

Volume 8 Issue 8

April 2000

CHILDREN'S DENTISTRY NEWSLETTER

PRACTICAL CLINICAL TIPS: KEEPING YOUR PEDIATRIC SKILLS CURRENT

FLUORIDE

(PART 1)

Introduction

In this issue we will discuss the role of fluoride in the prevention of dental caries, the role of dietary fluoride supplementation and dental fluorosis. Also, a brief overview of water fluoridation and the increased use of bottled water will be discussed.

For many years it has been known that fluoride plays an important role in decreasing the prevalence of dental caries. It is important however to understand how fluoride prevents caries. Many studies have been conducted investigating the cariostatic properties of fluoride and it has been found that multiple delivery systems provide the maximal benefit.

Systemic fluoride or ingested fluoride results in its incorporation into the dentin and enamel of unerupted teeth. The fluoride in the enamel of an unerupted tooth is at its highest concentration at the enamel surface. This makes the teeth more resistant to acid attack after eruption into the oral cavity. Systematic fluoride can also be secreted into saliva. Fluoride in saliva, although usually present in low concentrations, can be incorporated into the enamel of newly erupted teeth, enhancing enamel calcification.

Produced by

Betty Barr, D.M.D.
Nelle Barr, D.M.D.

Topical fluoride in dentifrices, rinses, and gels has a much higher concentration and can act directly on the enamel surface. Research now shows that the predominant impact of fluoride on reducing caries is due to the remineralization of demineralized enamel. The enamel surface remineralized in the presence of fluoride cause fluorhydroxapatite crystals to form that are much less acid soluble than the original enamel apatite. The most important sources of fluoride after eruption of the teeth are fluoride containing dentifrices, mouth rinses, professionally applied topicals and drinking water.

Water Fluoridation

Many studies during the past 40 years have proven how effectively community water fluoridation prevents dental decay in children. Community water fluoridation is the process by which the amount of fluoride is adjusted in the community's water to 1ppm, the best level for preventing tooth decay. Fluoridating community water is the least expensive and most effective way to reduce tooth decay. Fluoridation benefits both children and adults, is safe and requires no individual effort or direct action by those who will benefit! It is very important to determine where your patients get their daily water intake. There are a number of different sources:

Municipal Water

The fluoride content of municipal water varies from community to community. To obtain a state print-out for all districts in Colorado call (303) 692-3047.

Well Water

All well water must be analyzed to determine its fluoride content. The state will do this for a fee of \$9.00. You may call (303) 692-3047 and the state health department will send a container that can be filled with the well water that you in turn send back.

Bottled water

Today many more families have chosen to drink bottled water rather than regular "tap" water. Only a few brands of bottled water contain an adequate level of fluoride. It is important to determine the source of the bottled water the family is drinking. A few examples of bottled water and their fluoride levels are as follows.

<u>Product</u>	<u>FL mg/L</u>
Deep Rock Water	1.4
Eldorado Springs	.3
Sierra Springs	.0
Naya Spring	.2
Albertson A+	.0
Avalon	.0
Aquavista	.1
Calistoga	.0
Aquafina	.0
Rocky Mt. Summit	.2
Evian	.3
Arrowhead	.0
Big K (KingSoopers)	1.4
Crystal Geyser	1.1
Dasani	.0

Since there are so many brands of bottled water on the market, if a patient has a question regarding the fluoride level have them call the 1-800 phone number on the bottle or go to the bottled water Internet site www.bottledwaterweb.com. Also available is the International Bottled Water Association (IBWA) hotline at 1-800-water-11.

If the patient's water is not fluoridated one can suggest a few solutions:

- You can supplement with a prescription for F⁻ drops or F⁻ tablets .
- Have the family use bottled water. With about 1mg/L fluoride such as Deep Rock, Crystal Geyser or Big K (KingSoopers).

Another factor to consider is the use of water filters in the household. Only reverse osmosis removes fluoride and it removes all fluoride. Ask if the home water supply is being filtered when encountering a child with a high caries rate!

Recommended Dietary Fluoride Supplement Schedule

Age in Years Concentration of Fluoride in Drinking water. (PPM)

	<0.3 PPM	0.3-0.6 PPM	0.7-6 PPM
Birth-6mo	0	0	0
6mo-3yrs	.25mg	0	0
3yrs-6yrs	.50mg	.25mg	0
6-16yrs	1.0mg	.50mg	0

*Dosages are in milligrams F.day

Before writing a prescription for fluoride always inquire which source of drinking water is the patient's primary source of water. Beverages and foods processed in any metro area contain fluoride and therefore, children living in areas without fluoride probably attend schools that are providing fluoridated water and/or consume fluoridated beverages or food.

It is difficult to correctly assess the amount of fluoride ingested systemically by infants and young children either by drinking water, food or by ingestion of dentifrices. Therefore, dietary fluoride supplements should only be used in children with a high risk of caries to try to avoid the increased risk of dental fluorosis.

Dietary fluoride supplements are administered in the following dosage forms.

- 1 Fluoride Drops
- 2 Fluoride Drops with Vitamins
- 3 Fluoride Tablets/Lozenges
- 4 Fluoride Tablets with Vitamins
- 5 Fluoride Oral Rinse supplements

Fluoride oral rinse supplements provide both a systemic and topical effect. The solution is swished in the mouth providing a topical effect and then swallowed providing a later systemic effect. If tablets are prescribed for a dietary fluoride supplement, the patient should be instructed to chew the tablet and then swish the resulting solution to provide both a topical and systemic effect.

Fluorosis

There have been many studies that have shown the positive effects fluoride has on dental caries. However, an excess of systematic fluoride consumption during tooth development can result in enamel hypomineralization defects known as fluorosis.

Fluorosis can present in many different forms in the permanent dentition. The earliest signs of enamel fluorosis present as thin white lines that span the entire enamel surface. As the severity increases one sees small white patches and then eventually the entire surface appears chalky. Sometimes "brown staining" can be present but this is not a measure of the severity of fluorosis but is an incorporation of extrinsic materials by the porous enamel.

Fluorosis in the primary dentition is usually less prevalent and severe than in the permanent dentition. It also appears more often in the cervical portions of primary molars.

The major source of fluoride is the daily ingestion of water and food, although other factors have been shown to influence the prevalence and severity of fluorosis. Most importantly it has been shown in recent studies that the ingestion of fluoride containing dentifrices in pre-school children play a major role in the prevalence of fluorosis in the permanent dentition. It is very important that young children be supervised when using fluoridated toothpaste. The parents of young children should be instructed to use only a pea-size amount of toothpaste once a day to avoid ingestion of excess amounts of fluoride. Always instruct the parents to have children spit out excess toothpaste to avoid ingestion.

Bibliography

1. Levy SM, Kohout FJ, Guha-Chowdhury N, Kiritsy MC, Heilman Jr, Wifel JS: Infants' fluoride intake from drinking water alone, and from water added to formula, beverages, and food. *J Dent Res* 74(7) 1399-1407. (1995).
2. Warren JJ, Levy SM,: A review of fluoride dentifrice related to dental fluorosis. *Pediatric Dentistry* 21:4 265-270 (1999).
3. Warren JJ, Kanellis MJ, Levy SM, : Fluorosis of the primary dentition: What does it mean for permanent teeth? *JADA*, Vol 130, 347-356 (1999).
4. Grembowski D, Fiset L, Spadafora A,: How fluoridation affects adult dental caries/systemic and topical effects are explored. *JADA* Vol 123 p49-54 (1992).
5. Miller MC, Truhe TF, : Fluoride: An update for the year 2000, center for dental information (1995).



**Children's Dentistry,
A Partnership**

**5150 W. 80TH AVE.
WESTMINSTER, CO 80030
303-427-1951**

www.ddschild.com