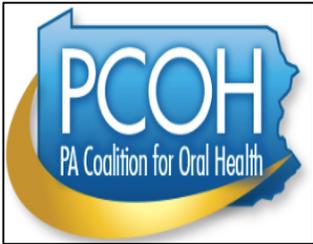


Evidence Suggesting Silver Diamine Fluoride (SDF) as a Nonrestorative Treatment

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Authors:

Zarafshan Bhojani,
MPH

What is SDF?

Silver diamine fluoride (SDF) is a topical liquid fluoride solution that is applied as a dental caries preventative agent. After the application of the solution, it leaves a black stain on the tooth. Although the black stain is permanent, SDF is still a noninvasive method that is more effective, affordable, and safer than traditional restoration techniques.

Why should SDF be considered?

A common treatment that dentists use to control decay of a cavity is general anesthesia. However, this method can be a dangerous measure for children under 5 years of age as it is associated with many short-term and long-term health implications such as dental anxiety, slow behavioral development, and even death.

Who could benefit from SDF?

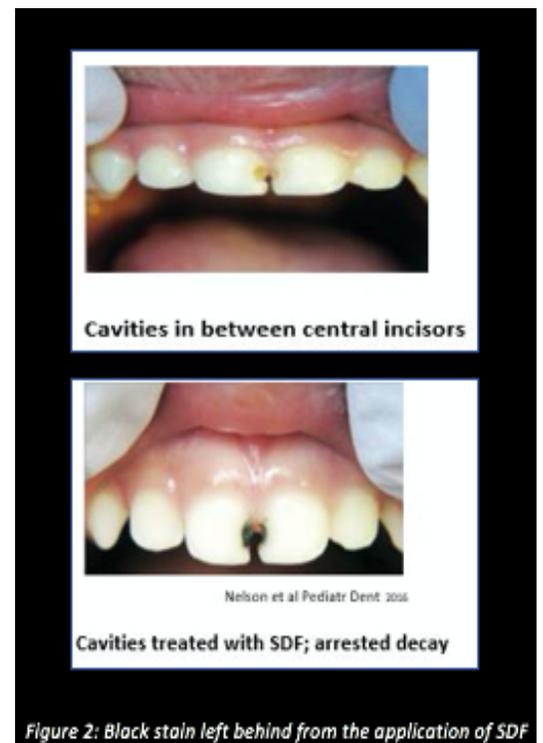
The lack of awareness, knowledge and access to quality oral health care remains an issue among the underserved populations and affects dental professionals as well. The magnitude of this public health issue has the potential to negatively impact many families. Having limited access to quality oral health care produces many challenges for economically disadvantaged families restricting their ability to undergo dental treatments thus worsening the condition or disease present in the mouth.

What is the purpose of this brief?

The intent of this brief is to propose the use of silver diamine fluoride as a nonrestorative measure to treat dental caries in children under 5 years of age versus utilizing general anesthesia or sedation. To provide evidence to support use of SDF, this brief will explore risks and benefits of general anesthesia and SDF as a method to treat caries. The aim is to provide additional context, inform the magnitude of the issue, and support formulation of potential solutions.

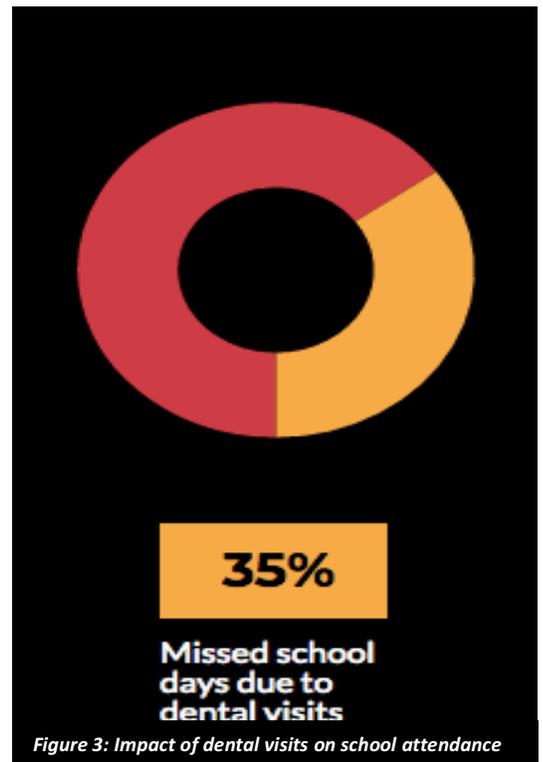
Parent Perceptions

- Parents may be hesitant to have SDF applied on their child's cavity as the solution leaves behind a permanent black stain on the tooth in place of the cavity.
- In one study, researchers asked parents to examine photographs of carious teeth treated by SDF.
 - Parents perceived the staining from the SDF to be undesirable on anterior teeth, however they preferred any staining effect from SDF over the use of advanced behavioral techniques such as sedation or general anesthesia (Crystal, Janal, Hamilton, & Niederman, 2017).
- As shown in Figure 2, the cavities in between the central incisors were treated by the application of SDF leaving a black stain to limit further decay of the cavity.



Health Impacts from Dental Treatments

- Poor dental health can cause a child to experience much pain and discomfort affecting their attendance at school thus leading to limited social interactions among other peers and friends.
- Children with poor oral health are almost three times more likely to miss school days from dental pain which then impacts their school examination and academic performance as well as job attainment (Watt et. Al., 2018).
- Dental treatments can require multiple visits depending on the severity of the condition.
 - One study has shown that dental health issues were responsible for 35% of a child's missed school days (Jackson et. Al., 2011).



Silver Diamine Fluoride (SDF)

VS

General Anesthesia

Advantages

- **Quick, safe, and effective:** SDF is applied with a micro-brush up to two times and left to dry for 2-3 minutes. It is then washed with water to remove the excess solution inside the mouth. This helps to arrest the cavities, prevents newer cavities from developing, and helps the areas affected by the cavity to recover as cavities cause the proteins of the mouth to break down.
- **Inexpensive:** SDF is a very inexpensive treatment. The fees range anywhere from \$25-75 per tooth with each drop only costing \$0.50.

Disadvantages

- **Esthetics:** When SDF is applied to the tooth to arrest the cavity, it leaves behind a black staining of the lesion wherever caries are present.
- **Newly introduced method:** Silver diamine fluoride is a measure that is fairly recent and has not been tested thoroughly enough to be adapted among other dental practices in the US. Most of the research that is available on SDF originates from professionals in Japan, making SDF a common practice in Asian countries.

Advantages

- **Convenient and preferable:** Pediatric dentists prefer this common method because putting a child under sedation helps their body to relax restricting any movements during the procedure that may affect the dentist to err.
- **Advanced procedure:** General anesthesia can be used to treat complex cases where the cavity has developed into an infection. This advanced procedure has the ability to treat a wide range of oral health conditions.

Disadvantages

- **High-Costs:** General anesthesia costs for dental work range anywhere from \$200-500 depending on the type of sedation given to the patient.
- **Psychological impacts:** There is a strong correlation between fear and 'dental anxiety' among families. It is associated with many short-term and long-term health implications on the child resulting in deaths and behavioral complications.

Recommendation: With increasing rates of individuals needing oral health care, quick reform is necessary to ensure patients have access to cost-effective, quality care. Although using general anesthesia has been successful in some facilities, there is a need for broad implementation of safer and preventable initiatives which do not have the potential to hurt the health of patients. While using SDF will not arrest 100% of caries, the individual burden of economic costs and other health implications are minimal and much less than the current commonly used practices.

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