

Riva Star



4.3



ORIGINAL POST DATE

March 08, 2021

MANUFACTURER/DISTRIBUTOR

SDI

WEBSITE

<http://www.sdi.com.au/>

RAVES & RANTS

- + KI component can minimize staining
- + Does not affect bond strength
- High pH can cause soft tissue irritation
- Does not totally eliminate staining

PRICES

Unit dose kit (20)
\$107.53 (\$5.38/capsule)

Bottle kit (4.5ml)
\$107.53 (\$23.90/ml)

SHELF LIFE

Unit dose 2 years refrigerated

Bottles 2 years room temperature

INTRODUCTION/MANUFACTURER'S CLAIMS

Treating teeth with carious lesions is always a hot topic, but has become downright sizzling lately. Even diagnosis has changed, with tactile discovery using a sharp explorer being discouraged to eliminate iatrogenic damage and false positives. While remineralizing approaches without any cavity preparation has obvious appeal, minimally invasive techniques are trending with great gusto.

Before we go any farther, we need to emphasize that **REALITY** has been encouraging minimally invasive dentistry since our inception 35 years ago. So even though it is trending now, there is really nothing new about this approach except for the latest generation of materials.

Which brings us to Riva Star. Although it is badged as a "tooth desensitizing agent" to stay on the good side of onerous government regulators, its real importance is the promise that it can inhibit or even reverse the progression of a carious lesion without having to remove all the carious tooth structure as a feature of its SDF (silver diamine fluoride) component.

Of the evaluators who used it to inhibit carious progression, most (62.5%) felt comfortable not removing all carious dentin and risking a pulpal exposure, while the others (37.5%) still preferred to remove all carious dentin. Some comments:

- My real answer is it depends on every case--size and depth of prep, age of tooth, previous restorative history of tooth, etc.
- I also used HealOzone when I placed a restoration over it and always only restored on 1 mm of caries as I knew this combination would give me excellent results.
- More and more so. I think our concepts of "affected" and "infected" dentin need to be updated.
- Neither answer really works for me. For comprehensive care I will use Biodentine to avoid endo and I am confident of pulpal longevity. I use SDF in situations where I want to arrest decay because of time constraints or on special needs patients, the elderly or around a crown which cannot be restored easily or soon. Biodentine is my go-to in areas of deep decay.
- Actually I'm more half way. I will leave a small amount but not a lot and with no symptoms reported by the patient.

Most (54%) evaluators did follow the company line and only used it as a desensitizer, 23% used it to arrest caries, and 23% used it for both functions. Some comments:

- It is very effective.
- Boy, that first bottle really stinks, takes your breath away. I like the clear color taking the black out, but this is only if residual caries is left. Plus it is cheaper than Advantage Arrest (see below).
- This product does work!
- Prefer to use Superseal for desensitization.
- I have many other ways of desensitizing like Super Seal. No reason to use this for sensitivity.

- It seems to work well for my patients.
- Used mostly on posterior teeth.

How can it perform this miracle? Presumably through the interaction of its prime ingredients, namely silver diamine fluoride (SDF) and potassium iodide (KI). These components provide a powerful antibacterial effect, while in addition, there is a low-solubility precipitate that is formed, which seals dentinal tubules and thus the desensitizing effect is achieved. Furthermore, it has been found to increase the bond strength of self-cured glass ionomer cement to dentin.

According to one of its creators, Dr. Geoff Knight, when KI is applied over SDF, free silver ions precipitate out as silver iodide and prevent the propensity for SDF to stain either a glass ionomer used to restore a prep or the surrounding tooth structure. Most (83%) evaluators found that KI helped control the staining most of time, but didn't eliminate it, while the other 17% stated that they still had staining most of the time.

COMPOSITION

Step 1 Silver Diamine Fluoride (SDF) 63%

- Silver 32.3%
- Fluoride 5.7%
- Ammonia 25%

Step 2 Potassium Iodide (KI) 58.3%

PH

Step 1 (SDF) 13 (9 after KI is applied)

Step 2 (KI) Not disclosed by manufacturer

USE

If you want to use it as a desensitizer for exposed roots and/or abfraction lesions, clean the sensitive area as you would with any product. Isolate and blot the tooth dry. Since Step 1 (SDF) has a pH of 13, it can cause soft tissue burns. Therefore, it would be prudent to apply a resin shield (the type you use when performing in-office bleaching), petroleum-like jelly, or even a dental dam (unlikely if you are not anesthetizing the patient) to protect the marginal gingiva. While it is doubtful you will use a dental dam, if you do use it and have to anesthetize the patient, you will not be able to get the immediate feedback if the desensitization actually worked.

Then, if you are using the unidose kit, take a silver capsule (SDF), which looks like a glass ionomer or amalgam capsule that has been on a diet and, using the silver applicator tip, pierce the foil top seal and push the edges of the foil to the circumference of the aperture to open the capsule maximally. This piercing motion requires moderate pressure, causing one of our applicator tips to bend at its thin neck. Apply the clear SDF solution to the target site. The instructions do not detail the application technique, so we just applied it with gentle agitation without rubbing or scrubbing.

Next, working fast, take a lime green capsule (KI), pierce its foil top with the green applicator tip, and apply the KI solution over the SDF. Keep applying the KI until the creamy white mixture turns clear. Then blot dry and remove the gingival protection.

If you are using the bottles instead of the capsules, you are supposed to dispense one drop of SDF, apply it, and then dispense 2 drops of KI and apply as noted above.

For the evaluators who used it to desensitize teeth, the SDF component was most often placed for 15 seconds (44%) or 30 seconds (44%), while 12% preferred 60+ seconds. As far as desensitization effectiveness is concerned, half of the evaluators found it worked all of the time, while the other half reported it worked most of the time.

For use in carious teeth, you would remove only enough enamel to gain access to the lesion. Excavate the soft “infected” dentin from the lesion. One of the developers, Dr. Geoff Knight, believes creating a shallow trough into sound dentin with a slowspeed round bur around the remaining carious dentin is a prudent step.

Then, although not recommended by SDI, we believe cleaning the prep with a pumice slurry (very inexpensive) or any non-fluoridated cleaning paste is also a prudent step. Follow this by rinsing and drying with air. Then SDI recommends that you etch the prep with conventional phosphoric acid for only five seconds, and again rinse and blot dry.

Apply SDF liberally followed by KI, then rinse again and blot dry. Restore the entire cavity with conventional, self-cured glass ionomer if the restoration is intended to be interim or the glass ionomer can replace the lost dentin and you can veneer it with composite for more durability and much better esthetics. As expected, some type of ionomer was the preferred material by most (80%) evaluators, while a bonded composite was favored by the other 20%. One evaluator found glass ionomer was best in masking the residual SDF staining. And there were no debonds for either type of material.

For the evaluators who used it to arrest caries, most (67%) evaluators placed the SDF component for 15 seconds, while the other 33% were evenly split between 45 seconds and 60 seconds.

Note: According to the manufacturer, you must apply the KI immediately after the SDF for the technique to work. In addition, both components are only active for five minutes after opening the capsules.

Finally, there is a stern warning not to use the product on anterior teeth due to the staining potential of SDF. According to SDI, this can happen if the product is “incorrectly used”.

PACKAGING

Unidose Kit Comes in a conventional, white and lime green cardboard box with a few gray accents and is sealed with tape. Product identification is on the top and three sides. You don't have to search for the storage temperature — there is a KEEP REFRIGERATED banner right on the top. A label on the bottom has both the manufacturing and expiration dates.

Interestingly, despite the obvious restorative uses of this product, the front of the lid discretely states that the product is to be used for “Treatment of Dentinal Hypersensitivity” in “Adults over the age of 21”. We are not sure why 21 is a magical age, but this must have something to do with complying with all the myriad restrictions from various government entities. You obviously can use it for caries inhibition in even small children.

Inside is a white plastic tray securing the contents, which are nicely organized. The color-coded silver and lime green capsules are housed in separate recesses adjacent to similarly color-coded applicator tips.

Bottle Kit Small white cardboard box with product identification on the top, front, back, and one side. A label on the side has both the manufacturing and expiration dates. Interestingly, the bottles don't need to be refrigerated like the capsules. According to SDI, the capsules somewhat expand under heat, which will put pressure on the foil seals, so keeping them in the refrigerator can eliminate any leakages. Since the bottles do not have foil seals, they don't need refrigeration.

There is a perforated strip near the bottom of the box. Although there are no indications on the box to pull the tab at one end of the perforated strip, we assumed this is reason it is there in the first place. When you pull this tab to remove this strip, the box becomes divided into a top and bottom section.

The top section has the two bottles of solution in a small, recloseable plastic bag, while the bottom section has a black cardboard bottle stand with receptacles clearly marked Step 1 and Step 2. The Step 1 bottle, which is the smaller of the two, contains the SDF and has a gray label that identifies the product, notes that it is SDF, and includes the expiration date. The larger Step 2 bottle has a lime green label that also identifies the product but not that it is KI and includes the expiration date. Both of these bottles are conventional squeeze types.

Most (62%) evaluators preferred the capsules, while 23% chose the bottles and 15% had no preference. Some comments:

- I'm more used to dispensing materials from bottles, so it seemed quicker and more efficient; using the capsules and piercing the foil seemed like it was less efficient.
- Capsules are less messy and cleaner.
- Bottle is only a preference but it would depend on whether the chemical will be spoiled once it is exposed to air.
- Capsules are best for cross infection reasons.
- You can control the amount with bottles, no waste, probably cheaper.
- Capsules are easy to use and the instructions were informative and the application procedure was easy.

Overall, the packaging was considered to be adequate by most (69%) evaluators, while the other 31% found it to be exemplary. One evaluator liked the color-coding, while another did not appreciate not having a cover over the capsules that could prevent them from spilling out if the box was accidentally tipped over.

DIRECTIONS

Our kits came with plain paper directions only in English. The font is small, but you should be able to read the instructions without loupes. The information is reasonably easy to follow, but as noted previously, there is no mention about how long to apply the SDF.

In the unidose kit, there is also a plastic-coated, double-sided technique card with well-done color illustrations demonstrating its use in a step-wise manner. This is much better than the paper version and uses a font that can be read without creating eyestrain, but it only covers the desensitizing function. As noted previously, there is a red WARNING blurb at the top of the card, emphasizing that anterior teeth could be stained if the product is used improperly.

Most (61%) evaluators found the directions to be adequate, while 31% thought they were exemplary and 8% were not impressed at all. Some comments:

- Seemed unclear about how long to apply SDF before applying KI.
- How long after desensitizer application can the patient eat and drink? I could not find this information in directions.
- Easy to follow.
- The instruction card with information and schematic drawing is very convenient.
- Very technique sensitive, needed to read directions several times.

REALITY > REVIEW

Overall

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Strengths

Effective desensitizer -- works immediately after application. Arrests caries and can help with minimally invasive procedures in certain circumstances. KI can help in minimizing SDF staining. Nice to have dispensing options. Good alternative for pediatric dentistry when patients are anxious about more invasive treatment. Color-coded capsules and applicator tips make it easier to apply. Can quickly stabilize a patient with numerous gross carious lesions. Quick and easy to apply. Also effective in occlusally eroded teeth. Our tests found that it does not affect bond strength if you are using composite as the restorative material. Alluring packaging.

Weaknesses

Due to very high pH, it can cause severe soft tissue irritation. Does not eliminate SDF staining completely when restoring a carious lesion. Can stain skin, clothing, and hard surfaces.

BOTTOM LINE

SDF has the potential to help many patients. Internationally, it has been used for pediatric applications for quite some time, but using it on adults, especially the underserved, institutionalized and geriatric populations, for both caries control and desensitization, is more recent. In the U.S., only two products have FDA clearance: Riva Star and Advantage Arrest. Although we have not had an opportunity to evaluate AA, evaluators who have used it were split evenly on which they preferred. AA has a lower pH and only one component, but there is no mitigation of staining. RS with its KI component at least can reduce the amount of staining, making it a wise addition to your restorative and preventive arsenal. Note that when using it to arrest caries in preps when you don't remove all the carious tooth structure, the tooth must be asymptomatic and have no radiographic evidence of pulpal disease.