

1. Reasons to implement fluoride mouth rinse programs at elementary schools.

Chewing well with healthy teeth plays an important role in the development of children, and prevention of dental cavities is necessary for healthy development.

Dental cavities are not caused by the habits of families alone. Dental cavities frequently develop in early childhood years when children begin spending large amounts of time in groups. By taking measures to prevent cavities in children not only at home but also at nursery school, kindergarten, and elementary schools, it is possible to support children's current and future health.

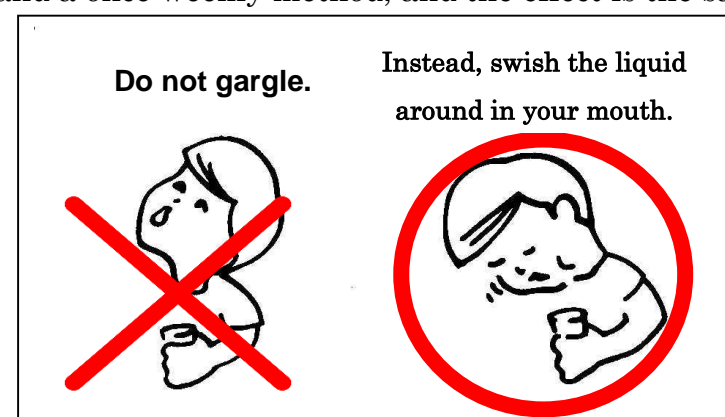
★ Important points for group dental hygiene programs.

The following points are important when conducting group fluoride rinse programs in elementary schools.

- ① Voluntary Participation (Freedom of choice)
- ② Consent and Permission
(Explaining to and receiving the consent of parents about the program)
- ③ Attentiveness and consideration
(Care to not treat children differently if they don't participate. i.e. carry out the program in the same way with plain water for children who are not part of the program)
- ④ Information provision
(Accurate information provision based on scholarly insight and scientific evidence from school dental practitioners etc.)

2. How are fluoride mouth rinse programs done?

Mouth-rinsing liquid (5~10 ml) having a concentration of 225 ppm to 900 ppm is held in the mouth and "swished" around. Two methods of implementation are available and one should be chosen based on the environment and age of the child. There is a daily method and a once weekly method, and the effect is the same.



Fluoride mouth rinse program method

- ① The daily method is recommended for pre-school children.
• Concentration: 250 ppm
- ② The once weekly method is recommended for children of elementary school age.

【 A point about the prevention of dental cavities 】

Fluoride mouth rinse programs alone are not 100% effective at preventing cavities. It is important to not rely on a mouth rinse program alone, but rather to combine it with daily habits that support oral hygiene like regular tooth brushing and refraining from eating sweets too frequently.

3. What are the expected results of fluoride mouth rinse programs?

Fluoride mouth rinse programs are said to be 23 to 30% effective in cavity prevention according to a recent study supervised by Associate Professor Yoichi Iijima of Nagasaki University

※ "The Fluoride Mouth Rinsing for Dental Cavities Prevention Manual" shows research that points to 30 to 80% efficacy in cavity prevention.

○How effective is fluoride in the prevention of dental cavities?

- ① It strengthens tooth structure. (Increases acid resistance)
When fluoride acts on teeth, hydroxyapatite becomes a fluoroapatite crystal structure which is very hard to dissolve in acid, and the tooth surface becomes stronger.
- ② It repairs tooth surface. (Remineralization)
Fluoride works to restore calcium to the enamel where cavities have developed and also prevents further decalcification and cavities from developing.
- ③ Other functions of fluoride
Fluoride also suppresses the production of acid in bacteria and the formation of dental plaque.

4. Are fluoride mouth rinse programs safe?

According to the "Fluoride Mouth rinse Program Guidelines" created by the Ministry of Health, Labor and Welfare, it has been shown that even inadvertently swallowing the entire dose by mistake will not be harmful so long as you maintain the proper concentration and amount. These assessments are verified by various poison tests.

Additionally, fluoride mouth rinse programs are recommended by the WHO and other specialized institutions as an effective method for the prevention of dental cavities.

Ex.) The amount of liquid used for children is 10 ml once a week. If a child (body weight of 30 kg) were to swallow about 6 to 7 times the prescribed amount, acute symptoms such as nausea, vomiting, and abdominal discomfort may occur. Fluoride mouthwash is for oral topical application (not for swallowing), so if the mouth rinse program is followed correctly even occasional swallowing will not cause chronic symptoms.

Ex.) The average daily fluoride intake due to a fluoride mouth rinse program is about 0.2 mg when calculating the residual rate in the oral cavity as 10 to 15%. This amount occurs naturally in 1 to 2 glasses of black, green, or oolong tea and is completely safe.

Ex.) About 90% of commercially available toothpaste contains fluoride at a concentration of about 900 ppm.

To parents and of guardians of students in schools

Let's start a school based Fluoride Mouth rinse Program for cavities prevention!

I. Why introduce Fluoride Mouth rinse Program in elementary schools?

Oral health is an important contributor to overall health and well-being in children is a fundamental component of health and physical and mental well-being. As many of children are affected tooth decay, also known as cavities at school ages, it is effective for them to establish the cavities preventive strategy, including a school based Fluoride Mouth rinse Program (hereafter called FMP) in a daily activity of school, not only family. Implementing FMP to elementary schools affect not only children's current health, but also their future health as well.

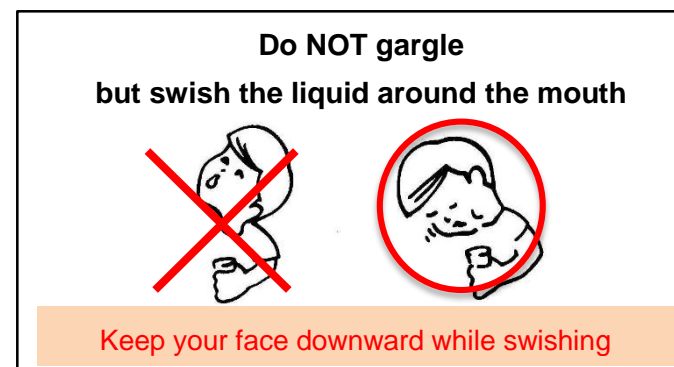
Principles for implementing FMP to prevent cavities in schools

- ① Voluntary Participation(Freedom of choice)
→ A parent or guardian makes a choice his/her child to participate in this program.
He / She can withdraw his /her child from participation in the program at any time by notifying the school in writing.
- ② Consent and Permission
→ A consent form or permission slip signed by a parent or guardian must be submitted for participation in FMP.
- ③ Attentiveness and consideration
(Care to not treat children differently if they don't participate. i.e. carry out the program in the same way with plain water for children who are not part of the program)
- ④ Information provision
(Accurate information provision based on scholarly insight and scientific evidence from school dental practitioners etc.)

II. How to conduct FMP

Doing FMP only takes less than ten minutes of class time each week and is easy to learn and do. Non-dental personnel including classroom teachers or school staff, parents, and volunteers easily supervise the procedure. Here we introduce 2 types of mouth rinsing: Weekly mouth rinsing which recommended for elementary schools while Daily mouth rinsing (five times a week) is recommended for preschoolers. For Weekly mouth rinsing, children rinse with a 0.2 percent solution of neutral sodium fluoride of correct amount (7~10mL) for one minute. For Daily mouth rinsing, preschooler do with a 0.055% solution of NaF of 5~7mL for 30~60 seconds to swish vigorously around the mouth without swallowing in downward posture

(see Figure right) for one minute.
FMP should be done when eating and drinking is not scheduled for at least 30 minutes. Studies show FMP is effective even when plaque is on the teeth.



III. How does fluoride work to prevent tooth decay?

Fluoride is the 13th most abundant element in the earth's crust and found in both water and air, and is a naturally occurring compound that can help prevent tooth decay.

- Recent study showed that decay reductions observed in FMP were 23-30% for permanent teeth or adult teeth.
 - Fluoride works by stopping or even reversing the tooth decay process—it keeps tooth enamel (the hard surface of the tooth) strong and solid.
- ① Making tooth enamel stronger, making it easier to resist tooth decay due to decrease its solubility and improve its crystallinity.
 - ② Repairs early tooth decay (Remineralization*)
The remineralization effect of fluoride is important. Fluoride ions in and at the enamel surface result in remineralized enamel that is not only more resistant to decay (loss of minerals or demineralization**), but enamel that can repair or remineralize early tooth decay caused by acids from decay-causing bacteria. Fluoride ions necessary for remineralization are provided by various fluoride products such as Mouth rinse or toothpaste.
 - ③ Action on the bacteria of the plaque : Inhibit demineralization**
Tooth decay is caused by certain bacteria in the mouth. When a person eats sugar and other refined carbohydrates, these bacteria produce acid that removes minerals from the surface of the tooth (demineralization). Fluoride helps to inhibit demineralization tooth surfaces and prevents cavities from forming.

* Remineralization: a process enhanced by the presence of fluoride whereby partially decalcified enamel, become recalcified by mineral replacement.

** Demineralization : Dietary sugars are broken down by the bacteria to form acid(H+). The acids lead to subsurface demineralization and result in weakened enamel. This is the first step in caries formation.

IV. Does FMP, recommended for the prevention of tooth decay, adversely affect children health?

The scientific evidence indicates, as in Guideline for FMP issued in 2003 by Ministry of Health, Labour and Welfare in Japan, that FMP is a safe measurement for preventing cavities. If a child is to accidentally swallow the fluoride solution, it will not cause an adverse reaction. The test results regarding acute and chronic poisoning confirmed the safety of FMR. Also, many organizations and associations of oral health in worldwide, including WHO (World Health Organization) have ruled that FMP is safe and effective in reducing the incidence of tooth decay.

Example 1; Accidental ingestion of fluoride by children usually does not present a serious risk if the amount of fluoride ingested is less than 2mg/Kg of body weight. If the child (30 kg weight) takes a weekly mouth rinsing accidentally swallows the over dose of fluoride solution, 60-70 ml at once, the acute symptoms such as nausea, vomiting, and abdominal discomfort may appear unfortunately. Due to rapid onset of symptoms, please call school dentist as soon as possible. As FMP is a topical use of fluoride (a method which does not swallow), so even if pupils swallowed several times it will not cause chronic symptoms.

Example 2; The average intake of fluoride after FMP will be about 0.2 mg when calculating as 10 to 15% retention rate in the mouth, which contains 1 to 2 tea spoon(s) of tea, green tea and oolong tea. It is equivalent to the amount of natural fluoride that is available and is safe.

Example 3; We use a fluoridated toothpaste 2-3 times a day at toothbrushing time, and it concentrates about 950 ppm fluoride.

NOTE:

Fluoride is a key component in any recommended strategy

Exposure to fluoride is not the only measure available to decrease the risk of decay. In formulating a decay prevention program, a number of intervention strategies may be recommended such as good oral hygiene, changes in diet and placement of dental sealants. However, fluoride is a key component in any recommended strategy.