

# FDI STATEMENT

## Fluoride and Dental Caries

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### **Introduction**

Over 50 years of extensive research throughout the world has consistently demonstrated the safety and efficacy of fluoride in preventing dental decay. The scientific basis for the use of fluoride and its safety has been accepted by numerous scientific bodies, expert groups and Government agencies. The use of fluoride has resulted in a substantial decline in the incidence and prevalence of dental decay and has improved the quality of life for millions of people.

### **How Fluoride Inhibits Caries**

The original investigations into the role of fluoride in the prevention of dental decay linked its mode of action to its presence and concentration in the water supply. It was assumed that the beneficial effect of fluoride related to its systemic effect in strengthening tooth enamel during development.

It has now become clear that the constant supply of appropriate levels of fluoride in the mouth is the most important factor, as the presence of low levels of fluoride inhibits demineralisation and encourages remineralisation of the tooth enamel during the dental decay process.

These findings are of profound importance with regard to the use of fluoride as a preventive or therapeutic measure. They have confirmed that the topical application of fluoride, or indeed any means of maintaining an adequate concentration of fluoride in the mouth, is of central importance in preventing dental decay.

### **Delivery systems for fluoride**

#### ***Fluoridation of water supplies***

Fluoridation of water supplies, where possible, remains the most effective public health measure for the prevention and treatment of dental decay. This is attributable to the fact that water is a dietary component required and used by everyone and therefore benefits all sectors of the community. The only limitations to its use are a reliable and controllable water supply, which almost invariably means a centralised piped source of water.

The availability of fluoride from other sources needs to be known in order to determine the most appropriate water fluoride levels for a given population or geographical area.. Recommendations for the concentration of fluoride in water depend primarily on water consumption, which may be effected by climate. In addition, local cultural or dietary practices should also be taken into account.

### ***Fluoridated salt***

Administration of fluoride via salt intake is an alternative where the local situation is not suitable for water fluoridation. Studies have produced consistent data indicating its effectiveness in reducing dental decay. The production of fluoridated salt for a particular country or geographical area should be centralised with strong technical support to ensure controlled production.

Concentration of fluoride in salt must be based on studies of salt intake and the availability of fluoride from other sources. The fluoride concentration should appear on the salt packaging.

### ***Fluoridated milk***

Fluoridated milk has been used as a fluoride source, especially for young children through school programmes. A number of studies have shown it to be effective. However it has had limited exposure as a public health measure.

### ***Fluoride-Containing Dentifrices***

Of all the delivery systems in use at the present time, fluoride dentifrices have been the subject of the most comprehensive testing. A wide range of well-controlled studies has been carried out and almost all of these have demonstrated considerable reductions in dental decay resulting in greatly improved oral health. Fluoride dentifrices are therefore a most important public health measure and efforts should be made to extend their use.

Excessive swallowing of toothpaste by young children may result in an increase in the prevalence of very mild dental fluorosis (enamel opacities). In order to reduce this possibility the ingestion of toothpaste by children should be minimised. In some regions of the world low concentration fluoride-containing dentifrices (550ppm fluoride), especially for children, are available. There is conflicting evidence of their effectiveness in reducing dental decay.

Dentifrices should be used at least twice per day with a minimum amount of water used to rinse the mouth after brushing

Dentifrice containers must display the fluoride concentration and a notice that children under 6 years of age should be supervised during brushing, and only use a small amount (e.g. pea-sized portion) of toothpaste.

### ***Fluoride Supplements***

Fluoride tablets may be recommended for at-risk individual patients and can also be considered for general use in at-risk groups in the community when other fluoride sources are not available. The effectiveness of fluoride tablets is not as clearly documented as other delivery systems. In view of the recognition of the importance of the topical effect of fluoride it is recommended that supplements should be sucked, chewed or dissolved in the mouth before being swallowed. There is also the possibility of an increased risk of opacities/ fluorosis if supplements are used inappropriately.

Dosage must take into account local fluoride availability particularly in the water supply. Dosage schedules should, where available, be consulted. There are several

national dosage schedules available which differ somewhat in their recommendations. These must be monitored carefully and updated regularly in the light of other sources of fluoride.

### ***Fluoride Mouthrinses***

In at risk individuals and populations fluoride mouthrinses may be an effective measure. Mouthrinses can be used on a daily basis or at other intervals as dictated by local needs. Fluoride mouthrinsing is not recommended for children under six years of age.

Commercially available fluoride mouthrinses intended for individual use have been demonstrated to be effective and should be used according to the specific needs of the individual.

### ***Professionally applied gels***

Professionally applied gels are indicated for individuals at-risk of dental decay. Concentrations are usually high. In view of this they must be handled with care.

### ***Fluoride Varnishes***

Fluoride varnishes are indicated for individuals at-risk of dental decay or for patient's at increased risk due to dental or medical treatment.

## **Fluoride exposure from multiple sources**

Fluorides are found naturally throughout the world. They are present to some extent in all foods and waters so that all humans ingest some fluoride. Fluoride has become more available via food and drink, fluoridated water, dentifrices, mouthwashes etc. This can be extremely beneficial in terms of the prevention of dental decay. It can also increase the risk of the milder forms of dental opacities/fluorosis. Because of this there should be a co-ordinated approach to fluoride delivery. It is imperative that fluoride availability from all sources is taken into account before embarking on a specific course of fluoride treatment.

## **Health risk assessment**

It is clear from a vast amount of scientific evidence that, if used properly, and at the concentrations appropriate for the prevention of dental decay, fluoride is safe and effective. However enamel opacities / fluorosis can be caused by excessive fluoride ingestion during the pre-eruptive development of teeth. At the fluoride levels used to prevent decay opacities/fluorosis only occur in a relatively small proportion of the population and the changes are very mild and are primarily of aesthetic interest. Recent studies have shown that the public generally do not notice or find objectionable these minor changes on teeth.

Provided that levels of intake are carefully monitored, fluoride is considered to be a most important public health measure in maintaining oral health.