

American Dental Association

ADACommons

Patient Dental Health Education Brochures

Special Collections

1967

Fluoridation Facts: Answers to criticisms of fluoridation (1967)

American Dental Association

Follow this and additional works at: <https://commons.ada.org/patientbrochures>



Part of the [Community Health and Preventive Medicine Commons](#), [Dental Public Health and Education Commons](#), [Health Law and Policy Commons](#), [Health Policy Commons](#), and the [History of Science, Technology, and Medicine Commons](#)

Recommended Citation

American Dental Association, "Fluoridation Facts: Answers to criticisms of fluoridation (1967)" (1967). *Patient Dental Health Education Brochures*. 180.
<https://commons.ada.org/patientbrochures/180>

This Book is brought to you for free and open access by the Special Collections at ADACommons. It has been accepted for inclusion in Patient Dental Health Education Brochures by an authorized administrator of ADACommons. For more information, please contact commons@ada.org.

FLUORIDATION FACTS

**ANSWERS
TO CRITICISMS
OF
FLUORIDATION**

AMERICAN DENTAL ASSOCIATION

FLUORIDATION FACTS

Sections

I. Danger to health

1. Harmful effects on human beings
2. Rat poisons and insecticides — 20-year effects
3. Cause of neuroses and other mental and neural diseases
4. Cause of mongolism
5. Cause of many diseases and physical ailments
6. Cause or accelerator of growth of cancer
7. Damage to internal organs of adults
8. Harmful effect on kidneys of adults
9. Increase of various diseases in vital statistics of Grand Rapids, Mich.

II. Public policy and interference with human rights or freedom

10. Restriction of religious freedom
11. Mass medication
12. Compulsory medication
13. Socialized medicine
(Summary of court cases on fluoridation)
14. Defeated by voters if placed on referendum ballot

III. Need for a trial of other methods of administering fluorides

15. Addition to salt, milk, bread and other foods
16. Wastefulness of fluoridating *all* water

IV. Lack of evidence of value

17. Need for further proof
18. Benefits only to children
19. "Artificial" versus "natural" fluoridation
20. No "final" knowledge of value

V. Other criticisms

21. Unsightly staining of teeth by high concentrations of fluoride
22. Position of American Water Works Association on fluoridation
23. Engineering problems
24. Differences in opinions of physicians and dentists

FLUORIDATION FACTS

The Truth in Answer to Anti-fluoridation Charges

"Who are we to believe?" asked Luther Gulick, nationally renowned president of the Institute of Public Administration. To him the answer was obvious: The public should leave the question of the value of community water fluoridation programs to those (1) scientists, (2) engineers, (3) lawyers and (4) political leaders who are trained to deal with the problems related to this question.

Dr. Gulick wrote his definitive answer to the problem of whom to believe in 1957. Since that time, his penetrating analysis has not changed in its essentials. On the contrary, the amount of data supporting fluoridation of public water supplies has increased; the scientists, engineers, lawyers and political leaders have reassured those who will accept scientific truth that the pioneers in fluoridation research were uniformly correct.

The following pages are written to bring the reader at least partially up to date on the research, court determinations and endorsements of fluoridation by professional, learned and civic societies. They are meant to answer the questions posed about the safety, effectiveness, legality and public policy soundness of fluoridation. They are divided roughly into categories similar to those proposed by Dr. Gulick. Essentially, they say to the public: You ought to believe the experts who say that the fluoridation of public water supplies can safely reduce the incidence of tooth decay for all the people.

During the almost 20 years since fluoridation of community water supplies began, proposals for this public health measure have been met with a barrage of unfounded allegations. These baseless charges have taken many forms, but experience has shown that they can be classified in several categories:

I. Danger to health

II. Public policy and interference with human rights or freedom

III. Need for a trial of other methods of administering fluorides

IV. Lack of evidence of value of fluoridation

V. Other criticisms

Allegations by anti-fluoridationists have generally been of the "hit and run" variety, seldom with even attempted scientific substantiation. As Easlick has indicated, "The literature which attempts to provide scientific data to support assertions of anti-fluoridationists is virtually nonexistent."¹

This publication is designed to answer, with the facts, assertions made in opposition to fluoridation.

I. Danger to health

The charge:

1. Fluorides in the public water supply may have a harmful effect on human beings.

The fact:

For generations more than 7,000,000 people in the United States have lived in areas where the drinking water naturally contains fluorides in concentrations as high as or higher than that recommended for dental health. Many painstaking studies have been conducted among these people by competent investigators, yet no one has been able to find any adverse physiological effect.

Every national health organization in the United States that speaks with authority on the benefits and safety of fluoridation has adopted policies favorable to the measure. The official policy statement of the American Medical Association "Fluoridation of Public Water Supplies" points out that the House of Delegates of the Association on Dec. 6, 1951, adopted a resolution endorsing fluoridation, affirming the statement of the A.M.A. Council on Pharmacy and Chemistry.

In 1956, the A.M.A. House of Delegates requested that the Association's Councils on Drugs and on Foods and Nutrition review this policy. In 1957, the favorable report of the two councils was adopted by the House of Delegates.²

National health and service organizations that have endorsed fluoridation are listed on the back cover of this publication.

The charge:

2. Fluorides are poisonous substances found in rat poison and insecticides. Their effects may not be noticed for 20 years or longer.

The fact:

The first part of this assertion is true, but the inference that the same substance in minute concentrations in drinking water has the same effect as fluorine in high concentrations is completely incorrect. Many substances in common use by human beings are beneficial when used in proper amounts but may be harmful when used improperly. For example, chlorine is used in most public drinking waters in the United States. Sodium chloride is poisonous in large amounts; yet it is ordinary table salt.

It has long been known that drugs and vitamins are often highly poisonous when used in excess dosages. Hodge and Smith have shown, however, that there is no possibility of acute fatal poisoning when the fluoridation of water is controlled at 1.0 ppm.³

Heyroth⁴ reviewed studies investigating the health of persons who lived to advanced ages in areas where the water contained more than 1 ppm fluoride from natural sources. No evidence was found of skeletal fluorosis (bones abnormally heavy and dense) in x-rays of 31 persons who had lived for 18 to 68 years at Bureau, Ill., where the water contained 2.5 ppm of fluoride or in those of 86 residents of Kempton, Ill., where the content has varied between 1.3 and 3.0 ppm.

Heyroth also cited examinations of 50 persons in Lake Preston, S.D., where the water contained 6.0 ppm of fluoride. He stated that "All four lines of evidence lead to the conclusion that fluoridation of water to 1.0 ppm provides an ample margin of safety."

Leone⁵ studied the x-rays of 114 persons living at Bartlett, Texas, where the water contained 8.0 ppm of fluoride. There was evidence of an increase in density of the bones of 12 per cent of those examined, but no deformities or interference with skeletal function was found. The 114 persons had lived for at least 15 years in Bartlett.

Leone also reported that "A most unusual finding was the evidence of beneficial adult bone effect in counteracting the osteoporotic (lessened bone density) changes in the aged; hip fracture, a common occurrence in aging groups, was absent in the high fluoride area."⁶

It is thus clear that, even though millions of people have used throughout their lives water fluoridated far beyond the trace quantity recommended for dental health, no evidence of injury has been observed, with the exception of mottled tooth enamel, which occurred in areas using water containing excessive quantities of fluoride.⁷

The charge:

3. Drinking fluoridated water causes such conditions as neuroses, psychoses, lowered mentality, parasthesia, stammering, failing memory, interference with transmission of neural impulses, neuritis, neuralgia, poliomyelitis, multiple sclerosis, degeneration of nervous tissue.

The fact:

An exhaustive review of 1,393 scientific references in the literature on fluoridation fails to provide any evidence of support for these allegations. No studies that could be investigated have been reported in support of these allegations. Reports of many careful, comprehensive short and long range studies by scientists have furnished conclusive evidence of the value and safety of fluoridation of communal supplies of water.⁸⁻¹²

The charge:

4. Fluoridation causes an increase in the rate of children born as mongoloids.

The fact:

This charge is based solely on studies by Ionel Rapaport, a French-trained psychiatrist with no training in epidemiology or dental research. Data he collected in 1956 in several midwestern states have been used as the basis for articles published in French journals purporting to prove a relationship between fluorides in the water and the incidence of monogolism.¹³

Qualified epidemiologists and dental researchers from the National Institute of Dental Research and staff members of the National Institute of Mental Health have charged that the statistical procedures and the design of Rapaport's studies are so faulty as to invalidate any conclusions based on them.

A study which specifically refutes Rapaport's conclusions was carried out in England by W. T. C. Berry, M.D., who concluded that there was no association between the incidence of mongolism and the level of fluoride in the water consumed by the mother.¹⁴

The charge:

5. Fluoridated water causes or makes worse many diseases or physical ailments. Included in anti-fluoridation literature are the following diseases alleged to be caused or made worse by the consumption of fluoridated water:

Cancer; diseases of the digestive tract; liver diseases; kidney diseases; respiratory diseases, including tuberculosis; diseases of the circulatory system, including hardening of the arteries; hemophilia, leukemia and anemia; eye diseases and defects; diseases of the endocrine glands; degeneration of the thyroid gland; diabetes; impaired functioning of the thyroid, adrenal and sex glands; diseases of the skin, nails and hair, and diseases and abnormalities of the bones and joints.

The fact:

This list is long, but Elwell and Easlick in "Classification and Appraisal of Objections to Fluoridation" cite 141 references specifically refuting these charges and those made concerning neurological diseases and impairments. For those seeking more complete information about scientific studies establishing fluoridation's safety, the Elwell and Easlick publication is invaluable.¹⁵

It is sufficient to say here that research studies have failed to identify fluoridation in one single instance as causing or contributing to diseases or physical ailments. Among the millions of people living in naturally fluoridated areas or in controlled fluoridation areas, there has been no increase in illness traceable to fluoridation.

The charge:

6. Fluorides cause or accelerate the growth of cancer.

The fact:

Dr. Charles S. Cameron, president of the American Cancer Society, stated in a letter to Dr. Tom M. Oliver of Waco, Texas: "No valid scientific evidence known to the society supports a causative relationship of fluorine (specifically in amounts used in water fluoridation for the purpose of dental caries prophylaxis) to cancer. On the contrary, such epidemiological and laboratory experimental data as are available indicate no such relationship."¹⁶

Additional information on this subject is provided in the records of bureaus of vital statistics in various states. The statistics indicate that cancer rates are lower in states where there are many natural fluoride areas than in states where the waters are fluoride-deficient.^{17,18} There is no reason to believe, however, that these lower cancer rates are due to the presence of fluorides in drinking water.

The charge:

7. Fluorides added to public water supplies will do untold damage to the internal organs of adults.

The fact:

Persons who raise such "warnings" have no evidence on which to base their charge.^{5,11,19-24} Those who make unsubstantiated statements on harmful effects should be challenged to bring forth facts to support their contentions. Actual observations of individ-

uals who have lived up to 70 years or more in areas where water has a high concentration of fluoride have not revealed injuries to the internal organs.²⁵

In the town of Stratford, Ont., Canada, where water has contained fluoride to a level of 1.6 ppm continuously for 38 years, physicians were asked individually whether or not they had observed any ill effects on internal organs from the fluoride in the water. All reported that they had observed no ill effects to the internal organs.²⁶

The charge:

8. Fluorides accumulating in the body will have a harmful effect on the kidneys of adults.

The fact:

A review of the vital statistics available from state boards of health, such as in Illinois and Wisconsin, reveals no difference in the data on nephritis in different cities with varying amounts of fluorides in their public water supplies.^{10,27,28}

It is estimated that the amount of fluorine ingested daily through drinking water containing 1 ppm fluorine is from 0.5 to 1.0 mg.²⁹ It has also been shown that, when the total amount of fluorine ingested by adults does not exceed 4.0 to 5.0 mg. daily, its elimination in the urine, perspiration and fecal excretion is virtually complete.³⁰ The ability of the body to handle fluorides is thus more than adequate for the amount ingested through fluoridated water.

The charge:

9. The vital statistics of Grand Rapids, Mich., show an increased number of deaths from heart disease, intracranial lesions and nephritis since the program of fluoridation was initiated.

The fact:

This statement is erroneous because it is based on a comparison of 1944 data for the city of Grand Rapids with 1948 data for the whole of Kent County in which Grand Rapids is situated. Reliable population data for this area are available from official agencies in Grand Rapids and in the state of Michigan.

Changes in the death rates in Grand Rapids have not been significantly different from those for the country as a whole. A claimed increase in the number of deaths from heart disease in 1949 is not a fact but is due to a 1949 revision in the methods of recording deaths.³¹

II. Public policy and interference with human rights or freedom

The charge:

10. Fluoridation is a restriction of religious freedom.

The fact:

In five cases concerning fluoridation that were tried in 1952,³² the decision was similar: No constitutional rights of citizens to freedom of religious belief would be invaded or violated by the adoption of fluoridation.

In Baltimore, the court ruled that "A person has a right to believe in any particular religion or faith that he desires, but he does not have the freedom to act in accordance with the tenets of any of those religions, since in his action he is bound to follow the laws duly enacted for the preservation of the health of citizens generally. He cannot object on religious grounds to laws enacted, either by the nation's, state's or city's authorities."

In 1954, the United States Supreme Court refused to interfere with previous decisions of the California court which upheld San Diego's legal right to fluoridate its water supply.

Writing in 1962, Butler reviewed subsequent cases dealing with court findings on fluoridation as an alleged restriction of religious freedom.³³ He stated:

"In considering the issue, the courts have ruled that the right of the individual under the Constitution to freedom of religion must be subordinate to the overriding public interest. For example, in *DeAryan vs. Butler* (1953) 119 Cal. App. 2d 674, the court recognized that freedom of religion forbade 'direct compulsions but did not forbid reasonable interference incident to a fundamental service or facility.'"

Butler also cited a 1961 decision concerning fluoridation of community water supply and religious freedom, that of *Dagmar Ready vs. St. Louis County Water Company*, 352 S.W. 2d 622. He concludes his discussion with this summation:

"Virtually every case which has considered the question of religious invasion has followed the basic principle that, even if there were something invidious to his religious beliefs, benefit to the community at large to be derived from the fluoridation of the water supersedes the individual's religious rights. The individual's freedom to act is subordinate to the over-

riding public interest. In essence, there is no interference with the freedom of the individual to believe that there is something inherently wrong with the addition of the fluoride ion, but, as in the case of compulsory sterilization or the chlorination of water or the curtailment of excessive sound in disseminating religious beliefs, this freedom to act is subject to such reasonable regulation as comports with the over-all good of the community."

The charge:

11. The fluoridation of public water supplies constitutes mass medication.

The fact:

The generally accepted definition of medication as used by dentists and physicians refers to the administration of remedies to treat or cure a given condition.³⁴ Fluoridation does not constitute a remedy; it does not treat an existing disease. Fluoridation supplies a normal constituent found in human teeth and makes fluoride available in the proper amounts through food or drink in order to produce normal teeth and bones.

Fluorides in the public water supply are no more a medication than are other substances normally found in water or than the various constituents of food necessary for the maintenance of health. Adding sodium fluoride to the water supply is no more a medication than enriching natural foods with vitamins and minerals. The addition of certain nutrients to white flour to enrich it is now required by law in some³⁵ states as a nutritional measure, and the practice is followed in all states.

The charge:

12. Fluoridation is compulsory medication because everyone is compelled to drink the fluoridated water.

The fact:

Lull,³⁶ while secretary and general manager of the American Medical Association, analyzed this objection directly. He stated:

"It is claimed by some that the community has no right to force them to take undesired medication. This is a double-barrelled fallacy because, to begin with, fluoridation is not medication; it is adjustment to normal of a deficient content of fluorine in the water in certain areas where needed. In the second place, no one is forced to use a public water supply;

bottled water can be purchased. The public water supply is in the nature of a public utility, like gas, or electricity; it is a convenience but is in no sense a right. Although commonly run by the municipality, it may be a private enterprise in the same manner as electricity or gas which in some areas are publicly owned and in others, privately."

It would be a travesty of the democratic process if a minority of misguided but militant partisans were to be permitted to prevent the majority of the population from choosing to prevent dental disease by the simplest, cheapest and most effective method available.

The charge:

13. Fluoridation constitutes socialized medicine.

The fact:

As is pointed out in the preceding sections, fluoridation is not medication or a form of "medicine." Fluoridation is no more "socialized" than is chlorination or other measures employed by the community for the prevention of disease. In fact, fluoridation represents one of the most realistic arguments against "socialized medicine" inasmuch as it is a preventive measure and is a project which communities determine and provide for themselves.

Summary of Court Cases on Fluoridation

In 1957, a report of the Council on Legislation of the American Dental Association indicated that the courts of 10 states have held that the fluoridation of public water supplies does not infringe on the constitutional or legal rights of the individual and under appropriate state enabling authority is a proper exercise of the charter powers of local communities. The decisions, stated the report, "were rendered by the courts of last resort in California, Louisiana, Ohio, Oklahoma, Oregon, Washington, Wisconsin and by trial courts in Maryland, Pennsylvania and North Dakota." They "are strengthened by the fact that the Supreme Court of the United States has refused to review four of these decisions for the stated reason that no substantial federal constitutional question was involved."³⁷

Subsequent to the writing of this 1957 report, additional cases on the legality of the fluoridation procedure reached the courts of Iowa (1961), Missouri (1961), Florida (1962) and Illinois (1964); in Iowa, Missouri, Illinois, Michigan, New York and South Carolina cases were heard in the respective state supreme

courts. In no case did the courts find for the plaintiffs seeking to prevent fluoridation. Butler, writing in 1962, summarized the relevant court findings to the date of his writing:

"Accordingly, it may be safely concluded today that every argument which the ingenuity of the opponents of fluoridation has found has been heard and answered by the courts. It is now a settled principle of law that a community has the inherent right to fluoridate the public water supplies. In so doing, it is not practicing medicine, engaging in socialized medicine, giving mass medication or violating the pharmaceutical laws. The individual's rights, which are protected under the Constitution, do not extend to prevent public programs of this kind. In view of this unanimity and comprehensiveness of judicial opinion, it is unlikely that there will be any decisions in the future adverse to fluoridation of public water supplies."³³

An interesting case on fluoridation was concluded in 1963 in the Supreme Court of Ireland. The Court declared that the Health Act of 1960 was constitutional and dismissed the appeal of Mrs. Gladys Ryan, an Irish housewife, with costs against her. The decision affirmed several of the points on personal rights and the rights of the state which were made by American courts.

The charge:

14. Fluoridation is usually defeated by the voters when it is placed on a referendum ballot.

The fact:

At the end of 1964, 2,758 American communities were fluoridating water for more than 47 million residents. In comparison to this figure, 143 communities have discontinued fluoridation from 1945 to the end of 1963. Of this total, 32 communities re-instituted the measure.

Referendums to retain fluoridation once instituted or to initiate it in a community have been defeated at the polls in about 60 per cent of the cases. Reasons for this have been covered in extensive studies made by behavioral scientists.³⁸

Anti-fluoridationists have found effective techniques for creating doubts and fears among the electorate. Those in favor of fluoridation have been unable to communicate their supporting evidence in sufficient strength to counteract the dramatic assertions of the opponents. This is probably because voters have a tendency to vote opposition more strongly than conversion to a cause and because many voters are unable or unwilling to make a valid scientific analysis of the data on fluoridation.

III. Need for a trial of other methods of administering fluorides

The charge:

15. One could just as well add fluoride to table salt, milk, bread or some other foodstuffs.

The fact:

Fluoride is a natural constituent of many water supplies. The discovery that fluoride ingested in proper amounts reduces tooth decay was the result of work in towns where the supplies contained fluorides naturally. Water, therefore, is a natural medium for caries control.

It is impractical to add fluoride to table salt because it is not uniformly consumed and because the use of salt with a common fluoride content could be hazardous in view of the widely varying natural fluoride content of water supplies. The consumption of food items, such as milk and bread, varies considerably among individuals. The intake of water, though it may be irregular, is less variable than any other single item in human nutrition.

There are also practical difficulties that would hamper the "fluoridation" of such items as milk, bread and salt. For example, control testing would be difficult, and responsibility for the procedure would be divided.³⁹⁻⁴¹

Fluoridation of the public water supply is especially practical and safe because it is constantly subject to control by competent health authorities and does not require action on the part of individual citizens.⁴²

Freedom of the individual to accept or reject fluoride is sometimes given as a reason for suggesting it as a dietary supplement. This has a certain philosophical appeal, but in practice researchers have found that a lack of uniformity in administration of the tablets results. The behavior of an experimental group of 121 children taking a 1.0 mg. fluoride tablet daily for an average of two-thirds of their lives was observed. The researchers noted that "although the persons involved in this study were, on the whole, a highly educated group, only about half of them actually continued to give their children tablets for the necessary number of years."⁴³

It would then seem to be impractical to expect equal caries reduction in a group taking dietary supplements of fluoride and those depending on community water supply fluoridation.

Further evidence that fluoridation of community water supplies is preferable to fluorides as a dietary supplement will be found in the extensive review of the literature in this field made by Nikiboruk and Fraser in 1964.⁴⁴

The charge:

16. It is wasteful to fluoridate all the water when only a small amount of it is used for drinking purposes.

The fact:

Water which is chlorinated, softened or in other ways processed is used for watering lawns, for washing cars and for most industrial purposes as well as for drinking. Yet it has been found much more practical to treat the entire water supply than to have separate water systems. The same is true of water fluoridation, particularly in view of the fact that the annual cost per person will average about 9 cents, and this amount covers fluoridation of all the water, not just that used for drinking purposes.

IV. Lack of evidence of value of fluoridation

The charge:

17. There is a need for further proof of the effectiveness of water fluoridation.

The fact:

Studies related to the various factors involved in fluoridation have been made for more than 30 years.⁴⁵

Long-term practical research in communities adopting fluoridation of water supplies for periods of ten or more years have been completed and are readily available in printed form. These prove that fluorides in controlled use decrease the prevalence and incidence of dental caries.

In 1957, Hill,⁴⁶ in reviewing fluoridation research, cited three major studies. All three of these reported statistically significant reductions in the rates for dental caries. They are available for Brantford, Ont., Canada;²⁶ Grand Rapids, Mich.;^{47, 48} and Newburgh, N.Y.⁴⁹

In 1962, Ast and Fitzgerald⁵⁰ reviewed continuing studies which extended the data in Brantford through the fourteenth year⁵¹

and Grand Rapids through the fifteenth.⁵² Evanston, Ill.,⁵³ and Milan, Tenn.,⁵⁴ have also reported statistics on caries incidence during extended periods.

This is how Dr. Donald J. Galagan, assistant surgeon general and chief, Division of Dental Public Health and Resources, U.S. Public Health Service sums up the case for fluoridation:

"The Public Health Service encourages the practice of fluoridating community water supplies. Fluoridation is the most effective means known to prevent dental caries. This endorsement has been made on the basis of over 30 years of extensive laboratory and epidemiological research.

"Every public health measure, and even the physical 'laws' we have come to accept as fact, have always been questioned or disputed by some.

"Progress in applying scientific advances to the betterment of human life would be impossible if new scientific techniques could not be put into practical effect until every last dissenter ceased to claim the existence of some vague shadow of doubt. In every field of applied science, competent and responsible authorities must decide when the scientific community has pronounced a reasoned judgment of safety before sanctioning a technique for use. Where the scientific evidence clearly proves safety, mankind must move ahead, even if some objectors still assert doubts.

"All the evidence must be weighed, and a judgment must be made. Such is the case with fluoridation. The verdict of the scientific community is that fluoridation is safe."

The charge:

18. Fluoridation benefits children only.

The fact:

It is true that, in the beginning of a fluoridation program, the greatest benefits will accrue to the younger children. However, as these children become adults, they will continue to benefit, and eventually the entire continuous-resident population of the community will be enjoying the full benefits from fluoridation. Studies conducted among adults in fluoride areas show that the dental benefits continue throughout life.⁵⁵

The charge:

19. Artificial fluoridation may not produce the same results as do natural fluorides.

The fact:

Actually, there is no such thing as "artificial fluoridation." Fluorides are always added to water, generally being picked up by the water running through underground passages and crevices where the ground contains various fluoride compounds. In this process, man has no control over the concentration.

Studies show that the same results occur whether the fluoride is added in controlled amounts by man or added accidentally by nature, except that dental benefits are assured and no tooth staining occurs when the fluoride is added in controlled amounts.

The charge:

20. Fluoridation should not be undertaken because we do not yet have final knowledge of the effect of fluorides on humans.

The fact:

In science there is no such thing as final knowledge. New information is continuously being brought forth even on such accepted procedures as pasteurization of milk and chlorination of water. All evidence on fluoridation, however, as on these other procedures, attests to its safety and effectiveness.

V. Other criticisms

The charge:

21. Fluorides cause an unsightly staining of teeth.

The fact:

It is a well-known fact that high concentrations of fluorides found naturally in public water supplies may lead to a condition known as dental fluorosis, often called mottled enamel. In such areas, the degree of dental fluorosis may be such that the dental enamel readily picks up stains which discolor the teeth.

Where the drinking water contains a concentration of 1 ppm fluorine, there is evidence of a very mild degree of dental fluorosis in less than 10 per cent of children using such water. This degree

of dental fluorosis does not cause staining.¹⁹ It can be detected only by dentists with special training and experience in recognizing such slight degrees as are present. In fact, most trained observers point out the increased whiteness which can be associated with 1 ppm fluorine in drinking water actually enhances the beauty of the teeth.^{56, 57} The advantage of controlled fluoridation is that the development of decay-resistant teeth is promoted without the staining of the teeth.

Sometimes, since water consumption varies because of climate and humidity changes, health authorities recommend that the fluoride content of the public water supply be adjusted.⁵⁸⁻⁶⁰ Hot, dry climates require less than 1 ppm fluoride, some other areas a fraction more. The amount of fluoride necessary to control tooth decay in any region is always less than that which would cause tooth staining.

The charge:

22. Fluoridation has not been "recommended" by the American Water Works Association.

The fact:

The water works engineer is not in a technical position to recommend fluoridation. Such recommendations are the prerogative of the dental, medical and public health groups. The American Water Works Association has stated, however, that the water works industry is willing and ready to follow through when the proper authorities recommend or approve the treatment.⁴⁰

The charge:

23. Fluoridation will present many difficult engineering problems.

The fact:

Dr. A. P. Black, Research Professor of Chemistry and Sanitary Science, University of Florida, recently pointed out:

"In the 15-year period between 1945, when only three water systems in this country serving approximately 230,000 were being fluoridated, and Dec. 31, 1961, when fluorides were being added to 1,236 water systems serving 42,183,000 people in 2,193 communities, the personnel of more than 1,000 water systems has faced the problem of reducing to practice this new method of water treatment."⁶¹

These facts give assurance that the addition of fluorides to a

municipal water supply is practical from an engineering standpoint. The mechanics of fluoridation are no more involved than those of water purification; moreover, the machinery and equipment commonly used in water plants are easily adapted.

Doubts have been raised about the danger of mishaps which would cause fluoridation machinery to add too much of the compound to the water supply, danger to pipes and equipment from incrustation, corrosion and other chemical actions and danger to water plant employees from fluoride handling. These doubts and fears have been shown by expert opinion to be groundless.⁶² Rigorous controls in adherence to specifications prepared by the American Water Works Association have assured the purity and safety of fluoridation. No difficulty has been experienced in maintaining with a high degree of precision the desired concentration of fluoride.

The most ludicrous charges involving engineering and the control of safely fluoridated water are those which imply that by accident or nefarious design a city's water supply could be flooded with enough poisonous fluorides to kill off the whole population.

To lay these charges to rest, it has been pointed out that acute morbidity manifested by increased salivation and vomiting may be caused by ingesting 0.25 g. sodium fluoride. This quantity in an 8-ounce glass of water represents 1,000 ppm sodium fluoride or about 250 ppm fluorine. To obtain this concentration would require more than four tons of sodium fluoride per million gallons of water processed. This is obviously not possible in a program of water fluoridation, even if gross negligence occurred.³⁹

And, if saboteurs did wish to strike through the water supply, they certainly would not rely on tons of sodium fluoride when they could dump a mere ounce of botulinus toxin in a water reservoir to accomplish their deadly purpose.

The charge:

24. Some physicians and dentists do not agree with the majority of their colleagues on the value of fluoridation.

The fact:

Seldom are opinions unanimous on any scientific subject. The vast majority of dentists and physicians, however, firmly support fluoridation.

Endorsement of fluoridation by the American Dental Association, the American Medical Association and the other national organizations listed on the back cover of this booklet came as a result of serious investigation of published research and debate about research findings. Not once has the validity of a charge against fluoridation been substantiated by reliable evidence.

For a very large majority of those practicing in the health professions, there is no doubt about the safety and effectiveness of fluoridation.

The wholehearted support of the health professions in Connecticut resulted, in May 1965, in a state law requiring fluoridation for all towns of 20,000 or more population. In addition, the law calls for fluoridation of all water utilities serving populations of 50,000 or more by January 1967.

REFERENCES

1. Easlick, Kenneth A. An appraisal of objections to fluoridation. *JADA* 65:686 Nov. 1962.
2. American Medical Association policy statement. Fluoridation of public water supplies. Chicago, American Medical Association Department of Environmental Health and Division of Environmental Medicine and Medical Services, undated.
3. Hodge, H. C., and Smith, F. A. Some public health aspects of water fluoridation. In Shaw, J. H. (ed.). Fluoridation as a public health measure. Washington, D.C., American Association for Advancement of Science, 1954, p. 79-109.
4. Heyroth, F. F. Toxicological evidence for the safety of the fluoridation of public water supplies. *Am. J. Pub. Health* 42:1568 Dec. 1952.
5. Leone, N. C., and others. Roentgenologic study of a human population exposed to a high fluoride domestic water — a ten-year study. *Am. J. Roentgenol.* 74:874 Nov. 1955.
6. Leone, N. C. In Our Children's Teeth, a digest of expert opinion based on studies of the use of fluorides in public water supplies. New York, Committee to Protect Our Children's Teeth, Inc., 1957, p. 34-40.
7. Doty, J. R. In Hearings before the Committee on Interstate and Foreign Commerce, House of Representatives, 83rd Congress, 2nd Sess., on H.R. 2341, a bill to protect the public health from the dangers of fluoridation of water. May 25-27, 1954. Washington, D.C., U. S. Government Printing Office, 1954, p. 295.
8. Shaw, J. H. (ed.). Fluoridation as a public health measure. Washington, D.C., American Association for the Advancement of Science, 1954.
9. Newburgh-Kingston caries-fluorine study: final report. *JADA* 52:290 March 1956.
10. Hagan, T. L., Pasternack, M., and Scholz, Grace. Waterborne fluorides and mortality. *Pub. Health Rep.* 69:450 May 1954.
11. Cox, G. J., and Hodge, H. C. Toxicity of fluorides in relation to their use in dentistry. *JADA* 40:440 April 1950.
12. Leone, N. C., and others. Review of the Barlett-Cameron survey: a ten-year fluoride study. *JADA* 50:277 March 1955.
13. Rapaport, Ionel. Nouvelle recherches sur le mongolisme: à propos du rôle pathogénique du fluor. (New research on mongolism: concerning the pathogenic role of fluorine.) *Bull. Acad. Nat. Med., Paris* 143:367 May 1959.
14. Berry, W. T. C. A study of the incidence of mongolism in relation to the fluoride content of water. *Am. J. Mental Defic.* 62:634 Jan. 1958.
15. Elwell, K. R., and Easlick, K. A. Classification and appraisal of objections to fluoridation. Ann Arbor, Mich., School of Public Health, University of Michigan, 1960.
16. Cameron, Charles S. President, American Cancer Society. Personal communication to Dr. Tom M. Oliver, Waco, Texas, April 10, 1953.
17. New York City Board of Health. Report to the mayor on fluoridation for New York City, 1955, p. 29.
18. Federal Security Agency Dental News, Dec. 1951.
19. Dean, H. T. The investigation of physiological effects by the epidemiological method. In Moulton, F. R. (ed.). Fluorine and dental health. Lancaster, Pa., American Association for the Advancement of Science, 1942.
20. McClure, F. J. Nondental physiological effects of trace quantities of fluorine. In Moulton, F. R. (ed.). Dental caries and fluorine. Lancaster, Pa., American Association for the Advancement of Science, 1946.
21. Roholm, K. Fluorine intoxication. London, H. K. Lewis & Co. Ltd., 1937.
22. Machle, W., and Largent, E. J. The absorption and excretion of fluorides. II. The metabolism at high levels of intake. *J. Indust. Hyg. & Toxicol.* 25:112 1943 *Chem. Abstr.* 37:6032, 1943.
23. Smith, F. A. An annotated bibliography of the literature on the pharmacology and toxicology of fluorine and its compounds. University of Rochester, Atomic Energy Project, Jan. 29, 1951.
24. Schlesinger, Edward R., Overton, David E., and Chase, Helen C. Newburgh-Kingston caries fluorine study. II. Pediatric Aspects — preliminary report. *J. Pub. Health & Nation's Health* 40:725 June 1950.
25. Leone, N. C., and others. Medical aspects of excessive fluoride in a water supply. *Pub. Health Rep.* 69:925 Oct. 1954.
26. Brown, H. K., and others. Brantford-Sarnia-Stratford. Fluoridation caries study — 1955 report. *J. Canad. D. A.* 22:207 April 1956.
27. Wisconsin State Board of Health. Continuous-resident data, 1951: Death rates per 100,000 population in cities with varying concentrations of fluorides in public water supplies 1945-1949. Death rates in cities with varying concentrations of fluorides in public water supplies, 1940-1944.
28. Mortality in fluoride and non-fluoride areas. Illinois Health Statistics Bulletin. Special release no. 20. Springfield, Ill., Illinois Department of Public Health, April 1, 1952.
29. McClure, F. J. Ingestion of fluoride and dental caries. Quantitative relations based on food and water requirements of children one to twelve years old. *Am. J. Dis. Child.* 66:362 Oct. 1943.
30. McClure, F. J., and others. Balances of fluorine ingested from various sources in food and water by five young men. Excretion of fluorine through the skin. *J. Indust. & Hyg. Toxicol.* 27:159 1945.
31. Council on Dental Health, American Dental Association. An analysis of the statements by Rep. A. L. Miller which appear in the Congressional Record March 24 and May 7, 1952 (mimeo.).
32. Land, W. W., and Mosenthal, E. K. Court decisions on municipal water fluoridation. *J. Am. Water Works A.* 45:387 April 1953.
33. Butler, H. William. Legal aspects of fluoridating community water supplies. *JADA* 65:653 Nov. 1962.
34. Dorland, W. A. The American illustrated medical dictionary, Philadelphia, W. B. Saunders Co., 1947, p. 856.
35. Drink away tomorrow's tooth decay. Public Health Service publ. no. 72, 1951.
36. Lull, G. F. Fluoridation of water supplies. *Today's Health* 33:13 June 1955.
37. Council on Legislation, American Dental Association. A review of court decisions on fluoridation of public water supplies. *JADA* 54:379 March 1957.
38. Kegeles, S. Stephen. Contributions of the social sciences to fluoridation. *JADA* 76:667 Nov. 1962.
39. Cox, Charles R., and Ast, David B. Water fluoridation — a sound public health practice. *J. Am. Water Works A.* 43:641 Aug. 1951.

40. Questions and answers on fluoridation of public water supplies. *Will-ing Water. Am. Water Works A.* Vol. 14 April 1951.
41. Pearlman, S. Untested alternatives to fluoridation of domestic water supplies. *JADA* 46:287 March 1953.
42. Statement of Inter-Association Committee on Health, Feb. 1, 1952.
43. Arnold, F. A., Jr., McClure, F. J., and White, C. L. Sodium fluoride tablets for children. *D. Prog.* 1:8 Oct. 1960.
44. Nikiforuk, Gordon, and Fraser, Donald. Fluoride supplements for prophylaxis of dental caries. *J. Canad. D. A.* 30:67 Feb. 1964.
45. Dean, H. T. Fluorine in the control of dental caries. *JADA* 52:1 Jan. 1956.
46. Hill, I. N. Fluoridation research and related development. *JADA* 54:454 April 1957.
47. Arnold, F. A., Jr., and others. Effect of fluoridated public water supplies on dental caries prevalence. *Pub. Health Rep.* 71:652 July 1956.
48. Dean, H. T., and others. Studies on mass control of dental caries through fluoridation of the public water supply. *Pub. Health Rep.* 65:1403 Oct. 1950.
49. Ast, David B., and others. Newburgh-Kingston caries-fluorine study. XIV. Combined clinical and roentgenographic dental findings after ten years of fluoride experience. *JADA* 52:314 March 1956.
50. Ast, David B., and Fitzgerald, Bernadette. Effectiveness of water fluoridation. *JADA* 65:5 Nov. 1962.
51. Brown, H. K., and others. Brantford-Sarnia-Stratford fluoridation caries study — 1959 report. *J. Canad. D. A.* 26:131 March 1960.
52. Arnold, F. A., and others. Fifteenth year of the Grand Rapids fluoridation study. In McClure, F. J. (ed.). *Fluoride drinking waters, a selection of Public Health Service papers on dental fluorosis and dental caries: physiological effects, analysis and chemistry of fluoride.* Public Health Service publ. no. 825, Washington, D.C., U. S. Government Printing Office, 1962.
53. Blayney, J. R. Report on thirteen years of water fluoridation in Evanston, Ill. *JADA* 61:76 July 1960.
54. Trithart, A. H., and Denney, R. P. Study of caries experience rates of six-year-old children of Milan, Tenn., after five years of fluoridation. *J. Tennessee D. A.* 36:156 April 1956.
55. Russel, A. L., and Elvove, Elias. Domestic water and dental caries. VII. A study of the fluoride-dental caries relationship in an adult population. *Pub. Health Rep.* 66:1389 Oct. 26, 1951.
56. Plater, W. R. Caries control: its influence and effects on malocclusion. *Am. J. Orthodont.* 35:790 Oct. 1949.
57. Cox, G. H. Evaluation of methods of caries prevention and control. *J. Wisconsin D. S.* 27:185 Nov. 1951.
58. Levin, Margaret M., and Cox, Gerald J. Water consumption in relation to environmental temperature and its significance in the fluoridation of water supplies. *J. D. Res.* 29:663 Oct. 1950.
59. Galagan, D. J.; and Lamson, G. G. Climate and endemic fluorosis. *Pub. Health Rep.* 68:497 May 1953.
60. Galagan, D. J. Climate and controlled fluoridation. *JADA* 47:159 Aug. 1953.
61. Black, A. P. Feasibility of water fluoridation. *JADA* 65:588 Nov. 1962.
62. Maier, Franz J. *Manual of water fluoridation practice.* New York, McGraw-Hill Book Co., Inc., 1963.

Subject Index by Paragraph Number

| <u>Subject and paragraph no.</u> | <u>Subject and paragraph no.</u> |
|------------------------------------|-------------------------------------|
| Adults, benefits to 18 | Kidneys, effect on 8 |
| American Medical Association 1 | |
| American Waterworks Association 22 | "Medication" 11-13 |
| "Artificial" vs. "natural" 19 | Mongolism 4 |
| | |
| Cancer 6 | National health organizations 1, 22 |
| Chlorination 2, 16 | |
| Climate factor 21 | |
| Compulsory medication 12 | Physiological effect 1 |
| Concentration, recommended 21 | "Poisonous" substance 2 |
| Cost 16 | Policies, favorable 1, 22 |
| Court decision on legality 10-13 | |
| | |
| Elimination 8 | "Rat poison" 2 |
| Enamel, "mottled" 21 | Referendums 14 |
| Endorsements 1, 22 | Research 1-5, 7-9 |
| Engineering problems 23 | |
| | |
| Final knowledge 20 | "Socialized medicine" 13 |
| Foods 15 | Staining of teeth 21 |
| Freedom of religion 10 | |
| | |
| "Harmful" effects 1-9 | "Toxicity" 1-9 |
| | |
| Ingestion 7 | Vital statistics 5, 7-9 |
| Insecticides 2 | |
| Internal organs, effect on 7 | "Wasteful" 16 |

National and international organizations that have endorsed fluoridation:

AMERICAN ACADEMY OF PEDIATRICS
AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE
AMERICAN ASSOCIATION OF PUBLIC HEALTH DENTISTS
AMERICAN DENTAL ASSOCIATION
AMERICAN DENTAL HYGIENISTS' ASSOCIATION
AMERICAN FEDERATION OF LABOR AND CONGRESS OF INDUSTRIAL
ORGANIZATIONS
AMERICAN HEART ASSOCIATION
AMERICAN LEGION
AMERICAN MEDICAL ASSOCIATION
AMERICAN PHARMACEUTICAL ASSOCIATION
AMERICAN PUBLIC HEALTH ASSOCIATION
AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN
ASSOCIATION OF STATE AND TERRITORIAL DENTAL DIRECTORS
ASSOCIATION OF STATE AND TERRITORIAL HEALTH OFFICERS
CANADIAN DENTAL ASSOCIATION
CANADIAN MEDICAL ASSOCIATION
CANADIAN PUBLIC HEALTH ASSOCIATION
COMMISSION ON CHRONIC ILLNESS
INTERNATIONAL DENTAL FEDERATION
NATIONAL CONGRESS OF PARENTS AND TEACHERS
NATIONAL RESEARCH COUNCIL
U.S. JUNIOR CHAMBER OF COMMERCE
U.S. PUBLIC HEALTH SERVICE



AMERICAN DENTAL ASSOCIATION
211 East Chicago Avenue, Chicago, Illinois 60611