ELIMINATE SENSITIVITY

CLINICAL EVALUATION OF TOP CENTRIX DESENSITIZERS

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3 Easy Solutions for Your Practice

Dentinal hypersensitivity is a common condition for dentists and their patients. According to data published by JADA, approximately **1 in 8 adults suffer from hypersensitivity**[1]. This condition is not only painful and uncomfortable for the patient but also poses a challenge to the clinician. Understanding how to prevent sensitivity before it can occur, and how to treat post-op sensitivity, is an important need for every dental practice.

We've developed three unique solutions to help prevent or eliminate common causes of sensitivity.

PREVENT THE DEVELOPMENT OF SENSITIVITY BEFORE IT CAN BEGIN

Glu/Sense™
Dentin Pre-Treatment Desensitizer Gel

ELIMINATE POST-OP SENSITIVITY

D/Sense® Crystal™
Dual-Action Crystal Precipitate Desensitizer Gel

ELIMINATE SENSITIVITY CAUSED BY CARIES

SilverSense SDF®
38% Silver Diamine Fluoride

centrix® MAKING DENTISTRY EASIER®

PREVENT THE DEVELOPMENT OF SENSITIVITY BEFORE IT CAN BEGIN – WITH GLU/SENSE

During tooth preparation, for both direct and indirect restorations, there are many factors that can cause post-operative sensitivity, typically due to irritation or injury to the dentin or pulp.

These include:

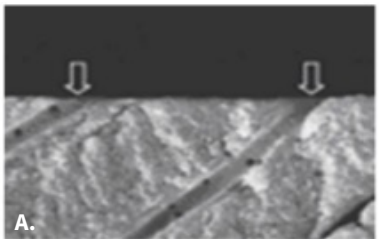
- **Dentinal Tubule Exposure** where the removal of enamel or superficial dentin exposes open dentinal tubules allowing external stimuli (cold, heat, air, sweets) to cause fluid movements within the tubules, stimulating nerve endings and triggering sharp pain.
- **Desiccation**, or over-drying from aggressive air-drying or suction, removes dentinal fluid and can cause the collapse of the tubules and sudden fluid shifts that irritate the pulp, leaving the tooth with heightened sensitivity to thermal or osmotic changes.
- **Mechanical Trauma** from aggressive cutting or vibration could damage odontoblasts. The resulting inflammatory response can cause transient or persistent sensitivity.
- **Use of Irritants** like acid etchants, unbuffered liners, or improperly cured resins can result in pulpal inflammation from chemical insult or cytotoxicity.
- **Polymerization Shrinkage**, especially in direct resin restorations, results in gaps at the tooth-restoration interface, leading to microleakage and post-op sensitivity.

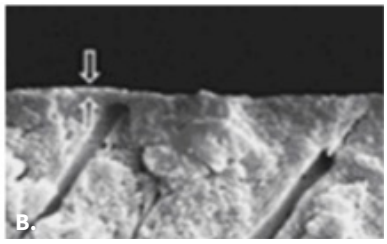
GLU/SENSE is a glutaraldehyde-based hydroxyethyl methacrylate (HEMA) substance that functions to disinfect the tooth and aid in the coagulation of collagen[2]. Glu/Sense is designed for preventive use during preparation of the tooth for direct or indirect restoration to occlude the dentinal tubules and stabilize the collagen matrix for long-term elimination of post-operative sensitivity, whether caused by mechanical, thermal or chemical trauma. And, because it is clear, Glu/Sense is ideal for use in direct and indirect esthetic restorations ensuring beautiful results.

GLU/SENSE HAS A TRIPLE EFFECT

- Reduces tooth sensitivity by occluding dentinal tubes
- Promotes adhesion due to HEMA presence[3]
- Provides an antibacterial effect[4]

The glutaraldehyde in Glu/Sense kills the remnant bacteria inside the preparation. Glutaraldehyde is a biological fixative and intrinsically blocks dentinal tubules. HEMA is a hydrophilic monomer that blocks the tubules through coagulation of dentinal fluid proteins within the tubules. This combined effect **stops the pain** transmission that arises due to fluid movements[5].





SEM images* showing:
A. Open dentinal tubules

B. HEMA glutaraldehyde-treated dentin for comparison. Tubules are effectively occluded.

The exposure of deep dentin is common during cavity preparation. When coupled with high heat from rotary instruments and dentin dehydration, the result is sensitivity, which is exacerbated by acid-etching. Without intervention, post-operative sensitivity can occur. **Glu/Sense induces coagulation of proteins within the dentinal tubules**. This coagulation of collagen occludes the dentinal tubules thus reducing the dentin's ability to transmit pain to the pulp[6].

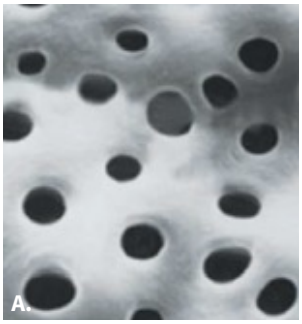
The HEMA wets the tooth surfaces, drawing the bonding resin into the dentinal canals, resulting in a significant reduction in tooth sensitivity. It is used like a liner under direct composite or indirect prosthetic restorations to seal the dentinal tubules and prevent post-operative sensitivity from occurring. When applied in the prep before dentin adhesives, Glu/Sense will not affect the bonding of the restorative material or interfere with their adhesion and sealing[7]. Glu/Sense also does not affect the color of the treated area so it is the perfect choice under direct or indirect esthetic restorations.

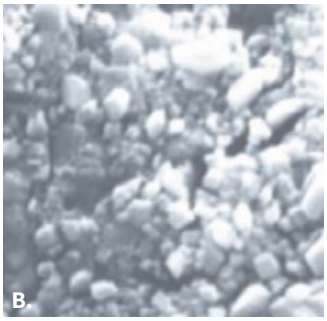
***Image source:** Biris, Carmen & Bechir, Edwin & Odor, Alin & Bechir, A. & Suciu, Ilinca & Gabriela, Ciavoi & Pribac, Valentin & Curt-Mola, Farah. (2019). Comparative Desensitization Effect of Vital Abutments Realized by Different Methods. Revista de Chimie. 69. 3638-3643. 10.37358/RC.18.12.6809.

ELIMINATE POST-OP SENSITIVITY WITH D/SENSE CRYSTAL

Post-operative dentin sensitivity is common after dental procedures for many reasons including exposed dentin after enamel reduction/cavity prep; shrinkage after bonding or curing of restorative materials; tooth desiccation/dehydration; and chemical irritation from dental materials. Gingival recession in adults may also expose the cementum or dentin, causing sensitivity. Additionally, tooth whitening, whether at-home or in-office, can cause additional sensitivity in some patients. Typically these types of causality present as the classic 'my tooth hurts'.

D/SENSE CRYSTAL is a topical, one-step, dual-action desensitizer gel and cavity liner used to treat post-op tooth sensitivity and naturally occurring sensitivity (not caused by caries). When D/Sense Crystal is applied to the affected surface, it precipitates calcium oxalate and potassium nitrate crystals, which penetrate deeply to occlude the tubules and seal the dentin surface with a continuous, acid-resistant complex. This reaction eliminates sensitivity in as little as 30 seconds, leaving the tooth it's natural color.





A. Dentin before D/Sense Crystal treatment. Exposed dentin tubules are at risk for sensitivity.

B. Dentin after treatment with D/Sense Crystal. Calcium oxalate and potassium nitrate crystals effectively occlude the tubules, eliminating sensitivity.

D/SENSE CRYSTAL is clear and won't alter the color of the surface to which it is applied, making it ideal for cases where esthetics are critical. The Brush Tip applicator enables precise, comfortable application directly on the sensitive area, and prevents drips and wasted material. D/Sense Crystal is also gentle on adjacent soft tissue.

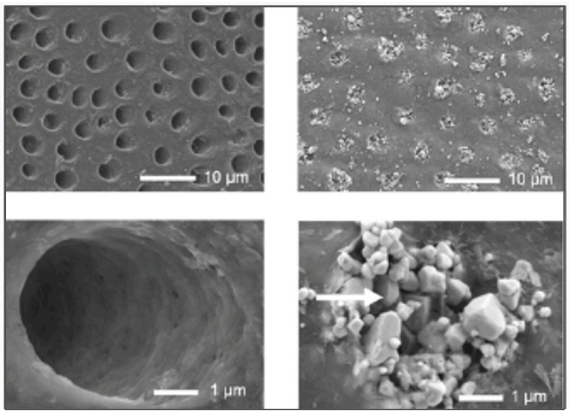
D/SENSE CRYSTAL IS RECOMMENDED FOR SENSITIVITY IN THESE CASES:

- Presenting in the smile zone
- Caused by bleaching procedures, scaling, root planing or prophylaxis
- At cervical margins and/or exposed root surfaces.
- Due to consumption of acidic foods and beverages
- After preparation for crowns and bridges, to reduce discomfort if the tooth is vital and to block bacterial infiltration into dentinal tubules, specially if a temporary crown is not used

ELIMINATE SENSITIVITY CAUSED BY CARIES WITH SILVERSENSE SDF

Dental caries causes pain and sensitivity primarily by progressively destroying tooth structure, eroding enamel and exposing dentin. The bacteria responsible for caries produce an acidic environment that inflames the surrounding tissue, causing mild to severe sensitivity. The exposed dentin allows fluids to move within the tubules in response to this stimuli, triggering nerve endings in the pulp and causing the sharp pain associated with sensitivity.

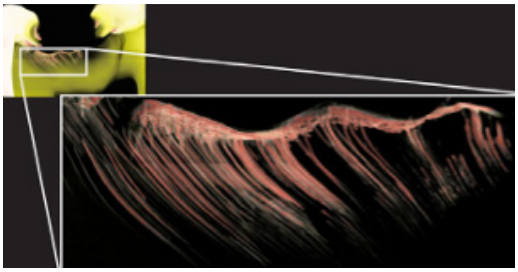
SILVERSENSE SDF, a 38% silver diamine fluoride, is a powerful desensitizer for treating caries-related sensitivity. It penetrates ~50-200 µm deep into dentin[8], and blocks nerve impulses by occluding dentinal tubules with insoluble precipitates. Because the silver in SilverSense SDF is bactericidal[9], it is effective in preventing the development of post-operative sensitivity. These insoluble precipitates occlude the tubules, reducing sensitivity and preventing further decay progression[10]. And, SDF has been found to be a more effective desensitizer than potassium nitrate or glutaraldehyde[11] for pain caused by caries[11].



SEM images* showing: Low/high magnification.

A. Left column: Control

B. Right column: Occluded dentinal tubules 2 weeks post SDF treatment.



Silver Microwire coursing through dentinal tubules following clinical treatment of caries lesions with SDF.**

SILVERSENSE SDF is a site-specific solution, used to eliminate sensitivity caused by caries. It can also be used as an interim step in the restorative process. Research has shown the properties of silver work to stop the formation of harmful bacteria. SilverSense SDF will darken and harden the lesion (that's how you know it is working), until the lesion can be restored. It is ideal for use with either a GIC or composite restorative material. SilverSense SDF does not adversely affect bond strength[12,13].

When using light-cured composite materials, the free silver may cause the margins or the restoration to darken. To avoid discoloration, lightly prep the cavo-surface margins or place an opaquer over the SilverSense SDF-treated area and then restore as normal for an esthetic restoration.

SILVERSENSE SDF is cleared by the FDA for the treatment of dental hypersensitivity and reduction of post-operative sensitivity.

***Image source:** Srisomboon S, Kettratad M, Stray A, Pakawanit P, Rojviriya C, Patntirapong S, Panpisut P. Effects of Silver Diamine Nitrate and Silver Diamine Fluoride on Dentin Remineralization and Cytotoxicity to Dental Pulp Cells: An In Vitro Study. Journal of Functional Biomaterials. 2022; 13(1):16. https://doi.org/10.3390/jfb13010016

****Image source:** Horst J, Seto J. Silver fluoride as a treatment for the disease dental caries. bioRxiv. 2017 Jun; 152207; doi: https://doi.org/10.1101/152207

Precision Desensitization for Every Indication

	GLU/SENSE	D/SENSE CRYSTAL	SILVERSENSE SDF
DESENSITIZING INGREDIENT(S)	35% HEMA (2-Hydroxyethyl Methacrylate Pentanedial), 5% Glutaraldehyde	Potassium Binoxalate	38% Silver Diamine Fluoride
MECHANISM OF ACTION	Stops intratubular fluid shifts through coagulation of proteins and polymerization of HEMA within the dentinal tubules, up to 200 microns.[14]	Reacts with the smear layer to precipitate micro crystals of calcium oxalate and potassium nitrate. The crystals penetrate the tubules and seal the dentinal surface with a continuous, acid-resistant complex (typically less than 3 microns thick).	Forms insoluble precipitates with calcium or phosphate in the dentinal tubules to block nerve impulses.
APPLY DIRECTLY ON CARIES	No	No	Yes. Note that the lesion will darken but can then be restored.
USE PRE- OR POST-OP	Pre-Op	Post-Op	Pre-Op – initial caries and to address secondary caries.
EFFECT ON SOFT TISSUE	May result in irritation or burn. Avoid contact with soft tissue.	Low irritation potential. Safe to use next to soft tissue.	May result in irritation or temporary tissue discoloration but may be used next to soft tissue, e.g., on cervical lesions. Do not use on patients with ulcerative gingivitis or stomatitis.
DELIVERY METHOD	Syringe with Brush Tip foam-tip	Syringe with Brush Tip foam-tip	Dropper bottle with Benda® Micro applicator
BOTTOM LINE	Use preventively, before the restoration is placed, to seal the dentinal tubules prior to bonding to prevent the development of post-op sensitivity. Goes on clear, making it ideal for esthetic direct or indirect restorations.	Use to address post-op sensitivity not caused by caries, especially in areas where esthetics are important. Ideal in cases where the patient experiences sensitivity due to acidic diet, and/or exposed root surfaces.	Use to address sensitivity caused by caries; can be restored over in areas preferably where esthetics are not of concern.

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