



Center for Advancing
Rural Health Equity

The Use of Silver Diamine Fluoride (SDF) in Pediatric Care



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Early Childhood Caries (ECC) is a leading chronic disease among children, affecting nearly 40% of children in Vermont alone ([CDC, 2019](#)), ([Krol et al, 2023](#)), ([Vermont Oral Health Survey, 2023](#)), ([New Hampshire Oral Health Survey, 2021-2023](#)).

Despite advances in dental care, many children still suffer from preventable cavities, sometimes leading to invasive and costly treatments, often under general anesthesia. **Primary care providers are uniquely positioned to combat this issue.**

Each year about 400 Vermont children under age 6 undergo general anesthesia to treat dental decay ([Vermont Oral Health Survey, 2023](#)).

The Case for SDF in Pediatric Practices Vermont Oral Health Survey, 2023:

- Over 40% of Vermont's children have experienced tooth decay, a rate that is significantly worse than in recent years.
- Dental care needs have increased significantly in the past ten years. One in four Vermont children need dental care.
- Only 42% of third graders in Vermont have dental sealants, a rate that has not improved in recent years.
- Silver diamine fluoride (SDF) and other preventive oral health measures may be underutilized. Only 2.1% of children in Vermont have teeth treated with SDF.

New Hampshire Oral Health Survey: In the most recent New Hampshire Oral Health Survey, conducted with 3rd graders during the 2021-2023 school year:

- 59% had at least one tooth with decay experience.
- 25% have untreated tooth decay, 54% have sealants.
- 24% need restorative dental care; 2 % for urgent issues or pain.

About Silver Diamine Fluoride

Silver Diamine Fluoride (SDF) is a minimally invasive, safe, and effective treatment to stop dental decay. Developed in the 1960s in Japan and used globally, SDF has transformed how dental care is delivered, especially in underserved populations ([Gao et al, 2021](#)). It's quick, painless, and can be relatively easily integrated into routine pediatric care ([Horst, 2016](#)).

Some pediatric practices already provide oral health risk assessments and fluoride varnish applications during well-child exams, which can help prevent dental decay. **Pediatric healthcare providers can now apply SDF to address existing decay.**

SDF Quick Facts:

- SDF is a brush-on liquid containing silver and fluoride.
- The silver in the SDF turns the decay black, that's how you know it's working to kill the bacteria. The fluoride strengthens the tooth.
- Once applied, SDF will continue to protect the tooth that was treated as well as other teeth in the mouth.
- SDF can be used for people of any age, but may be especially useful for children with special needs and patients who may be at risk for going under anesthesia.
- SDF is a great way to address dental decay while people are waiting to get connected with a dental practice.
- In 2021 the World Health Organization included SDF as an essential medicine for arresting caries.

Why Integrate SDF into Your Pediatric Practice

Pediatric providers are in a unique position to use SDF to treat children with early childhood caries before decay progresses to the point where it needs to be treated under general anesthesia. Here are some reasons to adopt this service:

- **Prevent Severe Tooth Decay:** The application of SDF during well-child visits may stop decay early, reducing the need for more invasive dental procedures, which often require sedation.
- **Provide More Comprehensive Care:** Strengthen your whole-health services to patients by offering dental care in combination with medical care.
- **Address Gaps in Access to Dental Care:** Most young children have a primary care provider who they see regularly, but may not have a dentist.
- **SDF is Safe and Easy to Apply:** SDF is a quick, painless procedure that can be relatively easily incorporated into regular check-ups, making it a feasible option for busy practices.
- **It's Covered by Medical Insurance:** Vermont Medicaid (sometimes called Green Mountain Care or Dr. Dinosaur) covers SDF treatment for children and adults.

Guidelines for Integrating SDF into your Practice

Each practice should determine the best integration strategy for SDF. The practice manager should involve front office staff, medical assistants, nurses, and providers in the process. SDF can be applied during Well Child Visits, episodic visits, or scheduled for a later date. Some clinics designate specific times for SDF applications, while others identify high-risk patients through electronic medical records or staff coordination.

Currently, there are no standardized guidelines for SDF use in medical settings, but the American Academy of Pediatrics (AAP) will release guidance in 2024, and this toolkit will align with AAP recommendations.

- The American Academy of Pediatric Dentistry provides guidance on SDF use for dental caries management [here](#).
- The University of California, San Francisco (UCSF) offers a protocol for using SDF, including rationale, indications, and consent, accessible [here](#).

Providers should assess if a child is a good candidate for SDF, discuss the procedure and alternatives with the child and their parents/guardians, explain that the treated area will turn black, show before and after pictures, and obtain signed consent.

SDF Application Guides and Videos:

- [CareQuest Institute Non-Invasive Caries Therapy Guide](#)
- [American Dental Association's Video & Guide for SDF Application](#)
- [Jeannette MacLean's Video: Application of Silver Diamine Fluoride without Aerosols](#)

Risk Assessment Tools, Consent Form Examples, and Patient Education

Risk Assessment Tools:

- American Academy of Pediatrics: [Oral Health Risk Assessment Tool](#)
- Vermont Department of Health: [Oral Health Risk Assessment](#)

Consent Form Examples:

- Vermont Board of Dental Examiners: [SDF Consent Form](#)
- Appletree Dental: [Informed Consent SDF-Silver Diamine Fluoride](#)

Patient Education:

- Vermont Department of Health:
 - [SDF Fact Sheet](#)
 - [SDF Comparison Sheet](#)
- Early Childhood Learning and Knowledge Center: [Parent Education on SDF](#)
- Apple Tree Dental: [Patient Education Form on SDF](#)
- American Dental Association: [SDF Brochure](#)

Supplies Needed for SDF Application:

- 38% Silver Diamine Fluoride (Advantage Arrest): [Order from Elevate Oral Health](#). One drop can treat up to 5 teeth; one 3 ml bottle contains 92 drops. For video examples of using SDF, visit oralscience.com.
- [Dappen Dishes](#)
- Small Micro Brushes | [Small](#) | [Medium](#)
- [Dental Cotton Rolls](#)
- Oral Mirrors
- Chux or Waterproof Type Dental Bibs
- Fluoride Varnish
- Vaseline for Lips (Optional, helps prevent stains)

Coding & Billing for SDF

Effective July 1, 2023, Vermont Medicaid added CPT code 0792T for the application of silver diamine fluoride to its Medicaid Fee Schedule, reimbursing \$23.00 per tooth. This code has not yet been activated by New Hampshire. For more details, visit the [Vermont Medicaid Portal](#).

Coding:

- ICD-10 Codes for Medical Practitioners:
 - K02.9 – Dental Caries, unspecified (ECC)
 - Z91.843 – Risk for dental caries, high
 - K05.1 – Chronic gingivitis
 - Z29.3 – Encounter for prophylactic fluoride administration (only varnish)

Billing:

- SDF Application for Caries Arrest:
 - [CPT code 0792T](#)
 - 99188 (only if fluoride varnish was also applied)
 - [Vermont Medicaid fee schedule](#)
- Additional Billing:
 - SDF and fluoride varnish codes can be billed alongside the office E&M visit based on medical complexity or time.
 - Consult with your organization's billing specialist for detailed billing procedures.

For more information on the application of silver diamine fluoride and Medical/Dental Health Integration, visit the [Vermont Department of Health's website](#).

Read more about the SDF CPT code [here](#).

Additional Resources to Support SDF in the Medical Home:

Harvard:

- [Webinar on SDF Application in Medical Practice](#)
- [Initiative to Integrate Oral Health and Primary Care](#)

American Academy of Pediatrics:

- [Protect Tiny Teeth Toolkit](#)
- [Payment for Oral Health Services](#)

Headstart

- [Using Silver Diamine Fluoride on Children's teeth](#)

Smiles for Life:

- [Free Virtual Instructional Videos and Modules \(see Child Oral Health Module\)](#)
- [Primary Care Oral Health Integration Guide](#)

Qualis:

- [White Paper: Oral Health: An Essential Component of Primary Care](#)
- [Safety Net Medical Home Initiative](#)

Maine:

- [From the First Tooth](#)

Dartmouth:

- [Pediatric Oral Health ECHO: Emerging Role of Silver Diamine Fluoride for Early Childhood Caries in Primary Care \(Video or Slides\)](#)

Affiliated Children's Dental Specialists:

- [Video of Dr. Jeanette MacLean demonstrating SMART filling technique using SDF and glass ionomer cement](#)

This is a quick, painless alternative to more invasive restorative dentistry often involving sedation and drilling, which can be especially challenging for young children.

Information About the SDF in the Pediatric Medical Home Pilot Project and the Development of this Toolkit

This oral health project was made possible through the efforts of the Dartmouth Health Center for Advancing Rural Health Equity (CARHE), with funding from HRSA and The Northern Border Regional Commission, in collaboration with the Vermont and New Hampshire Departments of Health. The goal of the project was to integrate silver diamine fluoride (SDF) application into primary pediatric care as a strategy to reduce the incidence of ECC. This project was centered around engaging pediatric health care providers in arresting oral disease before it needed to be drilled and filled.

The project provided training to pediatric primary care providers on the application of Silver Diamine Fluoride to treat ECC, helped fund SDF supplies, and increased communication between local medical and dental healthcare practices. Historically medical and dental health care providers have remained separate and “siloeed” creating a disconnect between oral health and systemic health. This project provided medical and dental healthcare providers with opportunities to partner to address ECC for children in their communities.

The project also resulted in the development of this toolkit, which is a compilation of resources designed to support medical practices that are interested in integrating SDF into their practice. This toolkit was developed based on learning from the Center for Advancing Rural Health Equity (CARHE) SDF pilot project; we hope you find it useful!

This toolkit is compiled by staff from the Dartmouth Health Center for Advancing Rural Health Equity in partnership with the Vermont Office of Oral Health. We acknowledge with gratitude the support of the Federal Office of Rural Health Policy (FORHP), which has granted the Rural Health Redesign Center Organization (RHRCO) supplemental funding in collaboration with the Northern Border Regional Commission (NBRC). This generous support enables us and six other organizations across Maine, New Hampshire, New York, and Vermont to implement innovative healthcare programs over the next year, aimed at enhancing services for rural residents in these states.

Disclosure: This toolkit is not intended to be a complete expert guideline for SDF care in pediatrics, but a compilation of information about SDF, and a resource to point interested readers to acceptable sources of information about best practices related to using SDF in pediatric practices, from which practitioners can gain education and make informed choices about offering SDF treatment in their practices.