# **Design and Implementation of Template to Record and Evaluate SDF Caries Arrest**



## Background/Aims

Silver diamine fluoride (SDF) is an easy, safe, and effective method to achieve caries arrest on primary teeth. As an invaluable tool for caries management on children, it has been widely adopted in pediatric dentistry teaching programs in the US.

Lesion activity is difficult to assess even in controlled circumstances. A SDF-treated carious lesion can increase in size, even though it appears black. Currently at the New York University Pediatric Dentistry clinic (NYUCS-PC), there is no standardized method of documenting lesion arrest and therefore the efficacy of SDF.

An electronic note template was developed. It included lesion baseline characteristics, application protocols, and re-application details. This template was implemented on October 31, 2023 by the post-graduate residents at NYUCD-PC on a voluntary basis.

The first aim of this study was to determine the effectiveness of this method to document and evaluate caries arrest. The second aim was to evaluate adherence to its use. The third aim was to determine any barriers that prevented residents from utilizing the template as intended, how to overcome these barriers, and to explore feasible alternatives to uniformly document and evaluate caries arrest by SDF application.

### Methods

A retrospective chart review was conducted and comprised of patients who received SDF treatment at the dental clinic from October 1, 2023 to March 31, 2025, using ADA CDT code D1354. The follow-up period for patients treated varied from 0 (never returned) to 3 years. The following variables were extracted the EHR notes: lesion size, color, consistency, sensitivity, and re-application, adherence to the template, provider (deidentified), and final outcome of the tooth.

On February 26, 2025, two one-hour focus group discussions were conducted, one for first year residents and one first second year residents. Topics focused on 3 themes pertaining to the importance of recording and evaluating treatment methods, barriers that prevent the template from being utilized, and alternative methods of consistently documenting and evaluate treatment outcomes. The sessions were recorded and transcribed for qualitative analysis. Both portions of the study were deemed to be exempt from IBR overview: i24-00328 and FY2025-9845.

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#### Results

373 visit encounters of 250 patients were analyzed. These results show that when used as instructed, the note template was effective in identifying arrested lesions through characteristics of hardness, color, and reapplication, as well as documenting the clinical protocol that was utilized.

Template utilization among 26 residents ranged from 0% (never used) to 100% (always used), with 13 residents utilizing the template over 50% of the time and 13 residents using it less than 50% of the time (2 residents never used the template).

Qualitative analysis of focus groups' data revealed that both current PGY-1 and PGY-2 residents have a clear understanding of the importance of proper documentation for patient-centered care, evaluation, and medical legal reasons. Barriers for utilization included: time restraints, accentuated by patient behavior and punctuality, and poor accessibility within the software system. It was suggested that a separate form/charting with its own tab built into AxiUm, would be more accessible. Clinical photographs were not favored as an option to monitor.

Resident	# of Non-Uses	# of Partial Uses	# of Complete Uses	% Complete template used	% Complete OR partial template was used
1	14	0	5	26.32	26.32
2	9	0	6	40	40
3	6	0	5	45.45	45.45
4	7	0	3	30	30
5	15	0	0	0	0
6	7	1	1	11.11	22.22
7	8	0	5	38.46	38.46
8	13	0	5	27.78	27.78
9	6	1	5	41.67	50
10	0	1	25	96.15	100
11	15	2	9	34.62	42.31
12	5	2	41	85.42	89.58
13	9	1	16	61.54	65.38
14	13	0	18	58.06	58.06
15	2	7	7	43.75	87.5
16	7	0	3	30	30
17	10	1	7	38.89	44.44
18	7	4	19	63.33	76.67
19	3	1	3	42.86	57.14
20	3	0	1	25	25
21	1	0	2	66.67	66.67
22	3	0	5	62.5	62.5
23	4	0	0	0	0
24	0	0	3	100	100
25	2	0	2	50	50
26	0	1	2	66.67	100

Different colors represent current PGY-1s, current PGY-2s, and graduated PGY-2s. Darkened rows represent that the resident utilized the template in over 50% of encounters.

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### Discussion

Results show that although the template is effective in recording and documenting caries arrest, adherence to utilization of such a method for documentation is not ideal. The current PGY-1 and last year's graduated classes experienced fewer total encounters due to limited time in the clinic. However, 8 out of 9 of the graduated residents utilized the template for less than 50% of the encounters, compared to 7 out of 9 of the current PGY-2 class, and 7 of 8 for the current PGY-1 class. This could reflect increased awareness for required proper documentation in current and incoming classes due to cultural changes. Lack of adherence to the template is multifactorial and influenced by environmental factors (i.e. technical difficulties with hardware and software), time constraints, and interpersonal factors (i.e. patient cooperation, faculty on

the floor).

Electronic templates help to shorten the amount of time for documentation while maintaining an accurate description of the procedure completed. Partial use of the template was present in 6.2% of encounters, as residents occasionally utilized the clinical protocol section of the template instead of the entire note. This is consistent with what was reported during qualitative analysis. Residents understand the importance of documenting the procedure that was completed, however, also prioritized quality patient care and obtaining informed consent within a limited time, resulting in less time to complete documentation.

#### Conclusions

An electronic note template is useful for standardized recording of caries arrest after SDF application when the patient is being treated by many different providers. However, universal utilization is problematic.

Investigation is required to determine how such a method can be implemented successfully and uniformly. Alternative methods of evaluating caries arrest and documentation, i.e. markings on an existing odontogram in AxiUm or a pre-existing EHR form could achieve an accurate documentation and evaluation of caries arrest. **Clinical implications:** Standardization of documentation in educational institutions will allow for more accurate assessment of outcomes of treatment and lead to better quality of care.

**Future research:** It is important to troubleshoot the current method and explore other avenues of documenting and assessing caries arrest through SDF application in an academic environment.