Tooth hypersensitivity caused by exposed dentinal tubules is prevalent in the adult population, affecting as many as one in three adults. Periodontal patients have historically demonstrated the highest prevalence, with 60–98 percent of patients reporting sensitivity. This higher prevalence in periodontal patients is expected, given the exposure of the root surface resulting from both the disease process and the treatment of the disease.

Most dental professionals perceive that the number of general-population patients experiencing sensitivity is growing. Such an increase in prevalence in the general population might also have been anticipated, particularly given the increasing usage of tooth-whitening products and the increasing consumption of acidic foods and beverages (e.g., fresh fruits, juices, carbonated beverages), which promotes acid erosion of the tooth structure, as each is recognized as a contributing or causative factor for dentin hypersensitivity.

Dentin hypersensitivity is characterized by short, sharp pain arising from exposed dentin in response to stimuli — typically thermal, evaporative (movement of air over the tooth), tactile, osmotic or chemical — which cannot be attributed to any other dental defect or disease. For hypersensitivity to be experienced, two processes must have occurred: 1) exposure of the dentin, typically resulting from gingival recession and 2) opening of the dentinal tubules, usually through loss of the smear layer, predominantly from acid challenges. Any tooth may be affected, but the most common sites for dentin hypersensitivity are the buccal cervical areas of the cuspids and premolars.

Surprisingly, a majority of patients do not seek treatment to relieve their dentin hypersensitivity pain. The subtle onset of the sensitivity allows for the unconscious development of coping strategies to minimize the discomfort, such as avoidance of ice, drinking through straws and brushing with warm water. Additionally, patients may not perceive the sensitivity to be a severe problem, or conversely, they may fear it is a sign of a more severe problem and choose to tolerate it rather than seek invasive treatment.

Given the increase in prevalence of dentin hypersensitivity, continuous care strategy to manage dentinal hypersensitivity is crucial.

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‘Surprisingly, a majority of patients do not seek treatment to relieve their dentin hypersensitivity pain. The subtle onset of the sensitivity allows for the unconscious development of coping strategies to minimize the discomfort.’

effective treatment option for patients. By identifying the factors contributing to the hypersensitivity, patients can be educated to modify their behaviors to minimize or prevent the occurrence of pain. Behavior modifications may include changing the technique used when brushing teeth and avoiding brushing immediately after ingesting acidic foods and drinks. Patients at risk of acid wear may be advised to modify dietary habits when consuming acidic foods and beverages that contribute to erosion and exposure of the tubules. Patients utilizing whitening products should be given instruction on how to modify the whitening process to avoid or manage the sensitivity associated with tooth whitening.

Treatments for hypersensitive dentin can be self applied by the patient at home or be applied in-office by a dental professional, and work by either occluding the dentinal tubules or blocking nerve conduction by depolarizing the nerve. As patient-applied treatments tend to be simple and inexpensive and can treat generalized hypersensitivity affecting many teeth, they should be prescribed as the first line of treatment.

The effectiveness of over-the-counter desensitizing fluoride toothpastes that contain 5 percent potassium nitrate as the desensitizing agent is well established. The level of potassium at the dentin surface will increase following each use of potassium nitrate toothpaste. This localized increase in concentration is hypothesized to lead to a diffusion of potassium ions through the tubules, toward the pulp, where it could interrupt nerve conduction.

Twice-daily toothbrushing with a potassium nitrate toothpaste provides the regular doses of potassium ions that are necessary to build up and then maintain the depolarizing activity of the potassium ions. A significant reduction in sensitivity can occur within as little as two weeks with twice-daily application. Continual use of the desensitizing dentifrice is
necessary for ongoing protection, so to favor patient compliance, sensitivity dentifrices are available in a variety of formulations to meet the patients' needs and desires, such as tartar control, whitening and sodium lauryl sulphate-free formulations.

If the patient's dentin hypersensitivity persists after four weeks usage of the OTC desensitizing toothpaste, a further dental examination should be carried out, and a professional treatment should be considered as the second line of treatment.

Recently developed calcium phosphate technologies have also demonstrated effectiveness in tubule occlusion, including ACP, CPP-ACP, and NovaMin®, a calcium sodium phosphosilicate. The effectiveness of NovaMin in occluding dentinal tubules is attributed to its unique mechanisms of action. Not only do the NovaMin particles immediately bind to exposed dentin and fill open tubules, the subsequent release and surface reaction of calcium and phosphate ions forms a protective hydroxy carbonate apatite-like layer that provides tubule occlusion, which is resistant to the challenges of acidic environments.10-11

Treatment for dentin hypersensitivity should also be included in routine preventive and periodontal therapies. The instrumentation used during adult prophylaxis, perio maintenance and periodontal debridement (SRP) procedures can cause pain at pre-existing hypersensitive sites and may result in new sites of transient hypersensitivity.

To manage hypersensitivity stimulated during and following periodontal instrumentation, the continuous care treatment strategy can include usage of NUPRO® Sensodyne® prophylaxis paste with NovaMin. As detailed previously, the incorporation of NovaMin particles into the prophyl paste provides immediate tubule occlusion and formation of an acid-resistant hydroxy carbonate apatite-like layer.14

NUPRO Sensodyne prophyl paste with NovaMin, available in polishing and stain-removal grits, can be used for the immediate relief of tooth sensitivity and for lasting sensitivity relief for up to 28 days after just one application.12,13 A thin, white residue might remain visible after rinsing. This is inherent in the product formulation and is considered normal.

For localized hypersensitive sites that do not respond to the first or second lines of treatment, in-office treatments that are more complex and/or more potent may be indicated. Such treatments involve use of adhesives, including varnishes, bonding agents and restorative materials: iontophoresis, lasers or gingival grafting. One option, NUPRO White Varnish (Fig. 1), is a uniquely formulated varnish for hypersensitivity relief; another option is Seal & Protect™, a protective light-cured sealant indicated for use in the treatment of hypersensitive cervical areas (Fig. 2).15

Effective prevention and management of dentin hypersensitivity requires a continuous care approach. The continuum of care starts with a screening assessment for hypersensitivity, followed by identification and modification of causative factors to help prevent hypersensitivity.

A combination of at-home and in-office therapies...
(available from Sensodyne and NUPRO) are next in the continuum of care, with the treatment regimen adopted being dependent upon the perceived severity of the discomfort and the number of teeth involved.

As the first line of treatment, patient-applied OTC desensitizing dentifrices containing potassium nitrate, such as Sensodyne brand toothpastes, provide an easy, inexpensive, and effective therapy for generalized hypersensitivity.

When a second line of treatment is indicated, a professional treatment should be considered. The continuum of care can be maintained chairside at routine prophylactic and perio maintenance appointments by using NUPRO Sensodyne prophylaxis paste with NovaMin to reduce hypersensitivity resulting from periodontal instrumentation.

References

11. Data on file
14. Data on file
15. Data on file
16. Data on file

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