For well over ten years it has been apparent that fluoride supplements are unwise for young children. Indeed, a Rand Corporation literature review in 1981 found that supplements are "simply not warranted" by the results (RAND report N 1732-RWJF Dec 1981). Furthermore, their use clearly increases the risk of dental fluorosis, which is now at an all time high in the US. It is equally clear that there is little or no evidence of any dental benefits from pre-eruptive supplementation. For these reasons, fluoride supplements are banned or strictly regulated in Africa, Europe, Canada, Japan, and India.

It is heartening, therefore, to read that a long time fluoride advocate agrees that "fluoride supplements should no longer be used for young children in North America" (Abstract in *Fluoride 27* 121 1994). The question that Dr. Burt should now address is: Given the uselessness and risk of fluoride supplements, why should the practice of giving young children the same fluoride dissolved in water (fluoridation) be continued?

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Professor Burt responds:

The American Dental Association (ADA) conducted a workshop to consider its schedule for dietary fluoride supplementation on Jan 31-Feb I, 1994. Dr. Lee has circulated some inferences from my paper at that workshop which stray far from the sense of my presentation, and which could be interpreted to imply that I am opposed to water fluoridation as a public health measure in the United States. That is not the case, and this response is to comment briefly on Dr. Lee's inferences.

Dr. Lee has quoted accurately from the abstract, but it seems that he has not read the full paper. (Along with other papers from the workshop, this is to be published in the *Journal of Public Health Dentistry* in due course). My conclusion, correctly quoted by Dr. Lee, was that the risks of using fluoride supplements in young children outweigh the benefits. "Risk" was described as the likely development of the mildest forms of fluorosis from regular use of supplements by infants and young children, while "benefits" were the minor (at best) cariostatic effects likely to result from this use. Dr. Lee then goes on to extrapolate that line of thinking to the use of water fluoridation, but this does not follow because with water fluoridation the benefits outweigh the risks.

Dr. Lee seems to be suggesting that the relative lack of cariostatic effect of systemic fluoride is a new finding, but this is not true. The first review of literature that I know of to point this out was in 1976 (Levine RS. The action of fluoride in caries prevention: a review of current concepts. *British Dental Journal 140* 9-14 1976). The evidence for a primarily topical cariostatic effect of fluoride has grown and has been cited many times since then, culminating with the 1989 Georgia conference (proceedings in *Journal of Dental Research 69* special issue 1990).

There is considerable evidence that vehicles like fluoridated water and table salt have powerful topical cariostatic effects. These methods are highly effective public health approaches to caries control, though they are accompanied by about 12% prevalence of the mildest forms of fluorosis. I consider the benefits of water fluoridation exceed the risks associated with its use, and my argument about eliminating supplements for young children in fact depends partly upon the

effectiveness of fluoride in water and toothpaste. Supplements are unlikely to add much to this existing effectiveness, but do increase the risk of fluorosis.

Dr. Lee may not have read the following part of my discussion, which I think helps put the issue in perspective:

> *The exposure to fluoride from multiple sources, a fact of life in the United States today, is a prime reason why dental caries experience has been reduced to its current low levels. The caries decline is a major public health achievement which must be preserved in those who have benefited from it, and extended to those remaining segments of society which need it most.*

I would like to finish by summarizing my philosophy on fluoride use, which I believe is well-based on published evidence. I hope that this will counter any wrong impression that Dr. Lee's inferences may have produced.

- Fluoride most effectively controls caries when a low concentration can be maintained consistently in the oral environment. While any method of using fluoride which helps achieve this state will be effective, fluoridated water and fluoride toothpaste rank first as public health measures in the United States.
- Fluoride continues to be a major reason why the oral health of Americans is today better than ever and continues to improve.
- Fluoridation of water to appropriate levels, and the regular use of fluoride toothpaste, as the two most effective public health means of controlling dental caries. The majority of Americans need little or no extra fluoride to maintain oral health.
- Public health uses of fluoride mean that some systemic absorption of fluoride is inevitable. In the amounts associated with water fluoridation, there will be some dental fluorosis of the mildest varieties. This condition is minor when compared to the accompanying benefits of reduced tooth decay.
- It is incumbent on dentistry to reduce the risk of fluorosis as far as possible while not compromising the benefits of fluoride. My view is that eliminating supplements use for infants and young children will be a step toward achieving this goal.

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Dr Lee replies:

I wish to thank Dr Burt for his acknowledgement of the accuracy of my use of the quotations from his published summary (despite his objections to my inferences of them) and for his further comments defending the continued practice of public water fluoridation. Further, I appreciate his acknowledgement that water fluoridation has little or no systemic dental benefit but, rather, supposedly works solely by its topical effects. It is good that this aspect of the argument be addressed.

- Common sense would dictate that the amount of fluoride touching the teeth during the act of swallowing fluoridated water is extremely small. In fact, I doubt that it would even be measurable. It is certainty uncommon for children to swish their drinking water back and forth through their teeth while imbibing a drink. One would think that brushing with fluoridated toothpaste would be more effective in bringing fluoride into contact with the teeth.

• The argument that fluoride in public drinking water is responsible for the observed decline in children's dental caries is contrary to numerous studies in the US and world-wide which find that the same decline occurred also in unfluoridated communities. (See references 1 - 11 in the list that follows below.) In fact, I have continuously challenged any dental authority to provide one valid study of the past two decades justifying the presumption of fluoridation's dental benefits and none has been forthcoming.

• Dr. Burt's statement that fluoridation results in only "12 % prevalence of the mildest forms of fluorosis" is contradicted by the US Public Health Service (the Hoover report) indicating a fluorosis prevalence of 22.3% in fluoridated communities and by other authoritative reports in which dental fluorosis prevalence was variously found to be 30-60 % in communities with supposedly "optimal" fluoridation. (See references 4 and 12-15 in list below.)

• Dr. Burt is seemingly unaware that dental fluorosis connotes fluoride toxicity far more important than mere dental disfigurement. Dental. fluorosis is a visible indicator in developing teeth of generalized fluoride toxicity throughout the body, including damage to connective tissue, bone tissue, immune functions, and enzyme functions. As such, *any* rise in the prevalence of dental fluorosis is cause for concern.

I shall look forward to continuing this discussion when Dr. Burt's full paper is published (in due course) in the *Journal of Public Health Dentistry*.

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[Editor: *Fluoride 23* (3) 1990 page 106 listed 7 studies which reported dental fluorosis prevalences in 12 fluoridated communities. The average prevalence was 29%. One of the studies, co-authored by Dr Burt, reported dental fluorosis prevalences in 3 Michigan fluoridated communities of 32%, 49% and 51% (*Journal of Dental Research 67* 802-806 1988).]