



Arizona Silver Diamine Fluoride Program Year 1 Evaluation Report

September 2019



LeCroy & Milligan
ASSOCIATES, INC.

Arizona Silver Diamide Fluoride Program: Year 1 Evaluation Report – September 2019

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Health and Wellness for All Arizonans



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About LeCroy & Milligan Associates:

Founded in 1991, LeCroy & Milligan Associates, Inc. is a consulting firm specializing in social services and education program evaluation and training that is comprehensive, research-driven and useful. Our goal is to provide effective program evaluation and training that enables stakeholders to document outcomes, provide accountability, and engage in continuous program improvement. With central offices located in Tucson, Arizona, LeCroy & Milligan Associates has worked at the local, state and national level with a broad spectrum of social services, criminal justice, education and behavioral health programs.

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Introduction

The Health Resources and Services Administration (HRSA), an agency of the U.S. Department of Health and Human Services, awarded the Arizona Department of Health Services (ADHS), Office of Oral Health (OOH) a four-year grant to improve oral health outcomes in Arizona. The overall goal of the Arizona Silver Diamine Fluoride (SDF) Program is to increase oral health workforce activities that improve the oral health of children in Arizona, by implementing an innovative prevention program. This program is piloting the use of SDF in the Dental Health Professional Shortage Areas (DHPSA) of Arizona's border counties, with the goal of expanding this program to DHPSAs statewide. OOH contracted with LeCroy & Milligan Associates, Inc. to provide evaluation services for this program. Evaluation efforts in Year 1, from November 2018 through September 2019, focused on the first five program activities listed below:

1. **Convening an SDF Advisory Workgroup** – The workgroup, which consisted of ADHS staff and external subject matter experts in dental public health programs, convened to provide expertise on SDF best practices and how to integrate SDF into community-based models. The workgroup reviewed current SDF clinical recommendations nationwide to create program policies and procedures for Arizona and developed program materials including consent forms, treatment records, and information for parents.
2. **Training oral health professionals in the use of SDF** – The program provided training to dental hygienists and dental assistants in how to apply SDF. The training was developed with consideration to sustainable continuing dental education, and the curriculum includes attention to Culturally and Linguistically Appropriate Service (CLAS) standards.
3. **Conducting outreach to and scheduling SDF sites** – The program is identifying sites at which screenings for and treatment with SDF will occur. This outreach and scheduling will occur throughout the school year for school sites and year-round for early childhood sites.
4. **Researching reimbursement strategy for program sustainability** - The HRSA Grant Manager has researched rules and policies that will potentially allow OOH to bill for SDF services.
5. **Developing SDF database capacity** – ADHS Information Technology Services (ITS) staff worked on expanding OOH's existing dental database to enhance its ability to collect, track, and report on data collected by the SDF program.
6. **Collecting oral health status data** – The program will collect oral health status data utilizing the Association of State and Territorial Dental Directors' Basic Screening Survey (BSS) protocol.



Methodology

Evaluation Design

The Year 1 evaluation focused on developing instruments to be used during program implementation, reviewing and advising on forms developed by the program, and conducting a process evaluation of the program’s preparatory activities. Evaluation activities included:

- Review of program consent forms;
- Identification of variables needed for the expansion of OOH’s database to accommodate this project’s data collection needs;
- Development and administration of SDF Advisory Workgroup surveys;
- Development and administration of SDF training surveys;
- Development of school staff and parent surveys;
- Development of a Rapid Cycle Quality Improvement (RCQI) rubric;
- Development of an SDF/Sealant cost benefit literature review (included in Appendix A);
- Contributing to the HRSA progress report;
- Collaborating with OOH in planning RCQI activities for Year 2.

Instruments and Measures

The evaluation team developed four online surveys to collect data about program activities (Exhibit 1). Two surveys captured information about the practices the SDF Advisory Workgroup used to develop the guidelines for applying SDF during dental events at school and other community sites. Two surveys examined the effectiveness of the training of dental professionals who will apply SDF at dental events.

Exhibit 1. Data Collected, Purpose, and Analysis Method

Data/Instrument	Construct/Purpose	Analysis Method
SDF Advisory Workgroup Member Survey	Assess collaborative SDF guidelines development process from perspective of dental professional; identify group practices and processes that may make future public health work groups function effectively.	Thematic content analysis
SDF Advisory Workgroup OOH Leadership Survey	Assess collaborative SDF guidelines development process from perspective of program staff; identify group practices and processes that may make future public health work groups function effectively.	Thematic content analysis
SDF In-person Training Survey	To assess participants’ level of knowledge of content presenting and satisfaction with training.	Descriptive statistics
SDF Webinar Training Survey	To assess participants’ level of knowledge of content presenting and satisfaction with training.	Descriptive statistics



Data Collection

The evaluation team collected survey data on the functioning of the SDF Advisory Workgroup from workgroup members and OOH staff through a Qualtrics online survey collector from May 24, 2019 through June 17, 2019. This instrument consisted of 10 open-ended questions, with slight variations in question wording for the survey that OOH staff completed.

Dental professionals who participated in the online webinar training completed a Qualtrics online survey after this training, during the time frame of July 18, 2019 through August 8, 2019. Additionally, dental professionals who participated in an in-person SDF training on August 14, 2019 completed a paper survey that was collected at the end of the training. The training survey was comprised of the following question types: closed-ended questions to assess attendees' knowledge gained from the training; rating of training quality statements using a 4-point scale from "strongly disagree" to "strongly agree;" and open-ended questions on the most valuable aspects of the trainings and suggestions for improvement.

Literature Review

In response to the DHPSA of border counties in Arizona, OOH is implementing this tooth decay prevention program to administer SDF at school and community-based sites. The program targets school-aged children in underserved areas through community-based prevention services. There is a great need for dental caries prevention. Dental caries or tooth decay are the second most common disease after the common cold (Deshpande et al., 2016) and it has been found that 27 percent of low-income children in the United States will have untreated cavities by adolescence (Griffin et al., 2016). A growing form of preventive dentistry involves dental sealant application. Sealant application is becoming more widely accepted because of its low cost, effectiveness, and because it is a non-invasive dental procedure (Deshpande et al., 2016). Dental sealant application that occurs at schools with low-income student populations has been found to reach more high-risk patients (Griffin et al., 2016).

This literature review was conducted to enhance the program through the inclusion and dissemination of research studies that utilized SDF in dental caries prevention and those that analyzed the cost effectiveness of similar prevention programs. Searches were conducted across multiple databases including the Cumulative Index to Nursing and Allied Health Literature (CINAHL), PubMed, and EBSCOhost. Due to SDF application being a relatively new treatment approach the search years were not limited. The following search terms were used to perform each search, silver diamine fluoride, SDF, cost effectiveness, and oral health. When searching in PubMed the key MeSH term (medical subject headings) combinations used were (silver diamine fluoride) and (caries). A second literature review of dental sealants and cost-benefit analysis was also performed. The second search was conducted in EBSCOhost utilizing the following search terms, dental sealants, caries prevention, and cost benefit analysis. All literature that was applicable was then organized by author. A large portion of the literature includes studies conducted in Asia and Europe.



Key Findings from Dental Sealant Literature

Dental sealants have been found by many studies to be an effective dental caries prevention strategy. In a 2012 study, Liu, Lo, Chu, and Lin found that application of resin sealants, sodium fluoride (NaF) varnish, and SDF were all effective in preventing pit and fissure caries in permanent molars. Bravo et al. (2005) conducted a randomized control trial (RCT) in a school-based dental clinic to compare sealants and varnish for the reduction of caries in children ages six to eight years old. Children randomized to the sealant group were treated at the start of the trial and had a re-application of the sealant up to three years after the first application. Children in the varnish group were also treated at the start of the trial and received treatment every six months for three and a half years. The results of the RCT concluded that after four years of treatment, there was 76.3% reduction of caries for sealants and a 43.9% reduction of caries for varnish compared to children who received no treatment. These results suggest that sealants are more effective in the reduction of caries for school-aged children.

In a review of dental sealants and cost benefit analyses, Griffin et al (2017) found that when dental sealants are applied as a part of school programs instead of being applied at the dental office, the benefit exceeded the cost. The authors also found that, “the median one-time SSP [School Sealant Program] cost per tooth sealed was \$11.64. Labor accounted for two thirds of costs, and time to provide sealants was a major cost driver. The median annual economic benefit was \$6.29, suggesting that over 4 years the SSP benefit (\$23.37 at a 3% discount rate) would exceed costs by \$11.73 per sealed tooth” (Griffin et al., 2017, pg. 407). The authors used these components to determine overall cost effectiveness of sealant application, cost, economic benefit (e.g. averted treatment costs), net cost or cost minus benefit, and finally, cost effectiveness or net cost per gained health outcome. Although it can be more costly to seal primary molars in children, when compared with not sealing molars, it is a cost-effective strategy to improve the quality of life children who come from low-income households. Exhibit 2 shows one example used in a cost benefit analysis of dental sealant application, as reported by Neidell, Shearer, and Lamster (2016). It should be noted that the overall cost of sealants will be quite lower than the figure below if the equipment costs also remains low.



Exhibit 2. Costs of Sealant and Varnish Applications

	Sealants	Varnish
Labor costs per patient, USD	75.00	2.50
Time needed to apply treatment, min	30	5
Applicator training level	D, DH	SA
Combined wage per hour, USD	150.00	30.00
Reapplication rate, USD	0.10	-
Material costs per patient, USD	19.56	4.20
Equipment costs per patient, USD	0.21	0.01
Curing light, USD	625.00	-
Patients treated before replacement, n	10,000	-
Bulb replacement, USD	50.00	-
Patients treated before replacement, n	1,000	-
Dental chair, USD	985.00	50.00
Patients treated before replacement, n	10,000	10,000
Training costs per patient, USD	-	0.21
SA hours, n		7
Patients treated per aide, n		1,000
Treatment duration, months	42	6
Discount rate, %	6	6
Total treatment costs per 3.5 years, USD	104.25	44.96

D = Dentist; DH = dental hygienist; SA = school aide.

(Source: Neidell, Shearer & Lamster, 2016)

In another cost-benefit analysis study, Deshpande et al. (2016) found that when sealants are applied correctly and other preventative dental measures are practiced, 96% of children were free of dental caries. The authors report that cost benefit analyses for sealant application should consider the following factors: materials and equipment to be used, the technique of application, selection of the patient as well as the teeth, use of adjunctive preventive measures, and recalling of the patient (Deshpande et al. 2016). Griffin et al. (2016) conducted a cost effectiveness study of dental sealants and found that under nearly all tested scenarios, school-based sealant programs met the cost-effective threshold.

In Chi, Van der Goes, & Ney's (2014) article on cost-effectiveness of sealants, they compared two strategies: always sealing a tooth and never sealing a tooth. This study was conducted with children who were enrolled in Medicaid. The results of the study showed that for 10,000 simulated teeth there was a standard care cost of \$214,510, a cost of \$232,141 to always seal a tooth, and to never seal a tooth cost \$186,010 (Chi et al., 2014). The study indicated that when teeth were sealed there was a decrease in restorations from 2,389 to 340. As opposed to an increase in restoration to 2,853 when teeth were never sealed. Their report stated, "Compared with standard care, always seal cost \$8.12 per restoration avoided (95% confidence interval [CI]=\$4.10, \$12.26). Compared with never seal, standard care cost \$65.62 per restoration avoided (95% CI=\$52.99, \$78.26)" (pg. 555). As it was concluded in the study, always sealing teeth is more costly, but it reduces any additional dental treatment, which avoids additional costs. Subsequently, never sealing a tooth costs less, but usually requires additional treatment, which can be costly.



Key Findings from the SDF Literature

The majority of the literature that exists regarding SDF application are systematic reviews. There are few RCT studies that have been conducted using SDF and they usually focus on older underserved populations instead of school aged children. The review of this literature suggests that the application of SDF is a low-cost approach to preventing dental caries in young children who do not have regular access to care.

The U.S. Food and Drug Administration approved SDF in March 2015 to treat tooth hypersensitivity (White & Wright, 2017) and SDF was approved in Canada in February 2017 to prevent dental caries (Argáez & Yeung, 2017). SDF is more appealing to school-aged children as it is less invasive than traditional procedures and has minimal complications of which could potentially include tooth discoloration and gingival irritation (Argáez & Yeung, 2017). White and Wright (2017) state that SDF is made up of 25% silver, 8% amine, 5% fluoride, and 62% water. SDF is recognized to be the most concentrated fluoride product to treat caries. One of the benefits of SDF treatment is that it does not require sedation. General anesthesia or any form of sedation is expensive and risky to conduct in children. By using SDF, there are less probabilities of causing harm to children and it also reduces the costs of delivery of care. As indicated by White and Wright, the American Dental Association (ADA) has created a specific billing code to use in caries management that includes SDF treatment.

Schwendicke and Göstemeyer (2017) found in their study that SDF is effective in preventing caries in high risk populations and is a cost-effective preventative treatment option. In a review of three RCTs studying the effectiveness of SDF in managing caries in elderly adults, Subbiah and Gopinathan (2018) found that the effectiveness of SDF improved when coupled with oral health education. The black staining of the dental lesions that can occur after SDF application is due to a chemical reaction when the application site is exposed to sunlight (Lo, Chu, & Lin, 2001). While this staining is not harmful, Lo, Chu, and Lin (2001) noted that more studies regarding the acceptance of the treatment are needed because of this possible side effect. Although, Horst, Ellenikiotis, Milgrom, and UCSF Silver Caries Arrest Committee (2016) found in their literature review that parents often thought of the teeth staining as an indication that the SDF treatment was effective.



Summary of SDF Literature Reviewed

The articles regarding SDF application, selected key findings, and the study design are shown in Exhibit 3 for ease of reference.

Exhibit 3. Summary of Relevant SDF Literature

Author/Date	Study Finding	Study Design
Schwendicke & Göstemeyer, 2017	Four treatments were compared for cost effectiveness of root caries preventative treatment: no treatment, daily fluoride rinses, chlorhexidine varnish (2x/year), and silver diamine fluoride varnish (2x/year). For patients that had more teeth and higher risk for caries across all treatment methods, silver diamine fluoride was found to be the most effective and least costly.	Quasi experimental design utilizing systematic review data and statistical modeling.
Subbiah & Gopinathan, 2018	The authors found that SDF is considered to be cost effective because the treatment itself is inexpensive and it is easy to apply. There is no expensive equipment required and the application can be done by non-dental professionals who receive training. SDF should be considered as a public health measure to control dental caries in populations that have limited or no access to dental care. No adverse side effects were reported except for the staining of teeth.	Systematic review of literature.
Lo, Chu & Lin, 2001	This study found that SDF annual application resulted in a significantly lower amount of new dental caries in children when compared to the control group. The low cost of labor associated with the treatment was noted as the painting of the SDF was non-invasive and all of the children (N=375), including pre-school aged children were compliant with the SDF application.	Randomized control trial
Gao et al., 2016	This review noted the many studies that found that SDF application was more effective glass ionomer cement or fluoride varnish in arresting dental caries in primary teeth. The authors also noted that before applying SDF, caries removal was unnecessary. The authors then concluded that SDF is a low-cost treatment to manage dental caries in young children or patients with special needs.	Systematic review of literature.
Horst, Ellenikiotis, Milgrom, & UCSF Silver Caries Arrest Committee, 2016	In this comprehensive literature review, the authors noted that glass ionomer cement or resin sealants often outperformed SDF in preventing caries in first molars in children but that both alternative treatments were prone to falling out and were found to be about twenty times more expensive than SDF.	Systematic review of literature.
Crystal & Niederman, 2016	From the review of the literature it was found that SDF is more than twice as effective as fluoride varnish in arresting dental caries. The authors estimate that SDF application is equal to less than one dollar per child for supplies. (\$.80 for the SDF for one drop of SDF sufficient to treat eight teeth, and \$.11 for the micro brush).	Systematic review of ten randomized control trials.



Evaluation Findings

SDF Advisory Workgroup Functioning

The survey for Advisory Workgroup members that are not OOH staff SDF (i.e., “Workgroup Member Survey”) and the survey for the OOH Director and Dental Program Manager (i.e., “Leadership Survey”) consisted of ten open-ended questions. Many of the questions in the OOH Leadership Survey were the same or very similar to those in the Workgroup Member Survey. Survey findings are presented thematically and the questions from each survey type are indicated in text boxes. Findings from both surveys are presented together for the same or very similar questions. For all questions, “respondent” refers to a workgroup member who completed the Workgroup Member Survey (N=8). The OOH Director and Dental Program Manager collaborated on responding to the OOH Leadership Survey.

Member Recruitment

Workgroup Member Survey: How were you recruited?
Leadership Survey: How did you decide who to recruit for the SDF workgroup?

Workgroup members were recruited through several ways: the OOH Director directly recruited individuals; they received a recruitment email from OOH staff; or they were asked to participate by their supervisor. One respondent reported that they are an OOH staff member who participated in the Advisory Workgroup as a member, rather than in a supervisory or facilitating role.

OOH leadership reported that they consciously recruited members for the SDF Advisory Workgroup from the regions where the SDF program will be piloted. They specifically reached out to dental hygienists and site coordinators who are involved in current children’s dental health programs to which SDF events will be added. The recruitment process involved sending an initial invitation letter, followed by e-mail and telephone calls. OOH leadership noted that verbal communication with members was the most effective recruitment method.

Member Expertise

Workgroup Member Survey: What expertise do you bring to the group?
Leadership Survey: Were you able to recruit people representing all areas of expertise needed? If not, who else would you have liked to recruit?

The SDF Advisory Workgroup includes subject matter experts with considerable experience in public health and oral health. Members have professional experience as an oral health care provider, including dentists, Registered Dental Hygienists (RDHs), dental clinicians, and dental program supervisors. Several members surveyed specifically noted that they have current involvement in public health dental programs. OOH leadership highlighted that the SDF



Advisory Workgroup included coordinators from a wide range of government and private stakeholders including: the OOH Dental Sealant Program; First Things First’s Fluoride Varnish Program; Head Start; preschool prevention programs; and the Arizona Alliance For Community Health Centers’ Oral Health Programs. OOH leadership noted that even though the workgroup represented many sectors and dental professions, the workgroup could have been strengthened by having an additional dentist as an advising member.

Effective Workgroup Practices

Workgroup Member Survey: What were some effective processes and procedures that the workgroup utilized to accomplish its work? How could such processes be improved? What procedures did the workgroup use to make decisions? How could such processes be improved? Was the length of meetings just right, too long, or too short? Did the timeline for accomplishing the workgroup's objectives/products include sufficient time?

Leadership Survey: What were some effective processes that the workgroup utilized to accomplish its work? What processes did you put in place for workgroup functioning, including decision-making? Was a timeline established for accomplishing the workgroup's objectives/products and was it met?

Respondents identified a variety of effective strategies that enabled the workgroup to accomplish its tasks within the projected timeframe.

Facilitation Strategies

Workgroup members and OOH staff agreed that a process mapping activity and use of open discussions and/or brainstorming sessions were useful strategies to accomplish the Workgroup’s tasks. At the initial workgroup meeting, the OOH Dental Program Manager facilitated a process mapping session to identify new processes of the SDF program and review how they interface with the existing processes of current dental programs.

Several workgroup members also identified effective meeting organization and facilitation practices utilized by OOH staff. Examples cited included the creation of a pre-work SDF information binder, establishing goals and a timeline at the beginning, sticking to agendas during meetings, and using sticky notes to gather and display workgroup members’ ideas. OOH leadership also identified action steps that workgroup members completed between meetings as a well-utilized process.

Form Development Strategies

To develop SDF forms, the group reviewed existing dental program forms and then voted on sections to keep, delete, or revise. Workgroup members felt that reviewing example forms from existing programs was an effective and efficient way to develop the SDF program forms. Members also appreciated receiving resources specific to SDF and having their questions answered by representatives from pharmaceutical companies that develop SDF.



Decision-Making Strategies

At the formation of the committee, Advisory Workgroup members collectively decided on rules of operation, which were repeated at the beginning of each meeting. Workgroup members reported utilizing consensus-based decision-making, whereby all members would give input during a group discussion or brainstorm session to share ideas. The group would then decide based on what a majority of participants favored. One respondent was not sure how decisions were ultimately made; however, they did indicate that all workgroup members gave their input during discussions.

Meeting Length

Most Advisory Workgroup members felt that the length of meetings was adequate. A few expressed appreciation that meetings included a working lunch and that meeting start and end times were amenable to those with longer commutes (up to 3 or 4 hours round trip). One respondent felt that meetings could have been shorter if materials were distributed and reviewed by members before the next meeting.

Task Timeline

OOH leadership established a timeline that outlined meeting dates and projected timeframes for completion of activities. OOH staff and workgroup members both indicated that the Advisory Workgroup was able to complete all stated objectives within this timeframe. Workgroup members agreed that the timeline established for their work was realistic, although some expressed concern that deadlines were tight, which required monitoring by OOH leadership and for members to complete work in between meetings. Several members reported that OOH's leadership and facilitation skills to keep the group on task was critical to completing the work within a set timeframe. A few respondents also commented that work completed by members in between meetings enabled timely completion of the workgroup's required tasks during meetings and within the timeline scheduled.

Workgroup Challenges

Workgroup Member/Leadership Survey: What were challenges the workgroup faced and how were they overcome?

Workgroup members and OOH leadership both identified the geographic dispersion of members and the resultant drive time as being a challenge for meeting in person. The workgroup addressed this challenge by rotating meeting locations across central and southern Arizona, so that travel time could be shared by all members. A few respondents identified that members' differing ideas was sometimes a challenge; however, allowing discussion of the pros and cons related to options was identified as a successful practice for making informed decisions. One person identified the specific challenge of when a workgroup member wanted to reopen consideration of a form that the group had previously approved by consensus. They felt



that revisiting approved materials was not a productive use of meeting time. As a way to overcome this type of challenge, OOH staff effectively used the “parking lot” technique to capture ideas that would be discussed later, so that meetings could stay on track. Another specific challenge noted by one respondent was workgroup members’ differing awareness levels of the efforts of the National Oral Health Innovation & Integration Network (NOHIIN) and Oral Health Progress Equity Network (OPEN). These networks advocate for integrating oral health care into overall health care, especially for underserved individuals, and some workgroup members had limited awareness of them.

Workgroup Successes and Tasks Completed

Workgroup Member/Leadership Survey: In what ways was the workgroup successful?

Leadership Survey: Was the workgroup able to complete all of its tasks, including developing SDF Program Policies and Procedures, a program manual, and materials such as a consent form, within the established timeline?

Workgroup members and OOH staff agreed that the workgroup’s completion of tasks needed to begin implementation of the SDF pilot program in a timely manner was a notable success. Respondents overwhelmingly agreed that that the workgroup had the expertise needed to accomplish its work, including dental professionals, program coordinators, and consultation with a pharmaceutical company representative. However, one respondent expressed that it would have been useful to have access to more providers with experience in applying SDF. Another noted that while the workgroup had the expertise it needed to do its work, there were differing perspectives on where the program should be going in the future as well as how it will get there.

OOH leadership identified completion of the program’s objectives to establish policies, procedures, and benchmarks and create program forms as indicators of success. Gathering coordinators from across the participating counties’ programs to share resources and information was also viewed as a success. The following are the Workgroup objectives that were completed in Year 1:

- Expertise was provided on SDF best practices and integrating SDF into existing community- based models;
- SDF clinical recommendations nationwide were reviewed to create program policies and procedures;
- Program materials were developed, such as a variety of consent forms, treatment records, and information for sites and parents;
- Program-specific standards were developed to ensure that providers give the highest quality of services; and
- SDF Program Training was developed and implemented in-person and online.



Lessons Learned

Workgroup Member/Leadership Survey: What lessons have the workgroup learned that a similar workgroup could apply?

Many workgroup members identified that being organized from the onset was critical to the workgroup’s successful functioning, including having well-defined objectives and a detailed timeline. Respondents also highlighted specific aspects of preparing for and conducting meetings as being important, including distributing agendas and materials before the meeting, doing homework between meetings, use of forms and materials from existing programs as templates, and using meeting time effectively by keeping to the agenda. Several respondents also mentioned the qualities of workgroup members as being crucial to success, including being open to other ideas and having the necessary expertise. OOH leadership mentioned the importance of convening an advisory workgroup that includes members who have decision-making authority for their department or organization, especially those implementing programs that will be directly affected by SDF implementation and that have the capacity to contribute to the planning stage. From this perspective, organizations not meeting such criteria should be brought in after the initial program planning has been completed.

SDF Training Survey Results

In-person Training

The survey for the SDF in-person training included six multiple choice knowledge-based questions. Eight satisfaction questions asked respondents to rate their level of agreement with statements about quality of an aspect of the training. Three opened-ended questions allow respondents to offer further information about their views on the training. Most respondents who provided additional thoughts addressed ways to improve the training. A total of 16 training participants from Pima County and Cochise County completed the survey.

Training participants demonstrating having knowledge about key subject areas of the training (Exhibit 4). The only subject area in which some training participants showed a lack of knowledge is the consent form.

Exhibit 4. SDF Trainee Knowledge – In-person Training

Knowledge Area	Percentage (n) that answered correctly (N=16)
Rate that active dental caries are arrested by annual SDF application.	100% (n=16)
True/false - after applied, SDF prevents caries in neighboring teeth.	100% (n=16)
Strategies to prevent SDF stains on skin and surfaces.	100% (n=16)
Cleaning techniques if SDF is spilled.	100% (n=16)
Contraindications of SDF.	94% (n=15)
Information NOT provided on the informed consent form for parents.	50% (n=8)



Most training participants rated all aspects of the training highly (Exhibit 5).

Exhibit 5. Satisfaction with the SDF In-Person Training

Satisfaction Area	Agreed or Strongly Agreed % (n)
1. The trainer effectively held my interest.	88% (n=14)
2. The trainer answered trainees' questions well.	88% (n=14)
3. The trainer presented information in a way that was easy to understand.	88% (n=14)
4. The trainer was well-prepared.	88% (n=14)
5. The training handouts present information in an understandable way.	88% (n=14)
6. The training handouts present information in an understandable way.	88% (n=14)
7. The room in which the training was held was comfortable.	88% (n=14)
8. Overall, I am satisfied with the training.	88% (n=14)

(N=16) Note: two respondents selected "Strongly Disagree" for all the questions. It is possible that these respondents misread or misinterpreted the response choices as neither offered a critical response to any of the open-ended questions.

The survey included three open-ended questions to learn about the training's strengths and how it might be improved. One of these questions asked respondents to identify what the most valuable part of the training had been. Responses to the question included:

- Seeing photos of teeth that could have SDF applied.
- I liked the quizzes.
- Brainstorming together
- Clarification of coding.
- The stats.
- How to apply SDF.
- In-person enforcement.

Respondents also offered suggestions for improving the training.

- Include some hands-on parts.
- I think it will improve the more times you do it and after we have sorted through all the info.
- Limit discussion between individuals.
- Asepsis.
- Maybe practice on patient (example).
- I think if you have additional training's and need feedback from providers ahead of time, it would be best to give us a month for a long presentation to help you.
- Refer some questions to Prog Staff.



Webinar Training

The survey for the SDF Webinar 1 training included six multiple choice knowledge-based question. Eight satisfaction questions asked respondents to rate their level of agreement with statements about quality of an aspect of the training. Three opened-ended questions allow respondents to offer further information about their views on the training. Fifteen training participants from Pima County completed the survey.

Training participants demonstrated having knowledge about key subject areas of the training (Exhibit 6). As with the in-person training, the only subject area in which some respondents showed a lack of knowledge is on the consent form.

Exhibit 6. SDF Trainee Knowledge – Webinar Training

Knowledge Area	Percentage (n) that answered correctly (N=15)
Contraindications of SDF.	100% (n=15)
Strategies to prevent SDF stains on skin and surfaces.	100% (n=15)
Rate that active dental caries are arrested by annual SDF application.	93% (n=14)
True/false - after applied, SDF prevents caries in neighboring teeth.	93% (n=14)
Cleaning techniques if SDF is spilled.	93% (n=14)
Information NOT provided on the informed consent form for parents.	67% (n=10)

Most training participants rated all aspects of the webinar highly (Exhibit 5).

Exhibit 7. Satisfaction with the SDF Webinar Training

Satisfaction Area	Agreed or Strongly Agreed % (n)
1. The webinar effectively held my interest.	87% (n=13)
2. The information presented in the webinar was easy to understand.	93% (n=14)
3. The trainer presented information in a way that was easy to understand.	93% (n=14)
4. The videos used for the webinar were useful.	93% (n=14)
5. The webinar was easy to view on my monitor.	93% (n=14)
6. The sound quality of the webinar was good.	87% (n=13)
7. Overall, I was satisfied with the webinar.	88% (n=14)

(N=15) One respondent selected “Strongly Disagree” for all the questions. It is possible that this respondent misread or misinterpreted the response choices as they didn’t offer a critical response to any of the open-ended questions.



The webinar survey included the same three open-ended questions as the in-person training survey. Responses to the question asking what the most valuable part of the training had been generally focused on review of SDF forms and SDF application procedures.

- Previewing the forms prior to the hands-on portion.
- Brainstorming together
- The most valuable part of the training was seeing the tools and forms we will be working with.
- Statistics.
- Information on what SDF is because I was not familiar with it.
- The most valuable part of the webinar was the forms and the explanation, including highlighted area of most importance.
- Going through the process and tray set up with appropriate barriers.
- Great slides; not overloaded with info on one slide.

Respondents offered a variety of suggestions for improving the SDF training webinar.

- Great slide show. Would just like some audio.
- Acknowledge not everyone will do in person training.
- Possibly showing a time-lapse video of teeth being exposed to SDF and a video of a team in action using the screening and SDF process.
- Maybe in the survey has us fill out an impromptu form to see if we are filling out the forms correctly.
- Try to get a video of our program applying SDF to child.
- It is hard to grasp the whole procedure from this webinar. I guess it is okay for preliminary training just to give an idea.



Recommendations and Next Steps

Literature reviewed for this program supports school-based programs that utilize dental sealants or SDF varnish. Both treatment modalities are cost effective when compared to no treatment at all. Furthermore, when the school program is targeted at school sites that have a high percentage of low-income high-risk students, the application of sealants or SDF varnish was found to be most effective (Griffin et al, 2017). As mentioned by Chu, Lin, Liu, and Lo (2012), “In rural or less-developed areas, where resources and dental care services are limited, innovative and cost-effective preventive methods are called for” (p. 753). SDF varnish has been found to be an effective means of dental caries prevention that costs less than one dollar per child (Crystal & Niederman, 2016).

Using SDF reduces to the risk of additional harm to children since sedation or anesthesia is not needed for SDF treatment. With the application of SDF, children can receive treatment they need to ensure they have proper oral care. Treating children at a younger age for dental caries will promote their oral care over their life course and prevent complications as they grow older (Neidell et al., 2016). As Neidell et al. mentioned, it is critical to identify the risk factors for dental caries in children, which include variables such as “income, race and ethnicity. It is important to understand the impact that the lack of availability of resources has on children and their oral care. Ensuring that these resources are available to underserved, school aged children is essential to be able to provide these community-based prevention services.

SDF Advisory Workgroup

Both SDF advisory workgroup members from collaborating stakeholders and SDF leadership viewed the planning stage of the process as having been successful. OOH recruited members having deep expertise in both oral health and public health program implementation, with good representation from all counties participating in the SDF program. Advisory workgroup members generally felt that OOH facilitation of planning meetings had been effective and resulted in incorporating their input into the program’s standards and materials. Moreover, the advisory workgroup was essentially able to keep to the timeline established at its convening, with only the program manual awaiting completion.

Each recommendation offered for the coming work of the SDF Advisory Workgroup or similar public health advisory workgroups that may convene in Arizona or other states reiterate what seem to be the useful ideas of a single participant rather than being something suggested by multiple participants. These recommendations are as follows:

1. Some advisory workgroup members may not have been clear on the workgroup’s decision-making processes, despite some efforts by the OOH leadership to remind participants of them at each meeting. More discussion about the distinction between majority rule and consensus may be warranted.



2. Meeting productivity can benefit by, whenever possible, distributing an agenda and all materials for review well in advance.
3. Further discussion and agreement about limitations on revisiting actions taken may save meeting time and enhance workgroup participation satisfaction.
4. Rotating the location of meetings was a fairly distribute the burden of travel time amongst advisory workgroup members. However, the advisory workgroup may wish to consider use of an on-line meeting platform for some meetings. Such platforms may also serve a purpose in obtaining needed information. For example, one advisory workgroup member wished there had been the opportunity to speak with more individuals who had used SDF. Use of an on-line or webinar style meeting practice could enable direct communication with dental professionals using SDF in other states.

SDF Training

Participants in both the in-person and webinar trainings demonstrated knowledge of key information regarding SDF procedures. However, based on the percentage of respondents that incorrectly answered a survey question about the consent form, additional attention in the training to the form's contents may be useful. OOH may also wish to consider whether any hands-on activities may be added to the training.

References

- Argáez, C., & Yeung S.T. (2017). Silver diamine fluoride for the prevention and arresting of dental caries or hypersensitivity: a review of clinical effectiveness, cost-effectiveness and guidelines. Ottawa (ON): CADTH.
- Bravo, M., Montero, J., Bravo, J.J., Baca, P., Llodra, J.C. (2005). Sealant and fluoride varnish in caries: a randomized control trial. *J Dent Res*. 84, 1138-1143.
- Chi, D. L., Van Der Goes, D. N., & Ney, J. P. (2014). Cost-effectiveness of Pit-and-fissure Sealants on Primary Molars in Medicaid-enrolled Children. *American Journal of Public Health*, 104(3), 555-61.
- Crystal, Y. O. & Niederman, R. (2016). Silver diamine fluoride treatment considerations in children's caries management. *Pediatric Dentistry*, 38(7), 466-471.
- Deshpande, A. N., Raol, R. Y., Sudani, U., Joshi, N., & Pradhan, N. (2016). Sealing versus Nonsealing: Cost-benefit analysis. *Journal of Oral Research and Review* 8(2), 92.
- Gao, S. S., Zhao, I. S., Hiraishi, N., Duangthip, D., Mei, M. L., Lo, E. C. M. & Chu, C. H. (2016). Clinical trials of silver diamine fluoride in arresting caries among children: a systematic review. *JDR Clinical & Translational Research*, 1(3), 201-210.



Griffin, S. O., Naavaal, S., Scherrer, C., Patel, M., Chattopadhyay, S., & Community Preventive Services Task Force. (2017). Evaluation of school-based dental sealant programs: an updated community guide systematic economic review. *American Journal of Preventive Medicine*, 52(3), 407-415.

Griffin, S., Naavaal, S., Scherrer, C., Griffin, P.M., Harris, K., & Chattopadhyay, S. (2016). School-based dental sealant programs prevent cavities and are cost-effective. *Health Affairs* 35(12), 2233-2240.

Horst, J. A., Ellenikiotis, H., Milgrom, P. M., & UCSF Silver Caries Arrest Committee. (2016). UCSF protocol for caries arrest using silver diamine fluoride: rationale, indications, and consent. *Journal of the California Dental Association*, 44(1), 16.

Liu, B. Y., Lo, E. C. M., Chu, C. H., & Lin, H. C. (2012). Randomized trial on fluorides and sealants for fissure caries prevention. *Journal of Dental Research*, 91(8), 753-758.

Lo, E. C. M., Chu, C. H., & Lin, H. C. (2001). A community-based caries control program for pre-school children using topical fluorides: 18-month results. *Journal of Dental Research*, 80(12), 2071-2074.

Neidell, M., Shearer, B., & Lamster, I.B. (2016). Cost-effectiveness analysis of dental sealants versus fluoride varnish in a school-based setting. *Caries Research* 50, no. Suppl. 1, 78-82.

Schwendicke, F., & Göstemeyer, G. (2017). Cost-effectiveness of root caries preventive treatments. *Journal of Dentistry*, 56, 58-64.

Subbiah, G. K., & Gopinathan, N. M. (2018). Is silver diamine fluoride effective in preventing and arresting caries in elderly adults? A systematic review. *Journal of International Society of Preventive & Community Dentistry*, 8(3), 191-199.

White, A., & Wright, J.T. (2017). Silver diamine fluoride: Changing the caries management paradigm and potential societal impact. *NCMJ*. 78(6), 394-397.

