that 84% of the caries experience in the 5 to 17 year-old population involves tooth surfaces with pits and fissures. Although fluorides cannot be expected appreciably to reduce our incidence of caries on these surfaces, sealants can." (Preserving the perfect tooth," Editorial, *Journal of the American Dental Association*, Vol. 108, Mar. 1984.)

"The program focused on four caries-prevention techniques: sealants, a plastic-like coating applied to the chewing surfaces of back teeth and to pits and fissures on the sides of teeth (these surfaces are most prone to decay and ones which fluorides cannot protect adequately)". ("Dental study upsets the accepted wisdom," in *Science News*, Vol. 125, No. 1., Jan. 7, 1984.)

"The type of caries now seen in British Columbia's children of 13 years of age, is mostly the pit and fissure type. Knudsen in 1940, suggested that 70% of the caries in children was in pits and fissures. Recent reports indicate that today, 83% of all caries in North American children is of this type. Pit and fissure cavities aren't considered to be preventable by fluorides, they are prevented by sealants," ("Fluoridation: Time For a New Base Line?" By A.S. Gray, DDS. FRCD©, *Journal of the Canadian Dental Association*, No. 10, 1987. (See 10-5: "Pit and Fissure Tooth Decay").

Possibly the best alternative is to give the children whole grain bread. Children raised on whole grains, instead of white flour, from early childhood have been found in a British study to have less than half as much dental decay as children who are reported to have drunk fluoridated water from birth and have eaten white bread. (See 10-6: "Better Diet vs. Fluoridation," by Albert W. Burgstahler, Ph.D., Professor of Chemistry, University of Kansas, Nov. 1967. Also, see 10-7: chart by Vickery and Turner, *Vitalstoffe*, 11:99-101, 1966.) Why not use our tax dollars to promote this idea, instead of trying to force the whole country to put a prescription drug in our water supply?

A report by Czechoslovakian researchers indicates that fluoride matters little when it comes to preventing tooth decay. A study of 745 children aged 6 to 14 years, from several localities of Czechoslovakia where the drinking water contains calcium and magnesium in large amounts, showed

impressively fewer caries in these children than in others throughout the country. This finding was no surprise to other scientists who reported previously that calcium combined with magnesium has a beneficial effect on the resistance of teeth to caries. Interestingly, in all of the localities where tooth decay was below average, the fluoride content of the water was also low. (Cesk. Stomat., May-June, 1966.)

"Fluoride gets a lot of the credit for preventing tooth decay that should go to magnesium, a University of Colorado dental researcher says. He is Dr. Lewis Barnett, who has been doing research into tooth decay since 1950. Barnett said that magnesium also strengthens teeth and bone. 'It is just as feasible for communities to add magnesium to their water supplies,' he said. Given a choice between fluoride and magnesium, Barnett said, he would choose magnesium." ("Researcher Says Magnesium Aids Dental Health," *St. Louis Post-Dispatch*, Aug. 28, 1966.)

"Herford, Texas has been called the 'TOWN WITHOUT A TOOTH ACHE.' This is not true. But the phrase has been used effectively by the people interested in marketing SODIUM FLUORIDE, ALL OVER THE COUNTRY. — As the years went by I continued to study the local situation. I observed that, as the town grew and more people began to live on processed foods, such as-canned goods, white flour products, soft drinks etc., tooth decay increased. This increase of decay occurred, even though they were drinking the same fluorinated water we had always been drinking. I am now fully convinced that good natural food is the preventive of dental caries as well as other diseases." (See 10-9: Copy of Dentist's Letter from "The Town Without a Toothache," George W. Heard, the dentist who succeeded in getting the dental profession to find out why the people's health was so good in Herford, Texas, 3/15/54).

Question 11.

Can the consistent use of bottled water result in individuals missing the benefits of optimally fluoridated water?

ADA's Fluoridation Facts Short Answer

Yes. The majority of bottled waters on the market do not contain optimal levels (0.7-1.2 ppm) of fluoride.

ADA's Fluoridation Facts Long Answer

Individuals who drink bottled water as their primary source of water could be missing the decay preventive effects of optimally fluoridated water available from their community water supply. Therefore, consumers should seek advice from their dentist about specific fluoride needs.

The fluoride content of bottled water can vary greatly. A 1989 study of pediatric dental patients and their use of bottled water found the fluoride content of bottled water from nine different sources varied from 0.04 ppm to 1.4 ppm.⁸⁷ In a 1991 study of 39 bottled water samples, 34 had fluoride levels below 0.3 ppm. Over the two years the study was conducted, six products showed a two- to four-fold drop in fluoride content.⁸⁸

In evaluating how bottled water consumption affects fluoride exposure, there are several factors to consider. First is the amount of bottled water consumed during the day. Second is whether bottled water is used for drinking, in meal preparation and for reconstituting soups, juices and other drinks. Third is whether another source of drinking water is accessed during the day such as an optimally fluoridated community water supply at daycare, school or work.

A final important issue is determining the fluoride content of the bottled water. If the fluoride level is not shown on the label of the bottled water, the company can be contacted, or the water can be tested to obtain this information. The fluoride level should be tested periodically if the source of the bottled water changes and, at a minimum, on a yearly basis.⁸⁷

Information regarding the existing level of fluoride in a community's public water supply can be obtained by asking a local dentist, contacting the local or state health department, or contacting the local water supplier.

Repeat of Question 11.

Can the consistent use of bottled water result in individuals missing the benefits of optimally fluoridated water?

Opposition's Response

What they will miss is the damaging effects of fluoride, providing they order the unfluoridated water and make sure it is very low in natural fluoride. The Environmental Protection Agency (EPA) scientists order unfluoridated bottled water for use in their offices. (See 1-6: "WHY EPA'S HEADQUARTERS UNION OF SCIENTISTS OPPOSES FLUORIDATION," EPA document, May 1, 1999).

Question 12.

Can home water treatment systems (e.g. water filters) affect optimally fluoridated water supplies?

ADA's Fluoridation Facts Short Answer

Yes. Some types of home water treatment systems can reduce the fluoride levels in water supplies potentially decreasing the decay-preventive effects of optimally fluoridated water.

ADA's Fluoridation Facts Long Answer

There are many kinds of home water treatment systems including carafe filters, faucet filters, reverse osmosis systems, distillation units and water softeners. There has not been a large body of research regarding the extent to which these treatment systems affect fluoridated water. Available research is often conflicting and unclear.

However, it has been consistently documented that reverse osmosis systems and distillation units remove significant amounts of fluoride from the water supply.^{16, 89} On the other hand, a recent study regarding water softeners confirmed earlier research indicating the water softening process caused no significant change in fluoride levels.^{90, 91} With water filters, the fluoride concentration remaining in the water depends on the type and quality of the filter being used, the status of the filter and the filter's age.

Individuals who drink water processed by home water treatment systems as their primary source water could be losing the decay preventive effects of optimally fluoridated water available from their community water supply. Therefore, consumers should seek advice from their dentist about specific fluoride needs.

Consumers using home water treatment systems should have their water tested at least annually to establish the fluoride level of the treated water. More frequent testing may be needed. Testing is available through local and state public health departments. Private laboratories may also offer testing for fluoride levels in water.

Information regarding the existing level of fluoride in a community's public water system can be obtained by asking a local dentist, contacting your local or state health department, or contacting the local water supplier.

Consumers should seek advice from their dentist about specific fluoride needs.

Repeat of Question 12.

Can home water treatment systems (e.g. water filters) affect optimally fluoridated water supplies?

Opposition's Response

The fluoride molecule is smaller than the water molecule, therefore, it cannot be removed by filtration —nly by distillation. Reverse osmosis, however, will remove 80 to 90% of the fluoride. ("Intake and Metabolism of Fluoride," G. Whitford, from *Adv. Dental Research*, 8 (1):5-14, June 1994.)

SAFETY

Question 13.

Does fluoride in the water supply, at the levels recommended for the prevention of tooth decay, adversely affect human health?

ADA's Fluoridation Facts Short Answer

The overwhelming weight of scientific evidence indicates that fluoridation of community water supplies is both safe and effective.

ADA's Fluoridation Facts Long Answer

For generations, millions of people have lived in areas where fluoride is found naturally in drinking water in concentrations as high or higher than those recommended to prevent tooth decay. Research conducted among these persons confirms the safety of fluoride in the water supply.^{54, 92-95} In fact, in August 1993, the National Research Council, a branch of the National Academy of Sciences, released a report prepared for the Environmental Protection Agency (EPA) that confirmed that the currently allowed fluoride levels in drinking water do not pose a risk for health problems such as cancer, kidney failure or bone disease.⁹⁶

Based on a review of available data on fluoride toxicity, the expert subcommittee that wrote the report concluded that the EPA's ceiling of 4 ppm for naturally occurring fluoride in drinking water was "appropriate as an interim standard."⁹⁶ Subsequently, the EPA announced that the ceiling of 4 ppm would protect against adverse health effects with an adequate margin of safety and published a notice of intent not to revise the fluoride drinking water standard in the Federal Register.⁹⁷

As with other nutrients, fluoride is safe and effective when used and consumed properly. No charge against the benefits and safety of fluoridation has ever been substantiated by generally accepted scientific knowledge. After 50 years of research and practical experience, the preponderance of scientific evidence indicates that fluoridation of community water supplies is both safe and effective.⁹⁸

Additional discussion on this topic may be found in [Question 19](#) and [Question 32](#).

Many organizations in the U.S. and around the world involved with health issues have recognized the benefits of community water fluoridation. The American Dental Association adopted its original resolution in support of fluoridation in 1950, and has repeatedly reaffirmed its position publicly and in its House of Delegates based on its continuing evaluation of the safety and effectiveness of fluoridation.³ The American Medical Association's (AMA) House of Delegates first endorsed fluoridation in 1951.

In 1986, and again in 1996, the AMA reaffirmed its support for fluoridation as an effective means of reducing dental decay.⁹⁹ The World Health Organization, which initially recommended the practice of water fluoridation in 1969,¹⁰⁰ reaffirmed its support for fluoridation in 1994 stating that: "Providing that a community has a piped water supply, water fluoridation is the most effective method of reaching the whole population, so that all social classes benefit without the need for active participation on the part of individuals."⁸² Following a comprehensive 1991 review and evaluation of the public health benefits and risks of fluoride, the U.S. Public Health Service reaffirmed its support for fluoridation and continues to recommend the use of fluoride to prevent dental decay.⁵⁴

National and international health, service and professional organizations that recognize the public health benefits of community water fluoridation for preventing dental decay may be viewed in the Compendium.

Repeat of Question 13.

Does fluoride in the water supply, at the levels recommended for the prevention of tooth decay, adversely affect human health?

Opposition's Response

A letter from the FDA on August 15, 1963, states: "Sodium fluoride used for therapeutic effect would be a drug, not a mineral nutrient. Fluoride has not been determined essential to human nutrition. Above 2 milligrams per day of total intake of fluorides can cause tooth mottling in sensitive persons. It would be impossible to state a safe amount for supplementation by an individual without knowledge of the amount of fluorides already being consumed by him from such sources as drinking water and food grown in soils that are rich in fluorides." (See 13-1: copy of letter from FDA, and see [Overdose](#) section).

"The Food and Drug Administration Office of Prescription Drug Compliance has confirmed, to my surprise, that there are no studies to demonstrate either the safety or effectiveness of these (fluoride) drugs, which FDA classifies as unapproved new drugs." (See 13-2: letter by John V. Kelly, New Jersey Assemblyman, dated June 3, 1993).

On May 26, 1995, John V. Kelly also wrote: "Children's fluoride supplements are marketed without the required New Drug Applications demonstrating safety and effectiveness. This situation exists as a result of manufacturers introducing products directly into the market prior to 1962 without seeking FDA approval. According to the FDA Office of Prescription Drug Compliance there are approximately 3,000 drugs in this category." (See 13-8: Letter. Also see www.citizens.org).

Yet the American Dental Association leads us to believe that it is safe for everyone, that the Environmental Protection Agency (EPA) endorses fluoridation, and that they consider up to 4 ppm fluoride in the water as "perfectly safe."

When the EPA was engaged in revising its drinking water standard for fluorine in 1985, the EPA's Headquarters Union of Scientists (consisting of 1,500 professional people) made a thorough investigation into the pros and cons of fluoridation, and found that there is a great deal of proof that it is neither safe nor effective.

Their conclusions were: The public water supply should not be used "as a vehicle for disseminating this toxic and prophylactically useless (via ingestion, at any rate) substance."

They also stated: "Recent, peer-reviewed toxicity data, when applied to EPA's standard method for controlling risks from toxic chemicals, require an immediate halt to the use of the nation's drinking water reservoirs as disposal sites for the toxic waste of the phosphate fertilizer industry." (See 1-6: "Why EPA's Headquarters Union of Scientists Oppose Fluoridation," by Union Vice-Pres., J. W. Hirzy, May 1, 1999. It covers the many reasons why they arrived at this conclusion).

Because (these) EPA scientists refused to back down on their insistence that the maximum contaminate level (MCL) for fluoride should be reduced, the EPA (management team) contracted with the National Academy of Sciences (NAS), a private agency, to review the fluoride MCL of 4.0 ppm. The NAS formed a seven-member National Research Council (NRC) subcommittee dominated by long-time fluoridation promoters from the National Institute of Dental Research (NIDR). Although a number of researchers have published evidence of harm from fluoridation, not one of them was asked to participate in the work of the subcommittee.

At the same time that this NIDR-dominated subcommittee was evaluating the safety of water containing 1.0 - 4.0 ppm fluoride, the NIDR was informing New Jersey Assemblyman Kelly that it "could not produce any research demonstrating either the safety or the effectiveness of prescription fluoride in doses of the same magnitude as those administered in fluoridated water."

Nonetheless, a 1988 administrative decision in the EPA raised the MCL for fluoride from 2.0 ppm to 4.0 ppm (with no proof of safety) in order to relieve certain water suppliers of the burden of removing excess endemic fluorides from their water. Removing fluoride from water is expensive. In most cases it requires distillation or reverse osmosis filtration. Charcoal filters used to remove chlorine and other substances from water do not remove fluorine compounds. (See 13-3: details in "Comments on Reevaluating the Fluoride in Drinking Water Standard," by Robert J. Carton, Ph.D., Vice-President, Local 2050 of the National Federation of Federal Employees, before the Drinking Water Committee of the Science Advisory Board of the Environmental Protection Agency, Arlington, VA, Nov. 1, 1991. At that time this union represented the 1,100 scientists, lawyers, and engineers at EPA Headquarters).

"Our members' review of the body of evidence over the last eleven years, including animal and human epidemiology studies, indicate a causal link between fluoride/fluoridation and cancer, genetic damage, neurological impairment, and bone pathology. Of particular concern are recent epidemiology studies linking fluoride exposure to lowered IQ in children." (Letter dated July 2, 1997, from J. William Hirzy, Ph.D. to Jeff Green. The union (now NTEU, Chapter 280) consists of and represents all of the toxicologists, chemists, biologists and other professionals at EPA headquarters, Washington, D.C.)

Regarding the silicofluorides used in 90% of US fluoridation programs, EPA states, "In collecting the data for the fact sheet, EPA was not able to identify chronic studies for these chemicals." (Letter of June 23, 1999, from EPA Asst. Adm. J. Charles Fox to US Representative Ken Calvert, Chairman, Subcommittee on Energy and The Environment, Washington, DC.)

Dr. Hardy Limeback, B.Sc.,Ph.D. (biochemistry), D.D.S., Head of Department of Preventative Dentistry, University of Toronto, Ontario, Canada, leading Canadian fluoride authority and consultant to the Canadian Dental Association, after surveying the growing evidence, makes this statement: "Children under three should never use fluoridated toothpaste. Or drink fluoridated water. And baby formula must never be made up using Toronto (fluoridated) tap water. Never." He goes on to say: "... we are now spending more treating dental fluorosis than we would spend treating cavities if water were not fluoridated." (See 13-4: "A Crack Appears in the Fluoride Front," from *Toronto Star*, Apr. 25, 1999).

John D. MacArthur states, "History repeats itself. Just like the acidic leaves that leached lead from the paint on that 18th century roof, fluosilicic acid leaches lead from plumbing. This was graphically demonstrated in two communities that stopped fluoridating their water systems. Their lead levels dropped significantly. During a 1992 drought in Tacoma, Washington, they temporarily stopped fluoridating their water and lead levels dropped from 32 ppb (parts per billion) to 17 ppb. When Thurmont, Maryland stopped fluoridating their drinking water in 1994, the lead level in homes dropped from 30 ppb to 7 ppb. (The EPA's Maximum Contaminant Level is 15 ppb). ("Fluoride Banned in Thurmont, Maryland," *Frederick Post*, Feb. 3, 1994, p. A-9.) Also see, 13-5: "Letter from C.R. Myrick, Water Quality Coordinator, Tacoma Public Utilities to Washington State Dept. of Health", Dec. 2, 1992, in which he states: "It is interesting to note the 90th percentile lead concentration was 17 ppb this time compared to 32 ppb last time. We have not been using fluoride since the drought this summer." Fluoride was held responsible for the high lead level.

In research funded in part by the Environmental Protection Agency Office of Criminal Enforcement, Forensics and Training (published in August 1999 in the *International Journal of Environmental Studies*), a survey of over 280,000 Massachusetts children, comparing a matched group in 30 towns that do not use silicofluorides to children in 30 communities that use these chemicals to fluoridate, showed that when silicofluorides were present in the water the children were more than twice as likely to suffer from blood lead above the danger level of 10 micrograms per deciliter of blood. The correlation with blood lead levels is especially serious because lead poisoning is associated with higher rates of learning disabilities, hyperactivity, substance abuse and crime. (See 13-6: "Water Treatment With Silicofluorides and Lead Toxicity," by Roger D. Masters and Myron J. Coplan from the *International Journal of Environmental Studies*, 1999, Vol. 56. pp. 435-449).

"Children who are black or Hispanic given the same exposures as white children absorb significantly more lead. ... This means that the level set by EPA is marginally safe for white adults, but unsafe for African American or Hispanic children." (See 13-7: letter by William L. Marcus, Ph.D., D.A.B.T., Board Certified Consulting Toxicologist).

Herbert L. Needleman, of the University of Pittsburgh's School of Medicine, said, "He found much higher lead rates in a group of juvenile delinquents than in a control group. He used 416 youths-216 delinquents and 200 in a control group. Adjusting for such factors as race, parental education, occupation, family size and crime rate in the neighborhood the youths came from, he found those with high lead levels were twice as likely to be delinquent than those with low levels." ("Chemicals and Crime: A Truly Toxic Effect," by Judy Mann, May 26, 2000, page C 11, *Washington Post*. Judy Mann can be reached at (202) 334-6109 or at Mannj@washpost.com.)

Dr. Pierce Anthony, (D.D.S.) Editor, in an Editorial in the *Journal of the American Dental Association* (just five months before the people of Grand Rapids, Michigan, were fluoridated) made this statement: "To be effective, fluorine must be ingested into the system during the years of tooth development, and we do not yet know enough about the chemistry involved to anticipate what other conditions may be produced in the structure of the bone and other tissues of the body generally. We do know that the use of drinking water containing as little as 1.2 to 3.0 parts per million of fluorine will cause such developmental disturbances in bones as osteosclerosis, spondylosis and osteopetrosis, as well as goiter, and we cannot afford to run the risk of producing such serious systemic disturbances in applying what is at present a doubtful procedure intended to prevent development of dental disfigurements among children."

"Fluoride is capable of a very wide variety of harmful effects, even at low doses." (Dr. Patrick, Harvard Ph.D., former National Institute of Health scientist.)

"Because of our anxiety to find some therapeutic procedure that will promote mass prevention of caries (cavities), the seeming potentialities of fluorine appear speculatively attractive, but, in the light of our present knowledge or lack of knowledge of the chemistry of the subject, the potentialities for harm far outweigh those for good. — The control of the dosage to the children would be impossible since scientific investigation reveals that children drink different amounts of water, some 25 times more than others. Some would get too little, and what is more serious, some would get too much." (Dr. Max Spencer Rohde, (M.D.), F.A.C.S., F.I.C.S., New York City.)

"Fluoridation has never been proved to be safe. The medical literature abounds in reports from all parts of the world of damage from natural fluoride water." (Dr. L. A. Alesen, Past President of California Medical Association and member of American Medical Association House of Delegates.)

American Medical Association, 535 N. Dearborn St., Chicago Il.,60610 official policy statement as to safety and practicality, contains this proviso which nullifies any so-called 'endorsement in principle.' "In localities with warm climates, or where for other reasons the ingestion of water or other sources of considerable fluoride content is high, a lower concentration of fluoride is advisable. ... It is manifestly impossible to adjust the concentration to allow for the many variables in consumption or exposure to fluoride."

"If one wants to experiment with fluoridation, fluoride can easily be taken by the individual in tablet form or mixed with foods. If fluoride were put in the drinking water it would have a harmful effect on people with skin disease, those with low calcium, with kidney trouble, or with diabetes." (Dr. William Wolf, Endocrinologist, former Clinical Professor of Dental Medicine at New York University.)

"I believe that the widespread use of fluoridated water is a faulty procedure and will lead to unhappy results." (Dr. Alford D. Scholl, Associate Research in Pediatrics, Harvard University, Cambridge.)

"For water fluoridation at one part per million the short distance to toxic (poisonous) dosage seems to imply a serious hazard. We have even to pay attention to the great individual variation in sensitivity and in consumption of drinking water. Because of that fluoridation of tap water should not be allowed until more research work may have established that it is harmless." (Dr. Hugo Theorell, (M.D.) Nobel Prize Winner in report to Royal Medical Board of Sweden.)

"The question is asked as to what is the effect of fluoridated water if continued throughout lifetime. The answer is simply this-that no one knows for sure." (Dr. M. B. Dymond, Minister of Health, Province of Ontario.)

The Agriculture Yearbook, 1939, page 212, states " ... fluorine interferes with the normal calcification of the teeth, and it should be avoided from birth to age of 12." " ... this dental disease is always found when water containing even as little as 1 part per million of fluorine is used continuously during the period of formation of the permanent teeth." This was a known fact when the U. S. Public Health Service started their fluoride experiment on the people. (See 13-7 A).

Compulsory fluoridation could well be a much greater medical mistake than putting iodine in the water, stilbestrol, lithium or thalidomide. Many endorse fluoridation, but no one guarantees its safety.

The Food and Drug Administration requires, as of April 7, 1997, that all fluoride-containing toothpaste and mouth rinse must carry a poison label, warning that the products be kept out of the reach of children under 6, and to contact a Poison Control Center if more than the amount for brushing (pea-sized drop) is swallowed. Fluoride is not "just a mineral nutrient that is safe and harmless."

Question 14.

Are additional studies being conducted to determine the effects of fluorides in humans?

ADA's Fluoridation Facts Short Answer

Yes. Since its inception, fluoridation has undergone a nearly continuous process of reevaluation. As with other areas of science, additional studies on the effects of fluorides in humans can provide insight as to how to make more effective choices for the use of fluoride. The American Dental Association and the U.S. Public Health Service support this ongoing research.

ADA's Fluoridation Facts Long Answer

For the past 50 years, detailed reports have been published on all aspects of fluoridation.^{54, 96} The accumulated dental, medical and public health evidence concerning fluoridation has been reviewed and evaluated numerous times by academicians, committees of experts, special councils of government and most of the world's major national and international health organizations. The verdict of the scientific community is that water fluoridation, at the recommended levels, provides major oral health benefits. The question of possible secondary health effects caused by fluorides consumed in optimal concentrations throughout life has been the object of thorough medical investigations which have failed to show any impairment of general health.^{82, 92-95}

In scientific research, there is no such thing as "final knowledge." New information is continuously emerging and being disseminated. While research continues, the weight of scientific evidence indicates water fluoridation is safe and effective in preventing dental decay in humans.⁵⁴

Additional discussion on this topic may be found in [Question 36](#).

Repeat of Question 14.

Are additional studies being conducted to determine the effects of fluorides in humans?

Opposition's Response

Numerous studies have already proven that fluoridation does not prevent tooth decay, and that it contributes to many diseases, but proponents totally ignore all negative reports even when the study has been done by "one of their own."

OVERDOSE

Question 15.**Does the total intake of fluoride from air, water and food pose significant health risks?****ADA's Fluoridation Facts Short Answer**

The total intake of fluoride from air, water and food in an optimally fluoridated community in the United States does not pose significant health risks.

ADA's Fluoridation Facts Long AnswerFluoride from the Air

The atmosphere normally contains negligible concentrations of airborne fluorides. Studies reporting the levels of fluoride in air in the United States suggest that ambient fluoride contributes little to an individual's overall fluoride intake.^{101, 102}

Fluoride from Water

Fresh or ground water in the United States has naturally occurring fluoride levels that can vary widely from less than 0.1 to over 13 parts per million. Few private well water sources exceed 7 ppm.¹⁰² Public water systems in the U.S. are monitored by the Environmental Protection Agency (EPA), which requires that public water systems not exceed fluoride levels of 4 ppm.⁹⁷ The optimal concentration for fluoride in water in the United States has been established in the range of 0.7 to 1.2 ppm. This range will effectively reduce tooth decay while minimizing the occurrence of mild dental fluorosis. The optimal fluoride level is dependent on the annual average of the maximum daily air temperature in the geographic area.²⁷

Additional discussion on this topic may be found in [Question 32](#).

Children living in a community with water fluoridation get a portion of their daily fluoride intake from fluoridated water and a portion from dietary sources which would include food and other beverages. When considering water fluoridation, an individual must consume one liter of water fluoridated at 1 part per million (1 ppm) to receive 1 milligram (1 mg) of fluoride.^{17, 103} Children under six years of age, on average, consume less than one-half liter of drinking water a day.¹⁰³ Therefore, children under six years of age would consume, on average, less than 0.5 mg of fluoride a day from drinking optimally fluoridated water (at 1 ppm).

A ten-year comparison study of long-time residents of Bartlett and Cameron, Texas, where the water supplies contained 8.0 and 0.4 parts per million of fluoride respectively, included examinations of organs, bones and tissues. Other than a higher prevalence of dental fluorosis in the Bartlett residents, the study indicated that long term consumption of dietary fluoride (resident average length of fluoride exposure was 36.7 years), even at levels considerably higher than recommended for decay prevention, resulted in no clinically significant physiological or functional effects.⁹⁵

Fluoride in Food

The fluoride content of fresh solid foods in the United States generally ranges from 0.01 to 1.0 part per million.¹⁰⁴ Fish, such as sardines, may contribute to higher dietary fluoride intake if the bones are ingested. Brewed teas may also contain fluoride concentrations of 1 ppm to 6 ppm depending on the amount of dry tea used, the water fluoride concentration and the brewing time.¹⁰⁴

The average daily dietary intake of fluoride (expressed on a body weight basis) by children residing in optimally fluoridated (1 ppm) communities is 0.05 mg/kg/day; in communities without optimally fluoridated water, average intakes for children are about 50% lower.⁷⁴ Dietary fluoride intake by adults in optimally fluoridated (1 ppm) areas averages 1.4 to 3.4 mg/day, and in nonfluoridated areas averages 0.3 to 1.0 mg/day.⁷⁴

A 1990 review of literature identified no significant increases in concentrations of fluoride in food associated with water fluoridation.¹⁰⁵

Questions concerning the possible concentration of fluoride through the biologic food chain have been addressed by the National Academy of Sciences, which concluded:¹⁰⁶

Indeed, domestic animals can serve as a protective barrier for humans. Approximately 99% of the fluoride retained in the body is stored in bone, and only slight increases in the concentration of soft tissue fluoride occur even at high levels of dietary fluoride intake. There is, therefore, little danger to humans from the consumption of meat or milk from domestic animals even if the animals have ingested excessive fluoride. A few meat and fish products prepared for human consumption contain portions of comminuted (crushed) bone that may contribute to a higher fluoride content. The proportion of the total diet represented by these products, however, would generally be very small indeed.

The U.S. Food and Drug Administration has established "market baskets" which reflect the actual 14-day consumption of various food items by an average individual in different age groups from six-month-old children to adults. In a nationwide study of market baskets from areas with varying levels of fluoride in water supplies, it was determined that little or no change in food fluoride content has occurred as a result of the fluoridation of U.S. water supplies.^{107, 108}

Repeat of Question 15.

Does the total intake of fluoride from air, water and food pose significant health risks?

Opposition's Response

Yes. See the section on [Diseases](#).

The *Journal of the American Dental Association (JADA)*, in their December 1995 and July 1996 issues (in an effort to slow down the ever-increasing rise in dental fluorosis, the visible display of fluoride poisoning) advise dentists to warn parents of fluoride overdose from fluoride-based pesticide residue and fluoridated water found in fruit juices and drinks made from concentrates. Meanwhile, the ADA claims that children aren't getting enough. Juice concentrates are a real problem. Fluoride is not like chlorine; you can't boil it away. The more you boil fluoride, the more concentrated and poisonous it becomes. (See 15-1: "Fluoride Levels and Fluoride Contamination of Fruit Juices," from *The Journal of Clinical Pediatric Dentistry*, Vol. 16, #1/1991).

Independent laboratory analyses now show that regularly consumed products found in every neighborhood store, such as Coca-Cola Classic™, Minute Maid™ Orange Juice, and Lucerne™ 2% Milk, contain equal to or more than the amount of fluoride they intend to put in our water; with Froot Loops™, Gerber's™ baby juices, and almost every product with white grape juice, containing two, three, and up to six times the concentration due to fluoride pesticide residue and/or processing with fluoridated water. (See 15-2: "Analytical Testing Report," by Expert Chemical Analysis, Inc., 6/17/98).

In 1995, both the American Dental Association (ADA) and American Academy of Pediatrics (AAP), while segments of these same trade associations simultaneously continued to lobby for fluoridation, created new policy recommendations for fluoride drops and tablets, which are intended to be the substitute for fluoridated water in non-fluoridated communities. The new schedules indicate that mass medication, at the claimed optimal level of fluoridation, grossly exceeds the dosage that a qualified professional could prescribe, even after the professionals individual evaluation of a child for growth and development, weight, total exposure to fluoride from all sources, and individual susceptibility.

According to these new recommendations, infants are to receive no additional fluoride, no matter what the fluoride level in the water; and it is not until a child reaches the age of 6 that the new prescription recommendations ever reach the excessive dosage that is thrust upon a child that consumes fluoridated tap water. (See 15-3: "Policy Statement" from *Pediatrics*, May 1998, Vol. 95, Number 5).

The Natick Fluoridation Study Committee found that if they fluoridated the water, their children would be consuming about 2 to 3.5 times as much fluoride as was recommended by the American Academy of Pediatrics. (See 15-4: "Recommended Dosage of Fluoride," 9/27/97).

U.S. Public Health Service documents show that even in 1991, non fluoridated communities were already receiving more than the targeted fluoride dosage of 1 mg per day. Fluoridated communities were receiving up to 6 times the optimal goal. (See 15-5: "Review of Fluoride Benefits and Risks," 1991, U.S. Dept. of Health and Human Services).

According to the study published in the July/August Pediatric Dentistry, "... children with educated parents who typically have better oral hygiene practices are at risk for fluorosis ... Fluorosis was found in 69 % of children from high socioeconomic-status families whose parents had college degrees and lived in fluoridated communities." (See 15-6: "Early Fluoride Exposure," from *American Academy of Pediatric Dentistry*, July 31, 1998).

The famous *Washington Post* newspaper reported research at the Georgia School of Dentistry at the University of Connecticut showing children should only brush their teeth once a day to avoid fluoride overexposure. Doesn't the ADA say to brush after every meal?

"Not only does the 1 mg/day claimed necessary for teeth **not** require water fluoridation, but this is why the **only** oral epidemic is fluorosis in fluoridated areas of the US; and is why the Academy of General Dentistry representing 35,000 dentists has warned parents to limit the amount of juice their children drink — too much fluoride!" (See 15-8).

Question 16.

How much fluoride should an individual consume each day to reduce the occurrence of dental decay?

ADA's Fluoridation Facts Short Answer

The appropriate amount of daily fluoride intake varies with age and body weight. As with other nutrients, fluoride is safe and effective when used and consumed properly.

ADA's Fluoridation Facts Long Answer

In 1997, the Food and Nutrition Board of the Institute of Medicine developed a comprehensive set of reference values for dietary nutrient intakes.⁷⁴ These new reference values, the Dietary Reference Intakes (DRI), replace the Recommended Dietary Allowances (RDA) which had been set by the National Academy of Sciences since 1941. The new values present nutrient requirements to optimize health and, for the first time, set maximum-level guidelines to reduce the risk of adverse effects from excessive consumption of a nutrient. Along with calcium, phosphorous, magnesium and vitamin D, DRIs for fluoride were established because of its proven effect on tooth decay.

As demonstrated in Table 2, fluoride intake in the United States has a large range of safety.

The first DRI reference value is the Adequate Intake (AI) which establishes a goal for intake to sustain a desired indicator of health without causing side effects. In the case of fluoride, the AI is the daily intake level required to reduce tooth decay without causing moderate dental fluorosis. The AI for fluoride from all sources (fluoridated water, food, beverages, fluoride dental products and dietary fluoride supplements) is set at 0.05 mg/kg/day (milligram per kilogram of body weight per day). Using the established AI of 0.05 mg/kg, the amount of fluoride for optimal health to be consumed each day has been calculated by gender and age group (expressed as average weight). See Table 2.

The DRIs also established a second reference value for maximum-level guidelines called tolerable upper intake levels (UL). The UL is higher than the AI and is not the recommended level of intake. The UL is the estimated maximum intake level that should not produce unwanted effects on health. The UL for fluoride from all sources (fluoridated water, food, beverages, fluoride dental products and dietary

fluoride supplements) is set at 0.10 mg/kg/day (milligram per kilogram of body weight per day) for infants, toddlers, and children through eight years of age. For older children and adults, who are no longer at risk for dental fluorosis, the UL for fluoride is set at 10 mg/day regardless of weight.

Using the established ULs for fluoride, the amount of fluoride that may be consumed each day to reduce the risk of moderate dental fluorosis for children under eight, has been calculated by gender and age group (expressed as average weight). See Table 2.

As a practical example, daily intake of 2 mg of fluoride is adequate for a nine to 13-year-old child weighing 88 pounds (40 kg). This was calculated by multiplying 0.05 mg/kg/day (AI) times 40 kg (weight) to equal 2 mg. At the same time, that 88 pound (40kg) child could consume 10 mg of fluoride a day as a tolerable upper intake level.

Children living in a community with water fluoridation get a portion of their daily fluoride intake from fluoridated water and a portion from dietary sources which would include food and other beverages. When considering water fluoridation, an individual must consume one liter of water fluoridated at 1 part per million (1 ppm) to receive 1 milligram (1 mg) of fluoride.^{17, 103} Children under six years of age, on average, consume less than one-half liter of drinking water a day.¹⁰³ Therefore, children under six years of age would consume, on average, less than 0.5 mg of fluoride a day from drinking optimally fluoridated water (at 1 ppm).

If a child lives in a nonfluoridated area, the dentist or physician may prescribe dietary fluoride supplements. As shown in Table 1, "Dietary Fluoride Supplement Schedule 1994" (See [Question 9](#)), the current dosage schedule recommends supplemental fluoride amounts that are below the AI for each age group. The dosage schedule was designed to offer the benefit of decay reduction with margin of safety to prevent mild to moderate dental fluorosis. For example, the AI for a child 3 years of age is 0.7 mg/day. The recommended dietary fluoride supplement dosage for a child 3 years of age in a nonfluoridated community is 0.5 mg/day. This provides leeway for some fluoride intake from processed food and beverages, and other sources.

Decay rates are declining in many population groups because children today are being exposed to fluoride from a wider variety of sources than decades ago. Many of these sources are intended for topical use only; however, some fluoride is inadvertently ingested by children.¹⁰⁹ Inappropriate ingestion of fluoride can be prevented, thus reducing the risk for dental fluorosis without jeopardizing the benefits to oral health.

For example, it has been reported in a number of studies that young children inappropriately swallow an average of 0.30 mg of fluoride from fluoride toothpaste at each brushing.¹¹⁰⁻¹¹³ If a child brushes twice a day, 0.60 mg may be inappropriately ingested. This may slightly exceed the Adequate Intake (AI) values from Table 2. The 0.60 mg consumption is 0.10 mg over the AI value for children 6 to 12 months and is 0.10 mg under the AI for children from 1-3 years of age.⁷⁴ Although toothpaste is not meant to be swallowed, children may consume the daily recommended Adequate Intake amount of fluoride from toothpaste alone. In order to decrease the risk of dental fluorosis, the American Dental Association has since 1992 recommended that parents and caregivers put only one pea-sized amount of fluoride toothpaste on a young child's toothbrush at each brushing. Also, young children should be supervised while brushing and taught to spit out, rather than swallow, the toothpaste.

It should be noted that the amounts of fluoride discussed here are intake, or ingested, amounts. When fluoride is ingested, a portion is retained in the body and a portion is excreted. This issue will be discussed further in [Question 17](#).

Repeat of Question 16.

How much fluoride should an individual consume each day to reduce the occurrence of dental decay?

Opposition's Response

None. Many children even in non-fluoridated communities today are showing signs of fluoride poisoning (dental fluorosis) due to too much fluoride in today's foods processed with fluoridated water and from use of fluoridated toothpaste. (See [Overdose](#) section).

The ADA refers to fluoride as a nutrient. The FDA states that fluoride is not a nutrient — that it is a prescription drug. You don't have to have a prescription to obtain a nutrient. Every prescription drug has side-effects; that is why they can be obtained only on prescription, yet the ADA leads us to believe that it is safe and effective to put fluoride in the water supply, where there can not be any control of dosage. How could that be safe or effective? If it were calcium that our children needed (which is not an industrial waste product) would anyone be fighting to put that in our water supply? (See 13-1 document.).

The ADA "Table 2," shows that 10 mg fluoride is "tolerable," but for how long? (See [Question 13](#)). Children have become crippled with skeletal fluorosis from drinking water that contained just 4 ppm. (See 16-1: "Deformities Brought About by Fluoride," by Prof. D.G. Steyn, Professor of Pharmacology, University of Pretoria. Includes photos).

Question 17.

When fluoride is ingested, where does it go?

ADA's Fluoridation Facts Short Answer

Much is excreted; almost all of the fluoride retained in the body is found in calcified (hard) tissues, such as bones and teeth. Fluoride helps to prevent dental decay when incorporated into the teeth.

ADA's Fluoridation Facts Long Answer

After ingestion of fluoride, such as drinking a glass of optimally fluoridated water, the majority of the fluoride is absorbed from the stomach and small intestine into the blood stream.¹¹⁴ This causes a short term increase in the fluoride levels in the blood. The fluoride levels increase quickly and reach a peak concentration within 20-60 minutes.¹¹⁵ The concentration declines rapidly, usually within three to six hours following the peak levels, due to the uptake of fluoride by hard tissue and efficient removal of fluoride by the kidneys.¹⁰⁴ Approximately 50% of the fluoride absorbed each day by young or middle-aged adults becomes associated with hard tissues within 24 hours while virtually all of the remainder is excreted in the urine. Approximately 99% of the fluoride present in the body is associated with hard tissues.¹¹⁴

Ingested or systemic fluoride becomes incorporated into forming tooth structures. Fluoride ingested regularly during the time when teeth are developing is deposited throughout the entire surface of the tooth and contributes to long lasting protection against dental decay.¹⁷

Additional discussion on this topic may be found in [Question 1](#).

An individual's age and stage of skeletal development will affect the rate of fluoride retention. The amount of fluoride taken up by bone and retained in the body is inversely related to age. More fluoride is retained in young bones than in the bones of older adults.^{104, 114, 115}

According to generally accepted scientific knowledge, the ingestion of optimally fluoridated water does not have an adverse effect on bone health.¹¹⁶⁻¹²⁰ Evidence of advanced skeletal fluorosis, or crippling skeletal fluorosis, "was not seen in communities in the United States where water supplies contained

up to 20 ppm (natural levels of fluoride).^{74, 121} In these communities, daily fluoride intake of 20 mg/day would not be uncommon.⁷⁴ Crippling skeletal fluorosis is extremely rare in the United States and is not associated with optimally fluoridated water; only 5 cases have been confirmed during the last 35 years.⁷⁴

Additional discussion on this topic may be found in [Question 18](#).

The kidneys play the major role in the removal of fluoride from the body. Normally kidneys are very efficient and excrete fluoride very rapidly. However, decreased fluoride removal may occur among persons with severely impaired kidney function who may not be on kidney dialysis.⁹⁶ No cases of dental fluorosis or symptomatic skeletal fluorosis have been reported among persons with impaired kidney function; however, the overall health significance of reduced fluoride removal is uncertain and continued follow-up is recommended especially for children with impaired kidney function.⁵⁴

Additional discussion on this topic may be found in [Question 31](#).

Repeat of Question 17.

When fluoride is ingested, where does it go?

Opposition's Response

The ADA statement (above) says that because of the rapid removal of plasma fluoride by hard tissues and the kidneys, the plasma and soft tissue levels will return to pre-ingestion levels within three to six hours. That may be true if your kidneys are working properly; otherwise, fluoride is stored in soft tissues.

NOTE

Dr. John Yiamouyiannis says that if you drink lots of distilled water that "within 3 to 6 months, you will have your soft tissue fluoride levels down to normal and this is what really makes the difference. It's not so much the fluoride that's accumulated in your bones or your teeth, which is very hard to remove, but it's the fluoride that accumulates in the soft, active tissues." (See 17-1: "Fluoride: An Interview with Dr. John Yiamouyiannis," from *Health Freedom News*). Obviously, if a person is drinking fluoridated water on a daily basis, the fluoride will continue to accumulate in the tissue.

DISEASES

Question 18.

Will the ingestion of optimally fluoridated water over a lifetime adversely affect bone health?

ADA's Fluoridation Facts Short Answer

According to generally accepted scientific knowledge, the ingestion of optimally fluoridated water does not have an adverse effect on bone health.^{116-120, 122}

ADA's Fluoridation Facts Long Answer

The weight of scientific evidence does not supply an adequate basis for altering public health policy regarding fluoridation because of bone health concerns. A number of investigations have studied the effects on bone structure of individuals residing in communities with optimal and higher than optimal concentrations of fluoride in the drinking water. These studies have focused on whether there exists a possible link between fluoride and bone fractures. In addition, the role of fluoride in strengthening bone and preventing fractures has been investigated. Lastly, the possible association between fluoride and bone cancer has been studied.

Water Fluoridation Has No Significant Impact on Bone Mineral Density In 1991, a workshop, co-sponsored by the National Institute of Arthritis and Musculoskeletal and Skin Diseases and the National Institute of Dental Research, addressed the potential relationship of hip fracture and bone health in humans to fluoride exposure from drinking water. Meeting at the National Institutes of Health, researchers examined historic and contemporary research on fluoride exposure and bone health. At that time, participants concluded there was no basis for altering current public health policy regarding current guidelines for levels of fluoride in drinking water. Recommendations were made regarding additional research in several areas.¹¹⁶

In 1993, two studies were published demonstrating that exposure to fluoridated water does not contribute to an increased risk for hip fractures. One study looked at the risk of hip fractures in residents of two similar communities in Alberta, Canada.¹¹⁷ In this study, researchers compared a city with fluoridated drinking water optimally adjusted to 1 ppm to a city whose residents drank water containing naturally occurring fluoride at a concentration of only 0.3 ppm. No significant difference was observed in the overall hip fracture hospitalization rates for residents of both cities. "These findings suggest that fluoridation of drinking water has no impact, neither beneficial nor deleterious, on the risk of hip fracture."¹¹⁷

The second study examined the incidence of hip fracture rates before and after water fluoridation in Rochester, Minnesota.¹¹⁸ Researchers compared the hip fracture rates of men and women aged 50 and older from 1950 to 1959 (before the city's water supply was fluoridated in 1960) with the ten-year period after fluoridation. Their findings showed that hip fracture rates had decreased, and that the decrease began before fluoridation was introduced, and then continued. These data demonstrate no increase in the risk of hip fracture associated with fluoridation of the public water supply in Rochester, Minnesota.

Prior to 1993, the lead author of the 1993 Minnesota study had authored two earlier fluoridation-hip fracture studies showing a very slight increase in fracture risk in fluoridated communities.^{123, 124} The 1990 study examined the regional variation within the United States in the incidence of hip fracture in women aged 65 and over. The analysis of hip fracture incidence data at the county level demonstrated a strong pattern of regional variation among women, with a band of increased risk in the southern United States. The results of the analysis suggested that soft and fluoridated water, poverty, reduced sunlight exposure and rural location all increased the risk of hip fracture. In the summary, the author stated that no presently recognized factor or factors adequately explained the geographic variation.¹²³ The second study, published in 1992, was a national ecologic study of the association between water fluoridation and hip fractures in women and men aged 65 and over. (In ecological studies, groups of people are studied instead of individuals.) The study reported a small positive ecologic association between fluoridation of public water supplies and the incidence of hip fracture among the aged. The authors stated that this observation did not yet provide a firm platform for health policy, but stated further research was warranted.¹²⁴

In 1997, the lead author of the 1993 Minnesota study and the two studies noted in the preceding paragraph, issued a statement which concluded: "To my knowledge, no study has demonstrated that the introduction of fluoride to the public water supplies has increased the risk of (hip) fracture, let alone a doubling of the risk."¹²⁵

An ecological study conducted in eastern Germany compared the incidence of hip fractures for adults living in Chemnitz (optimally fluoridated) and Halle (fluoride-deficient). The results suggested the consumption of optimally fluoridated water reduced the incidence of hip fractures in elderly individuals, especially women over 84 years of age.¹²²

According to generally accepted scientific knowledge, the ingestion of optimally fluoridated water does not have an adverse effect on bone health.^{116-120, 122} Exposure to fluoride at levels considered optimal for the prevention of dental decay appears to have no significant impact on bone mineral density.¹²⁶

Fluoride's Role in Strengthening Bone

The second major area of study regarding fluoride and bone health is the role of fluoride in strengthening bone and preventing fractures. For nearly 30 years, fluoride, primarily in the form of slow-release sodium fluoride, has been used as an experimental therapy to treat osteoporosis, a condition characterized by a reduction in the amount of bone mass. Individuals with osteoporosis may suffer bone fractures as a result of what would be considered minimal trauma. Sodium fluoride therapy has been used in individuals in an effort to reduce further bone loss, or add to existing bone mass and prevent further fractures.¹¹⁶ The results of the clinical trials have been mixed as noted in the two following studies. The need for further research is indicated.

In 1995, the final report of a four year study was published demonstrating the ability of fluoride to aid in an increase in bone mass.¹²⁷ The study examined females with post-menopausal osteoporosis who took slow-release sodium fluoride (25 mg twice a day) and calcium citrate (400 mg twice a day) for four years in repeated 14 month cycles (12 months receiving treatment and 2 months not receiving treatment). The study concluded this treatment was safe and effective in reducing the number of new spinal fractures and adding new bone mass to the spine.¹²⁷

In a six-year clinical trial in 50 postmenopausal women, treatment with sodium fluoride and supplemental calcium was not effective in the treatment of osteoporosis.¹²⁸

No Association Between Fluoride and Bone Cancer

Lastly, the possible association between fluoride and bone cancer has been studied. In the early 1990s, two studies were conducted to evaluate the carcinogenicity of sodium fluoride in laboratory animals. The first study was conducted by the National Toxicology Program (NTP) of the National Institute of Environmental Health Sciences.¹²⁹ The second study was sponsored by the Proctor and Gamble Company.¹³⁰ In both studies, higher than optimal concentrations of sodium fluoride were consumed by rats and mice. When the NTP and the Proctor and Gamble studies were combined, a total of eight individual sex/species groups became available for analysis. Seven of these groups showed no significant evidence of malignant tumor formation. One group, male rats from the NTP study, showed "equivocal" evidence of carcinogenicity, which is defined by NTP as a marginal increase in neoplasms — i.e., osteosarcomas (malignant tumors of the bone) — that may be chemically related. The Ad Hoc Subcommittee on Fluoride of the U.S. Public Health Service combined the results of the two studies and stated: "Taken together, the two animal studies available at this time fail to establish an association between fluoride and cancer."⁵⁴

Additional discussion on this topic may be found in [Question 22](#).

Repeat of Question 18.

Will the ingestion of optimally fluoridated water over a lifetime adversely affect bone health?

Opposition's Response

Yes. The *Journal of American Medical Association (JAMA)* links hip fractures and fluoridation in four different issues since 1990. Studies published in the Journal in August 1992, specifically states that their objective was to "test the effect of water fluoridated to 1 ppm on the incidence of hip fractures." Their study demonstrated a link between hip fractures in the elderly and water fluoridated at 1 ppm, the so-called 'optimal dose.' "Hip fractures, (according to the report) are the second most common cause for admission (of elderly) to nursing homes accounting for approximately 60,000 admissions per year."

"Each year in the U.S. about 250,000 people over age 65 suffer hip fractures and 25% die within three months." (*Chemical & Engineering News*, July 30, 1990.)

"... we recently reported the ecological association of discharge rates for hip fracture and water fluoride levels in 39 county districts in England. ... there appears to be a positive association between fluoride levels of county water supplies and fracture discharge rates. This ecologic association is consistent with a recently published study and others in progress." (*Journal of the American Medical Association (JAMA)* July 24, 1991.)

"We found a ... significant increase in the risk of hip fracture in both men and women exposed to artificial fluoridation at 1 ppm, suggesting that low levels of fluoride may increase the risk of hip fracture in the elderly." (*Journal of the American Medical Association (JAMA)* Aug. 12, 1992.)

"Thus, adjusting for major individual risk factors, this study suggests a deleterious effect of fluorine in drinking water on the risk of hip fractures, even for moderate concentrations of fluorine, and no effect on other kinds of fractures." (See 18-1: "Fluoride and Hip Fracture," *JAMA*, Vol. 273, No. 10, March 8, 1995, and "Hip Fracture Rates are Much Higher in People Residing in Fluoridated Communities" - chart).

"More recently, attention has shifted to lower dosages of fluoride, such as found in fluoridated water. There are now at least eight studies that showed an increase of hip fracture incidence in fluoridated compared to unfluoridated communities. They are summarized here." (See 18-2: "Brief Account of the Fluoridation/Hip Fracture Problem," by John R. Lee, M. D., June 30, 1995, for details on these eight studies).

"... many studies (demonstrate) adverse effects to bone caused by fluoride at levels to which the majority of the U.S. population are exposed. ... the (Environmental Protection) Agency needs to take immediate action to prevent further injury from occurring to our aging population that result in fluoride induced hip fractures." (William Marcus, Ph.D., EPA scientist, statement to EPA Office of Drinking Water, July 29, 1991.)

"Based on data from the National Academy of Sciences, current levels of fluoride exposure in drinking water may cause arthritis in a substantial portion of the population long before they reach old age." (Robert J. Carton, Ph.D., former EPA scientist.)

"A review of recent scientific literature reveals a consistent pattern of evidence-hip fractures, skeletal fluorosis, the effect of fluoride on bone structure, fluoride levels in bones and osteosarcomas-pointing to the existence of causal mechanisms by which fluoride damages bones. ... and that there is negligible benefit from ingesting fluoride ..." (See 18-3: "New Evidence on Fluoridation," by Mark Diesendorf, Institute for Sustainable Futures, University of Technology, Sydney; John Colquhoun, Department of Education, University of Auckland, Auckland; Bruce J. Spittle, Department of Psychological Medicine, University of Otago Medical School, Dunedin; Douglas N. Everingham, Former Federal Minister for Health, Canberra; and Frederic w. Clutterbuck, Medical Practitioner, Queensland).

Women in high fluoride communities have much earlier and much worse osteoporosis than in low fluoride communities. There was "no protective effect (on bone mass or fracture) with higher fluoride" but more fractures were reported. (*American Journal of Nutrition*, 44:889-98, 1986.)

Dr. Saul Genuth, director of the radioimmunoassay laboratory at Cleveland's Mt. Sinai Hospital, said he "regretfully joined in the endocrinologic and metabolic drugs advisory committee's unanimous opinion that fluoride has yet to prove its worth in the treatment of postmenopausal osteoporosis." (See 18-4: "FDA Committee Spurns Fluoride," in *Medical World News*, Nov. 13, 1989).

Question 19.
What is dental fluorosis?

ADA's Fluoridation Facts Short Answer

Dental fluorosis is a change in the appearance of teeth and is caused when higher than optimal amounts of fluoride are ingested in early childhood while tooth enamel is forming. The risk of dental fluorosis can be greatly reduced by closely monitoring the proper use of fluoride products by young children.

ADA's Fluoridation Facts Long Answer

Dental fluorosis is caused by a disruption in enamel formation which occurs during tooth development in early childhood.¹⁰⁴ Enamel formation of permanent teeth, other than third molars (wisdom teeth), occurs from about the time of birth until approximately five years of age. After tooth enamel is completely formed, dental fluorosis cannot develop even if excessive fluoride is ingested.¹³¹ Older children and adults are not at risk for dental fluorosis. Dental fluorosis only becomes apparent when the teeth erupt. Because dental fluorosis occurs while teeth are forming under the gums, teeth that have erupted are not at risk for dental fluorosis.

Dental fluorosis has been classified in a number of ways. One the most universally accepted classifications was developed by H. T. Dean in 1942; its descriptions can be easily visualized by the public (See Table 3).

In using Dean's Fluorosis Index, each tooth present in an individual's mouth is rated according to the fluorosis index in Table 3. The individual's fluorosis score is based upon the severest form of fluorosis recorded for two or more teeth.

Very mild to mild fluorosis has no effect on tooth function and may make the tooth enamel more resistant to decay. This type of fluorosis is not readily apparent to the affected individual or casual observer and often requires a trained specialist to detect. In contrast, the moderate and severe forms of dental fluorosis are generally characterized by esthetically (cosmetically) objectionable changes in tooth color and surface irregularities. Most investigators regard even the more advanced forms of dental fluorosis as a cosmetic effect rather than a functional adverse effect.⁷⁴

The EPA, in a decision supported by the U.S. Surgeon General, has determined that objectionable dental fluorosis is a cosmetic effect with no known health effects.⁹⁷ Little research on the psychological effects of dental fluorosis on children and adults has been conducted, perhaps because the majority of those who have the milder forms of dental fluorosis are unaware of this condition.⁵⁴ In a 1986-7 national survey of U.S. school children conducted by the National Institute of Dental Research, dental fluorosis was present in 22.3% of the children examined using Dean's Index.⁵⁴ These children were exposed to all sources of fluoride (fluoridated water, food, beverages, fluoride dental products and dietary supplements). The prevalence of the types of fluorosis were:

- Very mild fluorosis 17.0%
- Mild fluorosis 4.0%
- Moderate fluorosis 1.0%
- Severe fluorosis 0.3%
- Total cases of fluorosis 22.3%

The incidence of moderate or severe fluorosis comprised a very small portion (6%) of the total amount of fluorosis. In other words, 94% of all dental fluorosis is the very mild to mild form of dental fluorosis (See Figure 2).

As with other nutrients, fluoride is safe and effective when used and consumed properly. The recommended optimum water fluoride concentration of 0.7 to 1.2 ppm was established to maximize the decay preventive benefits of fluoride, and the same time minimize the likelihood of mild dental fluorosis.⁵⁴

As with all public health measures, the benefits and risks of community water fluoridation have been examined. The benefits of water fluoridation are discussed extensively in the [Benefits](#) section of this document and the safety of water fluoridation is discussed in great detail in the remainder of this Safety section. In assessing the risks in regards to dental fluorosis, scientific evidence shows it is probable that approximately 10% of children consuming optimally fluoridated water, in the absence of fluoride from all other sources, will develop very mild dental fluorosis.¹³³

As defined in Table 3, very mild fluorosis is characterized by small opaque, paper-white areas covering less than 25% of the tooth surface. The risk of teeth forming with the very mildest form of fluorosis must be weighed against the benefit that the individual's teeth will also have a lower rate of dental decay thus saving dental treatment costs.^{4, 5} In addition, the risk of fluorosis may be viewed as an alternative to having dental decay, which is a disease that may cause cosmetic problems much greater than fluorosis (See Figure 2).¹³⁴

In 1994, a review of five recent studies indicated that the amount of dental fluorosis attributable to water fluoridation was approximately 13%. This represents the amount of fluorosis that might be eliminated if community water fluoridation was discontinued.⁵² In other words, the majority of dental fluorosis can be associated with other risk factors such as the inappropriate ingestion of fluoride products.

Additional discussion on this topic may be found in [Question 20](#).

The type of fluorosis seen today remains largely limited to the very mild and mild categories, although the prevalence of enamel fluorosis in both fluoridated and nonfluoridated communities in the United States is higher than it was when original epidemiological studies were done approximately 60 years ago. Because fluoride intake from water and the diet appears not to have increased since that time, the additional intake by children at risk for dental fluorosis is believed to be caused by consumer's inappropriate use of fluoride-containing dental products. As the ADA has recommended, the risk of fluorosis can be greatly reduced by following label directions for the use of these fluoride products.^{74, 96}

Repeat of Question 19. What is dental fluorosis?

Opposition's Response

In 1954, proponents openly admitted that dental fluorosis was the result of chronic low-grade poisoning from excess fluoride ingestion. (See 19-1: "Metabolism of Fluoride in Man," from *Industrial Medicine & Surgery*, 23:431-2, Sept. 1954). It is not just a "cosmetic effect" — it is the first sign that your child has been overdosed with a poison.

66.4% of US schoolchildren in so-called "optimally" fluoridated communities have teeth that display the permanent visible signs of fluoride-overdose. Dental fluorosis: white spots, staining, chalky and brittle enamel. (K.E. Heller, et al, *Journal of Public Health Dentistry*, Vol. 57: No. 3, Summer 1997.) (See [Overdose](#) section).

"Fluorosis — An abnormal condition caused by excessive intake of fluorine, as from fluoridated drinking water, characterized chiefly by mottling of the teeth." (*The American Heritage Stedman's Medical Dictionary*, 1995).

For 35 years it has been known that African-American children have twice the prevalence of dental fluorosis as white children and tends to be more severe. (See 19-2: "Health Effects of Ingested Fluoride" from *National Academy Press*, Washington, D.C., 1993. Also see 19-3, 19-4 and 19-5: *H.T. Dean's 1942 Classification and Criteria of dental fluorosis*, "Dental Fluorosis — How it Happens," and photos of fluorosed teeth).

Dr. F. J. McClure, National Institutes of Health, states that "the first specific symptom of fluorine injury to the child is the appearance of hypocalcified enamel known as mild mottled enamel."

Classification of fluorosis is based on the two teeth most affected. If the two teeth are not equally affected, the classification given is that of the less involved tooth. The tooth with the worst fluorosis is not even scored. (See 19-6: "Oral Health of US Children," 1986-87 National Survey).

Sixty-nine percent of children examined from a suburb of Boston had dental fluorosis. They were from high-socioeconomic-status families. Thirteen percent of these children were moderate-to severe. (See 19-7: "Your Family," — a study published in *Pediatric Dentistry*, 20:4, 1998).

Eighty-one percent of 12-14 year-olds in "optimally fluoridated (1 ppm)" Augusta, Georgia had dental fluorosis. Moderate-to severe was found in 14% of these children. ("Health Effects of Ingested Fluoride," *National Academy Press*, Washington, D.C., 1993, pp. 37, 44, 45.)

A study of 708 children aged 5 to 19 in fluoridated Asheville, North Carolina, found that 75% had fluorosis. (See 19-10: "Pediatrics," from *Pediatric Dentistry* 17:19, Jan./Feb. 1995).

H. Trendley Dean, (D.D.S.) Dental Research of Council of American Dental Association, public health expert on mottling stated: "I don't want to recommend any fluoridation where you get any mild (mottling)." (Congressional Hearings (Delaney Committee) p.1652.) Dean is known as "the father of fluoridation." Today, in some areas, dental fluorosis is found in epidemic proportions, and many children are suffering from not just mild fluorosis, but from moderate to severe!

"Opinions differ as to what traces of fluoride can do, but all agree that they do damage to the teeth and that damage is serious. It can be far worse than the worst neglected decay." (Dr. F. B. Exner, (M.D.) Fellow of American College Radiology, Seattle, Washington.)

"I believe that fluorine does, in a mild way, retard caries, but I also believe that the damage it does is far greater than any good it may appear to accomplish. It even makes the teeth so brittle and crumbly they can be treated only with difficulty, if at all." (See 10-9: Copy of Dentist's Letter from "The Town Without a Toothache," George W. Heard, 3/15/54).

"There are several areas in the United States where the water has a natural fluorine content of 1 ppm. I am practicing in such an area. In 1937, after moving from Michigan to eastern New Mexico, I was impressed by the number of attractive young persons who were disfigured by defective teeth, which defects on cursory notice looked like severe decay. I had never before seen dental fluorosis. I asked several of the patients what was wrong with their teeth and the reply was invariable, "Texas teeth". (Dr. D. C. Badger, (M.D.) in *American Journal of Diseases of Children*, July 1949.)

A recent study in Europe looked at X-rays of children with dental fluorosis and children who did not have fluorosis. The bone structure of the children with fluorosis was different from that of the normal children. The largest deviations from normal were seen in younger children and boys. (*Fluoride, Journal of the International Society for Fluoride Research*, Jan. 1993, pp. 37-44.)

Question 20.**Can fluorosis in children's teeth be prevented?****ADA's Fluoridation Facts Short Answer**

Because risk factors have been identified and verified by generally accepted scientific knowledge, the occurrence of dental fluorosis in the United States can be reduced without denying young children the decay prevention benefits of community water fluoridation.

ADA's Fluoridation Facts Long Answer

During the period of enamel formation in young children (before teeth appear in the mouth), inappropriate ingestion of high levels of fluoride is the risk factor for dental fluorosis.^{52, 135} Studies of fluoride intake from the diet including foods, beverages and water indicate that fluoride ingestion from these sources has remained relatively constant for over half a century and, therefore, is not likely to be associated with an observed increase in dental fluorosis.^{104, 107}

Dental decay has decreased because children today are being exposed to fluoride from a wider variety of sources than decades ago. Many of these sources are intended for topical use only; however, some fluoride is inadvertently ingested by children.¹⁰⁹ Inappropriate ingestion of topical fluoride can be prevented, thus reducing the risk for dental fluorosis without reducing decay prevention benefits.

Since 1992, the American Dental Association has required manufacturers of toothpaste to include the phrase "Use only a pea-sized amount (of toothpaste) for children under six" on fluoride toothpaste labels with the ADA Seal of Acceptance. The rationale for choosing six years of age for the toothpaste label is based on the fact that the swallowing reflex is not fully developed in children of preschool age and they may inadvertently swallow toothpaste during brushing. In addition, the enamel formation of permanent teeth is basically complete at six and so there is a decreased risk of fluorosis. Because dental fluorosis occurs while teeth are forming under the gums, individuals whose teeth have erupted are not at risk for dental fluorosis.

Additional discussion on this topic may be found in [Question 16](#) and [Question 19](#).

Numerous studies have established a direct relationship between young children brushing with more than the recommended pea-sized amount of fluoride toothpaste and the risk of very mild or mild dental fluorosis.¹³⁶⁻¹³⁸ One study of 916 children residing in a fluoridated community revealed that an estimated 71% of identified fluorosis cases could be explained by a history of having brushed more than once a day with more than the recommended amount (only one pea-sized dab at each brushing) of fluoride toothpaste throughout the first eight years of life.¹³⁹ Parents and caregivers should put only one pea-sized amount of fluoride toothpaste on a young child's toothbrush at each brushing. Young children should be supervised while brushing and taught to spit out, rather than swallow, the toothpaste.

Additionally, it has been shown that 25% of the fluorosis cases could be explained by a history of taking dietary fluoride supplements inappropriately (i.e., while also consuming fluoridated water) during the first eight years of life.¹³⁹ Dietary fluoride supplements should be prescribed as recommended in the Dietary Fluoride Supplement Schedule approved by the American Dental Association, the American Academy of Pediatrics and the American Academy of Pediatric Dentistry in 1994 (See Table 1.)¹² Fluoride supplements should only be prescribed for children living in nonfluoridated areas. Because of many sources of fluoride in the diet, proper prescribing of fluoride supplements can be complex. It is suggested that all sources of fluoride be evaluated with a thorough fluoride history before supplements are prescribed for a child.⁷³ Included in that evaluation is the testing of the home water supply if the fluoride concentration is unknown.

Parents, caregivers and health care professionals should judiciously monitor use of all fluoride-containing dental products by children under age six. As is the case with any therapeutic product, more is not always better. Care should be taken to adhere to label directions on fluoride prescriptions and over-the-counter products (e.g., fluoride toothpastes and rinses). The American Dental

Association recommends the use of fluoride mouthrinses, but not for children under six years of age because they may swallow the rinse. In addition, these products should be stored out of the reach of children.

Finally, in areas where naturally occurring fluoride levels in ground water are higher than 2 ppm, consumers should consider action to lower the risk of dental fluorosis for young children. (Adults are not affected because dental fluorosis occurs only when developing teeth are exposed to elevated fluoride levels.) Families on community water systems should contact their water supplier to ask about the fluoride level. Consumers with private home wells should have the source tested to accurately determine the fluoride content. Consumers should consult with their dentist regarding water testing and discuss appropriate dental health care measures. In homes where young children are consuming water with a fluoride level greater than 2 ppm, families should use an alternative primary water source, such as bottled water, for drinking and cooking. Private wells should be tested at least yearly due to possible fluctuations in water tables. It is important to remember that the American Dental Association recommends dietary fluoride supplements only for children living in areas with less than optimally fluoridated water.

Additional discussion on this topic may be found in [Question 9](#) and [Question 32](#).

Repeat of Question 20.
Can fluorosis in children's teeth be prevented?

Opposition's Response

Yes; avoid fluoridated water and toothpaste containing fluoride.

Question 21.
Is fluoride, as provided by community water fluoridation, a toxic substance?

ADA's Fluoridation Facts Short Answer

Fluoride, at the concentrations found optimally fluoridated water, is not toxic according to generally accepted scientific knowledge.

ADA's Fluoridation Facts Long Answer

Like many common substances essential to life and good health — salt, iron, vitamins A and D, chlorine, oxygen and even water itself — fluoride can be toxic in excessive quantities. Fluoride in the much lower concentrations (0.7 to 1.2 ppm) used in water fluoridation is not harmful or toxic.

Acute fluoride toxicity occurring from the ingestion of optimally fluoridated water is impossible.¹⁰⁴ The amount of fluoride necessary to cause death for a human adult (155 pound man) has been estimated to be 5-10 grams of sodium fluoride, ingested at one time.¹⁴⁰ This is more than 10,000-20,000 times as much fluoride as is consumed at one time in a single 8-ounce glass of optimally fluoridated water.

Chronic fluoride toxicity may develop after 10 or more years of exposure to very high levels of fluoride, levels not associated with fluoride intake in drinking optimally fluoridated water. The primary functional adverse effect associated with long term excess fluoride intake is skeletal fluorosis. The development of skeletal fluorosis and its severity is directly related to the level and duration of fluoride exposure. For example, the ingestion of water naturally fluoridated at approximately 5 ppm for 10 years or more is needed to produce clinical signs of osteosclerosis, a mild form of skeletal fluorosis, in the general population. In areas naturally fluoridated at 5 ppm, daily fluoride intake of 10 mg/day would not be uncommon.⁷⁴ A survey of X-rays from 170,000 people in Texas and Oklahoma whose drinking water had naturally occurring fluoride levels of 4 to 8 ppm revealed only 23 cases of osteosclerosis and no cases of skeletal fluorosis.¹⁴¹ Evidence of advanced skeletal fluorosis, or crippling skeletal fluorosis, "was not seen in communities in the United States where water supplies contained up to 20 ppm (natural levels of fluoride)."^{74, 121} In these communities, daily fluoride intake

of 20mg/day would not be uncommon.⁷⁴ Crippling skeletal fluorosis is extremely rare in the United States and is not associated with optimally fluoridated water; only 5 cases have been confirmed during the last 35 years.⁷⁴

Additional discussion on this topic may be found in [Question 16](#) and [Question 32](#).

The possibility of adverse health effects from continuous low level consumption of fluoride over long periods has been extensively studied. As with other nutrients, fluoride is safe and effective when used and consumed properly. No charge against the benefits and safety of fluoridation has ever been substantiated by generally accepted scientific knowledge. After 50 years of research and practical experience, the preponderance of scientific evidence indicates that fluoridation of community water supplies is both safe and effective.⁹⁸

At one time, high concentrations of fluoride compounds were used in insecticides and rodenticides.²⁷ Today fluoride compounds are rarely used in pesticides because more effective compounds have been developed.¹⁰⁴ While large doses of fluoride may be toxic, it is important to recognize the difference in the effect of a massive dose of an extremely high level of fluoride versus the recommended amount of fluoride found in optimally fluoridated water. The implication that fluorides in large doses and in trace amounts have the same effect is completely unfounded. Many substances in widespread use are very beneficial in small amounts, but may be harmful in large doses - such as salt, chlorine and even water itself.

Repeat of Question 21.

Is fluoride, as provided by community water fluoridation, a toxic substance?

Opposition's Response

Yes. "It is now clear that fluoride is a potentially harmful substance when present in the water supply in any amount. Those who want their children to have fluoride can give it individually, in measured doses, and more safely, reliably and cheaply than when put in the water. We can see no justifiable reason why everyone in the city should be needlessly subjected to any degree of life-long risk such as is created when a known poison is added to the water. We can accept no compromise with the established principle that the city's water supply must be kept as safe as possible for everyone." (Dr. Simon Beisler, Chief of Urology, Roosevelt Hospital, New York City, Dr. Fred Squier Dunn, Head of Oral Surgery Department, Lenox Hill Hospital, NYC, Dr. John Garlock, Consulting Surgeon, Mount Sinai Hospital, NYC, Dr. Edgar A. Lawrence, Director of Medicine at Lenox Hill Hospital, NYC. and Dr. Girard F. Oberrender, Director of Otolaryngology at Lenox Hill Hospital, NYC.)

"It is well documented in the scientific literature that the substance sodium fluoride (used in fluoridation) has an effect on the metabolic cycle, from which we get the energy to maintain the life process and repairs to the body. The amount of the dosage has very little to do with the question because it is a 'cumulative material' — that is, it collects in the body — its effect would vary from person to person." (Professor J. Earle Galloway, Drake University, Bio-Chemist and Chairman, Dept. of Pharmacology, Des Moines, IA.)

Dr. L. O. Maynard, Cornell University, authority on the role of minerals in nutrition, states: "There is no proof that fluoride is a dietary essential."

"Fluorine has never been proved to be an indispensable chemical element for the maintenance of healthy body and healthy teeth. There is no disagreement about the fact that fluorine is a protoplasmic and enzymatic poison." (Dr. V. O. Hurme, former director of Clinical Research, Forsyth Dental Infirmary for Children, Boston, MA.)

"Sound teeth can be produced through dietary control and oral hygiene without the use of fluoride." (Dr. J. J. Rae, Professor of Chemistry, University of Toronto.)

"Good sound teeth have been and still are being developed without added dietary intake of fluorides." (Dr. Paul Phillips, University of Wisconsin, noted nutritionist and one of foremost U. S. experts on fluoride.)

Today the advice of most doctors is to drink lots of water; adults should drink at least 2 quarts a day. That is double the amount we were advised to drink when fluoridation first started, so why hasn't the recommended amount been lowered? Today, those who follow their doctor's orders would be overdosing on this drug. Studies show that many children, even in unfluoridated areas, are already getting far more than "the safe dose" in their food and beverages. (See [Overdose](#) section).

"The proponents of fluoridation stress the fact that not only fluorine, but many other materials introduced into the body, including salt, water and food, are potentially harmful when ingested in too large quantities. Such statements do not take into account the fact, however, that fluorine is actually a poison, which could be ingested without giving any warning to our senses. Our taste or smell would not warn us of the imminent danger. If added in too large a quantity, chlorine would warn our senses, irritating the mucous membranes of eyes, nose and throat. Furthermore, chlorine evaporates. Fluorine does not, and it is tasteless." (Dr. Ludwik Gross (M.D., F.R.C.P.), renowned Cancer Research Scientist.)

The ADA statement (above) states that fluoride is an important trace element in human nutrition, like zinc and iron, even though the FDA states that fluoride is a drug, not a mineral nutrient. It is not necessary to get a prescription from your doctor to obtain zinc or iron. Any chemist will verify that fluoride is extremely toxic, more so than lead and almost as toxic as arsenic. Now the maximum contaminant level (MCL) for lead is 0.015 ppm, and the MCL for arsenic was recently lowered to 10 ppb (parts per billion), with a goal of 0.0 ppm for both of them. Why wouldn't .07 to 1.2 ppm (parts per million) of fluoride be harmful, and why would the ADA compare fluoride with "salt, iron, vitamins A and D, chlorine, oxygen and even water itself?"

Question 22.

Does drinking optimally fluoridated water cause or accelerate the growth of cancer?

ADA's Fluoridation Facts Short Answer

According to generally accepted scientific knowledge, there is no connection between cancer rates in humans and adding fluoride to drinking water.¹⁴²

ADA's Fluoridation Facts Long Answer

Since community water fluoridation was introduced in 1945, more than 50 epidemiologic studies in different populations and at different times have failed to demonstrate an association between fluoridation and the risk of cancer.⁵⁴ Studies have been conducted in the United States,¹⁴³⁻¹⁴⁸ Japan,¹⁴⁹ the United Kingdom,¹⁵⁰⁻¹⁵² Canada¹⁵³ and Australia.¹⁵⁴ In addition, several independent bodies have conducted extensive reviews of the scientific literature and concluded that there is no relationship between fluoridation and cancer.^{54, 94, 96, 155}

The United States Environmental Protection Agency (EPA) further commented on the safety of appropriate fluoride exposure in the December 5, 1997, Federal Register.¹⁵⁶ In a notice of a final rule relating to fluoride compounds the EPA stated, "... the weight of evidence from more than 50 epidemiological studies does not support the hypothesis of an association between fluoride exposure and increased cancer risk in humans. The EPA is in agreement with the conclusions reached by the National Academy of Sciences (NAS)."

Despite the abundance of scientific evidence, claims of a link between fluoridation and increased cancer rates continue. This assertion is based on one study comparing cancer death rates in ten large fluoridated cities versus ten large nonfluoridated cities in the United States. The results of this study have been refuted by a number of organizations and researchers.¹⁵⁷ The National Cancer Institute analyzed the same data and found that the original investigators failed to adjust their findings for variables, such as age and gender differences, that affect cancer rates. A review by other researchers pointed to further shortcomings in the study. The level of industrialization in the fluoridated cities was

much higher than the nonfluoridated cities. Researchers noted that a higher level of industrialization is usually accompanied by a higher incidence of cancer. While the researchers noted that the fluoridated cities did have higher cancer rates over the twenty year study, the rate of increase in the nonfluoridated cities was exactly the same (15%) as the fluoridated cities. Following further reviews of the study, the consensus of the scientific community continues to support the conclusion that the incidence of cancer is unrelated to the introduction and duration of water fluoridation.⁵⁴

In the early 1990s, two studies using higher than optimal levels of fluoride were conducted to evaluate the carcinogenicity of sodium fluoride in laboratory animals. The first study was conducted by the National Toxicology Program (NTP) of the National Institute of Environmental Health Sciences.¹²⁹ The second study was sponsored by the Proctor and Gamble Company.¹³⁰ In both studies, higher than optimal concentrations of sodium fluoride were consumed by rats and mice. When the NTP and the Proctor and Gamble studies were combined, a total of eight individual sex/species groups became available for analysis. Seven of these groups showed no significant evidence of malignant tumor formation. One group, male rats from the NTP study, showed "equivocal" evidence of carcinogenicity, which is defined by NTP as a marginal increase in neoplasms — i.e., osteosarcomas (malignant tumors of the bone) — that may be chemically related. The Ad Hoc Subcommittee on Fluoride of the U.S. Public Health Service combined the results of the two studies and stated: "Taken together, the two animal studies available at this time fail to establish an association between fluoride and cancer."⁵⁴

In a 1990 study, scientists at the National Cancer Institute evaluated the relationship between fluoridation of drinking water and cancer deaths in the United States during a 36 year period, and the relationship between fluoridation and the cancer rate during a 15 year period. After examining more than 2.3 million cancer death records and 125,000 cancer case records in counties using fluoridated water, the researchers saw no indication of a cancer risk associated with fluoridated drinking water.⁵⁴

In a document entitled "Fluoride and Drinking Water Fluoridation," the American Cancer Society states, "Scientific studies show no connection between cancer rates in humans and adding fluoride to drinking water."

Repeat of Question 22.

Does drinking optimally fluoridated water cause or accelerate the growth of cancer?

Opposition's Response

Yes. Fluoridation causes a dramatic increase in bone cancer in young men. Dr. William Marcus, Senior scientist at the Office of Drinking Water, won over \$250,000 from a whistle blower's law suit against the Environmental Protection Agency over the fluoridation cancer connection. He was fired in 1990 for telling the truth about fluoride and calling for an independent review board. (See 1-6: "Why EPA's Headquarters Union of Scientists Opposes Fluoridation").

"In point of fact, fluorine causes more human cancer death, and causes it faster, than any other chemical." (Dean Burk, Ph.D. former head of the National Cancer Institute's cytochemistry section chief chemist emeritus at the U.S. National Institute.)

Dr. Alfred Taylor, (Ph.D.) Research Scientist, makes this statement: "We became involved in the fluoridation problem as a result of experiments set up to test the possible anti-cancer properties of sodium fluoride. The results indicated that the animals on fluoridated water developed cancer earlier than the controls (on fluoride-free water). I took these results to the State Health Department. I innocently thought that the backers of fluoridation would be glad to receive this data and would initiate research on their own so as to make sure the public was protected from a possible health hazard. Instead, the Texas State Health Group immediately became concerned with how they could invalidate the lead we had discovered. The report of the Open Hearings (Congressional) contains our results with seven experiments. Recently we have completed a further series of experiments in which mice were given a non-fluorine diet bringing the total number of experiments up to 16 involving 645 mice. The results which have a high order of statistical validity indicate shortening of the life-span of mice drinking the fluoridated water of 9%." (Alfred Taylor, Ph.D., Clayton Foundation, Biochemical Institute, University of Texas.) (See 22-1: "Fluoride and Cancer," also by Dr. Taylor, Oct. 2, 1965).

Studies show cancers increase by 5% when fluoride is added to the community drinking water. We can expect in the area of 10,000 fluoridation-linked cancer deaths yearly; in other words, over 500,000 people, alive today, can expect to die of a fluoridation-linked cancer unless something is done to stop fluoridation in the U.S. (See 22-2: "Update on Fluoride and Cancer," by John Yiamouyiannis, Ph.D., testimony delivered to a Congressional Committee, Sept. 21, 1977).

In 1992, the New Jersey State Department of Health released the results of a study which found six times more bone cancer among males under the age of 20 living in communities with fluoridated water. ("A Brief Report on the Association of Drinking Water Fluoridation and the Incidence of Osteosarcoma Among Young Males" by Perry D. Cohn, Ph.D. M.P.H. *Environmental Health Service*, New Jersey Department of Health, Nov. 8, 1992.

"In San Francisco there has been a 400% increase in thyroid cancer during the period that the city has had fluoridated drinking water." (*New England Journal of Medicine*, 1955, 253/2 (45-51).)

Question 23.

Does fluoride inhibit the activity of enzymes in humans?

ADA's Fluoridation Facts Short Answer

Fluoride, in the amount provided through optimally fluoridated water, has no effect on human enzyme activity according to generally accepted scientific knowledge.

ADA's Fluoridation Facts Long Answer

*Enzymes are organic compounds that promote chemical change in the body. Generally accepted scientific knowledge has not indicated that optimally fluoridated water has any influence on human enzyme activity. There are no available data to indicate that, in humans drinking optimally fluoridated water, the fluoride affects enzyme activities with toxic consequences.¹⁰⁵ The World Health Organization report, *Fluorides and Human Health* states, "No evidence has yet been provided that fluoride ingested at 1 ppm in the drinking water affects intermediary metabolism of food stuffs, vitamin utilization or either hormonal or enzymatic activity."¹⁵⁸*

The concentrations of fluoride used in laboratory studies to produce significant inhibition of enzymes are hundreds of times greater than the concentration present in body fluids or tissues.¹⁴⁰ While fluoride may affect enzymes in an artificial environment outside of a living organism in the laboratory, it is unlikely that adequate cellular levels of fluoride to alter enzyme activities would be attainable in a living organism.¹⁰⁵ The two primary physiological mechanisms that maintain a low concentration of fluoride ion in body fluids are the rapid excretion of fluoride by the kidneys and the uptake of fluoride by calcified tissues.

Repeat of Question 23.

Does fluoride inhibit the activity of enzymes in humans?

Opposition's Response

Yes. Fluoride poisons enzymes. All the chemical reactions necessary to the life and function of the body depend on enzymes. Continuous depression of enzyme activity by fluorides produces alterations of function and symptoms of disease. Professor Hugo Theorell, Nobel Prize winner, (Medical Nobel Inst. Biochemist, Dept. of Communication to Royal Medical Board, Sweden, Mar. 1, 1958) based his opposition to fluoridation on the fact that fluoride is an established enzyme poison and potent inhibitor of many enzyme systems. His research, together with that of others in the Nobel Institute, had much to do with the unanimous ruling of Sweden's Supreme Administrative Court, Dec. 1961, that fluoridation of water supplies was not permissible under the "Swedish Health Act." (See 23-1: "Fluoride Poisons Enzymes," by Harvey Petraborg, M.D., 9/6/64).

" ... We ought to go slowly. Everybody knows fluorine and fluorides are very poisonous substances and we use them in enzyme chemistry to poison enzymes, those vital agents in the body. That is the reason things are poisoned, because the enzymes are poisoned and that is why animals and plants die." (Dr. James B. Sumner, Director of Enzyme Chemistry, Department of Biochemistry and Nutrition, Cornell University; Nobel Prize winner for his work in field of enzyme chemistry.)

The standard medical protocol in England for treating children with attention deficit disorder (ADD) is enzyme therapy.

"Fluorine is known to be an enzymatic inhibitor and interferes with metabolism of the breakdown of glucose." (Dr. Paul H. Phillips, University of Wisconsin, Department of Biochemistry.)

"There is plenty of evidence to indicate that fluorine in the amount of 1 ppm or slightly more interferes with enzyme systems and these enzyme systems are involved in the growth of bones, in the functioning of nerve tissue and so forth. It is clear that fluoridation is a calculated risk." (Dr. Robert S. Harris, (Ph.D.), Director of Nutritional Biochemistry Laboratories, Massachusetts Institute of Technology.)

"From the chemical and biochemical point of view, a key finding came in 1981, when John Emsley showed that fluoride formed a strong hydrogen bond with the amide function. This certainly gives a very plausible explanation as to why this 'chemically inert' entity fluoride could cause biochemical harm. Indeed, interference with the H-bonding poses a threat to the very heart of biochemistry where so much of the structure and function of proteins and nucleic acids is dependent on hydrogen bond making and breaking. This potential disruption of H-bonds would explain fluoride's inhibition of certain enzymes and possibly its interference with DNA repair mechanisms." (See 23-2: letter by Dr. Paul Connett, Professor of Chemistry, St. Lawrence University, Canton, NY, May 26. 1999).

" ... it is known as a scientific fact that fluoride is deadly poison to enzymes, upon which all life depends." (Dr. J.J. Rae, for 20 years professor of chemistry and Ph.D. in biochemistry and organics, University of Toronto.)

"As biochemists we are aware that fluorides are enzyme inhibitors. The burden of proof is upon the Public Health Service to prove that areas fluoridated for long periods show no evidence of a greater incidence of metabolic hypo-function than the non-fluoridated areas." (Dr. H.J. Goeckel, (Ph.D.), Biochemist.)

"It is now known that such vital organs as the kidneys, thyroid, aorta (main heart artery), liver, lungs and others can be the sites of an unusually high fluoride build-up. No matter how small the amount of fluoride in the diet, a part of it tends to accumulate in the body. When the water supply is fluoridated the intake of the individual is considerably increased and the accumulation in the body increases accordingly. There is no clear-cut pattern as to the degree of retention among individuals. Further, it accumulates in certain organs in an unpredictable way. Some individuals may store up to 100 times more fluoride in certain tissue than others. This has given rise to concern over fluoride's possible role in chronic disease. Fluoride is an enzyme poison and medical authorities recognize that disturbances of the enzyme system are a cause of disease." (Dr. Jonathan Forman, M.D., world-renowned specialist in allergy, Professor-Emeritus of Ohio State University, former editor of the *Ohio State Medical Journal*, editor of *Clinical Physiology*, in statement in behalf of Medical-Dental Committee on Evaluation of Fluoridation.)

"Fluorine and fluorides act as direct cellular poisons by interfering with calcium metabolism and enzyme mechanisms." (*Handbook of Poisoning: Prevention, Diagnosis and Treatment*, 11th Edition, 1983.)

"Fluoride is an enzyme poison, in the same class as cyanide, oxalate, or azide ... it is capable of a very wide variety of harmful effects, even at low doses." (James B. Patrick, Ph.D., antibiotics research scientist.)

"Yes, fluoride is an (enzyme) inhibitor. You are right in the implication that when it comes to certain patients, it is important that they do not have fluoride in the water." (Dr. Harold Loe, National Institute of Dental Research, to a subcommittee of the House Appropriations Committee, 1989.)

Question 24.

Can fluoride, as found in optimally fluoridated drinking water, alter immune function or produce allergic reactions (hypersensitivity)?

ADA's Fluoridation Facts Short Answer

*According to generally accepted scientific knowledge, there is no evidence of any adverse effect on specific immunity from fluoridation, nor have there been any confirmed reports of allergic reaction.*¹⁵⁹

ADA's Fluoridation Facts Long Answer

*There are no confirmed cases of allergy to fluoride, or of any positive skin testing in human or animal models.*¹⁵⁹ *The American Academy of Allergy reviewed clinical reports of possible allergic responses to fluoride and concluded, "There is no evidence of allergy or intolerance to fluorides as used in the fluoridation of community water supplies."*¹⁶⁰ *A committee of the National Academy of Sciences evaluated the same clinical data and reported, "The reservation in accepting (claims of allergic reaction) at face value is the lack of similar reports in much larger numbers of people who have been exposed to considerably more fluoride than was involved in the original observations."*¹⁴ *The World Health Organization (WHO) also judged these cases to represent "a variety of unrelated conditions" and found no evidence of allergic reactions to fluoride.*^{161, 162}

*A 1996 review of the literature on fluoride and white cell function examined numerous studies and concluded that there is no evidence of any harmful effect on specific immunity following fluoridation nor any confirmed reports of allergic reactions.*¹⁵⁹

Repeat of Question 24.

Can fluoride, as found in optimally fluoridated drinking water, alter immune function or produce allergic reactions (hypersensitivity)?

Opposition's Response

Yes. As reported in the *Journal of Dental Medicine*, October 1961, (Vol.) 16:190, a 14 year experiment by Feltman and Kosel proved that 1% of the population is allergic to fluoride. (See 24-1: letter dated June 18, 1963, by E. R. Cooper, M.D. from Abbott Laboratories).

"Six children and one adult exhibited various allergic reactions after the use of toothpaste and vitamin preparations containing fluoride. The following conditions were encountered: Urticaria, exfoliative dermatitis, atopic dermatitis, stomatitis, gastro-intestinal and respiratory allergy." (See 24-2: Allergy to Fluoride, by J.J.Shea, M.D., F.A.C.A., S.M.Gillespie, M.D., and G.L.Waldbott, M.D., F.A.C.A from *Annals of Allergy*, Vol. 25, July 1967).

"No two people react alike to the same drug no matter how small the dose. At the so-called 'safe' concentration fluorine is a potent danger to every individual, especially to diabetics who drink more water, to nephritics who can't eliminate fluorine readily and to allergic people who have a low tolerance for drugs. That it is cumulative has recently been shown in Berkley at the University of California by radio-active tracer studies made by Dr. Wallace-Durbin with the Atomic Energy Commission, 1955." (Dr. George L. Waldbott, (M.D., F.A.C.P., F.A.A.A., F.A.C.A.) Detroit, Michigan.)

"As every physician knows some people have adverse reactions to the simplest drugs. It would be beyond expectation if none reacted unfavorably to fluoride." (Dr. G. W. Covey, (M.D.) Editor *Nebraska State Medical Journal*.)

Dr. H. Trendley Dean (so-called "father of fluoridation") made this statement: "The same amount of fluorine that causes a mild toxic reaction in one individual may cause a severe reaction in another. In other words we are dealing with a low-grade chronic poisoning of the formative dental organ in which

case some individuals may show a more severe reaction than others having a comparable fluorine intake." (*Journal of The American Dental Association*, August 1943.) However, in 1945, Dean was promoting the fluoridation experiments.

Dr. Reuben Feltman, Research Dentist at Passaic, N. J. General Hospital, has spent years conducting studies of children and pregnant women given fluorides. He states: "We have had some individuals in our study who have had reactions to fluorides — urticarias, vomiting, etc. — and we have discontinued the use of the element with no deleterious effects. What will happen to such individuals, when water is fluoridated, if it may cause unusual reactions to a few?"

Question 25.

Does drinking optimally fluoridated water cause AIDS?

ADA's Fluoridation Facts Short Answer

There is no generally accepted scientific evidence linking the consumption of optimally fluoridated water and AIDS (acquired immune deficiency syndrome).

ADA's Fluoridation Facts Long Answer

AIDS is caused by a retrovirus known as the human immunodeficiency virus (HIV). The routes of transmission of HIV include unprotected sexual activity, exposure to contaminated blood or blood products and as a result of an infected woman passing the virus to the fetus during pregnancy or to the newborn at birth.¹⁶³

There is no scientific evidence linking HIV or AIDS with community water fluoridation.¹⁶⁴

Repeat of Question 25.

Does drinking optimally fluoridated water cause AIDS?

Opposition's Response

Fluoride does not cause aids, but it could certainly be a co-factor in the development of AIDS. The immune system is the first line of defense against bacteria, viruses and other parasites, as well as from the spontaneous generation of potentially cancerous cells. Any agent which reduces the ability of the immune system to function efficiently, will tend to reduce the resistance of the population to infection, and will increase susceptibility to cancer and immune depressed states such as post-viral fatigue syndrome and AIDS. ("Effects of Fluoride on Immune System Function" by Sheila L.M. Gibson, M.D., *Complimentary Medical Research*, October 1992, pp. 111-113.)

Question 26.

Is fluoride, as provided by community water fluoridation, a genetic hazard?

ADA's Fluoridation Facts Short Answer

Following a review of generally accepted scientific knowledge, the National Research Council of the National Academy of Sciences supports the conclusion that drinking optimally fluoridated water is not a genetic hazard.⁹⁶

ADA's Fluoridation Facts Long Answer

Chromosomes are the DNA-containing bodies of cells that are responsible for the determination and transmission of hereditary characteristics. Genes are the functional hereditary unit that occupy a fixed location on a chromosome. Many studies have examined the possible effects of fluoride on chromosome damage. While there are no published studies on the genotoxic (damage to DNA) effect of fluoride in humans, numerous studies have been done on mice.⁹⁶ These studies have shown no evidence that fluoride damages chromosomes in bone marrow or sperm cells even at fluoride levels 100 times higher than that in fluoridated water.¹⁶⁵⁻¹⁷¹ Another independent group of researchers reported a similar lack of fluoride-induced chromosomal damage to human white blood cells, which are especially sensitive to agents which cause genetic mutations. Not only did fluoride fail to damage chromosomes, it protected them against the effect of a known mutagen (an agent that causes

changes in DNA).^{172, 173} The genotoxic effects of fluoride were also studied in hamster bone marrow cells and cultured hamster ovarian cells. Again, the results supported the conclusion that fluoride does not cause chromosomal damage, and therefore, was not a genetic hazard.¹⁷⁴ In further tests, fluoride has not caused genetic mutations in the most widely used bacterial mutagenesis assay (the Ames test) over a wide range of fluoride levels.¹⁷⁴⁻¹⁷⁷

Occasional questions arise regarding fluoride's effects on human reproduction, fertility and birth rates. Very high levels of fluoride intake have been associated with adverse effects on reproductive outcomes in many animal species. Based on these findings, it appears that fluoride concentrations associated with adverse reproductive effects in animals are far higher (100-200 ppm) than those to which human populations are exposed. Consequently, there is insufficient scientific basis on which to conclude that ingestion of fluoride at levels found in community water fluoridation (0.7-1.2 ppm) would have adverse effects on human reproduction.⁹⁶

One human study compared county birth data with county fluoride levels greater than 3 ppm and attempted to show an association between high fluoride levels in drinking water and lower birth rates.¹⁷⁸ However, because of serious limitations in design analysis, the investigation failed to demonstrate a positive correlation.¹⁷⁹

The National Research Council (NRC) of the National Academy of Sciences (NAS) supports the conclusion that drinking optimally fluoridated water is not a genetic hazard. In a statement summarizing its research, the NRC states, "in vitro data indicate that:

1. The genotoxicity of fluoride is limited primarily to doses much higher than those to which humans are exposed.
2. Even at high doses, genotoxic effects are not always observed.
3. The preponderance of the genotoxic effects that have been reported are of the types that probably are of no or negligible genetic significance."⁹⁶

The lowest dose of fluoride reported to cause chromosomal changes in mammalian cells was approximately 170 times that found normally found in human cells in areas where drinking water is fluoridated, which indicates a very large margin of safety.⁹⁶

Repeat of Question 26.

Is fluoride, as provided by community water fluoridation, a genetic hazard?

Opposition's Response

Yes. In Dr. Richard G. Foulkes' conclusion he writes: "Is our future being stolen? Yes. There are many medical problems that can be attributed to the hormone-disrupting chemicals and other substances, including fluoride. Lowered fertility and increased brain dysfunction are two of these for which there is mounting evidence." (See 26-1: "The Fluoride Connection," *Fluoride*, Vol. 29 No. 4 230-236).

"The biological activity of fluoride is not fully appreciated. It is a cytoplasmic toxin (poison to all cells), interfering with the action of oxidase enzyme systems. The effect of this property on the highly active enzyme system of the developing ovum and the fetus (unborn baby) has not been evaluated." (Colin P. Harrison, M.D., head of Diagnostic laboratory, in the *Australian Medical Journal*, Dec. 9, 1961.)

"According to Robert J. Carton, an environmental scientist at EPA, the scientific assessment of fluoride's health risks written by the agency in 1985 omits 90% of the literature on mutagenicity, most of which suggests fluoride is a mutagen." (Natick Fluoridation Study Committee Report, dated 9/27/97.)

Melatonin, the main pineal gland hormone now thought to act as a 'body clock,' is inhibited by fluoride causing early onset of sexual maturation in study animals. The mean age of menstruation for girls in fluoridated test city Newburgh, New York, in 1956, was 5 months earlier than non-fluoridated control city, Kingston. Low melatonin levels have been linked to both breast and prostate cancer. (*Caries*

Research, Vol. 28, p. 204, 1994; *Journal of American Dental Association*, Mar. 1956; Breast Health, Charles Simone, Princeton, oncologist.) (See 26-2: "Newburgh-Kingston-Report" from *The Journal of the American Medical Association*, Vol. 52, page 290-325, March 1956.)

"In conclusion, fluoride inhibits pineal gland melatonin synthesis in the immature gerbil. This is associated with an accelerated onset of pubertal development on the female gerbil. If these results can be extrapolated to humans, high plasma-fluoride levels during early childhood may be a contributory factor in the current decline in the age of puberty." (See 26-3: "Effects of Fluoride on the Physiology of the Pineal Gland," by J. Luke, University of Surrey, Guildford, England, from *Fluoride*, Vol. 31, No. 3, pp. 129-174, Aug. 1998).

Heifers exposed to 5 ppm fluoride in drinking water during 4 breeding seasons developed anestrus. Calving rates fell to 30% of normal rate. (Van Rensburg and De Vos, *Onderstepoort J. Vet. Res.*, Vol. 33, 185, 194 (1966).)

The Coeur d'Alene Press (Idaho), Jan. 20, 1955, had an advertisement by the Stice Chinchilla Ranch stating: "Chinchillas Not For Sale to residents of Coeur D'Alene. Our own experience has proven that you cannot raise chinchillas with fluoridated water. Our books, and reports prove that you cannot obtain but a fraction of normal production and have healthy animals with fluorine in the water." ("Fluorides, Fluoridation, and One Part per Million," by Harvey Petrabor, M. D., 7/29/64.)

Question 27

Does drinking optimally fluoridated water cause an increase in the rate of children born with Down Syndrome?

ADA's Fluoridation Facts Short Answer

There is no generally accepted scientific knowledge establishing a relationship between Down Syndrome and the consumption of optimally fluoridated drinking water.

ADA's Fluoridation Facts Long Answer

This question originally arose because of two studies published in 1956 and 1963. Data collected in several Midwest states in 1956 formed the basis for two articles published in French journals, purporting to prove a relationship between fluoride in the water and Down Syndrome.^{180, 181}

Experienced epidemiologists and dental researchers from the National Institute of Dental Research and staff members of the National Institute of Mental Health have found serious shortcomings in the statistical procedures and designs of these two studies. Among the most serious inadequacies is the fact that conclusions were based on the fluoridation status of the communities where the mothers gave birth, rather than the status of the rural areas where many of the women lived during their pregnancies.¹⁴⁰ In addition, the number of Down Syndrome cases found in both fluoridated and nonfluoridated communities were much lower than the rates found in many other parts of the United States and the world, thus casting doubt on the validity of findings.

The following paragraphs provide a summary of numerous studies that have been conducted which refute the conclusions of the 1956 studies.

A British physician reviewed vital statistics and records from institutions and school health officers, and talked with public health nurses and others caring for children with Down Syndrome. The findings noted no indication of any relationship between Down Syndrome and the level of fluoride in water consumed by the mothers.¹⁸²

These findings were confirmed by a detailed study of approximately 2,500 Down Syndrome births in Massachusetts. A rate of 1.5 cases per 1,000 births was found in both fluoridated and nonfluoridated communities, providing strong evidence that fluoridation does not increase the risk of Down Syndrome.¹⁸³

Another large population-based study with data relating to nearly 1.4 million births showed no association between water fluoridation and the incidence of congenital malformations including Down Syndrome.¹⁸⁴

In 1980, a 25-year review of the prevalence of congenital malformations was conducted in Birmingham, England. Although Birmingham initiated fluoridation in 1964, no changes in the prevalence of children born with Down Syndrome occurred since that time.¹⁸⁵

A comprehensive study of Down Syndrome births was conducted in 44 U.S. cities over a two-year period. Rates of Down Syndrome were comparable in both fluoridated and nonfluoridated cities.¹⁸⁶

Repeat of Question 27.

Does drinking optimally fluoridated water cause an increase in the rate of children born with Down Syndrome?

Opposition's Response

Yes. Dr. Ionel Rapaport, with the Psychiatric Institute at the University of Wisconsin, observed that the amount of fluoride in drinking water was related to the incidence of mongolism, a brain defect characterized by mental and physical retardation. The Rapaport studies covered 7 ½ million people and 340,000 births, and the results were published in the Bulletin of the National Academy of Medicine in France.

Proponents promptly found fault with his findings. Rapaport then ran another study, with their complaints in mind. His first study showed the probability was 50 to 1 that fluoride causes mongolism. Using the preferred method, the probability increased to 1000 to 1.

Proponents always talk about the first study, and ignore the second one. The British survey, upon which proponents rely, is improperly controlled because tea-drinking, fish-eating mothers in the area of England surveyed, even though they live where water contains little or no fluoride, may ingest more fluoride than those who reside in the U.S. where water is naturally high in fluoride. Both tea and fish are naturally high in fluoride. (See 27-1: "New Researches on Mongolism Related to the Disease Producing Role of Fluorine," from *Bulletin of National Academy of Medicine*, Paris, France, Vol. 143, Nos. from 15 and 16, pp 367-370, 1959).

Question 28.

Does ingestion of optimally fluoridated water have any neurological impact?

ADA's Fluoridation Facts Short Answer

There is no generally accepted scientific knowledge establishing a causal relationship between consumption of optimally fluoridated water and central nervous system disorders, including effects on intelligence.

ADA's Fluoridation Facts Long Answer

There have been claims that exposure to fluoride presents a neurotoxic (harmful or damaging to nerve tissue) risk or lowered intelligence. Such claims are based on a 1995 study in which rats were fed fluoride at levels up to 125 times greater than that found in optimally fluoridated water.¹⁸⁷ The study attempted to demonstrate that rats fed extremely high levels of fluoride (75 ppm to 125 ppm in drinking water) showed behavior-specific changes related to cognitive deficits.

In addition, the experiment also studied the offspring of rats who were injected two to three times a day with fluoride during their pregnancies in an effort to show that prenatal exposure resulted in hyperactivity in male offspring.

However, two scientists who reviewed the 1995 study¹⁸⁸ have suggested that the observations made can be readily explained by mechanisms that do not involve neurotoxicity. The scientists found inadequacies in experimental design that may have led to invalid conclusions. For example, the results

of the experiment were not confirmed by the use of control groups which are an essential feature of test validation and experimental design. In summary the scientists stated, "We do not believe the study by Mullenix et al. can be interpreted in any way as indicating the potential for NaF (sodium fluoride) to be a neurotoxicant." Another reviewer¹⁰⁴ noted, "... it seems more likely that the unusually high brain fluoride concentrations reported in Mullenix et al. were the result of some analytical error."

A seven-year study compared the health and behavior of children from birth through six years of age in communities with optimally fluoridated water with those of children the same age without exposure to optimally fluoridated water. Medical records were reviewed yearly during the study. At age six and seven, child behavior was measured using both maternal and teacher ratings. The results suggested that there was no evidence to indicate that exposure to optimally fluoridated water had any detectable adverse effect on children's health or behavior. These results did not differ even when data was controlled for family social background.¹⁸⁹

Repeat of Question 28.

Does ingestion of optimally fluoridated water have any neurological impact?

Opposition's Response

Yes, fluoride can affect the brain. Fluoride is the primary agent in many pharmaceuticals specifically intended to affect brain activity: Prozac (fluoxetine) to inhibit the reuptake of Serotonin, the brain chemical necessary for synapse; Phen-Fen (fenfluramine) the diet drug taken off the market because of heart valve damage (only the fluoride-containing half of Phen-Fen was outlawed); Rohypnol (commonly called "roofies"), recently in the news as the date rape drug; fluoride is the only toxic element in Sarin, the nerve gas (rated 1,500 times more toxic than cyanide) used in the Japanese subway by terrorists and referenced in the Gulf War illnesses; and virtually every general anesthetic contains fluoride.

Medical contraindications for fluoroquinolones include, "They should not be used during pregnancy or breast-feeding because of severe effect on bone growth of the fetus or infant."

The trade-organizations-turned-sales-agents do not describe these uses of fluoride because it accentuates the fact that fluoride is used extensively for purposes other than resisting tooth decay, and that there are a wide array of risks-none of which supports their proposition that fluoride is a "benign element that has no adverse health effects."

Dr. Phyllis Mullenix, former head of toxicology at Forsyth Dental Center in Boston for 11 years, and now a critic of fluoridation, conducted animal studies in the early 1990s. She found that fluoride is a powerful central nervous system toxin and that the human brain could be adversely affected even at low doses. Dr. Mullenix states: "Criticisms of our study by dentists say that our results in rats are not relevant to humans because the doses we used were too high (75-125 ppm NaF in drinking water). These criticisms are without merit because our doses in rats produce a level of fluoride in the plasma equivalent to that found in humans drinking 5-10 ppm fluoride in water, or humans receiving some treatments for osteoporosis. — The fluoride levels in the drinking water of our rats were not high, they were taken from the well known animal model developed for the study of dental fluorosis, a model used repeatedly by dental researchers for several years. — In summary, there are no advantages to water fluoridation today. The risks far exceed the hoped for benefit." (See 28-1: letter by Phyllis J. Mullenix, Ph.D., to Dr. Irwin Kash, June 17, 1999).

Research from China has shown a correlation between exposure to fluoride and diminished IQ in children. (See 28-2: "Effect of a High Fluoride Water Supply on Children's Intelligence," from *Fluoride*, Vol. 29, No. 4, pp. 190-192). But when Dr. Mullenix applied for a grant from the U.S. National Institutes of Health (NIH) to continue her central nervous system research, she was turned down. An NIH panel flatly told her that "fluoride does not have central nervous system effects."

However, a declassified atomic bomb program memo dated April 29, 1944 states clearly that, "clinical evidence suggests that uranium hexafluoride may have a rather marked central nervous system effect." The memo goes on to ask for a series of animal tests to be done on central nervous system effects and says, "this is important not only to protect a given individual, but also to prevent a confused workman from injuring others by improperly performing his duties."

"Be aware that a child's brain is vulnerable to damage from fluoride even before birth and that damage to the central nervous system and resultant low IQ not only robs the individual of the present but steals the future of society itself." (See 28-3: "Fluoride and Brain Damage: A Secret Revealed," by Richard G. Foulkes, BA, MD, from *Alive, Canadian Journal of Health and Nutrition*, #191, Sept. 1998, pp. 67-68).

"According to Dr. Isaacson's research, the damage from sodium and aluminum fluoride causes irreversible memory loss similar to Alzheimer's Disease. These results could also be translated to behavioral, motor sensory and learning problems. However, reducing the fluoride(s) intake of a child could inhibit further brain damage." (See 28-4: "Third Study Links Fluoride Ingestion to Brain Damage," from *Sarasota Eco Report*, Vol. 5, No. 12, Dec. 1995, by George Glasser, Journalist).

Question 29.

Does drinking optimally fluoridated water cause Alzheimer's disease?

ADA's Fluoridation Facts Short Answer

Generally accepted science has not demonstrated an association between drinking optimally fluoridated water and Alzheimer's disease.

ADA's Fluoridation Facts Long Answer

The exact cause of Alzheimer's disease (AD) has yet to be identified. Scientists have identified the major risk factors for AD as age and family history. Other possible risk factors include a serious head injury and lower levels of education. Scientists are also studying additional factors to see if they may be associated with the disease. These include genetic (inherited) factors, viruses and environmental factors such as aluminum, zinc and other metals. Researchers have found these metals in the brain tissue of people with AD, but it is not known if these metals cause AD or build up in the brain as a result of the disease.¹⁹⁰

Because aluminum has been found in the brain tissue of people with AD, claims have been made that fluoridated water "leaches" out the aluminum in cookware when used for boiling water, thereby implicating fluoride as a co-factor in the development of AD. One experiment attempted to test this claim by measuring the release of aluminum from aluminum cookware under the most adverse conditions, with and without the presence of fluoride. Throughout these trials, scientists were unable to leach out significant amounts of aluminum from any of the cookware, including those that were exposed to extreme acidic or alkaline conditions.¹⁹¹

A study published in 1998¹⁹² raised concerns about the potential relationship between fluoride and Alzheimer's disease. However, several flaws in the experimental design preclude any definitive conclusions from being drawn.¹⁹³

Interestingly, there is evidence that aluminum and fluoride are mutually antagonistic in competing for absorption in the human body.^{17, 194} While a conclusion cannot be made that consumption of fluoridated water has a preventive effect on AD, there is no generally accepted scientific knowledge to show consumption of optimally fluoridated water is a risk factor for AD.

Repeat of Question 29.**Does drinking optimally fluoridated water cause Alzheimer's disease?****Opposition's Response**

Researchers recently expressed their surprise that low doses of sodium fluoride, equivalent to the amount found in 1 ppm fluoridated water, were found to cause brain damage similar to that found in Alzheimer's and other forms of dementia, and that low doses of aluminum fluoride (0.5 ppm) resulted in double the amount of aluminum found in the brain compared to 100 times the dosage of aluminum (50 ppm) without the fluoride. (See 29-1: *Brain Research*, 784, 1998, 284-298).

"... water with 1 part per million (ppm) of fluoride frees nearly 200 ppm of aluminum when boiled 10 minutes in aluminum cooking pots. That is 1,000 times the aluminum leached by nonfluoridated water." (See 29-2: *Science News*, 1/31/87).

"With the discovery that abnormally high levels of aluminum are present in senile plaques in Alzheimer's dementia, the cumulative effects of aluminum poisoning and the question of how this metal enters the body become problems that need immediate attention." (See 29-2: "Aluminum Leaching From Cooking from Utensils," in *Nature*, Jan. 1987).

Question 30.**Does drinking optimally fluoridated water cause or contribute to heart disease?****ADA's Fluoridation Facts Short Answer**

Broad national experience and generally accepted scientific knowledge demonstrate that drinking optimally fluoridated water is not a risk factor for cardiovascular disease.

ADA's Fluoridation Facts Long Answer

This conclusion is supported by results of a study conducted by the National Heart and Lung Institute of the National Institutes of Health. Researchers examined a wide range of data from communities that have optimally fluoridated water and from areas with insufficient fluoride. The final report concluded that:

Thus, the evidence from comparison of the health of fluoridating and non-fluoridating cities, from medical and pathological examination of persons exposed to a lifetime of naturally occurring fluorides or persons with high industrial exposures, and from broad national experience with fluoridation all consistently indicate no adverse effect on cardiovascular health.¹⁹⁵

The American Heart Association has reaffirmed its historical position that heart disease is not related to the amount of fluoride present in drinking water.¹⁹⁶ The American Heart Association identifies cigarette and tobacco smoke, high blood cholesterol levels, high blood pressure, physical inactivity and obesity as major risk factors for cardiovascular disease.¹⁹⁷

A number of studies have considered trends in urban mortality in relation to fluoridation status. In one study, the mortality trends from 1950-70 were studied for 473 cities in the United States with populations of 25,000 or more. Findings showed no relationship between fluoridation and heart disease death rates over the 20-year period.¹⁴⁵ In another study, the mortality rates for approximately 30 million people in 24 fluoridated cities were compared with those of 22 nonfluoridated cities for two years. No evidence was found of any harmful health effects, including heart disease, attributable to fluoridation. As in other studies, crude differences in the mortality experience of the cities with fluoridated and nonfluoridated water supplies were explainable by differences in age, gender and race composition.¹⁴⁴

Repeat of Question 30.**Does drinking optimally fluoridated water cause or contribute to heart disease?****Opposition's Response**

Yes. On March 24, 1952, Dr. A. L. Miller, Congressman from Nebraska and formerly State Health Director, apologized to the members of Congress for having introduced legislation which led to the fluoridation of the water supply of the District of Columbia. He had been led to believe, he said, that the U.S. Public Health Service had researched all aspects of fluoridation. Hearings before the Special Commission on Chemicals in Foods had opened his eyes to things he had not known. He produced figures to justify his concern. A check of vital statistics of Grand Rapids, Michigan (which is the only city of any size that had had artificial fluoridation for more than four years) showed that the death rate from heart disease in the year 1944 numbered 585. Four years later, after fluoridation had started (in

1945), there were 1,059 deaths. There was an increase of 50% in the deaths from nephritis. There was an increase of 50%, over a period of four years, in the deaths from intercranial lesions. These figures are contained in the Vital Statistics of the U.S. published annually by the United States Public Health Service. (See 30-1: "Reprinted from the March 24, 1952, issue of the *Congressional Record*").

An editorial in the Newburgh, New York, *News*, Jan. 27, 1954, after nine years of fluoridation, states: "According to statistics now being released by the Government, heart disease, our leading menace, is responsible for a larger proportion of death in Newburgh than in most other sections of the United States. The 283 heart deaths in Newburgh in the (designated) year were equal to a rate of 882 deaths per 100,000." By these figures, heart deaths in Newburgh were 73.9% higher than the national rate. (See 30-2: "Mass Harm From Fluoridation," by Lee Hardy, Oct. 1997).

There was also a striking increase in the rate of deaths from heart disease in Antigo, Wisconsin, after fluoridation. (See 30-3: "Heart Deaths and Fluoridation," by I. Jansen, R. N. and H. M. Thomson).

A team of Japanese professors found that children with mottled teeth (caused by fluoride poisoning) have a higher incident of heart damage than those without mottling. This was indicated by electrocardiographic studies. (*The Lancet*, Jan. 28, 1961, p. 197, Tokushima J. Exper., Med. 3-50-53, 1956.)

A result of a study in China showed "that fluoride in drinking water consumed over time is harmful not only to bones and teeth but also to the cardiovascular system." (See 30-4: "Electrocardiogram Analysis of Patients With Skeletal Fluorosis," from, *Fluoride*, Vol. 30, No. 1, pp. 16-18, 1997).

Question 31.**Is consumption of optimally fluoridated water harmful to the kidneys?**

And does it affect diabetics, or have an affect on the thyroid? (This is a question posed by the opposition.)

ADA's Fluoridation Facts Short Answer

Generally accepted scientific knowledge suggests that the consumption of optimally fluoridated water does not cause or worsen human kidney disease.

ADA's Fluoridation Facts Long Answer

Approximately 50% of the fluoride ingested daily is removed from the body by the kidneys.^{104, 114, 115} Because the kidneys are constantly exposed to various fluoride concentrations, any health effects caused by fluoride would likely manifest themselves in kidney cells. However, several large community-based studies of people with long-term exposure to drinking water with fluoride concentrations up to 8 ppm have failed to show an increase in kidney disease.^{95, 198, 199}

In a report issued in 1993 by the National Research Council, the Subcommittee on Health Effects of Ingested Fluoride stated that the threshold dose of fluoride in drinking water which causes kidney

effects in animals is approximately 50 ppm - more than 12 times the maximum level allowed in drinking water by the Environmental Protection Agency. Therefore, they concluded that "ingestion of fluoride at currently recommended concentrations is not likely to produce kidney toxicity in humans."⁹⁶

Many people with kidney failure depend on hemodialysis (treatment with an artificial kidney machine) for their existence. During hemodialysis, the patient's blood is exposed to large amounts of water each week (280-560 quarts). Therefore, procedures have been designed to ensure that the water utilized in the process contain a minimum of dissolved substances that could diffuse indiscriminately into the patient's bloodstream.²⁰⁰

Since the composition of water varies in different geographic locations in the United States, the U.S. Public Health Service recommends dialysis units use techniques such as reverse osmosis and deionization to remove excess iron, magnesium, aluminum, calcium, and other minerals, as well as fluoride, from tap water before the water is used for dialysis.^{200, 201}

Additional discussion on this topic is available in [Question 17](#).

Repeat of Question 31.

Is consumption of optimally fluoridated water harmful to the kidneys?

And does it affect diabetics, or have an affect on the thyroid? (This is a question posed by the opposition.)

Opposition's Response

Dr. Heyroth is a proponent for fluoridation yet, when testifying under oath at Congressional Hearings to the question: "Would you give fluoridated water to one with kidney trouble," he answered, "No, the advice would be that he drink fluoride-free spring water." (Dr. Francis Heyroth of Kettering Institute, Cincinnati, Ohio.)

"... Since kidney damage can be caused by fluoride, there can be a vicious circle by which kidney damage causes more fluoride retention, which in turn causes further kidney damage." (Fredrick B. Exner, M.D., F.A.C.R.)

"Once renal function is severely impaired, the excretion of fluoride in the urine decreases and serum fluoride concentration increases." (K. Kono, et al, *Industrial Health*, 22:33-40, 1984.)

"Many studies ... have indicated suspicious bio-chemical events, especially in the kidneys, when consuming 1 ppm or more (up to 5 ppm in our study) fluoride ion in drinking water." (Harold Warner, Professor Emeritus, Yerkes Regional Primate Center, Emory University, June 20, 1983.)

"... bear in mind that all elderly folk eventually have had one degree or another of 'diminished renal (kidney) function' and will accumulate higher tissue levels of fluoride at a time when their tolerance capacities are diminished." (John R. Lee, M.D.)

"It would also seem prudent to monitor the fluoride intake of patients with chronic renal impairment ... particularly those living in areas of high naturally occurring fluoride, children, those with excessive thirst, and those with prolonged disease." ("Position Paper on Fluoride," *National Kidney Foundation*, page 2, Aug. 16, 1980.)

"Sodium fluoride is a very toxic chemical. It reacts with growing tooth enamel and with bones to produce irreversible damage. It may injure the nervous system, kidneys and other tissues of susceptible individuals. Fluoride is not a necessary trace element for dental health. Uniform dosage of any drug dissolved in the water supply is obviously impossible. Some individuals may drink 10 times as much as others. Thirst has many variables." (Dr. Granville F. Knight, (M.D., F.A.C., F.I.A.A.) Santa Barbara, California.)

"Until recently, I favored fluoridation of the City Water supply in the proportion of 1 ppm, but information provided me by Dr. C. C. Bass, Dean Emeritus of Tulane Medical School for the past 15 years (who has pursued research and study pertaining to teeth) along with some research done by British scientists indicating possible bad effects on the kidneys from fluoridation, has caused me to reverse my opinion on the matter." (Dr. Alton Ochsner, President Ochsner Foundation Hospital and Head of Department of Surgery, Tulane University Medical School, New Orleans, Louisiana.)

"You are absolutely correct in stating that many people have diabetes but don't know it. In the U. S., approximately half of the estimated 12 million people who have the disease don't realize it ... Diabetic care also depends on whether the individual suffers from complications associated with diabetes, such as kidney failure, coronary artery disease, etc. According to the National Institute of Dental Research, fluoride levels in water are set according to normal consumption of water. If an individual is consuming abnormally large quantities of water, he should drink bottled water." (See 31-1: Department of Health and Human Services letter, Jan. 4, 1991). Nearly all diabetics and many athletes drink abnormally large quantities of water-many drink over a gallon a day. Therefore the Public Health Service is saying these people should buy bottled water.

"Because it can be documented that fluorides were given as medication for hyperthyroid patients, it should be considered the **obvious** cause for hypothyroidism and other thyroid-hormone function-related disorders, including ADHD, arthritis, osteoporosis, etc., especially at intake levels as high as they are." (*Thyroid Hormones*, pp. 5, by Andreas Schuld, Parents of Fluoride Poisoned Children, PFPC., Vancouver, B.C., Canada.)

"Fluoride decreases the function of the thyroid gland by 30% to 40% and this is one of the most important glands in the body. In several parts of our country, children receive tablets with fluorine, but the fluoridation of drinking water has not been accomplished. We trust it will not happen in view of the special circumstances here regarding our thyroid problem. Research here demonstrates clearly an antagonism between iodine and fluorine. We also showed, in another experiment, that the calcium metabolism is greatly affected by fluorine. Since the bone picks up 30% less calcium in the presence of fluorine, the danger of osteoporosis in a growing organism is very great." (Dr. T. Gordonoff, Professor of Pharmacology, Bern, Switzerland.)

"Long continued ingestion of minute quantities of fluorine causes disease of the thyroid gland." (Dr. Douw G. Steyn, Department of Pharmacology, University of Pretoria, South Africa.)

"We have posted over 100 studies documenting the adverse effects of fluoride on the thyroid gland from the last 70 years or so in the Virtual Library on Fluoride Research at www.bruha.com." (Andreas Schuld, Parents of Fluoride Poisoned Children (PFPC), Vancouver, B.C., Canada.)

Question 32.

Will the addition of fluoride affect the quality of drinking water?

ADA's Fluoridation Facts Short Answer

There is no scientific evidence that optimal levels of fluoride affect the quality of water. All ground and surface water in the United States contains some naturally occurring fluoride.

ADA's Fluoridation Facts Long Answer

Nearly all water supplies must undergo various water treatment processes to be safe and suitable for human consumption. The substances used for this purpose include aluminum sulfate, ferric chloride, ferric sulfate, activated carbon, lime, soda ash and, of course, chlorine. Fluoride is added only to water that has naturally occurring lower than optimal levels of this mineral.²⁷

Fluoridation is the adjustment of the fluoride concentration of fluoride-deficient water supplies to the recommended range of 0.7 to 1.2 parts per million of fluoride for optimal dental health. The EPA has stated that fluoride in children's drinking water at levels of approximately 1.0 ppm reduces the number of dental cavities.²⁰² The optimal level is dependent on the annual average of the maximum daily air temperature in the geographic area.²⁷

Additional discussion on this topic may be found in [Question 1](#), [Question 3](#) and [Question 33](#).

Under the Safe Drinking Water Act, the EPA has established drinking water standards for a number of substances, including fluoride, in order to protect the public's health. There are several areas in the United States where the ground water contains higher than optimal levels of naturally occurring fluoride. Therefore, federal regulations were established to require that naturally occurring fluoride levels in a community water supply not exceed a concentration of 4.0 mg/L.²⁰² Under the Safe Drinking Water Act, this upper limit is the Maximum Contaminant Level (MCL) for fluoride. Under the MCL standard, if the naturally occurring level of fluoride in a public water supply exceeds the MCL (4.0 mg/L for fluoride), the water supplier is required to lower the level of fluoride below the MCL. This process is called defluoridation.

The EPA has also set a Secondary Maximum Contaminant Level (SMCL) of 2.0 mg/L, and requires consumer notification by the water supplier if the fluoride level exceeds 2.0 mg/L. The SMCL is intended to alert families that regular consumption of water with natural levels of fluoride greater than 2.0 mg/L by young children may cause dental fluorosis in the developing permanent teeth, a cosmetic condition with no known health effect.²⁰² The notice to be used by water systems that exceed the SMCL must contain the following points:

1. The notice is intended to alert families that children under nine years of age who are exposed to levels of fluoride greater than 2.0 mg/liter may develop dental fluorosis.
2. Adults are not affected because dental fluorosis occurs only when developing teeth are exposed to elevated fluoride levels.
3. The water supplier can be contacted for information on alternative water source or treatments that will insure the drinking water would meet all standards (including the SMCL).

The 1993 National Research Council report, *Health Effects of Ingested Fluoride*, reviewed fluoride toxicity and exposure data for the EPA and concluded that the current standard for fluoride at 4.0 mg/L (set in 1986) was appropriate as an interim standard to protect the public health.⁹⁶ In the EPA's judgment, the combined weight of human and animal data support the current fluoride drinking water standard and, in December 1993, the EPA published a notice in the Federal Register stating the ceiling of 4 mg/L would protect against adverse health effects with an adequate margin of safety and published a notice of intent not to revise the fluoride drinking water standards in the Federal Register.⁹⁷

The EPA further commented on the safety of fluoride in the December 5, 1997, Federal Register.¹⁵⁶ In a notice of a final rule relating to fluoride compounds the EPA stated, "There exists no directly applicable scientific documentation of adverse medical effects at levels of fluoride below 8 mg/L (0.23mg/kg/day)." The EPA's Maximum Concentration Limit (MCL) of 4.0 mg/L (0.114 mg/kg/day) is one half that amount, providing an adequate margin of safety.

The EPA indirectly regulates the intentional fluoridation of drinking water by having an enforceable Federal standard for fluoride at 4.0 mg/L. As long as the 4.0 mg/L standard is not exceeded, State or local authorities determine whether or not to fluoridate.²³⁷

Additional discussion on this topic may be found in [Question 2](#).

Repeat of Question 32.

Will the addition of fluoride affect the quality of drinking water?

Opposition's Response

Actually, "fluoride," as such, has never been added to any water supply. What is added is one of the silicofluorides. The most commonly used one is Hydrofluosilicic acid. "Hydrofluosilicic acid is the most corrosive chemical agent known to man: it is derived from toxic gases produced in the manufacture of phosphoric acid and phosphate fertilizers. It contains lead, mercury, arsenic, and high concentrations of radio nuclides; it is also the chemical agent most used for water fluoridation in the U.S. Because the

industrial grade fluorosilicic acid is a toxic waste by-product recovered from chimney pollution scrubbers ("scrubber liquor"), the volume of contaminants is profoundly influenced by the method of manufacture and the quality of raw materials used." (See 32-1: "Water: A Toxic Dump?" by Journalist, George Glasser; reprinted from the *Sarasota ECO Report*, Vol. 4:12, Dec. 1994, from *Health Freedom News*, July 1995).

"For every 6,800 gallons of fluorosilicic acid (FSA), 5,800 gallons is toxic pollution." (See 32-2: Gary Pittman letter, 11/18/98, page 4. Mr. Pittman was a supervisor at Occidental Chemical Corp.)

As soon as you add any type of fluoride (a prescription drug) to the water supply, you no longer have *pure water*, you have *medicated water*, making it unsafe for many people. All other additives are there to improve the water-fluoride is added to treat the people who drink it.

As stated earlier, there is no such thing as "fluoride-deficient" water. In 1979, the Food and Drug Administration (FDA) ordered that all government documents remove all references to fluoride as an "essential nutrient" or even a "probable essential nutrient." The FDA has never received or ever reviewed, much less approved, even the fluoride drops or tablets (which are pure pharmaceutical-grade fluoride) for safety or effectiveness. (See 13-2 document).

The Safe Drinking Water Initiative says: "Whereas water is essential to all and the public water supply should be safe for all to drink; and whereas individuals vary in their susceptibility and responses to various substances as well as in the amounts of water they consume; and whereas alternative methods of delivery for all substances exist; and, etc. ... the public water supply should not be used to deliver any product, substance, device, element, medicine of preventative agent with the intent or for the purpose of affecting the physical or mental functions of the body of any person consuming such water." (See 32-3 and 32-4: *Safe Drinking Water Initiative*).

When the Environmental Protection Agency was engaged in revising its drinking water standard for fluorine in 1985, the EPA's Headquarters Union of Scientists (consisting of 1,500 professional people) made a thorough investigation into the pros and cons of fluoridation. Their conclusions were: The public water supply should not be used "as a vehicle for disseminating this toxic and prophylactically useless (via ingestion, at any rate) substance." (See 1-6: EPA statement dated May 1, 1999).

The ADA leads the reader to believe that they are "adjusting the natural fluoride content of the water." Only calcium fluoride is found in nature, never the silicofluorides (crude toxic industrial waste products) that are used to fluoridate water. (See answer to [Question 1](#)).

We must also consider the environmental impact of fluorides in sewer effluent. This has been consistently ignored. A study of salmonids in the lower Columbia River for the period 1982-86 is one of several which document devastating effects of fluoride emissions at and below the levels to be expected in sewage effluent from fluoridated water systems. ("Evidence for Fluoride Effects on Salmon Passage at John Day Dam, Columbia River", 1982-1986 by David M. Damkaer and Douglas B. Dey in *North American Journal of Fisheries Management*, 9:154-162, 1989.)

Question 33.

Does fluoridation present difficult engineering problems?

ADA's Fluoridation Facts Short Answer

No. Properly maintained and monitored water fluoridation systems do not present difficult engineering problems.

ADA's Fluoridation Facts Long Answer

With proper planning and maintenance of the system, fluoride adjustment is compatible with other water treatment processes. Today's equipment allows water treatment personnel to easily monitor and maintain the desired fluoride concentration. Automatic monitoring technology is available that can

help to assure that the fluoride concentration of the water remains within the recommended range. Depending on the climate, the range for optimally fluoridated water is 0.7-1.2 ppm for an individual water plant.²⁷

There are only three basic compounds used to fluoridate community drinking water:

1. sodium fluoride, a white, odorless crystalline material
2. sodium fluorosilicate, a white or yellow-white, odorless crystalline powder
3. fluorosilicic acid, a white to straw-colored liquid.

The three fluoride compounds are derived from the mineral apatite which is a mixture of calcium compounds. Apatite contains 3% to 7% fluoride and is the main source of fluorides used in water fluoridation at the present time. Apatite is also the raw material used for production of phosphate fertilizers;^{27, 203} however, standards and minimum requirements have been established for all three compounds used in water fluoridation.²⁰⁴

From time to time, opponents of water fluoridation allege that the three compounds used in water fluoridation are impure or contain impurities at a level that may be potentially harmful. To help ensure the public's safety, compounds used for water fluoridation conform to standards established by the American Water Works Association.²⁰⁴ The American Water Works Association (AWWA) is an international nonprofit scientific and educational society dedicated to the improvement of drinking water quality and supply. Regarding impurities, the AWWA Standards state, "The [fluoride compound] supplied under this standard shall contain no soluble materials or organic substances in quantities capable of producing deleterious or injurious effects on the health of those consuming water that has been properly treated with the [fluoride compound]." Certified analyses of the compounds must be furnished by the manufacturer or supplier.²⁰⁴

When added to community water supplies fluoride compounds become diluted to the recommended range of 0.7 to 1.2 parts per million. At 1 ppm, one part of fluoride is diluted in a million parts of water. Large numbers such as a million can be difficult to visualize. While not exact, the following comparisons can be of assistance in comprehending one part per million:

- 1 inch in 16 miles
- 1 minute in 2 years
- 1 cent in \$10,000

Additional discussion on this topic may be found in [Question 21](#).

Fluoride compounds are added to the water supply as liquids, but are measured by two basic types of devices, dry feeders or solution feeders (metering pumps). By design, and with proper maintenance and testing, water systems limit the amount of fluoride that can be added to the system (i.e., the use of a day tank that only holds one day's supply of fluoride) so prolonged over-fluoridation becomes a mechanical impossibility.²⁷ It is very important that the water treatment operators responsible for monitoring the addition of fluoride to the water supply be appropriately trained, and that the equipment used for this process is adequately maintained.²⁰³ As with any mechanical equipment, water fluoridation equipment should be tested, maintained and replaced as needed. State health departments can procure federal grant monies for these purposes.

While the optimal fluoride concentration found in drinking water has been proven safe, water plant operators and engineers may be exposed to much higher fluoride levels when handling fluoride compounds at the water treatment facility.²⁷ In order to prevent overexposure to fluoride compounds by water plant operators, and ensure that fluoridated water systems provide optimal fluoride levels, the Centers for Disease Control and Prevention and the Occupational Safety and Health Administration provide guidelines/ recommendations for managers of fluoridated public water systems.^{203, 204} Adherence to these guidelines should assure continuous levels of optimally fluoridated drinking water while maintaining safe operation of all fluoridated water systems.

Allegations that fluoridation causes corrosion of water delivery systems are not supportable.²⁷ Corrosion by drinking water is related primarily to dissolved oxygen concentration, pH, water temperature, alkalinity, hardness, salt concentration, hydrogen sulfide content and the presence of certain bacteria. Under some water quality conditions, a small increase in the corrosivity of drinking water that is already corrosive may be observed after treatment with alum, chlorine, fluorosilicic acid or sodium fluorosilicate. In such cases, further water treatment is indicated to adjust the pH upward. This is part of routine water plant operations.

Repeat of Question 33.

Does fluoridation present difficult engineering problems?

Opposition's Response

There have been problems. One man died, and a woman was hospitalized "in critical condition near death," and at least 296 other citizens became ill as a result of "very high levels of fluoride" in a Hooper Bay, Alaska well on May 23, 1992. The symptoms — nausea, vomiting, diarrhea, fatigue and tingling arms and hands — "are compatible with acute fluoride poisoning." (*Anchorage Daily News* and *The Anchorage Times*, May 28-30, 1992.)

"An accidental leak of fluoride into the water supply of Annapolis caused the death ... of a 65-year-old man with kidney problems. ... Dr. Homez Guard said the death of Lawrence Blake on November 13 was caused by acute fluoride intoxication." ("Fluoride leak blamed for Annapolis death," *San Jose Mercury*, Nov. 29, 1979.)

See "Fluoridation Accidents and Poisonings" at www.fluoridealert.org for over twenty incidences, which includes the following (but with more details):

1. Officials of Middletown, MD warned residents by radio in November, 1993 not to drink or cook with city water due to high fluoride levels. Malfunctioning fluoridation equipment caused excessive fluoride levels of 70 parts per million (ppm) in the distribution system. This is 70 times the normal level and almost 18 times the level considered safe by EPA. The Maryland State Department of Health stated that they did not plan to do a health survey to determine if any residents experienced symptoms of fluoride poisoning.

"Based on other fluoridation accidents, the 70 ppm of fluoride is sufficient to cause vomiting, diarrhea, skin rashes, fever, and other effects. In 1986, a fluoridation accident in New Haven (North Brantford), Connecticut, resulted in the public receiving water with 51 ppm fluoride for twelve hours. A health survey, conducted four days later on 312 persons, determined that 55 of those experienced symptoms of fluoride poisoning which lasted from 1-60 hours." (*The Townsend Letter for Doctors*, October 1994, "Middletown Maryland Latest City to Receive Toxic Spill of Fluoride in their Drinking Water," report by Robert Carton, Ph.D., and The Truth About Fluoride, Inc.)

2. February 1992 — Rice Lake, Wisconsin: Residents vomiting. Centers for Disease Control stated that 150 water consumers potentially at risk. Pump overfed fluoride for two days, thought to have reached 20 ppm.
3. September 1991 — Calgary, Alberta, Canada: Fluoride diffuser problems in six machines. Leak of seven liters (quarts) of fluoride sent two water treatment personnel to the hospital for oxygen after breathing the fluoride fumes. Gary Lamb, engineer, stated that "This product is an acid so we can't put it through a steel pipe because it corrodes, but plastic isn't strong enough."
4. July 1991 — Portage, Michigan: Approximately 40 children with abdominal pains, sickness, vomiting and diarrhea at an arts and crafts show at school. One of the city's fluoride injector pumps failed. Fluoride levels not determined at the time, but later tested at 92 ppm.

5. October 1990 — Westby, Wisconsin: Four families suffered a week of diarrhea, upset stomach and burning throats. Fluoride equipment malfunctioned, causing the fluoride to surge to 150 ppm. The water utility supervisor said he had expected the fluoride to be ten times normal since it had burned his mouth. The fluoride corroded the copper off the pipes in area homes, 70 times higher than the EPA recommended limit. Westby Council stopped fluoridating.
6. March 1986 — New Haven (North Branford) Connecticut: Of the 312 persons interviewed four days after the accident, in the 127 households at risk, 18% had symptoms of abdominal cramping, nausea, headache, diarrhea, vomiting, diaphoresis (profuse sweating), and fever. This did not include those with rashes and Irritation from bathing and washing dishes. The fluoride peaked at 51 ppm. The acidic fluoride leached copper; the Connecticut State Dental Director chastised water department personnel for not recognizing immediately that public complaints were due to fluoride and not copper. This accident was finally reported two years later in the *American Journal of Public Health*, June 1988.
7. The *Baltimore Sun* reported in a November 1979 story on the fluoridation accident that, "Even though state and county health officials learned of the spill nine days after it occurred, no public announcement was made and the City Council was not told of the situation for six more days ..." And, quoted a County Health officer stating that the delay in notification was because "We didn't want to jeopardize the fluoridation program ... "

The toxicity and corrosiveness of fluoride compounds the risk of fluoridation equipment malfunction and operator error for all fluoridated water systems.

"When a city or village is fluoridated, no thought is given to the fact that there will be damage to the pipes of the water system, meters, hot water heaters and tanks and other equipment. Fluoride is extremely corrosive. The hard fact that this damage occurs comes as quite a shock a few years later." (See 33-1: "Fluoridation Damages Water Systems," by Harvey Petraborg, M.D., Oct. 7, 1964). To reduce some of this damage, the water companies are now required to add alkalizing agents when the acid level gets excessively high due to the added silicofluorides. This is just one more thing that is added to the water, but is never mentioned.

PUBLIC POLICY

Question 34.**Is fluoridation a valuable public health measure?****ADA's Fluoridation Facts Short Answer**

Yes. Fluoridation is a public health program that benefits people of all ages, is safe and is cost effective because it saves money.

ADA's Fluoridation Facts Long Answer

A former Surgeon General of the United States, Dr. Luther Terry, called fluoridation as vital a public health measure as immunization against disease, pasteurization of milk and purification of water.²⁰⁵ Another former U.S. Surgeon General, Dr. C. Everett Koop, has stated, "Fluoridation is the single most important commitment that a community can make to the oral health of its citizens." In 1998, the U.S. Public Health Service revised national health objectives to be achieved by the year 2010. Included under oral health was an objective to significantly expand the fluoridation of public water supplies.⁸ Water fluoridation has been lauded as one of the most economical preventive values in the nation,⁹ and today still has the greatest dental public health impact.³⁶

Repeat of Question 34.**Is fluoridation a valuable public health measure?****Opposition's Response**

No. It is compulsory mass medication. "Fluoride is a pharmacologically active substance unrelated to water purification. There is no possibility of obtaining individual informed consent for medication with this experimental drug when it is placed in a public water system. For these reasons, fluoridation violates the Nuremberg Code of medical ethics and human rights.

"It is not possible to claim that addition of pharmacologically active fluorine compounds to drinking water is not medication and at the same time claim that it reduces tooth decay. No one disputes the fact that consumption of fluorine compounds in water at the approximate rate of 1.0 ppm (the level advocated by fluoridation promoters) produces changes in the structure of tooth enamel and bone. This is a physiological effect caused by the fluorides.

"Although virtually every American is exposed to daily treatment with this medication (in fluoridated areas), the official FDA classification for fluoride is AN UNAPPROVED NEW DRUG. — This means that fluoridation of public water supplies is 'medical experimentation.'

"Some medical and dental authorities hold the opinion that these physiological changes are desirable. Others view these physiological changes as undesirable. — Clearly, individuals must retain the right to decide whether or not to undergo fluoride treatment.

"Because daily water consumption varies widely from individual to individual, depending on such factors as age, occupation and diet, there is no control of individual fluoride dosage. Furthermore, fluoride is administered without the knowledge or consent of many who depend on public water supplies.

Administration of this medication via public water supplies is an obvious violation of the Nuremberg Code of medical ethics." (*Fluoridation — Why The Controversy?*, by Janet Nagel, Ed.D., from National Health Federation.)

The U.S. Public Health Service has done this before — at least six times. (See 34-1: *U.S. Public Health Service Experiments on Non-Consenting Humans*, by Walter Miller).

"A majority vote which violates ethical or moral principles, or deprives individuals of rights they should be free to enjoy, is not democracy but tyranny. It is a subversion of democracy that will bring democracy to an end in the degree that it is allowed to operate." (the late F. B. Exner, MD FACR, Seattle.)

"Given a recommendation for medication, individuals in a free society have a right to choose whether or not to accept treatment, a right to expect properly controlled dosage and medical supervision, and a right to be told the truth. Water fluoridation abrogates these rights." (David R. Hill, P.Eng., Professor Emeritus, The University of Calgary, Calgary, Alberta, Canada T2N 1N4, Aug. 1997, hill@cpsc.ucalgary.ca.)

"Fluoridation is compulsory medication without parallel in the history of medicine. As one dentist wrote me recently — 'If I prescribe this drug for a patient and he goes to a pharmacist and has my prescription filled with NaF, he thinks he is taking medicine — and so do I. If the government puts an inferior quality of the same drug not fit for human consumption in the water, suddenly it is not medication.' To continue to argue that fluoridation is not mass medication is rather silly in view of the facts." (See 34-2: *Open Letter to a Proponent of Fluoridation*).

"It is morally bad to impose on another person something he does not desire when that person harms no one else by wishing to refrain. — It is morally evil to do in our City that for which Nazi physicians were hanged-medicated without the patient's consent." (See 34-3: *The Moral Aspect*, the 13 reasons why Reverend Jonas E. C. Shepherd, Knollwood Park Presbyterian Church, considers fluoridation ethically wrong).

Many people drink alcohol, eat meat, use sugar in coffee, drink diet sodas, eat spicy foods, smoke tobacco or cigars, etc., but our individual freedom of choice precludes the majority dictating that those in the minority must do the same.

Studies have proven that children who are given whole grains in place of white flour have less than half the tooth decay as children who drink fluoridated water and are eating white flour products, but the government would never make a law prohibiting white flour—and it shouldn't. (See [Alternatives](#) section for details).

"The real issue is the right of the individual to determine what shall be done to and with his body, dead or alive, as long as in the exercise of that right he does not impinge upon the equal rights of his fellows." (Dr. L. A. Alesen (M.D.) Past President of California Medical Association and member House of Delegates, American Medical Association.)

"It is not the province of the State to do something for us that is 'good for us.' The State has a right only to introduce foreign bodies into water supply or to take such other measures as is for the prevention or spread of disease and the protection of the community as a whole." (Dr. C. L. Farrell, M.D., Chairman American Medical Association, Public Health Committee, Oct. 16, 1954.)

"Fluoridation is a test to see just how well our constitution guarantees the right of the individual to physical integrity or the right to care for his own body and health without the State ordering him to do it in a certain way." (Dr. David W. Bronson, New York, NY.)

"For some persons, sulfur or iron or any other of the substances occurring naturally in some waters may be desirable and would, in their opinion, be beneficial if added to those waters where they were not found naturally ... The principle, therefore of permitting by Statute the treatment of communal water supplies by adding substances other than those required for purposes of purification could be unending. If fluorides are introduced, why not some other substance? If the principle is admitted we might just as well recognize that we have opened a door which the Province might never be able to close." (Dr. M. B. Dymond, Minister of Health, Province of Ontario.)

"Only the upper 10% who are financially in a position to buy unfluoridated water or drill their own wells will be able to save themselves from being poisoned if the water is fluoridated." (Dr. H. A. Salvesen (M.D.) Professor University of Oslo, Norway, Chief of State Hospital Medical Department, physician to the late King.)

"I do not wish the government to tell me what I should eat or drink. If the person next door wishes her children to have fluorine, let her put the fluorine in their water, but don't make me drink it because she wishes her children to have it." (Dr. Edwin G. Langrock (M.D.) Consulting Obstetrician, Beth Israel Hospital, New York City.)

Question 35.

Has the legality of fluoridation been upheld by the courts?

ADA's Fluoridation Facts Short Answer

Yes. Fluoridation has been thoroughly tested in the United States' court system, and found to be a proper means of furthering public health and welfare. No court of last resort has ever determined fluoridation to be unlawful. Moreover, fluoridation has been clearly held not to be an unconstitutional invasion of religious freedom or other individual rights guaranteed by the First, Fifth or Fourteenth Amendments to the U.S. Constitution.

ADA's Fluoridation Facts Long Answer

During the last fifty years, the legality of fluoridation in the United States has been thoroughly tested in our court systems. Fluoridation is viewed by the courts as a proper means of furthering public health and welfare.²⁰⁶ No court of last resort has ever rendered an opinion against fluoridation. The highest courts of more than a dozen states have confirmed the constitutionality of fluoridation.²⁰⁷ In 1984, the Illinois Supreme Court upheld the constitutionality of the state's mandatory fluoridation law, culminating 16 years of court action at a variety of judicial levels.²⁰⁸ Moreover, the U.S. Supreme Court has denied review of fluoridation cases thirteen times, citing that no substantial federal or constitutional questions were involved.²⁰⁷

It has been the position of the American courts that a significant government interest in health and welfare of the public generally overrides individual objections to public health regulation.²⁰⁷ Consequently, the courts have rejected the contention that fluoridation ordinances are a deprivation of religious or individual freedoms guaranteed under the Constitution.^{207, 209} In reviewing the legal aspects of fluoridation, the courts have dealt with this concern by ruling that: (1) fluoride is a nutrient, not a medication, and is present naturally in the environment; (2) no one is forced to drink fluoridated water as alternative sources are available; and (3) in cases where a person believes that fluoridation interferes

with religious beliefs, there is a difference between the freedom to believe, which is absolute, and the freedom to practice beliefs, which may be restricted in the public's interest.^{210, 211}

Fluoridation is the adjustment of a naturally occurring element found in water in order to prevent dental decay. Courts have consistently ruled that water fluoridation is not a form of compulsory mass medication or socialized medicine.^{207, 210, 212} A medication implies a substance used to treat disease. Fluoridation simply provides an individual with an increased level of protection against developing dental disease. Water that has been fortified with fluoride is similar to fortifying salt with iodine, milk with vitamin D and orange juice with vitamin C.

Repeat of Question 35.**Has the legality of fluoridation been upheld by the courts?****Opposition's Response**

(See answer to [Question 34](#).) In answer to the ADA statements: The FDA states specifically that fluoride is not a nutrient; fluoride is a prescription drug; sodium fluoride never occurs naturally in nature; and many people; who can't afford bottled water would be forced to drink this medicated water (against their will). Many people are already being overdosed, even in non-fluoridated areas, especially the children.

Some courts have ruled against fluoridation, and many more will in the future, now that there is so much proof of its harmfulness, and that it does not prevent tooth decay. (See [Benefits](#) and [Diseases](#) sections).

Judges in both Pennsylvania and Texas said "No." This is what Texas Judge Farris said was proven in court: "That the artificial fluoridation of public water supplies, such as is contemplated by (Houston) City Ordinance No. 80-2530, may cause or may contribute to the cause of cancer, genetic damage, intolerant reactions, and chronic toxicity, including dental mottling in man; that the said artificial fluoridation may aggravate malnutrition and existing illnesses in man; and that the value of said artificial fluoridation is in doubt as to the reduction of tooth decay in man."

Contrary to what has been said by promoters of artificial fluoridation of public water supplies, these findings of fact were specifically sustained and upheld as having been established at trial.

Judge R. C. Tarter, 28th Judiciary, District of Kentucky also said, "No." He made the following statements: "I found the scientific facts — undisputed — that fluorine is highly corrosive, one of the most poisonous elements known, a virulent poison; it is an effective rat killer; it is cumulative in human tissues and organs; administered via the public drinking waters there is no possible way to control what some of the 'experts' called the 'dosage.'

Now, in addition, these same experts failed to convince the court that fluorine is either effective in preventing caries, or safe for human consumption, even in the recommended 1 ppm. In the opinion of this court, even if the State Legislature were to pass a law giving some authority that right, it would be invalid, un-Constitutional; for our Constitution guarantees the right to pursue his own happiness to every man, and no arbitrary power exists within a Republic, even among a majority, to rob the minority, even if it be one

individual, of this right. The State Board of Health has no more power than the Maharaja of Benares to order fluoridation of the public water!" (See 35-1: "Kentucky Judge Defends Rights of Minority in Fluoridation of Water," 7/2/68).

The Independent Cities Association (ICA), which is comprised of forty-nine cities in the Southern California area, opposes the new fluoridation law. (See 35-2: letter to Senator Watson, dated 6/21/95, by Betty J. Ainsworth, Chairwoman).

Question 36.**Why does opposition to community water fluoridation continue?****ADA's Fluoridation Facts Short Answer**

Fluoridation is considered beneficial by the overwhelming majority of the health and scientific communities as well as the general public. However, a vocal minority continues to speak out against fluoridation of municipal water supplies. Some individuals may view fluoridation of public water as limiting their freedom of choice; other opposition can stem from misinterpretations or inappropriate extrapolations of the science behind the fluoridation issue.

ADA's Fluoridation Facts Long Answer

A vast body of scientific literature endorses water fluoridation as a safe means of reducing the incidence of tooth decay. Support for fluoridation among scientists and health professionals, including physicians and dentists, is nearly universal. Recognition of the benefits of fluoridation by the American Dental Association, the American Medical Association, governmental agencies and other national health and civic organizations (see Compendium) continues as a result of published, peer-reviewed research.

The majority of Americans also approves of water fluoridation. In June 1998, the Gallup Organization conducted a national survey of just over 1,000 adults on their attitudes toward community water fluoridation. When asked, "Do you believe community water should be fluoridated?" 70% answered "Yes", 18% answered "No," and 12% responded "I Don't Know." (See Figure 3). Results characterized by U.S. Census Region showed the level of support for community water fluoridation to be relatively constant throughout the United States, with 73% in the Northeast, 72% in the Midwest, 68% in the South and 70% in the West favoring community water fluoridation.² These results are consistent with a December 1991 Gallup survey that asked 1,200 parents, "Whether or not you presently have fluoridated water, do you approve or disapprove of fluoridating drinking water?" More than three-quarters (78%) of the responding parents approved, 10% disapproved and 12% answered don't know or refused to answer the question (See Figure 4). Disapproval ranged from 4% in communities where water was fluoridated to 16% in communities where it was not.^{213, 214}

Opposition to fluoridation has existed since the initiation of the first community programs in 1945. An article that appeared in the local newspaper shortly after the first fluoridation program was implemented in Grand Rapids, Michigan, noted that the fluoridation program was slated to commence January 1 but did not actually begin until January 15.

Interestingly, health officials in Grand Rapids began receiving complaints of physical ailments attributed to fluoridation from citizens weeks before fluoride was actually added to the water.⁷

Of the small faction that opposes water fluoridation for philosophical reasons, freedom of choice probably stands out as the most important single issue.²¹³ Some individuals are opposed to community action on any health issue, others because of environmental or economic arguments and some because they are misinformed. Some opponents may knowingly or unknowingly use half-truths and innuendoes to support their opinions, either misquoting or applying statements out of context. The sometimes alarming statements used by some antifluoridationists, however, are not substantiated by general accepted scientific knowledge.^{213, 215, 216}

"Junk science," a term coined by the press and used over the past decade to characterize data derived from atypical or questionable scientific techniques, also can play a role in provoking opposition to water fluoridation. In fact, decision makers have been persuaded to postpone action on several cost-effective public health measures after hypothetical risks have made their way into the public media.²¹⁷ Junk science impacts public policy and costs society in immeasurable ways. More people, especially those involved in policy decisions, need to be able to distinguish junk science from legitimate scientific research. Reputable science is based on the scientific method of testing hypotheses in ways that can be reproduced and verified by others; junk science, which often provides too-simple answers to complex questions, often cannot be substantiated.

In 1993 the U.S. Supreme Court issued a landmark decision that many view as likely to restrict the use of junk science in the courts. The Court determined that while "general acceptance" is not needed for scientific evidence to be admissible, federal trial judges have the task of ensuring that an expert's testimony rests on a reasonable foundation and is relevant to the issue in question. According to the Supreme Court, many considerations will bear on whether the expert's underlying reasoning or methodology is scientifically valid and applicable in a given case. The Court set out four criteria judges could use when evaluating scientific testimony: (1) whether the expert's theory or technique can be (and has been) tested, using the scientific method, (2) whether it has been subject to peer review and publication (although failing this criteria alone is not necessarily grounds for disallowing the testimony), (3) its known or potential error rate and the existence and maintenance of standards in controlling its operation, and (4) whether it has attracted widespread acceptance within a relevant

scientific community, since a known technique that has been able to attract only minimal support may properly be viewed with skepticism. The scientific validity and relevance of claims made by opponents of fluoridation might be best viewed when measured against these criteria.²¹⁸

Opinions are seldom unanimous on any scientific subject. In fact, there may be no such thing as "final knowledge," since new information is continuously emerging and being disseminated. As such, the benefit evidence must be continually weighed against risk evidence. Health professionals, decision makers and the public should be cooperating partners in the quest for that accountability.²¹⁹

Additional discussion on this topic may be found in the Introduction - Scientific Information on Fluoridation.

**Repeat of Question 36.
Why does opposition to community water fluoridation continue?**

Opposition's Response

Today there is so much proof against fluoridation (so much more than could be included here) that it is amazing how the proponents can keep saying that "only a small minority oppose this public health measure." When people are given the chance to vote on this issue, the majority of them vote "No." Many scientists, doctors and dentists are very much against fluoridation; their voices just aren't allowed to be heard. (See [Censorship](#) section).

**Question 37.
Where can reliable information about water fluoridation be found on the Internet and World Wide Web?**

ADA's Fluoridation Facts Short Answer

The American Dental Association, as well as other reputable health and science organizations, and government agencies have sites on the Internet that provide information on fluorides and fluoridation. These sites provide information that is consistent with generally accepted scientific knowledge.

ADA's Fluoridation Facts Long Answer

The World Wide Web is evolving as an accessible source of information. However, not all "science" posted on the Web is based on scientific fact. Searching the Internet for "fluoride" or "water fluoridation" directs individuals to a number of websites. Some of the content found in the sites is scientifically sound. Other less scientific sites may look highly technical, but contain information based on science that is unconfirmed or has not gained widespread acceptance. Commercial interests, such as the sale of water filters, may also be promoted.

One of the most widely respected sources for information regarding fluoridation and fluorides is the American Dental Association's (ADA) home page at www.ada.org. From the ADA website individuals can make contact with other websites for more information about fluoride.

Repeat of Question 37.

Where can reliable information about water fluoridation be found on the Internet and World Wide Web?

Opposition's Response

- The Optimal Wellness Center is a reference point for guiding healthcare professionals and consumers through the information resources of the Internet. Fluoride Action Network (Excellent Resource, Very Up-to-Date)
www.fluoridealert.org
- Fluorides and Fluoridation, Leading-Edge Research Group, by Val Verlerian (Many scanned documents; probably the biggest site.)
members.xoom.com/_XMCM/trufax/fluoride/fluorides.html
- Fluoride Facts
www.fluoridation.com
- Fluoride Controversy, the *Townsend Letter for Doctors and Patients*
www.tldp.com/fluoride.htm
- Citizens for Safe Drinking Water (Mountainview, California)
www.nofluoride.com
- Fluoride, Teeth, and the Atomic Bomb
www.inter-view.net/~sherrell/bomb.htm
- More Scientific Facts on Fluoride
www.all-natural.com/fleffect.html
- Fluoride Issues
www.sonic.net/~kryptox/fluoride.htm
- *Fluoride Research Journal*
www.fluoride-journal.com/contents.htm
- Elkie Babiuk Site
www.cadvision.com/fluoride/index.htm
- Fluoride Impairing Thyroid Health
www.bruha.com/fluoride/html/thyroid_page.htm
- Preventive Dental Health Site
emporium.turnpike.net/P/PDHA/health.htm
- The Fluoride Stop, by Andreas Schuld (Andreas is especially expert about fluoride/thyroid effects)
www.bruha.com/fluoride
- Stop Fluoridation U.S.A., by Darlene Sherrill (Diverse information)
www.rvi.net/~fluoride
- *Scholarly Journal of the International Society for Fluoride Research*
www.fluoride-journal.com/index.htm
- Fluoride Issues - Dan Montgomery (includes current news)
www.sonic.net/~kryptox/fluoride.htm
- "America Overdosed on Fluoride", by Lynn Landes (includes e-mail correspondence in which an ADA spokesperson refutes news reports that non-fluoridated bottled water causes cavities, and what you can do to ban fluoride and educate others.)
www.zerowasteamerica.org/fluorideoverdose.htm
- Ellie Rudolph's site (Find out if your Pennsylvania town or city water is fluoridated.)
www.penweb.org/issues/fluoride/index.html
- The Toxic Effects of Fluoride (Be aware that they are selling a fluoride removal system.)
www.wholywater.com/fluoride.html
- Fluoridation Debate (*Environmental Health Perspectives*, Volume 105, Number 11, November 1997)
ehpnet1.niehs.nih.gov/docs/1997/105-11/forum.html
- *Fluoridation: The Overdosing of America* — Fact or Fiction? (Slides by Gerald H. Smith, D.D.S.)
www.icnr.com/FluoridePres.html

- *Fluoridation for Dummies* — Oregon Citizens for Safe Water
www.greatseal.com/writer/youessay/fluoridation.html
- Darryl W. Roundy, D.C. — *Fluoride Research*
www.atlaschiro.com/fluorideresch.htm
- *Fluoride: Commie Plot or Capitalist Ploy*, by Joel Griffiths, investigative reporter
www.scruz.net/~paul/issues/Fluoride.html
- *Fluoride: Wide Range of Serious Health Problems*, by Shirley Lipschutz-Robinson
www.geocities.com/hotsprings/1158/fluoride.htm
- *Fluoridated Toothpastes must now be labeled "POISON,"* by Charlotte Gerson
www.geocities.com/Eureka/Enterprises/8669/flpoison.html
- Fluoride: Public Health Goal
www.saveteeth.org./index.htm
- Scientific Facts on the Biological Effects of Fluorides
www.all-natural.com/fleffect.html
- Fluoridation — Fluoride — Toxic Chemicals In Your Water
www.holisticmed.com/fluoride
- Gary Null's Site
www.garynull.com/issues/fluoride/fluorideactionfile.htm
- Does water fluoridation have negative side effects?
doctoryourself.com/fluoride_cancer.html
- Fluoride's Effect on Your Brain
www.realityi.org/fluoridePoison.htm

Question 38.

Why does community water fluoridation sometimes lose when it is put to a public vote?

ADA's Fluoridation Facts Short Answer

Voter apathy, blurring of scientific issues, lack of leadership by elected officials and a lack of political campaign skills among health professionals are some of the reasons fluoridation votes are sometimes unsuccessful.

ADA's Fluoridation Facts Long Answer

Despite the continuing growth of fluoridation in this country during the past decades, millions of Americans do not yet receive the protective benefits of fluoride in their drinking water. At the present time, only 62.2% of the population served by public water systems have access to fluoridated water.¹³ In 1992, approximately 70% of all U.S. cities with populations of more than 100,000 fluoridated their water, including 42 of the 50 largest cities (See Figure 6).²²⁰ In 1998, the U.S. Public Health Service revised national health objectives to be achieved by the year 2010. Oral Health Objective 10 deals specifically with community water fluoridation and states that at least 85% of the population served by community water systems should be receiving the benefits of optimally fluoridated water by the year 2010. At the time the objectives were revised, less than half of the states met the 85% goal (See Figure 7).

The adoption of fluoridation by communities has slowed during the past several decades. Social scientists have conducted numerous studies to determine why this phenomenon has occurred. Among the factors noted are lack of funding, public and professional apathy, the failure of many legislators and community leaders to take a stand because of perceived controversy, low voter turnout and the difficulty faced by an electorate in evaluating scientific information in the midst of emotional charges by opponents. Unfortunately, citizens may mistakenly believe their water contains optimal levels of fluoride when, in fact, it does not.

Clever use of emotionally charged "scare" propaganda by fluoride opponents creates fear, confusion and doubt within a community when voters consider the use of fluoridation.^{221, 222} Defeats of referenda or the discontinuance of fluoridation have occurred most often when a small, vocal and well organized group has used a barrage of fear-inspiring allegations designed to confuse the electorate. In addition

to attempts to influence voters, opponents have also threatened community leaders with personal litigation.²¹⁵ While no court of last resort has ever ruled against fluoridation, community leaders may be swayed by the threat of litigation due to the cost and time involved in defending even a groundless suit. In no instance has fluoridation been discontinued because it was proven harmful in any way.^{215, 216, 223}

Adoption of fluoridation is ultimately a decision of state or local decision makers, whether determined by elected officials, health officers or the voting public. Fluoridation can be enacted through state legislation, administrative regulation or a public referendum. Fluoridation is not legislated at the federal level and is perceived in most states as a local issue. From 1989-94, 318 communities authorized fluoridation by administrative governmental action. In the same time period, 32 referenda were held with fluoridation authorization approved in 19 and defeated in 13.²²⁴ As noted above, referenda can be unsuccessful for a variety of reasons. Nonetheless, a community's decision to protect the oral health and welfare of its citizens must, in some cases, override individual objections to implement appropriate public health measures.

Repeat of Question 38.

Why does community water fluoridation sometimes lose when it is put to a public vote?

Opposition's Response

Millions of our tax dollars are used every year to promote fluoridation, and to stifle any information against it. (See 38-1: "Fluoridation Campaign Funded by Public Purse," by Pete McConnell, from *Health Freedom News*). Big industries also invest a fortune for the same purpose. Antifluoridationists have very limited funds to work with, but in spite of that, they win at the polls more often than not, because truth is on their side.

Since 1990 sixty-four cities have rejected fluoridation. Thirteen cities have quit, some after having had it for 30 to 40 years. (See 38-2: "Rejection of Water Fluoridation.")

Procter & Gamble, the makers of Crest toothpaste state, "In 1980, 41 fluoridation referenda were held in the United States; fluoridation was disapproved in 33 of these and approved in only 8."

"It is no coincidence that historically fluoridation has been implemented by legislative bodies, and voted out by citizens. The decision to purposely contaminate our entire water supply for the sake of a few (even if it worked) is contrary to thousands of years of societal wisdom and must be made in the dark, where the coin of the realm is power, and the barter consequence is not improved water safety for all, but a transfer of public resource to commercial interest." (See 38-3: "An Open Letter To: Mayors, City Council Members, Boards of Supervisors, Water District Boards and Managers, and other Keepers of the Well," by Jeff Green, director of Citizens for Safe Drinking Water, San Diego, CA).

One troubling question is: "How would an individual, or a parent of a child, who is concerned about the amount of fluoride they are ingesting, either because they are concerned about ingesting too much or not receiving enough, determine how much total fluoride they are ingesting from all sources; and how would they be able to adjust the total amount they are ingesting?" (Jeff Green).

"The Natick Fluoridation Study Committee conducted a thorough review of the scientific literature and made the following findings regarding the benefits and risks of water fluoridation." (See 38-5: "Should Natick Fluoridate?" 9/27/97). They list their findings, which are the very reasons why the majority vote "No."

If you read a few of the following excerpts from the State Dental Directors conference with the Public Health Service and Children's Bureau, held on June 6-8, 1951, you will better understand where the ADA got the ideas for many of their *Fluoridation Facts*. (See 38-6).

To quote a few:

"We must not let them say that it has got to have 100% approval, or advance as a valid objection the fact that it may possibly have some bad in it. ... To the question, Isn't fluoride the thing that caused mottled enamel? You have got to have an answer and it had better be good. ... Now we tell them this, that at one part per million dental fluorosis brings about the most beautiful teeth that anyone ever had. ... So when you get the answer on the question to toxicity, please write me at once, because I would like to know. ... One thing that is a little hard to handle is the charge that fluoridation is not needed. They talk of other methods and when they get through adding up all the percentages of decay that we can reduce by such methods, we end up in a minus. When they take us at our own word they make awful liars out of us. ... Now, why should we do a pre-fluoridation survey? Is it to find out if fluoridation works? No. We have told the public it works, so we cannot go back on that. ... and let me tell you this: the medical audience is the easiest audience in the world to present this to. ... you have got to knock their objections down. The question of toxicity is on the same order. Lay off it altogether, just pass it over. 'We know there is absolutely no effect other than reducing decay,' you say and go on. ... don't bring it up yourself. ... And be sure not to present the ordinance to the city council before you have had an opportunity to really sell them. ... If you can, ... keep fluoridation from going to a referendum. ... The University of Texas had a research project on some white mice. ... There was a rumor that this research project indicated that fluoridation of water supplies causes cancer. That has knocked the pins from under us. We do not know how to combat it. ... When this thing came out, we never mentioned it in Wisconsin. All we did was to get some publicity on the fact that there is less cancer and less polio in high fluoride areas. We got that kind of information out to the public, so that if the opposition did bring up the subject they would be on the defensive, rather than having us on the defensive." (See 38-6: "Behind the Scenes with the Fluorine Conspirators." *Excerpts from 4th Annual Conference, State Dental Directors with the Public Health Service and the Children's Bureau, Federal Security Bldg., Washington, D.C., June 6/8/51*).

Question 39.

Is community water fluoridation accepted by other countries?

ADA's Fluoridation Facts Short Answer

Yes. Water fluoridation is practiced in approximately 60 countries benefiting over 360,000,000 (three hundred sixty million) people.¹

ADA's Fluoridation Facts Long Answer

The value of water fluoridation is recognized internationally. Countries and geographic regions with extensive fluoridation include the U.S., Australia, Brazil, Canada, Hong Kong, Malaysia, United Kingdom, Singapore, Chile, New Zealand, Israel, Columbia, Costa Rica and Ireland.⁷⁹ The most recent countywide decision for fluoridated drinking water occurred in South Africa.²²⁵ Following the recommendations of the World Health Organization (WHO), the initial phase of the project is expected to reach 40% of the country's population. By the year 2000, the goal is to reach 60% of the population which is widely spread in rural areas. Some of the most thorough investigations of fluoridation have been conducted in Britain and Australia. These investigations have resulted in a significant amount of published documentation which supports the safety and effectiveness of water fluoridation.^{92, 94, 226} Considering the extent to which fluoridation has already been implemented throughout the world, the lack of documentation of adverse health effects is remarkable testimony to its safety.^{54, 92-96}

The World Health Organization (WHO) and the Pan American Health Organization have endorsed the practice of water fluoridation since 1964. In 1994, an expert committee of WHO published a report which reaffirmed its support of fluoridation as being safe and effective in the prevention of tooth decay, and stated that "provided a community has a piped water supply, water fluoridation is the most effective method of reaching the whole population, so that all social classes benefit without the need for active participation on the part of individuals."⁸² In many parts of the world, fluoridation is not feasible or a high priority, usually due to the lack of a central water supply, the existence of more life threatening health needs and the lack of sufficient funds for start-up and maintenance costs.

Political actions contrary to the recommendations of health authorities should not be interpreted as a negative response to water fluoridation. For example, although fluoridation is not carried out in Sweden and the Netherlands, both countries support WHO's recommendations regarding fluoridation as a preventive health measure, in addition to the use of fluoride toothpastes, mouthrinses and dietary fluoride supplements.^{82, 227}

Repeat of Question 39.

Is community water fluoridation accepted by other countries?

Opposition's Response

Twenty-five countries in Europe, with bodies of health professionals, scientists and public health agencies of their own, reject fluoridation, some with outright bans. (See 39-1: "Most Major Developed Countries do not Fluoridate Their Water Supplies," from *Chemical and Engineering News*, Vol. 66, Aug. 1, 1988, pp. 26-42). 98% of Europe is now fluoridation free. The two holdouts are represented by England, 10% fluoridated, and Ireland, 73% fluoridated. The second largest political party of the most fluoridated population in the world, Ireland's Fine Gael, reported the week of January 15, 2001, that they have established as a major platform the eradication of all artificial fluoridation in the country due to "serious health concerns," even directing that the amount of natural fluoride in the water be reevaluated.

"Most of the world has rejected fluoridation. Only America where it originated, and countries under strong American influence persist in the practice. Denmark banned fluoridation when its National Agency for Environmental Protection, after consulting the widest possible range of scientific sources, pointed out that the long-term effects of low fluoride intakes on certain groups in the population (for example, persons with reduced kidney function), were insufficiently known. Sweden also rejected fluoridation on the recommendation of a special Fluoride Commission, which included among its reasons that: 'The combined and long-term environmental effects of fluoride are insufficiently known.' Holland banned fluoridation after a group of medical practitioners presented evidence that it caused reversible neuromuscular and gastrointestinal harm to some individuals in the population." (See 39-2: *Perspectives in Biology and Medicine*, 41,1 - Autumn 1997, by John Colquhoun, M. D., past Principal Dental Officer of New Zealand's largest city, Auckland).

Statements on fluoridation by governmental officials from several countries:

To access the full, photocopied letters from which these statements came (except for France's & Luxembourg's), visit www.fluoridation.com/c-country.htm.

France

"Fluoride chemicals are not included in the list [of 'chemicals for drinking water treatment']. This is due to ethical as well as medical considerations." (Louis Sanchez, Directeur de la Protection de l'Environment, August 25, 2000.)

Luxembourg

"Fluoride has never been added to the public water supplies in Luxembourg. In our views, the drinking water isn't the suitable way for medicinal treatment and that people needing an addition of fluoride can decide by their own to use the most appropriate way, like the intake of fluoride tablets, to cover their diary [sic] needs." (Jean-Marie RIES, Head, Water Department, Administration De l'Environment, May 3, 2000.)

Japan

"Japanese government and local water suppliers have considered there is no need to supply fluoridated water to **all** users because 1) impacts of fluoridated water on human health depends on each human being so that inappropriate application may cause health problems of vulnerable people, and 2) there is (sic) other ways for the purpose of dental health care, such as direct F-coating on teeth and using fluoridated dental paste and these ways should be applied at one's free will." (T. Nagayama, Environment Agency, Government of Japan, Mar. 8, '00.)

Belgium

"This water treatment has never been of use in Belgium and will never be (we hope so) into the future." (Chr. Legros, Directeur, Belgaqua Brussels, Feb.28, '00.)

Denmark

"We are pleased to inform you that according to the Danish Ministry of Environment and Energy, toxic fluorides have never been added to the public water supplies." (K. Werner, Danish Embassy, Washington, DC, Dec. 22, '99.)

Norway

"In Norway we had a rather intense discussion on this subject some 20 years ago, and the conclusion was that drinking water should not be fluoridated." (T. Krogh and T. Hofshagen, National Institute of Public Health, Oslo, Mar.1,'00.)

Sweden

"Drinking water fluoridation is not allowed in Sweden ... New scientific documentation or changes in dental health situation that could alter the conclusions of the Commission have not been shown." (G. Guzikowski, Chief Government Inspector, National Food Administration, Feb.28,'00.)

Germany

"In the former Democratic Republic (DDR) in several districts the drinking water was fluoridated but after the unification of both German states in 1990 fluoridation was stopped. In the Federal Republic of Germany there was in about 1952 a drinking water fluoridation experiment. But it was stopped after one or two years." (Dr. K. Ewing, Geschäftszeichen, Bonn, Feb.11, '00.)

Finland

"We do not favor or recommend fluoridation of drinking water. There are better ways of providing the fluoride our teeth need." (P. Poteri, Acting Managing Director, Helsinki Water, Feb. 7, '00.)

Austria

"Toxic fluorides have never been added to the public water supplies in Austria." (M. Eisenhut, Head of Water Department, OsterreichischeYereinigung fur das Gas-und Wasserfach, Feb. 17, '00.)

The full text of these statements can be accessed at: www.fluoridealert.org.

Despite the fact that these countries have decided against fluoridation, they have experienced the same significant declines in dental cavities as the United States has (which is around 70% fluoridated). See the World Health Organization chart below.

Table 1 : Declines in tooth decay in different countries. Based upon Decayed, Missing & Filled teeth (DMFTs) for 12-year-olds (WHO data).

Country	DMFTs	Year	DMFTs	Year	% Difference
Austria	1.0-3.5	1973	1.7	1997	+70, -51
Belgium	3.1	1972	2.7	1991	-13
Denmark	6.4	1978	1.2	1995	-81
Finland	7.5	1975	1.2	1994	-84
France	3.5	1975	1.9	1998	-46
Germany	6.0	1973	1.7	1997	-72
Greece	3.8	1959	1.6	1993	-58
Iceland	8.7	1980	1.5	1996	-83
Italy	4.0-6.9	1978-79	2.1	1996	-48, -70
Japan	5.9	1975	2.4	1999	-59
Netherlands	6.5-8.2	1974	0.9	1992-93	-86, -89
Norway	8.4	1973	2.1	1993	-75
Sweden	6.3	1977	1.0	1997	-84
Switzerland	2.3-9.9	1963-75	2.0	1987-89	-13, -80
United States	4.0	1965-67	1.4	1991	-65

Table 2: Current DMFT Status

Country	DMFTs	Year	Status
Australia	0.9	1996	fluoridated
Austria	1.7	1997	unfluoridated
Denmark	1.2	1995	unfluoridated
Finland	1.2	1995	unfluoridated
France	1.9	1998	unfluoridated
Germany	1.7	1997	unfluoridated
Greece	1.6	1993	unfluoridated
Iceland	1.5	1996	unfluoridated
Ireland	1.4	1993	fluoridated
Netherlands	0.9	1992-93	unfluoridated
New Zealand	1.5	1993	fluoridated
Sweden	1.0	1997	unfluoridated
Switzerland	2.0	1987-89	1% unfluoridated
United Kingdom	1.1	1996-97	10% fluoridated
United States	1.4	1991	fluoridated

Data from: World Health Organization (WHO) Oral Health Country/Area Profile Programme
 Department of Noncommunicable Diseases Surveillance/Oral Health WHO Collaborating Centre, Malmö
 University, Sweden www.whocollab.od.mah.se/euro.html

Question 40.**Is community water fluoridation banned in Europe?****ADA's Fluoridation Facts Short Answer**

No country in Europe has banned community water fluoridation.

ADA's Fluoridation Facts Long Answer

The claim that fluoridation is banned in Europe is frequently used by fluoridation opponents. In truth, European countries construct their own water quality regulations within the framework of the 1980 European Water Quality Directive. The Directive provides maximum admissible concentrations for many substances, one of which is fluoride. The Directive does not require or prohibit fluoridation, it merely requires that the fluoride concentration in water does not exceed the maximum permissible concentration.²²⁸

Many fluoridation systems that used to operate in Eastern and Central Europe did not function properly and, when the Iron Curtain fell in 1989-90, shut down because of obsolete technical equipment and lack of knowledge as to the benefits of fluoridated water.²²⁹ Water fluoridation is not practical in many European countries because of complex water systems with numerous water sources. As an alternative to water fluoridation, many European countries have opted for salt fluoridation, in addition to the use of fluoride toothpaste for topical benefits, as a means of bringing the protective benefits of fluoride to the public.

Additional discussion on this topic may be found in [Question 10](#).

Again, no European country has specifically imposed a "ban" on fluoridation, it has simply not been implemented for a variety of technical or political reasons.

Repeat of Question 40.**Is community water fluoridation banned in Europe?****Opposition's Response**

Yes, in some countries. (See answer to [Question 39](#)).

COST EFFECTIVENESS

Question 41.**Is water fluoridation a cost-effective means of preventing tooth decay?****ADA's Fluoridation Facts Short Answer**

Yes. Data from generally accepted scientific studies continue to confirm that fluoridation has substantial lifelong decay preventive effects and is a highly cost-effective means of preventing tooth decay in the United States, regardless of socioeconomic status.^{58, 61, 62, 230-232}

ADA's Fluoridation Facts Long Answer

It has been calculated that the annual cost of community water fluoridation in the U.S. is approximately \$0.50 per person.²³³ The annual cost ranges between \$0.12 and \$5.41 per person, depending mostly on the size of a community, labor costs, and type of fluoride compounds and equipment utilized.^{27, 62, 231, 232, 234} It can be calculated from these data that the lifetime cost per person to fluoridate a water system is less than the cost of one dental filling. With the escalating cost of health care, fluoridation remains a preventive measure that benefits members of the community at minimal cost.

Historically, the cost to purchase fluoride compounds has remained fairly constant over the years in contrast to the continued rising cost of dental care.²⁷ School-based dental disease prevention activities (such as fluoride mouthrinse or tablet programs), professionally applied topical fluorides and dental health education are beneficial but have not been found to be as cost-effective in preventing tooth decay as community water fluoridation.²³⁰ Fluoridation remains the most cost-effective and practical form of preventing decay in the United States and other countries with established municipal water systems.^{9, 58, 62, 230, 234}

Due to the decay-reducing effects of fluoride, the need for restorative dental care is typically lower in fluoridated communities. Therefore, an individual residing in a fluoridated community will generally have fewer restorative dental expenditures during a lifetime. Health economists at a 1989 workshop concluded that fluoridation costs approximately \$3.35 per tooth surface when decay is prevented, making fluoridation, "one of the very few public health procedures that actually saves more money than it costs."²³⁴ Considering the fact that the national average fee for a two surface amalgam (silver) restoration in a permanent tooth placed by a general dentist is \$75.84*, fluoridation clearly demonstrates significant cost savings.²³⁵

The economic importance of fluoridation is underscored by the fact that frequently the cost of treating dental disease is paid not only by the affected individual, but also by the general public through services provided by health departments, welfare clinics, health insurance premiums, the military and other publicly supported medical programs.⁶¹

Indirect benefits from the prevention of dental decay may include:

- freedom from dental pain
- a more positive self image
- fewer missing teeth
- fewer cases of malocclusion aggravated by tooth loss
- fewer teeth requiring root canal treatment
- reduced need for dentures and bridges
- less time lost from school or work due to dental pain or visits to the dentist

These intangible benefits are difficult to measure economically, but are extremely important.^{58, 231}

*The survey data should not be interpreted as constituting a fee schedule in any way, and should not be used for that purpose. Dentists must establish their own fees based on their individual practice and market considerations.

Repeat of Question 41.
Is water fluoridation a cost-effective means of preventing tooth decay?

Opposition's Response

Fluoridation cannot be cost-effective since it does not prevent tooth decay. (See [Benefits](#) section).

" ... several recent studies, here and abroad, show that fluoridation is correlated with higher caries, rather than lower ones. ... There has been no study that shows any cost-saving by fluoridation. This claim has been researched by a Rand corporation study and found to be 'simply not warranted by available evidence'." (See 41-1: "The Truth About Mandatory Fluoridation" by John R. Lee, M.D. Apr. 15, 1995).

A study was done to determine "The Amount of MediCal Money Spent in 1995 & 1994 for Dentistry in Relation to Fluoridation in the 15 largest Counties in California, which comprise 83% of the Eligible Recipients." (Tables are shown). "As is obvious from the above tables, fluoridation does not reduce MediCal dental treatment costs." The tables show that the cost is slightly higher in the fluoridated areas. "The statement made by Elizabeth G. Hill and Craig L. Brown, that fluoridated water systems ... reduce costs associated with dental treatment (including) ' ... higher Media-Cal dental costs' is so obviously false that the question of how such a statement could be made is worth examining." (See 41-2: Superior Court of the State of California statement, p.5, by Dr. John Yiamouyiannis, 1997).

Dentists make 17% more profit in fluoridated areas as opposed to non-fluoridated areas. There are no savings. (See 41-3: "Impact of Water Fluoridation on Dental Practice and Dental Manpower" from *The Journal of the American Dental Association*, Vol. 84, Feb. 1972, pp. 355-367).

The Natick Fluoridation Committee Report, dated September 27, 1999, included this statement on the cost-effectiveness of fluoridation:

"One has to consider the savings due to (possibly) fewer cavities in some children and the cost to treat those children. However, it is also true that there will be increased treatment costs due to dental fluorosis (between 10-30% of children in communities that fluoridate develop some form of dental fluorosis). Although these costs are not borne by the community at large, they should be considered in any assessment of cost-effectiveness. ... it seems clear that there will be a greater increase in fluorosis than there will be a reduction in cavities.

"The committee has also identified indirect costs that should be included in the cost effectiveness calculations. These include the costs borne by individual Natick residents who choose not to drink fluoridated water and individual

Natick residents who may incur medical or dental costs due to drinking fluoridated water. Finally, there are other costs to the town such as amortization, repair, etc., of equipment necessary to the program. These cost include (but are not limited to) the following identifiable items:

- Increased dental costs (not covered by insurance) to treat fluorosis.
- Purchase of unfluoridated water from other sources (\$3-4 per week)
- Increased medical costs
- Legal costs to the town to defend against lawsuits (see below)
- Increased plumbing costs resulting from corrosion (See 41-5)

"When a claimed 20% decrease in tooth decay is compared to a 600% increase in bone cancer or a 41% increase in hip fractures, when the cost of a tooth filling is compared to the cost of a hip fracture or cancer treatment, it is obvious that the human and economic costs of fluoridation are staggering." (*Fluoridation-Why the Controversy?*, by Janet Nagel, Ed.D., from National Health Federation.)

Fluoridation is also a financial hazard to the electronics industry who rely on pure water. Lucent Microelectronics states it will probably cost them \$5,000,000 to remove fluoride from the water they buy from the city.

Question 42.
Is it practical to fluoridate an entire water system?

ADA's Fluoridation Facts Short Answer

It is more practical to fluoridate an entire water supply than to attempt to treat individual water sources.

ADA's Fluoridation Facts Long Answer

It is technically difficult, perhaps impossible, and certainly more costly to fluoridate only the water used for drinking. Community water that is chlorinated, softened, or in other ways treated is also used for watering lawns, washing cars and for most industrial purposes. The cost of compounds for fluoridating a community's water supply is inexpensive on a per capita basis; therefore, it is practical to fluoridate the entire water supply. Fluoride is but one of more than 40 different chemicals that may be used to treat water in the United States.²⁷ The American Water Works Association, an international nonprofit scientific and educational society dedicated to the improvement of drinking water quality and supply, supports the practice of fluoridation of public water supplies.

Repeat of Question 42.
Is it practical to fluoridate an entire water system?

Opposition's Response

"Our water department calculates that we would be buying more than 33 tons of a substance that can't be given to us for free because it is classified as a toxic hazardous waste; yet, we are supposed to accept that, if we pay \$0.35 per gallon and they slap a new label on the container, this same toxic waste can be shipped to us untreated, directly from the scrubber systems of the phosphate fertilizer industry that they use to keep fluorine from becoming airborne and killing everything in sight, and that on the truck-ride here it will magically be converted to a safe and desirable nutrient. The kicker to this scheme is that

the amount intended for the targeted children is only 16 pounds of that 33 tons." (Escondido, California, City Council Member, Keith Beier, 1999.)

It is very practical, however, for the industries that have to dispose of their silicofluorides! "Chemicals that would cost \$7,000 per tanker in disposal fees are sold to cities at \$265 per ton. Every year 143,000 tons of this toxic waste are dispersed into our water and environment ... A 1991 Public Health Service report shows that U.S. children ingest up to 3½times the safe dose of fluoride via water, food, toothpaste and fluoride-containing insecticides in juices. ... Dental fluorosis ... can occur at just twice the USPHS recommended dose." (See 42-1: "Why Fluoridation is a Mistake" from *San Jose Mercury News*, Apr. 2, 1995).

Question 43.**(Posed by the Opposition)**

Statements made by the ADA, throughout their *Fluoridation Facts* booklet, leads the reader to believe that dentists are in a position to know if fluoride is truly "safe and effective" are they?

Opposition's Response

On December 21, 1999, David C. Kennedy, D.D.S. of San Diego, CA., Past President of the International Academy of Oral Medicine and Toxicology, received a letter from Arlyce Ten Broeck, Assistant Executive Officer of the Board of Dental Examiners. It read:

"Recently, you wrote to the Board of Dental Examiners and asked for a yes or no answer to the following question:

'Is the determination of whether a specific individual, or subset of the population, is at any time suffering from, or will suffer from adverse health effects outside of the oral cavity from ingested fluoride within the purview of dentistry?'

As we understand the question, the answer is no. As phrased, your question would appear to relate to a medical diagnosis." (See 43-1: copy of letter).

"The significance of this answer should be apparent to those individuals who have seen local dentists, as well as national spokespersons with dental licenses, offer their credentials as a dentist as proof that they possess expertise on the subject of whether adverse health effects do or do not occur, or may or may not occur, as a result of exposure to ingested fluoride." (See 43-2: "Background and Commentary").

CONCLUSION

Seldom has an issue come before the public that affects our personal health (and our personal freedom) as much as does this one. When the "smoke and mirrors" of the proponents of fluoridation are cleared away by scientific evidence, it is plain that there is no justification for putting this toxic substance in our water supply.

"Esteemed Voices have, for 50 years, warned the American public that water fluoridation has dangerous long-term consequences to health." (See 43-3: List of 128 leading authorities who are opposed to fluoridation, Maureen Jones, San Jose Citizens for Safe Drinking Water, Telephone (408) 297-8487).

Following are some of their quotes:

"I am appalled at the prospect of using water as a vehicle for drugs. Fluoride is a corrosive poison that will produce serious effect on a long-range basis. Any attempt to use the water this way is deplorable." Charles Gordon Heyd, M.D., Past President, American Medical Association.

On Nov. 24, 1992, Robert Carton, Ph.D., a former EPA scientist made this statement: "FLUORIDATION IS THE GREATEST CASE OF SCIENTIFIC FRAUD OF THIS CENTURY, IF NOT OF ALL TIME."

Professor Albert Schatz, Ph.D., Microbiology, discoverer of the antibiotic streptomycin, was of the same opinion. His statement was: "fluoridation ... it is the greatest fraud that has ever been perpetrated and it has been perpetrated on more people than any other fraud has."

David R. Hill, P.Eng., Professor Emeritus, The University of Calgary, Alberta, Canada, in Aug. 1997, stated: "My own conclusion is that there are, at best, real unresolved and serious questions about the safety and benefits of water fluoridation and related uses of fluoride. The most recent evidence suggests it is not particularly beneficial, and certainly not safe. The most charitable interpretation that one can put on the situation is that old habits die hard, and the medical/dental establishment is slow to adapt to the realities of modern research, and is fearful of losing both face and law suits if they admit they made a mistake."

For too many decades we heard from scientists who worked for the cigarette companies that cigarettes were not addictive, even in the face of mounting evidence of harm. No one died from smoking one cigarette, one pack, or one carton. But after twenty years, cancers started to "mysteriously" appear. We were told these deaths were unrelated to smoking.

Now, the American Cancer Society states that, "During 1995, approximately 2.1 million people in developed countries died as a result of smoking." Tobacco use is responsible for nearly one in five deaths in the U.S. Scientists were wrong about tobacco; tobacco was not safe and neither is fluoride.

The powerful financial interests behind fluoridation have managed to keep the public from knowing the truth by controlling the media. Here is the opportunity for those who have the courage to speak out and let the truth be known to do a real service for the public, who in the majority of cases have not even been given a choice in the matter.

Those opposed to fluoridation have but one thing to gain — water that is free of medication, a medication that has been proven time and again not to work for the purpose intended, and is harmful to many.

It is time to bring the evidence out in a free and open discussion, where reason and facts are the guidelines, rather than emotion and politics. To ignore the issue is to let others make the decision for us. It has been said that: "All bad men need is for good men to do nothing." Please help spread the true facts on this issue.