

# APPLICATION OF MEDICAMENTS AND DESENSITIZING RESINS

Policy Number: DCP034.04

Effective Date: November 1, 2018

Table of Contents	Page
<a href="#">INSTRUCTIONS FOR USE</a> .....	1
<a href="#">BENEFIT CONSIDERATIONS</a> .....	1
<a href="#">COVERAGE RATIONALE</a> .....	1
<a href="#">DEFINITIONS</a> .....	2
<a href="#">APPLICABLE CODES</a> .....	2
<a href="#">DESCRIPTION OF SERVICES</a> .....	2
<a href="#">CLINICAL EVIDENCE</a> .....	3
<a href="#">U.S. FOOD AND DRUG ADMINISTRATION</a> .....	6
<a href="#">REFERENCES</a> .....	6
<a href="#">POLICY HISTORY/REVISION INFORMATION</a> .....	7

## Related Dental Policy

- [Topical Fluoride Treatment](#)

## INSTRUCTIONS FOR USE

This Dental Coverage Policy provides assistance in interpreting UnitedHealthcare dental benefit plans. When deciding coverage, the member specific benefit plan document must be referenced. The terms of the member specific benefit plan document [e.g., Certificate of Coverage (COC), Schedule of Benefits (SOB), and/or Summary Plan Description (SPD)] may differ greatly from the standard benefit plan upon which this Dental Coverage Policy is based. In the event of a conflict, the member specific benefit plan document supersedes this Dental Coverage Policy. All reviewers must first identify member eligibility, any federal or state regulatory requirements, and the member specific benefit plan coverage prior to use of this Dental Coverage Policy. Other Clinical Policies and Coverage Guidelines may apply. UnitedHealthcare reserves the right, in its sole discretion, to modify its Policies and Guidelines as necessary. This Dental Coverage Policy is provided for informational purposes. It does not constitute medical advice.

## BENEFIT CONSIDERATIONS

Before using this policy, please check the member specific benefit plan document and any federal or state mandates, if applicable.

### **Essential Health Benefits for Individual and Small Group**

For plan years beginning on or after January 1, 2014, the Affordable Care Act of 2010 (ACA) requires fully insured non-grandfathered individual and small group health plans (inside and outside of Exchanges) to provide coverage for Pediatric Dental Essential Health Benefits ("EHBs"). Large group plans (both self-funded and fully insured), and small group ASO plans, are not subject to the requirement to offer coverage for Pediatric Dental EHBs. However, if such plans choose to provide coverage for benefits which are deemed Pediatric Dental EHBs, the ACA requires all dollar limits on those benefits to be removed on all Grandfathered and Non-Grandfathered plans. The determination of which benefits constitute Pediatric Dental EHBs is made on a state by state basis. As such, when using this policy, it is important to refer to the member specific benefit plan document to determine benefit coverage.

## COVERAGE RATIONALE

### **Application of Desensitizing Medicament or Resin**

**Application of desensitizing Medicament or Resin is indicated for the following:**

- For teeth with sensitivity that does not resolve with an over the counter desensitizing dentifrice

**Application of desensitizing Medicament or Resin is not indicated for the following:**

- Placement on teeth with erosion, recession, cervical abrasion or abfraction when asymptomatic
- As a base or liner prior to restoration placement

### **Interim Caries Arresting Medicament Application**

**Interim caries arresting Medicament application is indicated for the following:**

- As conservative treatment for active, non-symptomatic carious lesions
- Individuals with extreme risk of caries (such as xerostomia or severe early childhood caries)
- Individuals that cannot tolerate standard treatment for medical or psychological reasons. These may be included but are not limited to the following:
  - An extremely uncooperative child
  - Frail elderly individuals
  - Individuals with severe cognitive or physical disability
  - Individuals that are immunocompromised
- Individuals with multiple lesions that cannot be treated in one office visit
- Recurrent caries that are difficult to treat
- Individuals without access to dental care

**Interim caries arresting Medicament application is not indicated for the following:**

- Individuals with a silver allergy
- Pregnant women
- During the first six months of breast feeding

**Coverage Limitations and Exclusions**

- Any dental procedure performed solely for cosmetic/aesthetic reasons (cosmetic procedures are those procedures that improve physical appearance).
- Clinical situations that can be effectively treated by a less costly, dental appropriate alternative procedure will be assigned a benefit based on the least costly procedure.
- These codes are for Medicaments and Resins, and not for the use of lasers for desensitization.

**DEFINITIONS**

**Medicament:** Substance or combination of substances intended to be pharmacologically active, specially prepared to be prescribed, dispensed or administered by authorized personnel to prevent or treat diseases in humans or animals. (ADA)

**Remineralization:** A process enhanced by the presence of fluoride whereby partially decalcified enamel, dentin, and cementum become recalcified by mineral replacement. (Mosby's)

**Resin, Acrylic:** Resinous material of the various esters of acrylic acid, used as a denture base material, for trays or for other restorations. (ADA)

**Silver Fluoride:** A colorless aqueous solution containing silver ions and fluoride ions. (Shah Review Article)

**APPLICABLE CODES**

The following list(s) of procedure and/or diagnosis codes is provided for reference purposes only and may not be all inclusive. Listing of a code in this policy does not imply that the service described by the code is a covered or non-covered health service. Benefit coverage for health services is determined by the member specific benefit plan document and applicable laws that may require coverage for a specific service. The inclusion of a code does not imply any right to reimbursement or guarantee claim payment. Other Clinical Policies and Coverage Guidelines may apply.

CDT Code	Description
D1354	Interim caries arresting medicament application – per tooth
D9910	Application of desensitizing medicament
D9911	Application of desensitizing resin for cervical and/or root surface, per tooth

*CDT® is a registered trademark of the American Dental Association*

**DESCRIPTION OF SERVICES**

Many individuals experience significant dental sensitivity. It may be localized to select teeth, or generalized involving the entire dentition. The most common cause is due to exposed dentin (layer of tooth structure under tooth enamel) or cementum (root surface). This may be caused by erosion of tooth enamel, abrasion and abfraction from toothbrushing and traumatic occlusion, as well as systemic factors including diabetes and smoking. Many cases of hypersensitivity respond favorably to over the counter desensitizing products. When sensitivity persists, there is a variety of treatment options available by prescription, or in office application. One of the newest is silver diamine fluoride. This is a topical medicament used to treat dental caries and dentin sensitivity (The FDA cleared Diamine Silver Fluoride Dental Hypersensitivity Varnish in July of 2014, and its use as a caries arresting agent is considered

“off label”). The silver acts as a antimicrobial and prevents proteins from breaking down that would otherwise cause decay on the surface. The fluoride promotes remineralization. The one drawback is the SDF medicament may darken caries lesions when applied and give individuals a metallic or bitter taste in their mouth.

## CLINICAL EVIDENCE

### **Application of Desensitizing Medicament or Resin**

Castillo et al. (2011) conducted a multi-center, randomized clinical trial to assess the effectiveness and safety of topical diammine silver fluoride on tooth sensitivity. From two sites, 126 adults with at least one tooth sensitive to compressed air were randomly assigned to either the topical silver diamine fluoride or sterile water, and pain was assessed by means of a 100-mm visual analogue scale at 24 hours and 7 days. The diammine silver fluoride reduced pain at 7 days at both sites. No tissue ulceration, white changes, or argyria was observed. A small number of participants in the silver fluoride group experienced a mild but transient increase in erythema in the gingiva near the tooth. No changes were observed in the Gingival Index. The authors concluded that diammine silver fluoride is a clinically effective and safe tooth desensitizer.

In a randomized controlled clinical trial Ashwini et al. (2018) compared the desensitizing efficacy of dentifrice containing 5% fluoro calcium phosphosilicate against 5% calcium sodium phosphosilicate in individuals with sensitive teeth. 60 participants (age 18 and older) with a history of dentin hypersensitivity (DH) were randomly assigned to either 5% fluoro calcium phosphosilicate, 5% calcium sodium phosphosilicate or a standard dentifrice group containing fluoride. Sensitivity scores (VAS) were measured at baseline, and immediately after scaling and root planning, at 15, 30, and at 60 days. A significant reduction in DH during the 8 weeks of the active phase of the study independent of treatment groups was noted. The fluoro calcium phosphosilicate group showed a higher degree of effectiveness in reducing DH, followed by calcium sodium phosphosilicate then standard fluoride dentifrices. The clinical trial, showed a comparable reduction in the symptoms of DH for the fluoro calcium phosphosilicate group.

[Ravishankar et al. \(2018\)](#) conducted a randomized, split mouth clinical trial testing the effect of three different desensitizing agents on reduction of pain due to hypersensitive cervical dentin lesions. 28 individuals were selected with 84 teeth diagnosed with cervical dentin hypersensitivity (DH) in at least one tooth. Patients exhibiting pain scores of two or more on the visual analog scale (VAS) were included in the study. Random assignment was performed to one of the three treatment groups based on computer-generated random number. The desensitizing agents used were Profluorid Varnish (Voco: Cuxhaven Germany), Admira Protect (Voco: Cuxhaven Germany), and PRG-Barrier Coat (Shofu: Japan). One operator recorded the baseline sensitivity scores. A second operator who was not aware of the baseline values applied the desensitizing agents and recorded the sensitivity scores. VAS scores for both the stimuli were noted immediately after application, 1 week, and after 1 month. The data were analyzed using repeated measure ANOVA and post hoc Tukey's multiple comparison tests. There was a significant reduction in VAS scores from baseline in all the three groups at all the time intervals. Admira Protect showed significant reduction of hypersensitivity scores at 1 month compared to the other groups. It was concluded Admira Protect was proved to be better in reducing pain due to DH than PRG-Barrier Coat and Profluorid Varnish after 1 month of application.

In a randomized, double-blind, split-mouth clinical trial, Madruga et al. (2017) performed a comparison of the desensitizing efficacy of resin-modified glass ionomer cement (GIC) Clinpro™ XT and the conventional GIC Vidrion R. Subjects were required to have at least two teeth with dentin hypersensitivity. Teeth were divided at random into 2 groups, one group received Clinpro XT and the other conventional GIC Vidrion R. Treatments were assessed by tactile and air blast tests using Visual Analogue Scale (VAS) at baseline, after 20 minutes, and at 7, 15, 21, 30, 90 and 180 days post-treatment. Twenty subjects (152 teeth) were included. Both tests (tactile and air blast) showed a significant reduction of dentin hypersensitivity immediately after the application of Vidrion R and Clinpro XT (20 min). VAS scores obtained along the 6-month follow-up were statistically lower when compared to initial rates ( $p < 0.05$ ). Both GIC were able to reduce dentin hypersensitivity up to 6-month post-treatment period without statistically significant differences among them ( $p > 0.05$ ). Both cements provided satisfactory results in long-term dental sensitivity reduction.

In a randomized clinical trial, Han et al. (2017) evaluated the clinical efficacy of five commercially available desensitizing agents with different mechanisms applied to hypersensitive teeth. The study included 64 individuals that met the criteria and each was randomly assigned to five commercially available desensitizing agents, and applied according to the manufacturers' instructions. Before and after application of desensitizing agents, subjects were evaluated with the Visual Analogue Scale (VAS) at baseline, 1 week, 1 month and 3 months; no statistically significant differences between the products was shown. Desensitizing agents used in this clinical trial relieved dentin hypersensitivity up to 3 months. The authors concluded the five tested desensitizing agents with different mechanisms were clinically effective in relieving dentin hypersensitivity up to 3 months and showed statistically significant pain reduction when compared to baseline scores.

Vano et al. (2017) conducted randomized double-blind clinical trial aimed to compare the efficacy in reducing dentin hypersensitivity of a dentifrice formulation containing nano-hydroxyapatite with a fluoride dentifrice and a placebo. One hundred and five subjects were recruited to participate in the study. A computer-generated random table was used in order to have 35 subjects per group: (1) nano-hydroxyapatite 2% gel toothpaste fluoride free; (2) fluoride gel toothpaste; (3) placebo. Groups 1, 2, and 3 were instructed to treat their teeth for 10 min twice a day with the provided toothpaste gel. The participant's dentin hypersensitivity was evaluated at baseline and after 2 and 4 weeks. It was concluded the application of nano-hydroxyapatite in a gel-toothpaste is an effective desensitizing agent providing relief from symptoms after 2 and 4 weeks.

Craig et al. (2013) conducted a double-blind, randomized clinical trial. A total of 19 subjects with dentine hypersensitivity on both sides of their upper arch were selected. The most sensitive tooth in each quadrant was identified and received a cold stimulus. The response was recorded on a visual analogue scale (VAS). The tooth selected was treated with one of the treatment agents. One week later the level of dentine sensitivity was assessed. Participants were also asked for their subjective assessment of treatment effects.

The mean difference between VAS at baseline and seven days for teeth treated with diamine silver fluoride/potassium iodide was greater than that for teeth treated with the oxalic acid-based preparation. The subjects' subjective assessment of changes in dentine hypersensitivity indicated that more obtained relief with the diamine silver fluoride/potassium iodide treatment. The authors concluded that a diamine silver fluoride/potassium iodide product has potential as a treatment for dentine hypersensitivity.

Ding et al. (2014) This short-term (4-week) randomized, double-blind, placebo-controlled, split-mouth study evaluated the effect of Clinpro XT Varnish (VXT) paste-liquid, resin-modified glass-ionomer and the resinous dentin desensitizing varnish and Gluma Dentin Desensitizer (Gluma) in treating dentin hypersensitivity (DH). A total of 119 teeth from 31 individuals were randomized into three groups: VXT, Gluma, and placebo (warm water). Dentin sensitivity was evaluated by subjects' perception of DH determined by pretreatment tooth sensitivity score (TSS) measured on a 0-10 visual analogue scale (VAS) after tactile (probe) or thermal/evaporative (blast of air) stimuli. TSS was scored at baseline, immediately after treatment (Day 0), after 1 week and after 4 weeks. For both stimuli, mean TSS was significantly decreased in the VXT and Gluma groups at all time points compared with baseline. Regarding comparisons of TSS between treatment groups, the VXT group had significantly lower mean TSS compared with the Gluma group and placebo control group at all time points after treatment regardless of stimuli.

Pandit et al. (2012) conducted a randomized clinical trial was designed to compare the efficacy of two commercially available desensitizing agents (fluoride varnish containing 6% sodium fluoride and 6% calcium fluoride and a gel containing 6% potassium nitrate and 0.11% fluoride ions) in the treatment of dentinal hypersensitivity. Twenty-one patients were selected. Subjects were evaluated using three different stimuli, i.e., tactile test, air blast test and cold water test. They were then randomly divided into two groups. Patients in group I were treated with fluoride varnish and group II patients were treated with gel containing 6% potassium nitrate and 0.11% fluoride ions. The patients were examined at baseline, immediately after application of the agent, at 1 week, 1 month and 3 month intervals. The results showed that patients treated in group I showed significantly better results compared to group II patients at 1 month and 3 months interval. Teeth which required repeat dose and those which did not require repeat dose were comparable in number. The authors concluded that both the agents showed significant reduction in sensitivity at all-time intervals compared to baseline. A comparatively significant reduction in sensitivity score was seen in patients treated with fluoride varnish and it appeared to be more effective in providing long-term relief against all the three test stimuli.

Petersson, Lars G (2013) conducted a literature review of original scientific papers from clinical trials listed in PubMed and Medline from 2000 to October 2011 for studies using fluoride to control dentin hypersensitivity (DHS) and prevent root caries. The results showed that fluoride toothpaste shows a fair effect on sensitive teeth when combined with dentin fluid-obstructing agents such as different metal ions, potassium, and oxalates. Fluoride in solution, gel, and varnish give an instant and long term relief of dentin and bleaching hypersensitivity. Most fluoride preparations in combination with dentin fluid obstruction agents are beneficial to reduce DHS, while prevention of root caries is favorable with higher fluoride concentrations. The authors concluded that fluoride is an effective agent to control DHS and to prevent root caries particularly when used in higher concentrations.

### **Interim Caries Arresting Medicament Application**

Horst et al. (2016) authored a manuscript on rationale, indications and consent for using silver diamine fluoride. Nine published randomized clinical trials were reviewed each involving hundreds of children age 3-9 or adults aged 60-89 with at least one year duration of the study. The findings showed silver diamine fluoride outperformed standard fluoride varnish and was equivalent or better than glass ionomer cement. Direct application to healthy surfaces of children's teeth also prevented caries. These studies show that 38% silver diamine fluoride is effective in preventing carious lesions.

In a systematic review with meta-analysis, Oliveira et al. (2018) assessed the effect of silver diamine fluoride (SDF) in preventing and arresting caries in exposed root surfaces of adults. The authors found 2,356 unique records and included 3 trials in which the investigators randomly assigned 895 older adults. Investigators in all studies compared SDF with a placebo; investigators in one also compared 38% SDF with chlorhexidine and sodium fluoride varnishes. The studies had low risk of bias in most domains. SDF applications had a significantly better preventive effect in comparison with the placebo, and they were as effective as either chlorhexidine or sodium fluoride varnish in preventing new root carious lesions. SDF also provided a significantly higher caries arrest effect than did the placebo. Complaints about black staining of the carious lesions by SDF were rare among older adults. The authors concluded yearly 38% SDF applications to exposed root surfaces of older adults are a simple, inexpensive, and effective way of preventing caries initiation and progression.

Contreras et al. (2017) evaluated the scientific evidence regarding the effectiveness of silver diamine fluoride (SDF) in preventing and arresting caries in the primary dentition and permanent first molars. A systematic literature review was performed using PubMed, ScienceDirect, and Scopus. Articles from 2005 to January 2016 were searched and 7 publications were included. These included 1 study assessing the effectiveness of SDF at different concentrations; 3 studies comparing SDF with other interventions; 2 investigations comparing SDF at different application frequencies and with other interventions; and 1 study comparing semiannual SDF applications versus a control group. The study indicated at concentrations of 30% and 38%, SDF shows potential as an alternative treatment for caries arrest in the primary dentition and permanent first molars. To establish guidelines, more studies are needed to fully assess the effectiveness of SDF and to determine the appropriate application frequency.

Gao et al. (2016) performed a systemic review of 2,177 papers including 17 randomized trials from 1948 to 2014. Data of the selected studies were divided into two groups. Group one had ten studies, which investigated the use of professional fluoride application to remineralise early enamel caries or white spot lesions. Group two comprised studies investigating the arresting effect of fluoride in dentine caries. Meta-analysis using the random-effects model was used to evaluate the overall percentage of remineralised early enamel caries and to show the effective weight of each study in this review according to the sample size and calculated percentage of remineralised early enamel caries. For studies investigating dentine caries, the total number of active dentine caries surfaces at baseline and the total numbers of arrested dentine caries surfaces after intervention were used to calculate the caries arresting rates. The conclusion showed silver diamine solution at 38% is effective in arresting active dentine caries and the capability to remineralise early enamel caries in children.

Zhi et al. (2012) conducted a randomized clinical trial with 212 children that had a total of 719 active dentine caries lesions. After 24 months, 181 children remained in the study. This study addressed annual application of silver diamine fluoride solution or high fluoride-releasing glass ionomer. Both topical applications arrest active dentine caries. Increasing the frequency application of silver diamine fluoride to every 6 months can increase the caries arrest rate.

Gluzman et al. (2012) conducted a literature review of 31 studies. The goal of this literature review was to conduct a systematic review on the effectiveness of the seven leading preventive agents for root caries and to provide recommendations for use to the general population of healthy older adults as well as specific recommendations for vulnerable older adults. Results showed the recommended choice for primary prevention of root caries is a 38% Silver Diamine Fluoride solution professionally applied annually; the recommended secondary prevention of root caries, is fluoride varnish professionally applied every 3 months.

Mei et al. (2014) conducted an ex vivo study in association with a 24 month randomized clinical trial approved for the University of Hong Kong. The clinical trial compares the effectiveness of biannual silver diamine fluoride (SDF) application on arresting caries treatment. Ninety-eight four year old children with active caries on primary teeth were recruited. Their carious teeth were dried and cleaned and then application of 38% SDF solution was applied. At the end of the 24 month study, six 6 year old children were chosen for extraction of their primary upper central incisors with arrested cavitated dentinal lesions treated with biannual SDF in addition to 6 incisors with cavitated dentinal lesions with no topical fluoride application were collected. The study concluded a highly remineralised zone rich in calcium and phosphate was found on the arrested cavitated dentinal lesion of primary teeth with an SDF application. Clinical SDF application positively influences dentine remineralization.

Rosenblatt et al. (2009) performed a systemic review asking if silver diamine fluoride (SDF) would more effectively prevent caries than fluoride varnish. 99 human clinical trials were identified between 1966 and 2006 with only 2 meeting the inclusion criteria. The results suggest that SDF is more effective than fluoride varnish, and may be a valuable caries-preventive intervention.



## **Professional Societies**

### ***American Academy of Pediatric Dentistry (AAPD)***

The AAPD Council of Clinical Affairs policy on the use of silver diamine fluoride (SDF) for pediatric dental patients states the following:

- The AAPD supports the use of SDF as part of an ongoing caries management plan for the patient with the aim of optimizing individualized patient care.
- The AAPD supports third party reimbursement for fees associated with SDF.
- The AAPD encourages more practice-based research to be conducted on SDF to evaluate its efficacy.

## **U.S. FOOD AND DRUG ADMINISTRATION (FDA)**

Fluoride varnish currently has FDA approval as a cavity liner and desensitizer, and the application as a caries preventive agent is considered off label use. There are extensive manufacturers of fluoride varnish. See the following website for more information and search by specific product name: <http://www.fda.gov/MedicalDevices/default.htm>. (Accessed January 16, 2018)

The FDA cleared Diamine Silver Fluoride Dental Hypersensitivity Varnish in July of 2014. Application as a caries arresting agent is considered off label use. The varnish is a Class II device intended to block dentinal tubules for the purpose of reducing tooth sensitivity. For additional information, please see the following: <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfpmn/pmn.cfm?ID=K102973>. (Accessed January 16, 2018)

There are extensive products for in office application that have FDA clearance for reducing dental hypersensitivity. Please refer to the following website and search for product specific name: <http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfPMN/pmn.cfm>. (Accessed January 16, 2018)

## **REFERENCES**

American Dental Association (ADA). Glossary of Dental Clinical and Administrative Terms.

American Dental Association (ADA) CDT Codebook 2019.

American Academy of Pediatric Dentistry (AAPD). Guideline on caries-risk assessment and management for infants, children, and adolescents. Available at: [www.aapd.org](http://www.aapd.org).

AAPD. Policy on the Use of Silver Diamine Fluoride for Pediatric Dental Patients. *Pediatr Dent*. 2017 Sep 15;39(6):51-53. Revised 2018.

Ashwini S, Swatika K, Kamala DN. Comparative Evaluation of Desensitizing Efficacy of Dentifrice Containing 5% Fluoro Calcium Phosphosilicate versus 5% Calcium Sodium Phosphosilicate: A Randomized Controlled Clinical Trial. *Contemp Clin Dent*. 2018 Jul-Sep;9(3):330-336.

Castillo JL, Rivera S, Aparicio T, et al. The short-term effects of diammine silver fluoride on tooth sensitivity: a randomized controlled trial. *J Dent Res*. 2011 Feb; 90(2):203-8.

Contreras V, Toro MJ, Elías-Boneta AR, et al. Effectiveness of silver diamine fluoride in caries prevention and arrest: a systematic literature review. *Gen Dent*. 2017 May-Jun;65(3):22-29.

Craig GG, Knight GM, McIntyre JM. Clinical evaluation of diamine silver fluoride/potassium iodide as a dentine desensitizing agent. A pilot study. *Aust Dent J*. 2012 Sep; 57(3):308-11.

Ding YJ, Yao H, Wang GH, et al. A randomized double-blind placebo-controlled study of the efficacy of Clinpro XT varnish and Gluma dentin desensitizer on dentin hypersensitivity. *Am J Dent*. 2014 Apr; 27(2):79-83.

Gao SS, Zhang S, Mei ML, et al. Caries remineralisation and arresting effect in children by professionally applied fluoride treatment - a systematic review. *BMC Oral Health*. 2016 Feb 1; 16:12.

Gluzman R, Katz RV, Frey BJ, et al. Prevention of Root Caries: A Literature Review of Primary and Secondary Preventive Agents. *Special care in dentistry : official publication of the American Association of Hospital Dentists, the Academy of Dentistry for the Handicapped, and the American Society for Geriatric Dentistry*. 2013; 33(3):133-140.

Han KH, Hong JH, Shin JH, et al. Effects of desensitizing agents for cervical dentin hypersensitivity: A randomized clinical trial. *Am J Dent*. 2017 Apr;30(2):84-88.

Horst JA, Ellenikotis H, UCSF Silver Caries Arrest Committee, Milgrom PM. UCSF Protocol for Caries Arrest Using Silver Diamine Fluoride: Rationale, Indications, and Consent. *Journal of the California Dental Association*. 2016; 44(1):16-28.

Haupt M. Topical application of silver diamine fluoride may arrest dental caries. *J Evid Based Dent Pract*. 2011 Mar; 11(1):54-5.

Madruga MM, Silva AF, Rosa WL, et al. Evaluation of dentin hypersensitivity treatment with glass ionomer cements: A randomized clinical trial. *Braz Oral Res*. 2017 Jan 5;31:e3.

Mei ML, Ito L, Cao Y, Lo EC, Li QL, Chu CH. An ex vivo study of arrested primary teeth caries with silver diamine fluoride therapy. J Dent. 2014 Apr; 42(4):395-402.

Mosby's Dental Dictionary, 2<sup>nd</sup> edition (2008). <http://medical-dictionary.thefreedictionary.com/remineralization>. Accessed September 10, 2018.

Oliveira BH, Cunha-Cruz J, Rajendra A, Niederman R. Controlling caries in exposed root surfaces with silver diamine fluoride: A systematic review with meta-analysis. J Am Dent Assoc. 2018 Aug;149(8):671-679

Pandit N, Gupta R, Bansal A. Comparative evaluation of two commercially available desensitizing agents for the treatment of dentinal hypersensitivity. Indian J Dent Res. 2012 Nov-Dec; 23(6):778-83.

Petersson LG. The role of fluoride in the preventive management of dentin hypersensitivity and root caries. Clin Oral Investig. 2013 Mar; 17 Suppl 1:S63-71.

Ravishankar P, Viswanath V, Archana D, et al. The effect of three desensitizing agents on dentin hypersensitivity: A randomized, split-mouth clinical trial. Indian J Dent Res. 2018 Jan-Feb;29(1):51-55.

Rosenblatt A, Stamford TC, Niederman R. Silver diamine fluoride: a caries "silver-fluoride bullet". J Dent Res. 2009 Feb;88(2):116-25.

Vano M, Derchi G, Barone A, et al. Reducing dentine hypersensitivity with nano-hydroxyapatite toothpaste: a double-blind randomized controlled trial. Clin Oral Investig. 2017 Mar 30.

Weyant RJ, Tracy SL, Anselmo TT, et al. American Dental Association Council on Scientific Affairs Expert Panel on Topical Fluoride Caries Preventive Agents. Topical fluoride for caries prevention: executive summary of the updated clinical recommendations and supporting systematic review. J Am Dent Assoc. 2013 Nov;144(11):1279-91.

Zhi QH, Lo EC, Lin HC. Randomized clinical trial on effectiveness of silver diamine fluoride and glass ionomer in arresting dentine caries in preschool children. J Dent. 2012 Nov; 40(11):962-7.

#### POLICY HISTORY/REVISION INFORMATION

Date	Action/Description
11/01/2018	<ul style="list-style-type: none"><li>Updated supporting information to reflect the most current clinical evidence and references; no change to coverage rationale or list of applicable codes</li><li>Archived previous policy version DCP034.03</li></ul>