

Root of the Matter: Silver Diamine Fluoride

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On February 20, 2017, Health Canada approved **38% Silver Diamine Fluoride**, under the brand name **Advantage Arrest** by the **Elevate Oral Care** company for use as an anti-caries agent for those from childhood (minimum 3 years of age) to adults.¹

Efficacy and safety for the use of Silver Diamine Fluoride (SDF) has been documented over an 80 year span in Japan.^{2,3,4,5} Research has shown that SDF has had a positive effect for the control and management of both dentin and enamel carious lesions (up to 150microns thick).¹ The fluoride promotes remineralization, while the silver acts as an antimicrobial.^{2,3,4,5} Due to the high concentration of F⁻ and silver ions, there is a substantial reduction in the growth of cariogenic biofilm both on the tooth surface and in dentinal tubules.^{1,3} Lesions that are treated with SDF have increased mineral content thus decreasing the depth of the lesion and increasing the hardness, and in turn arresting the lesion.^{2,3,5}

A disadvantage when using SDF is the black staining that occurs on the lesion that is being treated. In addition to the side effect of treated lesions turning black, there are contraindications for use of SDF. These include: silver allergy and significant desquamative processes (e.g., ulcerative gingivitis, stomatitis).²

In British Columbia, the Scope of Practice for dental hygienists allows for the application of anticariogenic agents.⁶ As such, dental hygienists may use silver diamine fluoride (Advantage Arrest) as an anti-caries protective agent once a caries risk needs assessment has been completed. Options for including SDF within the treatment plan need to be discussed with the client along with any referral needs. The discussion should outline the benefits and risks of the procedure as well as any side effects of SDF and incorporate an evaluation on the effectiveness of the treatment.

While dental hygienists cannot diagnose decay, they are required to identify the caries risk by completing a caries risk assessment. This product is particularly indicated for those who do not have access to dental care or when timely restorative needs are not available. SDF is not a replacement for restorative treatment, and application should be completed in collaboration with the dentist and complement the dental treatment plan. When treatment planning the need for silver diamine fluoride, an identification of the client's unmet human need must be incorporated to support the need for the intervention. Analysis of the human needs is based on the *Human Needs Conceptual Model of Care*⁷. Examples of the human needs, related to incorporating silver diamine fluoride into the dental hygiene treatment plan, may include:

- **Freedom from pain** – this is the physical discomfort, pain and/or sensitivity in the head and neck region
- **Biologically sound and functional dentition** – this is the need for intact and sound tooth structure that ultimately reduces retention sites for cariogenic bacteria as well as allowing function for day-to-day oral activities, such as speech, eating and esthetics.

Before integrating SDF into the practice setting, registrants need to have appropriate knowledge and abilities related to the following:

- Rationale for application (adapted from the *Journal of the California Dental Association*)²
 - those without access to dental care.
 - extreme caries risk (xerostomia, severe early childhood caries);
 - treatment challenged by behavioral or medical management;
 - client with carious lesions that cannot be treated in one visit as guided by the dentist’s treatment plan;
 - difficult to treat lesions (as guided by the dentist’s treatment plan);
- Tooth selection
- Informed consent including communications for the benefits and risks
- Application technique including protective barriers for clinician and client
- Understanding maximum dose per age
- Understanding contraindications for use
- Application for use as guided by the CDHBC Scope of Practice

As with all products being introduced into the dental hygiene practice setting, it is the registrants’ responsibility to understand side effects and or contraindications for the use of the product. For example, this risk of temporary staining of mucosal tissue, and or soft dentin, as well as not applying if the client has ulcerative gingivitis and or stomatitis or an allergy to silver just to name a few. The material safety data sheet (MSDS) should be reviewed and kept on file. As well, infection and prevention and control protocols are required during the application of this anticariogenic product.

As a health care professional, a collaborative approach with the dentist is expected to ensure the overall oral health needs of the client are being met. Once SDF has been applied for the purpose of arresting a carious lesion, a referral to a dentist is required to ensure definitive restorative needs are addressed. Permanent restorative care may be required to maintain the integrity of the tooth to prevent any further breakdown, to enhance function or to improve esthetics.

As guided through the CDHBC Practice Standards, documentation is required for aspects of the assessment, diagnosis, planning, implementation and evaluation (ADPE) related to SDF. This includes the caries risk assessment, treatment planning and informed consent, application, post-operative instructions and any referrals made.

References:

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