Dentin hypersensitivity is a painful dental condition often left untreated. Prevalence of dentin hypersensitivity in the adult population can range from 8 to 50 percent, with the majority of the sufferers between 25 and 45 years of age. Therefore, a clinician will see, on an average day, between one and three patients who show varying degrees of sensitivity. The condition is slightly more prevalent in women and periodontally involved patients.

With the population aging and keeping their teeth longer, there is an increased incidence for dentin hypersensitivity, recession and periodontal disease. Initially, the majority of this older population is on medications that cause xerostomia. Differences in salivary flow or composition may contribute to the development of hypersensitive dentin by affecting the formation of the smear layer. The occurrence of pain from hypersensitive dentin can occur when patients brush their teeth, use dental floss, eat cold (or hot) foods, drink iced beverages, breathe in cold air and/or eat sour, acidic, sweet or sugary foods.

The hypersensitivity mechanism

The exact mechanism of pain transmission from the tooth surface to the pulp has not been completely proven, however the hydrodynamic theory proposed by Martin Brännstrom in 1963 has been the most widely accepted.

Fluids move within the dentinal tubules in response to external stimuli. The fluid movement transduces physical stimuli at the surface and stimulates mechano-receptors, thought to be the A-delta fibers, found around the odontoblastic process near the pulpal end of the tubule.

The fluid in the tubules may expand with heat and contract with cold. The fluid flow in turn excites nerve terminals at the inner ends of the tubules or in the outer layers of the pulp. This excitation of intradental nerves acts on the central nervous system and causes pain.

There are five different types of stimuli that can trigger pain when dentin is exposed: tactile (mechanical), chemical, thermal, osmotic and bacterial.

Tactile stimulation can be attributed to toothbrush bristles or filaments, friction from dental clasp or prosthesis, and metal objects such as eating utensils or dental instruments.

Chemical stimuli are possibly the most overlooked triggers of dentin hypersensitivity. Acids present in many foods and beverages, such as citrus fruits, vitamins, condiments, spices, wine, sauces and carbonated drinks should be suspect more than any other stimuli of dentin pain.

Acid foods and drinks have been shown to soften dentin and may remove deposits on the dentin surface. Ascorbic acid, from chewable vitamin C tablets, can even be a stimulus.

Up to 90 percent of individuals suffering from dentin hypersensitivity report that the effect of a thermal stimulus, particularly a cold stimulus such as breathing through the mouth on a cold day or consuming a cold drink, causes the painful sensation associated with sensitive teeth.

Osmotic flow within the dentinal tubules is important; there may be variations in the way in which different stimuli affect fluid flow. Bacteria produce acid when fermentable carbohydrates are available; it is this acid by-product, as it relates to demineralization or root caries, which can also cause sensitivity.

An increase or decrease in sensitivity may be attributed to the mechanisms of metabolic breakdown and products the bacteria produce.

Related to periodontal disease, it is known that periodontal pathogens can penetrate dentinal tubules a considerable distance.22 Once in the tubule, the bacteria may create a continual source of sensitivity.

Patients with sensitive teeth often have larger, more numerous carious lesions. The presence of dental plaque is a factor that enhances the development of dentin hypersensitivity.

According to a study published in the Journal of Periodontology, there is a 70 percent chance that patients with sensitive teeth will experience a reduction in sensitivity results after using a desensitizing agent.

Dentin hypersensitivity is the most prevalent cause of dentin sensitivity. Other causes of dentin sensitivity include root caries, which can also cause dentin hypersensitivity. Sensitivity may be attributed to the demineralization or breakdown of dentin.

Tooth decay is the most common disease for children, Von Essen said. Today decay is mainly caused by acidic, sweet or sugary foods. Academic studies have shown that eating the same foods at night can cause further decay.

“Dentist should be aware,” Von Essen said, “of the way a person eats. When we go to bed and put our teeth in a overnight tray, there is little saliva and this environment will create decay.”
Dear Reader,

I have been thinking slightly outside of the box with my clinical practice for about six years now. My thoughts began to take a different direction after I was exposed to an amazing hygiene meeting and the hygienists in attendance. I returned from that meeting rejuvenated and vowed I would switch things up a little bit. This was a difficult undertaking for me because I am a very traditional thinker. The first thing I did is begin practicing without any ceiling lights in my operatory. While my patients loved it, the dental assistant thought I was “off my rocker!” It took her a while to try this concept, but once she did, she (and the dentist) was sold. Now they can’t imagine practicing with the lights on!

Since this time I have incorporated more small steps to incorporate a bit of “Spa Hygiene” into my practice. Patients are treated to a back massage while getting their teeth cleaned. A bolster pillow is placed under their knees to conform their lower back to the chair and the massage pad. An extra pillow placed under their neck provides support while their neck is arched. A fleece blanket is available for those who feel chilled while receiving treatment.

Patients have become so accustomed to these small additions we have incorporated them into the other hygiene operatories. Patients enjoy coming to their appointment. It is a time to rest and relax. Many times, they don’t want to leave.

Our office staff has created a special niche because I ventured out of the box. Then, eventually, others joined me.

Don’t be afraid to open your mind to something out of the ordinary and try something new. It may be the beginning of something amazing!

Rest Regards,

Angie Stone, RDH, BS

Have you been thinking ‘outside of the box’ and seeing wonderful results? If so, share your story with us and it might be featured in Hygiene Tribune! Please send stories to Group Editor Robin Goodman at r.goodman@dental-tribune.com.

‘Prevalence of dentinal hypersensitivity in the adult population can range from 8 to 50 percent, with the majority of the sufferers between 25 and 45 years of age.’

dentinal tubules.

Managing dentinal hypersensitivity

It is important to note that dentinal hypersensitivity is a manageable condition. Management includes:

1. differential diagnosis to determine that tooth pain is actually a result of dentinal hypersensitivity;

2. prevent, modify, remove or control etiologic factors such as plaque, improper toothbrushing, and a diet high in fermentable carbohydrates and/or acidic foods;

3. patient home care and product use and

4. professional application of desensitizing agents.

Diagnosing root sensitiv

ity requires a careful history and methodical dental and radiographic examination.

The clinician must first rule out dental caries, pulpal pathology, vertical cracks, cracked cusps, abrasions, leaking restorations and/or teeth in hyperfunction.

Often, the dental hygienist is the first practitioner to recognize dentinal hypersensitivity. It is imperative to document dentinal hypersensitivity as a part of the treatment record.

Testing for hypersensitivity should be part of an initial examination and can be as simple as an air-blast test.

Patients who experience hypersensitivity appreciate it when teeth are dried carefully with gauze or cotton rolls before using the air syringe. It would be important to have a pretreatment record for sensitive teeth before periodontal therapy.

Treatment agents

Two groups of agents can be used in the treatment of dentin hypersensitivity: chemical or physical.

Chemical agents include:

• salts (most commonly potassium nitrate);

• fluoride agents in concentra-

• sodium citrate;

• potassium nitrate;

• strontium chloride;

• formaldehyde and
calcium hydroxide. Physical agents include:

• composite, microfilled and unfilled resins;

• sealants;

• dentin bonding agents;

• glass-ionomer cements;

• varnishes and soft tissue grafts.

Desensitizing agents may be classified by their mode of action. Agents act either by inactivating the nerve or by occluding the tubule. For example, potassium nitrate is an agent that inactivates the nerve. Potassium nitrate is the most common desensitizer in dentinific.

At the concentration of 5 per-
cent potassium nitrate, Sensodyne® (GlaxoSmithKline, Jersey City, N.J.), has been shown in clinical trials to significantly reduce symptoms within two weeks when applied on a toothbrush twice daily.

It works by allowing the potas-
sium ions to penetrate the length of the dentinal tubules and block regu-
larization of sensory nerve end-
ings, reducing the pain response. Frequent use is necessary to avoid recurrence of symptoms. For this reason, it is ideal via a dentifrice.

Potassium nitrate-containing toothpastes include Aquafresh Sensitive, Colgate Sensitive, Crest Sensitivity Protection, Dental Care Sensitivity Formula; other products for sensitive teeth are Protect Sen-

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We look forward to hearing from you!

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sitive Teeth Gel Toothpaste, Rembrandt Whitening Toothpaste for Sensitive Teeth and Orajel Sensitive Pain Relieving Toothpaste for adults.

All of these toothpastes contain fluoride to strengthen dental enamel and protect against cavity formation.

To ensure maximum compliance, patients should be advised to select desensitizing toothpaste similar to their current preference—be it whitening, baking soda, gel or tartar control, or a specific flavor (such as fresh mint).

Patients should be advised to read and adhere to the labeling found on the product packaging.

References