

Pathways to Improving Children's Oral Health Using Silver Diamine Fluoride

Center for Medicaid and CHIP Services (CMCS) Advancing Prevention and Reducing Childhood Caries in Medicaid and CHIP Learning Collaborative: Webinar #1

May 20, 2020

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Housekeeping Instructions

Webinar logistics

- Phone lines muted upon entry
- Q&A
- Chat

Chat

To: Host

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Q&A

All (0)

Ask: All Panelists

Select a panelist in the Ask menu first and then type your question here. There's a 256-character limit.

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Agenda

Topic	Speaker
Welcome and Overview of CMCS's Advancing Prevention and Reducing Childhood Caries in Medicaid and CHIP Learning Collaborative	Andrew Snyder CMCS
Silver Diamine Fluoride: Medicaid and Public Health Use for Dental Caries Control	Scott L. Tomar, D.M.D., Dr.P.H. University of Illinois at Chicago (UIC) College of Dentistry
Silver Diamine Fluoride in Oregon	Kellie Skenandore Oregon Health Authority Bruce Austin, D.M.D. Former Statewide Dental Director, Oregon Health Authority
Silver Diamine Fluoride in Virginia	Zachary Hairston, D.D.S. Virginia Department of Medical Assistance
Discussion and Q&A	Joe Zickafoose, M.D., M.S. Mathematica

CMCS's Advancing Prevention and Reducing Childhood Caries in Medicaid and CHIP Learning Collaborative

Goal: Support state Medicaid oral health teams over two years to increase the use of fluoride treatments

Participating state teams will have the opportunity to:

- **Expand their knowledge of oral health policies, programs, and practices**
- **Develop, implement, and assess a data-driven quality improvement project**
- **Network with peers**
- **Advance their knowledge of and skills in quality improvement**

Learning Collaborative events and opportunities

- **Webinar #2:** “Improving Children’s Oral Health Using Fluoride Varnish in Non-Dental Settings”—**June 2020**
- **Webinar #3:** “Introduction to Advancing Prevention and Reducing Childhood Caries in Medicaid and CHIP Learning Collaborative Affinity Group”—**July 2020**
- Affinity group expression-of-interest form posted—**July 2020**
- Affinity group expression-of-interest form due—**Summer 2020**
- Affinity group begins—**Summer 2020**

A close-up photograph of a dental arch, showing several teeth. A prominent white filling is visible on a molar tooth in the upper arch. The background is a dark, reddish-brown color, possibly a dental chair or a backdrop.

Silver Diamine Fluoride: Medicaid and Public Health Use for Dental Caries Control

Scott L. Tomar, D.M.D., Dr.P.H.

UIC College of Dentistry

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Disclosures

I have no financial interests in any silver diamine fluoride (SDF) product.


Outline

- What is SDF?
- What does SDF do?
- How does SDF work?
- How to use SDF
- Regulatory issues
- Medicaid and SDF

Why I think SDF is a game changer in dental public health and Medicaid

- SDF arrests ~80% dental caries (tooth decay) when used twice per year
- Indirect prevention
- Inexpensive
- Benefits far outweigh risks
- Easily used in field settings
- May be applied by dental hygienists
- Great potential for Medicaid cost savings

Projecting the economic impact of silver diamine fluoride on caries treatment expenditures and outcomes in young U.S. children

Ben Johnson, PhD¹; Nicoleta Serban, PhD¹ ; Paul M. Griffin, PhD²; Scott L. Tomar, DMD, MPH³

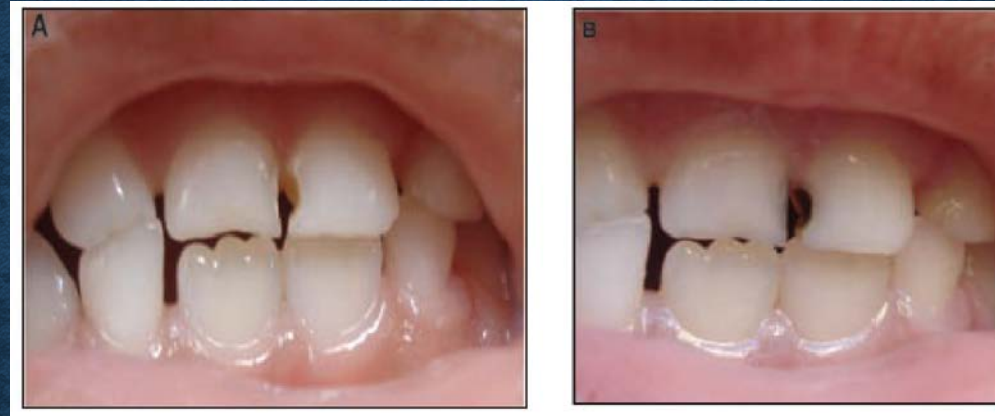
¹ School of Industrial and Systems Engineering, Georgia Institute of Technology, Atlanta, GA, USA

² Regenstrief Center for Healthcare Engineering, Purdue University, West Lafayette, IN, USA

³ Department of Community Dentistry and Behavioral Science, College of Dentistry, University of Florida, Gainesville, FL, USA

- Simulation to estimate averted restorative visits and Medicaid expenditures in seven states for children age 1–5 years
- Averted restorative visits range: 2,049 (VT) to 60,542 (NC) at 50% SDF penetration level
- Averted per-restorative visit costs ranged from \$100 to \$350 per visit
- SDF can reduce Medicaid expenditures by averting expensive caries treatment options
- Can prevent stressful restorative procedures

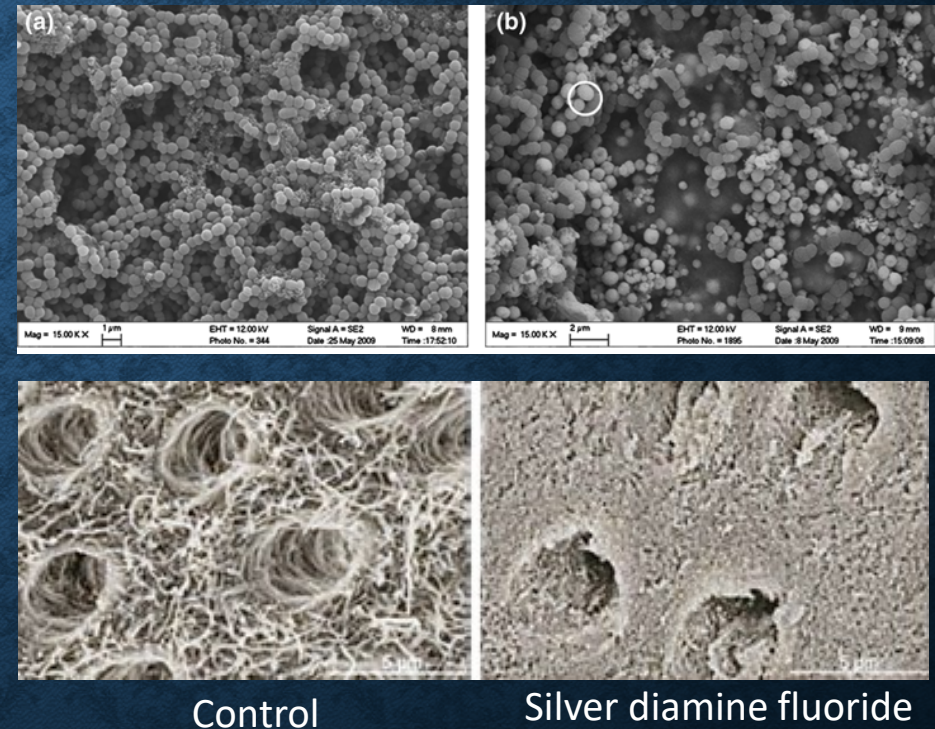
SDF—What is it? What does it do?



- Colorless liquid
- Arrests dental caries
- Prevents dental caries
- Decreases dentin hypersensitivity

SDF—How does it work?

- SDF kills bacteria, especially those that cause decay
- Keeps bacteria from attaching to teeth
- Inhibits destruction of tooth structure
- Promotes repair of tooth surfaces



Zhao et al. Mechanisms of silver diamine fluoride on arresting caries: a literature review. *Int Dent J* 2018;68(2):67-76.

Evidence of effectiveness

- Dozens of clinical trials and multiple systematic reviews*
- SDF is highly effective in arresting decay in children and older adults
- Outperforms anything else currently available for arresting decay



*References available upon request

SDF for caries management

- SDF is an approach to caries management
- Choice when restoration not possible or feasible, e.g., for infants, young kids
- Use in public health: provides treatment and prevention at the same time, easy to apply, noninvasive, requires minimal training, inexpensive
- Does not eliminate the need for follow-up
- May still need tooth restoration

When would you use SDF?

- Extreme caries risk
- Behavior or medical management challenges
- More lesions than treatable in one visit
- Difficult-to-treat lesions (including root surface caries)
- Patients without access to care
- Young patients wait-listed for OR-based dental treatment

Where we now use SDF

- Young patients wait-listed for OR- or sedation-based dental treatment
- Head Start
- Early learning centers

Recent study on impact of SDF in pediatric dental clinic

- Research question: Can SDF reduce the risk of dental emergencies among children wait-listed for treatment under general anesthesia or sedation?
- Comparing to historic control (chart review)
- Emergency visits reduced from 19% of children on wait list to 4%
- 81% of lesions arrested at follow-up visit

Thomas M, Mugayar L, Dávila ME, Salkowitz A, Tate A, Tomar SL. Silver diamine fluoride may prevent emergency visits in children with ECC. *Pediatric Dentistry* [in press].

SDF in the United States



- SDF used in other countries for many years
- Currently two products in U.S.:
 - Advantage Arrest (Elevate Oral Care)
 - Riva Star (SDI, Inc.)

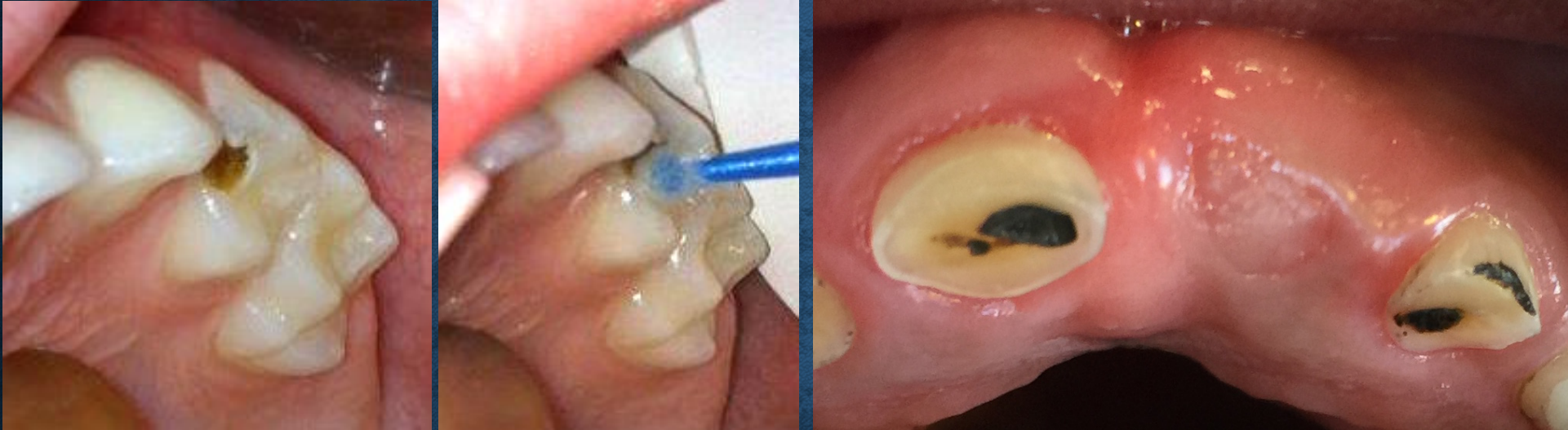


FDA clearance = hypersensitivity

Off-label use = caries treatment

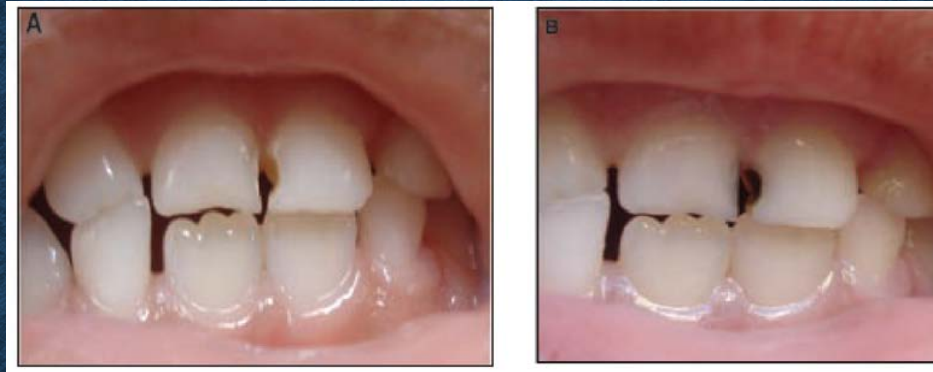
This is the same as fluoride varnish

How do you use SDF?



- Dry and apply 2+ times per year
- Minimal supplies needed
- Not highly technical but does require training

SDF staining



time 0



1 day



1 week

How safe is SDF?

- No adverse reports in >80 years of use in Japan
- Contraindication
 - Silver allergy
- Relative contraindication
 - Certain oral soft-tissue conditions, e.g., ulcerative gingivitis, stomatitis
- Side effects
 - Small, white mucosal lesions (disappear in 48 hours)
 - Will stain lesions black

Regulatory issues

- SDF cleared by U.S. Food and Drug Administration as Class II medical device to treat tooth sensitivity
- Treatment and prevention of dental caries is off-label use (same as fluoride varnish)
- U.S. FDA granted “breakthrough therapy status” to Advantage Arrest for caries arrest
 - “...may demonstrate substantial improvement over existing therapies on 1 or more clinically significant endpoints...”
 - First dental drug/device to gain such status

Regulatory issues

- Dental hygienists' permission to apply SDF varies among states
- Some states treat SDF like other topical fluorides in board rules; some explicitly include (or exclude) SDF

SDF CDT codes

D1208 - Topical application of fluoride

D9910 - Application of a desensitizing medicament, per visit

D1999 - Unspecified preventive procedure by report

CDT code for the use of caries-arresting medicaments, the off-label use of SDF:

D1354 - Interim caries-arresting medicament application

“Conservative treatment of an active, nonsymptomatic carious lesion by topical application of a caries-arresting or inhibiting medicament and without mechanical removal of sound tooth structure.”

Medicaid and SDF

- About 35 states have at least some coverage for CDT code D1354 in state Medicaid programs
- Wide range of fees, from \$2.75/tooth/application (Missouri) to \$98.50/tooth/lifetime (Indiana)
- Varying frequency of application; most allow application every six months, with a lifetime maximum number of applications per tooth

Summary

- SDF is very effective for arresting tooth decay
- Also prevents decay
- Especially useful for young children, older adults, and individuals with behavioral challenges
- Inexpensive
- Minimal training needed
- Very wide margin of safety
- Potentially cost-saving to Medicaid programs

Thank you!

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Silver Diamine Fluoride in Oregon

Kellie Skenandore
Dental Program Manager
Health Systems Division

SDF in Oregon

- Oregon is a Medicaid expansion state and has extensive dental coverage for adults.
- Much of Oregon is rural and frontier, which adds to access challenges.
- Much of the development of SDF occurred in Oregon, from the leadership of Dr. Mike Shirtcliff, Advantage Dental, who realized “we are not going to drill and fill our way out of the overwhelming caries in our Medicaid population.”
 - The result was the SDF product Advantage Arrest, by Elevate Oral Care.

SDF in Oregon

- State has the most extensive scope of practice for hygienists, along with Colorado. The application of SDF, which is considered a fluoride application, could be added to its scope in 2014.
- Current reimbursement rate is \$14.27 per tooth.
 - Reimbursement was priced similar to fluoride application
 - Allowed reimbursement for restorations on the same tooth

Barriers to SDF introduction

- Faced opposition from some dentists, dentist groups, and some dental care organizations and nonprofits providing dental services, based on their concerns that:
 - SDF may be an inferior treatment
 - SDF might create a two-tiered system of care
 - The treatment causes staining (though of the caries, not the “tooth”)
 - Reimbursing for SDF could seem to encourage SDF over more traditional treatments (restorations)

Factors driving acceptance of SDF

Factors that seemed to help introduction and acceptance:

- Continuing research on SDF's effectiveness
- Mainstream media articles and stories
- Provided parents with detailed consent forms accompanied by before/after photos
- Overwhelming acceptance by parents, who realized the benefits over traditional restorations, especially for “pre-cooperative children” (Dr. Jeremy Horst)

Uptake of SDF in Oregon

- We have seen continual increases in claims numbers for D1354 since it was introduced in 2016
- No known opposition or pushback since we went through the rollout period in the first year

SILVER DIAMINE FLUORIDE



Dr. Zachary Hairston, D.D.S.
DMAS Dental Consultant



Smiles For Children card

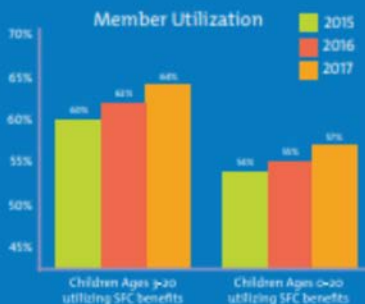
Virginia's Medicaid Smiles For Children Program



Virginia's Smiles For Children (SFC) Medicaid dental program is recognized as one of the top oral health programs in the country. Children, 20 years of age and younger, enrolled in SFC receive comprehensive dental benefits. Expanded dental benefits are also provided to adult pregnant women enrolled in Medicaid and FAMIS MOMS. Limited dental benefits are provided for Medicaid members over age 21.

DentaQuest serves as the Dental Benefits Administrator for the Smiles For Children program.

Virginia's Smiles For Children program offers benefits to over **950,000** Virginians



Percent Medicaid & CHIP Enrollees Ages 2-21 Who Received a Dental Visit in 2016



Data is in accordance with HEDIS technical specifications. HEDIS is a registered trademark of NCSQA.

15,000+ pregnant women received needed dental care.

	YEAR 1	YEAR 2	YEAR 3
Unique pregnant women with claims	4,200+	6,300+	6,800+
Claims paid	\$3M	\$5M	\$6.7M

Virginia continues to surpass the national average for children who receive a dental visit:

66.30% Virginia Children

52.66% National Average

Comparison of the utilization of dental services by SFC members to the utilization of dental services by state employees



* SFY 2017

Children under age 3 receiving fluoride varnish by non-dental providers **↑19%**

Number of non-dental providers administering fluoride varnish **↑30%**

MEMBER SATISFACTION

Satisfaction continued to be very high with the dentist, dental care received, and the Smiles For Children program.

- 85% have seen an improvement in their/their child's oral health in the past year.
- 98% felt the dentist/staff did everything they could to make them feel comfortable.

PROVIDER SATISFACTION

Providers continue to rate the Smiles For Children highly.

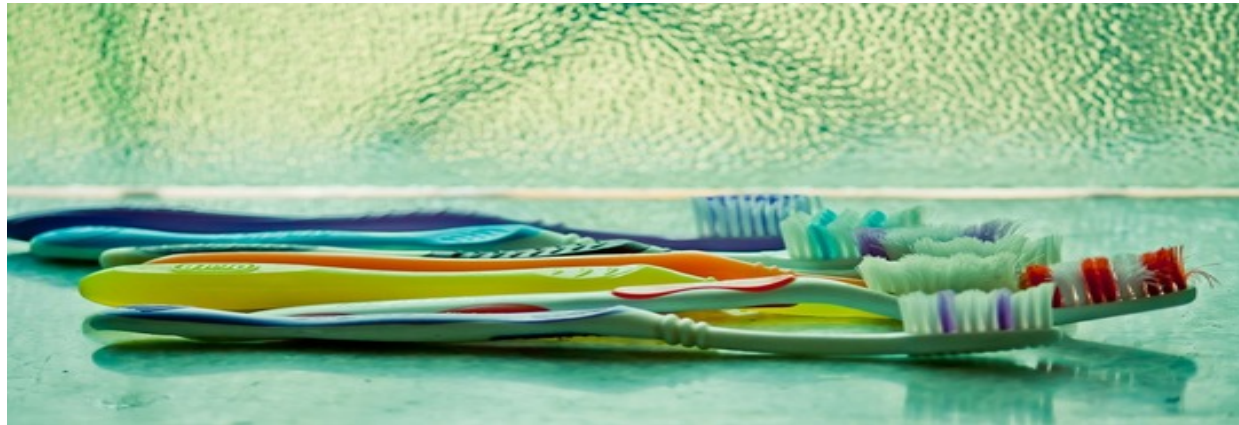
- 94% of providers plan to continue participating in the Smiles For Children program network next year
- 95% believed DentaQuest, the dental benefits administrator, was as good as or better than competitor dental insurance carriers



Smiles For Children
Member Benefit Administrator

Medical/dental collaboration in the SFC program

1. 2013 CPT 99188 added to reimburse physicians for fluoride varnish thru age 6 for Smiles For Children members
2. 2016 increased effort to train nondental providers in fluoride varnish administration



DMAS medical claims

Fluoride varnish applications

State Fiscal Year	# of medical providers	# of overall claims submitted by nondental providers
2016	386	16,650
2017	504	22,916
2018	567	22,952
2019	714	25,646



Fluoride varnish by non-dental providers: improvements over time

Children under age 3
receiving fluoride varnish
by non-dental providers

↑39%

2016 to 2019

(Source GA Report 2019)

Number of non-dental providers
submitting claims for
fluoride varnish application

↑85%

2016 to 2019

(Source GA Report 2019)

FLUORIDE VARNISH DENTISTS

State Fiscal Year 2019

325,196 billings

\$6.7 million



Benefits to provider for SDF

- D1354 added as benefit in 2017
- Two applications / tooth / lifetime
- Must be separated by no less than 91 days
- Primary and permanent dentition
- Restorative, endodontic, and extraction procedures cannot be billed within 180 days of D1354 or payment will be reduced by SDF amount



SDF data

Calendar year	Total number of services submitted	Total number of services paid for
October–December 2017	1,390	1,179
January–December 2018	16,757	15,279
January–September 2019	21,913	20,820



Takeaways: SDF usage

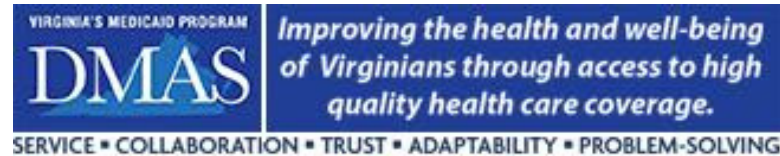
- Discoloration was not seen as much of a problem by parents when weighed against using operating room/sedation and reducing discomfort
- Ideally, both parents should be informed
- Youngsters who are just not ready for definitive treatment were able to build confidence
- Parental discussion to proactively address that kids are not receiving an inferior product
- Be mindful of elementary kids bullying recipients about having teeth with black discoloration
- Consider fluoride-releasing glass ionomer to shield against debris entering SDF-treated area

For additional information:

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Discussion and Q&A

Poll Question #1

Which type of organization do you represent? (Check all that apply)

- a) State Medicaid or CHIP agency**
- b) Other state or local agency**
- c) Community organization**
- d) Health/dental plan**
- e) Dental provider**
- f) Other health care provider**
- g) Other**

Poll Question #2

Please only respond if you represent a state Medicaid or CHIP agency.

Which types of quality improvement technical assistance activities are you interested participating in the next 3 to 4 months? (Check all that apply)

- a) Webinars**
- b) Affinity group: ongoing support for implementing a QI project on silver diamine fluoride or fluoride varnish in non-dental settings**
- c) Other (Type your response in the Q&A pod)**

Q&A

- **To submit a written question or comment, click the Q&A pod and type in the text box provided; please select “All Panelists” in the “Ask” field before submitting your question or comment**
 - *Your comments can only be seen by our presentation team and are not viewable by other attendees*

Wrap-Up

Upcoming Learning Collaborative events

- **Webinar #2:** “Improving Children’s Oral Health Using Fluoride Varnish in Non-Dental Settings ”—**June 2020**
- **Webinar #3:** “Introduction to the Advancing Prevention and Reducing Childhood Caries in Medicaid and CHIP Learning Collaborative Affinity Group”—**July 2020**
- Affinity group expression-of-interest form posted—**July 2020**

To sign up for upcoming Learning Collaborative events, visit our registration page:

<https://mathematica.webex.com/mathematica/onstage/g.php?PRID=abe273d4952e0cfb2a666aaaf879fff1>

Introduction to childhood caries prevention: resources

- [Integration of Oral Health and Primary Care Practice \(Health Resources and Services Administration\)](#)
- [Smiles for Life: A National Oral Health Curriculum](#)
- [American Academy of Pediatrics: Section on Oral Health](#)
- [Silver Diamine Fluoride Fact Sheet \(Association of State and Territorial Dental Directors\)](#)

Contact the Learning Collaborative

If you have any questions about the Advancing Prevention and Reducing Childhood Caries in Medicaid and CHIP Learning Collaborative, please email the TA mailbox at MACQualityImprovement@mathematica-mpr.com.

Thank you for participating!

Please complete the evaluation as you exit the webinar.

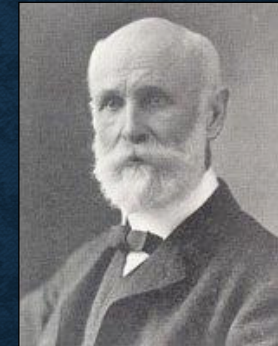
Appendix:

Silver Diamine Fluoride: Medicaid and Public Health Use for Dental Caries Control

**Scott L. Tomar, D.M.D., Dr.P.H.
UIC College of Dentistry**

Where did this come from?

- Silver nitrate used globally for > 1,000 years
 - Caries arrest case series and protocols in 1800s
 - 1891: 87 of 142 treated lesions were arrested
 - Founding fathers of dentistry had protocols
- Silver fluoride (AgF) used in Japan for ~900 years
 - Cosmetic blackening of teeth
 - Known to prevent caries
- NH_3^+ added > 80 years ago = SDF
 - Approved and monitored by Japan
- Available in Australia, Brazil, Argentina, Cuba, China since 1980s or before...



G.V. Black



Evidence: arrest of coronal caries

- At least 26 published clinical trials
- At least 7 published systematic reviews¹
- One recent umbrella review (“systematic review of systematic reviews”)²
- Nearly all studies on coronal caries arrest conducted with children, mostly deciduous teeth

¹ Rosenblatt et al. *J Dent Res* 2009;88:116-25. Duangthip et al. *BMC Oral Health* 2015;15:44. Gao et al. *JDR Clin Tranl Res* 2016; Gao et al. *BMC Oral Health* 2016;16:12. Contreras et al. *Gen Dent* 2017;65:22. Chibinski et al. *Caries Res* 2017. Oliveira et al. *Caries Res* 2019;53:24-32.

² Seifo et al. *BMC Oral Health* 2019;19:45.

SDF caries arrest in children

- SDF is effective in arresting caries in children (arrest rates 65%–91%)
- SDF consistently outperformed comparative treatments (fluoride varnish, atraumatic restorative technique, placebo) for arrest



Crystal & Niederman.
Dent Clin N Am 2019;
63(1)45-68.

SDF in root-surface caries

- SDF is effective in arresting root-surface caries (arrest rates 100%—725% higher than placebo)
- SDF prevents 38% of root-surface caries with yearly application (prevented fraction: 25–71%)



Advantage Arrest 38% SDF

- 8-ml bottle
- Provides ~250 drops
- Treats up to five sites per drop
- Elevate Oral Care, West Palm Beach, Florida www.elevateoralcare.com
 - \$175 / bottle (~\$0.70/drop)
 - Education institution discount available



Advantage Arrest SDF 38% unit dose

- 30 doses
- 30 small applicators
- 30 regular applicators
- Instruction card
- Price:

1 @	\$129.95	\$4.33/each
3+ @	\$116.50	\$3.88/each



Riva Star 38% SDF + KI

- Available in unit dose only
- 10 capsules SDF + 10 capsules potassium iodide (KI) + applicators for 10 patients
- Pricing \$97–\$107 (\$9.70–\$10.70 per use)

