NEW RECOMMENDATIONS APPEAL FOR ACTION

Various misconceptions about risk factors, causes and other aspects of dentin hypersensitivity have undermined proper management and treatment of the condition.

After identifying significant knowledge gaps in clinical practice, the Canadian Advisory Board sought to provide direction to clinicians in dealing with a wide range of concerns relating to dentin hypersensitivity: screening, diagnosis, predisposing factors and causes, treatment, follow-up, educational issues, and even research needs.

The board's best-practice recommendations urge practitioners to assume a more active role – to screen for the condition, educate patients about preventable risk factors, promote long-term management, and follow up on an ongoing basis.[1]

IN THE NEXT ISSUE

- ***Canadian Advisory Board recommendations***
- ***Treatment algorithm***

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The Canadian Advisory Board on Dentin Hypersensitivity was supported by an unrestricted educational grant from GlaxoSmithKline Consumer Healthcare.

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Dentin Hypersensitivity BULLETIN

Scientific Perspectives

ISSUE 2

The Dentin Hypersensitivity Bulletin is a Sensodyne® initiative designed to provide your busy practice with a convenient overview of the latest professional information regarding dentin hypersensitivity: events, trends, published materials, expert perspectives and commentary.

In this issue, we report on the most current views on aetiology, including chemical and physical predisposing factors, and the mechanism of pain as acknowledged by the Canadian Advisory Board on Dentin Hypersensitivity. Their collective conclusions were captured in the ***Consensus-Based Recommendations for the Diagnosis and Management of Dentin Hypersensitivity****, published in the* ***Journal of the Canadian Dental Association****.*[1]

In addition to addressing the factors that contribute to the condition, we report on some of the dental profession's misconceptions about dentin hypersensitivity and its treatment. These misconceptions highlight the need for improved understanding of dentin hypersensitivity and the timeliness of the new Canadian practice recommendations.

As consulting dentist and editor of the Bulletin, I am confident that you will find the content informative and relevant to your practice when dealing with dentin hypersensitivity.

David C. Alexander,
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Editor

Exposing Common Myths – How do Your Beliefs Compare?

Various misconceptions contribute to the confusion regarding the treatment of dentin hypersensitivity. Dental school curricula offer little preparation for dealing with chronic pain conditions such as dentin hypersensitivity. It is no wonder that half of Canadian dentists and dental hygienists lack confidence in managing their patients' pain.[1] We invite you to test your own beliefs against the following assertions.

TRUE OR FALSE?

1. ***Dentin hypersensitivity affects those with poor dental hygiene.***
2. ***Teeth should be brushed immediately after meals.***
3. ***Desensitizing toothpastes are not effective against caries.***
4. ***The key desensitizing ingredients in desensitizing toothpastes are fluoride compounds.***
5. ***Desensitizing toothpaste is effective when dabbed on sensitive teeth.***

1. FALSE – Sensitive teeth are often the cleanest.[2]

2. FALSE – New evidence suggests that brushing should be postponed for at least 30 minutes after meals. Brushing right after ingesting acidic foods or drinks, which "soften" the enamel, predisposes teeth to toothbrush abrasion. In fact, to completely re-harden, enamel requires approximately 2 hours.[2]

3. FALSE – Most desensitizing toothpastes contain fluoride to prevent caries, and are suitable for daily use.[1] In addition to fluoride, Sensodyne offers an entire array of secondary benefits, such as whitening, antibacterial action and breath freshening, to help patients stay with recommended treatment.

4. FALSE – Desensitizing toothpastes treat pain with either potassium nitrate (KNO_3) or strontium chloride ($SrCl_2$). KNO_3 is the most widely available ingredient and acts by interfering with pain transmission, while $SrCl_2$ occludes dentin tubules.[1]

5. FALSE – Best results are obtained with regular ongoing, twice-daily brushing. There is no published evidence to support the effectiveness of dabbing with medicated toothpaste.[1]

If you find any of this information surprising, you're not alone. The 2002 Canadian Needs Assessment Survey on dentin hypersensitivity, sent to 5,000 dentists and 3,000 dental hygienists, revealed a portrait of commonly held beliefs that didn't always reflect scientific evidence. The survey not only identified the profession's knowledge gaps, but also provided focus for the Canadian Advisory Board on Dentin Hypersensitivity in developing comprehensive practice recommendations. In addition to providing direction on management and treatment, the recommendations also included a summary of the most current perspectives about the processes that contribute to dentin hypersensitivity.[1]

EXPLAINING THE EBB AND FLOW OF DENTIN HYPERSENSITIVITY PAIN

Dentin hypersensitivity is a distinct clinical condition. It is chronic with acute episodes of discomfort and "satisfies all the criteria to be classified as a true pain syndrome."[3,4] Researchers have investigated its aetiology since the middle of the nineteenth century. While many theories have been postulated, the most widely accepted is the *hydrodynamic theory*, initially proposed by Gysi in 1900 and subsequently validated scientifically by Brännström in 1966.[3]

British Journal of Dental Science

No. 585. LONDON, OCT. 1, 1900. Vol. XLIII.

AN ATTEMPT TO EXPLAIN THE SENSITIVENESS OF DENTINE.*

By Alfred Gysi, Dr. Dent. Berg. Zurich.

By our Special Reporter.

In view of the wide difference of opinion among the highest dental authorities on this difficult and complex question, the short paper presented to the International Dental Congress on the sensitiveness of dentine is of considerable interest.

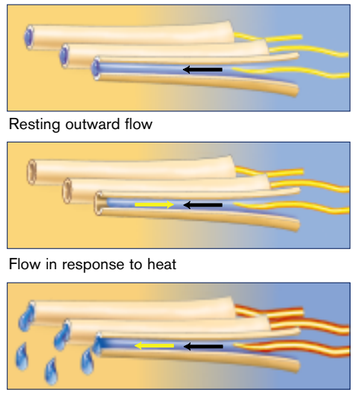
Dr. Alfred Gysi ranges himself with those who hold that the dentinal canaliculæ do not contain either nerves or fibres fulfilling nervous function (comparable to the roots of the nails, etc.) The contents of the canals, of which there is such an extensive network of branches in the dentine, he considers only serve the purpose of maintaining the organic fundamental substance of the tooth in a condition of vitality and elasticity.

"The sensitiveness of dentine," says Dr. Gysi, "is only of a secondary nature, and is not physiologic. The physiological sensibility of dentine is sufficiently provided for by the pulps and the periosteum, so that the supply of nerves in dentine would be superfluous. If the dentinal canaliculæ contained

* Paper read before the International Dental Congress.

Scientific evidence indicates that dentin tubules are filled with fluid, and when undisturbed, this fluid exerts a mild *outward* flow. Thermal, evaporative, tactile, osmotic or chemical stimuli, when directed into open tubules, cause movement of intra-tubular fluid. The sensations of hot and cold, for example, cause fluid to move in opposite directions. Heat causes expansion of the dentin tubule, evoking a relatively slow *inward* movement of fluid and is therefore not commonly identified as a significant pain stimulus. Cold and evaporative stimuli cause contraction of the tubules resulting in a rapid *outward* flow, and are generally reported as the most problematic for sufferers.

The flow of fluid in the dentin tubules of sensitive teeth can be up to 100 times greater than in non-sensitive teeth.[2] This movement distorts nerve fibres at the pulp-dentin border or within the dentin tubule, and is perceived as acute, immediate pain by the patient.[1,2,3]



Resting outward flow

Flow in response to heat

Flow in response to cold

AETIOLOGY – REVEALING THE PRIMARY CAUSE

Two processes need to occur before the patient experiences dentin hypersensitivity: first, dentin must be exposed, and second, the dentin tubule must be patent to the pulp. It is widely recognized that dentin becomes exposed through either enamel loss, commonly referred to as toothwear, or gingival recession.[2]

While gingival recession is frequently associated with the abrasive effects of excessive and aggressive tooth brushing, it is only a predisposing factor and not the primary cause of dentin hypersensitivity.

Contrary to the beliefs expressed by 85% of dentists and 94% of dental hygienists in the Canadian Needs Assessment Survey, abrasion is not the main culprit. Studies indicate that tooth brushing alone or with most toothpastes has little or no effect on enamel and clinically insignificant effects on dentin. The major contributor to the loss of tooth enamel and the development of dentin hypersensitivity is *erosion*, due to dissolution by acids that are not of bacterial origin.[1,2]

IDENTIFYING THE SYNERGY BETWEEN CHEMICAL RISK FACTORS AND PHYSICAL FORCES

There are two main sources of non-bacterial acids to be considered: extrinsic acids are ingested with food and beverages, and are by far the overriding risk factor. Intrinsic acids originate in the stomach and are associated with conditions such as gastric reflux or bulimia.[1,2]

Dietary acids from citrus fruits and juices, pickled products, wine and carbonated drinks, for example, play a critical role in demineralization of enamel, which is 96% mineralized substrate with 4% water and organic protein.[1,2,5] Normally, it is resistant to various physical stresses but when "softened" by acids, it becomes sensitive to toothwear forces such as abrasion, attrition, or even abfraction.

IDENTIFYING THE SYNERGY *CONTINUED*

Toothwear is most frequently a result of interaction between two or more of these forces on erosion-softened enamel, rather than any single force.[1,2]

EROSION: dissolution of teeth by acids, which are not of bacterial origin (major factor in toothwear)[1]

ATTRITION: *the wear of teeth at sites of direct contact between teeth (may be exaggerated by bruxism)[2,3]*

ABRASION: *the wear of teeth caused by objects other than another tooth (e.g. toothbrush)[2,3]*

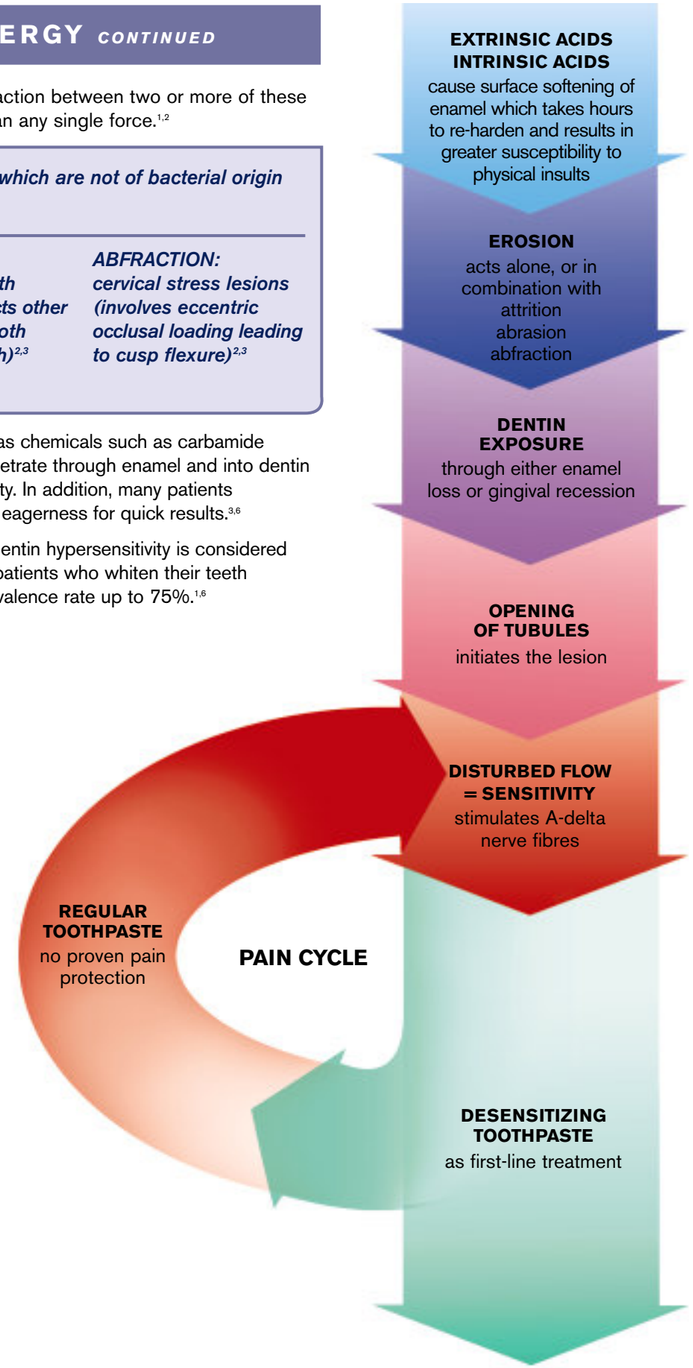
ABFRACTION: *cervical stress lesions (involves eccentric occlusal loading leading to cusp flexure)[2,3]*

Bleaching is another very common risk factor as chemicals such as carbamide peroxide or hydrogen peroxide can rapidly penetrate through enamel and into dentin creating the symptoms of dentin hypersensitivity. In addition, many patients compound the risk with over-treatment in their eagerness for quick results.[3,6]

With a prevalence rate between 8 and 57%, dentin hypersensitivity is considered pandemic among the general population, but patients who whiten their teeth represent a high-risk subpopulation with a prevalence rate up to 75%.[1,6]

THE EVOLUTION OF THE PAIN CYCLE

The following flow chart reflects the culmination of published science and clinical experience of the Advisory Board members. It outlines the basic process of dentin hypersensitivity, culminating in a recommendation for treatment. Desensitizing toothpaste is identified as first-line treatment because it is non-invasive, efficacious and inexpensive. Most importantly, the chart illustrates how patients with recurrent pain, who do not comply with proper ongoing treatment, can continue to relapse.



Adapted from Consensus-Based Recommendations for the Diagnosis and Management of Dentin Hypersensitivity[1]