

Silver Diamine Fluoride for the Oral Health Provider

Silver diamine fluoride (SDF) is an interim caries arresting liquid medicament clinically applied to control and to prevent the further progression of active dental caries and reduce dentin hypersensitivity. This treatment allows oral health care professionals to arrest dental caries with a minimally invasive, painless, and quick method across the age spectrum. SDF treatment is highly effective in arresting dental caries and the American Academy of Pediatric Dentistry recommends treated areas be actively monitored with a follow up evaluation plan. Many groups can benefit from this intervention, including the very young, individuals with disabilities or special health care needs, the elderly, and others with inconsistent access to dental treatment services.

What is SDF?

A basic solution (pH of 10-12) with a 38% w/v $\text{Ag}(\text{NH}_3)_2\text{F}$. The silver functions as an antimicrobial, while the fluoride is present in sufficient concentration to promote remineralization. The ammonia stabilizes the solution. Advantage Arrest and Riva Star are two SDF products available in the U.S. with important distinctions between the two. As they are not equivalent, clinicians should understand differences between them to select for optimal outcome.

What are the benefits to applying SDF?

SDF can arrest active carious lesions painlessly, avoiding or delaying traditional surgical removal of caries. When SDF is applied to active carious lesions, it kills bacteria and, through a series of complex interactions, results in the treated lesion having an increased mineral density, hardness, and decrease in lesion depth. Due to the high pH of SDF, a gingival barrier or rubber dam is recommended to prevent tissue irritation and staining.

Who can apply SDF?

SDF can be applied by any Illinois licensed oral health provider.

What does a licensed oral health provider need to do to start providing SDF?

Written and oral consent should be in an appropriate language, literacy level, and should include pictures. Treatment of teeth in the esthetic zone is of special concern due to the resulting discoloration. Informed consent is needed so that the patient/parent/caregiver understands the teeth and possibly clothing will be stained black, and that timely follow-up is indicated.

How is SDF applied?

- Protection of all surfaces and isolation of treatment field is strongly recommended.
- Removal of caries is not necessary.
- Dispense SDF into dampen dish for immediate use. Recap bottle. One drop treats up to five surfaces.
- Utilize protection for lips and surrounding areas with lip balm, petroleum jelly. A dab of toothpaste on the tongue or scented lip balm can be used to mask the taste or smell of the SDF.
- Isolate the tooth surface(s) to be treated.
- Dry the area with gauze or compressed air.
- Saturate lesion or high-risk surface with SDF using a micro brush for one minute.

Do not light cure, dry, or blow air.

Comments or Questions?

- Cleanup by carefully collecting all materials, avoiding contact, or dripping.
- If SDF contacts skin or other surface, absorb as much as possible with gauze. Do not wipe it, as wiping can spread the material and result in a larger stain.

How is the SDF applied to approximal surfaces?

- SDF can be applied to difficult to access high-risk surfaces and approximal caries lesions. Dry area(s) and then saturate with SDF with a micro brush or insert woven unwaxed floss, then saturate with SDF. Do not remove the floss for one minute. (Use extra caution as the SDF can migrate down the woven floss onto other hard and soft tissue structures.)

What instructions should the parent / caregiver be provided?

Advise that the treated surface(s) will darken and follow up visit 2-4 weeks post application is needed to determine reapplication interval and restoration of missing tooth surface(s). Rationale for restoring SDF-treated lesions may include, but not limited to, eliminating food traps, restoring form and function, and enhancing aesthetics.

What is the effectiveness of SDF?

Studies indicate an 81%-89% effectiveness of arresting caries rate. Active caries lesions can be managed with or without subsequent restoration, depending on clinical context. Glass ionomer cement (GIC) is a preferred restorative material, especially for same-day restorations, due to its fluoride release and recharge potential. Resin composite is a restorative option and is most appropriate after prior arrest with SDF and general caries control.

Coding for Reimbursement

CDT code D1354 for “interim caries arresting medicament application – per tooth” was approved by the Code on Dental Procedures and Nomenclature Code Maintenance Committee for 2018. The code definition is “Conservative treatment of an active, non-symptomatic carious lesion by topical application of a caries arresting or inhibiting medicament and without mechanical removal of sound tooth structure.”

Oral Health Resources

Illinois Department of Public Health

Public Health Intervention: Use of Silver Diamine Fluoride for Arresting Dental Caries. IDPH 8.2020.

<https://dph.illinois.gov/content/dam/soi/en/web/idph/files/publications/illinois-department-public-health-sdf-8252020-update.pdf>

Compendium

<https://www.aegisdentalnetwork.com/cced/2021/06/clinical-instructions-for-using-silver-diamine-fluoride-sdf-in-dental-caries-management>

American Dental Association

<https://www.ada.org/resources/research/science-and-research-institute/oral-health-topics/silver-diamine-fluoride>

PubMed

<https://pubmed.ncbi.nlm.nih.gov/29075024/>

Comments or Questions?