“The tooth’s response to bleaching is individualistic and can only be determined by starting treatment”

Interview with Prof. Van B. Haywood, USA

Prof. Van B. Haywood is a Professor in the Department of Oral Rehabilitation in the School of Dentistry at the Medical College of Georgia. In 1989, Dr Haywood and Prof. Harold Heymann co-authored the first article in the world on nightguard vital bleaching (NGVB). He has completed more than 90 publications on the topic of bleaching and aesthetics, including the first papers on treatment of bleaching sensitivity with potassium nitrate, direct thermoplastic tray fabrication, extended treatment of tetracycline stained teeth and primary teeth bleaching. Dental Tribune Editor Claudia Salwiczek spoke with Dr Haywood about bleaching sensitivity.

Claudia Salwiczek: Tooth sensitivity is the single most significant deterrent to the very popular dental bleaching. How well do we understand this condition?

Prof. Haywood: Tooth sensitivity is the most common side effect of bleaching. Whereas all of the typical causes of dentine hypersensitivity generally involve the hydrodynamic theory of fluid flow, the sensitivity associated with bleaching seems to have a different origin. In bleaching situations, the teeth may be in an exceptional condition, without cracks, exposed dentine, or deep restorations, but following a few days of bleaching, the tooth may experience severe sensitivity. This seems to be related to the easy passage of hydrogen peroxide through the enamel and dentine in the interterritorial spaces into the pulp within 5 to 15 minutes. The tooth is a semi-permeable membrane that is quite open to molecules of a certain size. Once it is understood how easily the peroxide penetrates the tooth, the resultant pulpal response of sensitivity may be considered a reversible pulpititis.

Can bleeding cause sensitivity damage in the long term?

Although penetration of peroxide through the tooth to the pulp can produce sensitivity, the pulp remains healthy and the sensitivity is completely reversible when treatment is terminated. No long-term sequelae remain after the sensitivity has abated.

Research has shown that patients have tooth sensitivity even when using non-bleaching agents in a tray, or just wearing a tray alone. Hence, it is not possible to have all patients be sensitivity free because of the mechanical forces of the materials and occlusion, and some plans must be made to address potential problems.

How can we avoid tooth sensitivity being triggered?

Reliable methods for complete prevention have not yet been established. However, a history of sensitive teeth and the patient’s response during examination can be reasonable predictors. The tooth’s response to bleaching is individualistic and can only be determined by starting treatment. Most reports of sensitivity occur within the first 2 weeks. Often, these reports are a single day of sensitivity, followed by no problems the next day.

Because tooth sensitivity mainly depends on inherent patient sensitivity, frequency of application and concentration of the material, a history of sensitivity should be determined during examination. Existing sensitivity can be determined from the preoperative exam by simple methods of exploring contact points with an explorer and placing it on the tooth or air blown on the teeth.

Patients must be counselled on the frequency of application and the appropriate concentration of bleaching material. They need to be aware that applications more than once a day or higher concentrations of bleaching agent can increase the likelihood of sensitivity. Patients with pre-existing tooth sensitivity must be cautioned that increased sensitivity, albeit transitory, may occur and that management of the sensitivity may require a longer time span for bleaching as a result of the additional time to treat the sensitivity.

What treatment objectives are available?

No bleaching treatment should be initiated without a proper dental examination, which generally includes radiographs and determines a diagnosis for the cause of the discoloration. The examination should include an explanation to the patient of all their treatment options, considering existing restorations—which will not bleach—and other aesthetic needs. It should be noted that there are several causes of discoloration (abscessed teeth, caries, internal or external re-attachment) for which bleaching will mask the indication of pathology but not resolve the problem. Other treatments will be required before or instead of bleaching. Sensitivity may require a treatment before bleaching can also minimise patients’ perceived pain responses.

How effective are the desensitising toothpastes available on the market, and how do they work?

The most common, professionally endorsed, self-applied approach to treating sensitive teeth is the use of desensitising toothpastes, which contain potassium salts (nitrates or chlorides). Potassium ions pass easily through the enamel and dentine to the pulp in a matter of minutes. Potassium is believed to act by interfering with the transmission of the stimuli, by depolarising the nerve surrounding the odontoblast process. Most potassium-based desensitising toothpastes also contain fluoride for cavity protection, and some offer an array of flavours and the whitening, tartar-control, and baking soda benefits found in most regular toothpastes.

Sensitivity may be treated actively or passively, but at home treatment is most favourable. Passive treatment involves reducing the frequency of application or the duration of treatment, or interrupting continuous application. Active treatment involves using a material with potassium nitrate in the product, applying potassium nitrate instead of bleaching material in the tray for 10 to 30 minutes when pre-brushing with potassium nitrate toothpaste for two weeks before bleaching initiation. Wearing the tray alone or with potassium nitrate before bleaching can also minimise patients’ perceived pain responses.

What is your recommendation to dentists performing bleaching procedures?

The biggest challenge in aesthetic dentistry is to maintain the ethics of the dental profession, and to place patient care ahead of financial gain. Patients should be presented with all options for treatment, including the cost/benefit ratio and the risk/benefit ratio, based on research where possible. Conservative treatment that preserves enamel and tooth structure is always preferred. My credo, which has worked well for me and my patients in the past, is “Do unto others as you would have them do unto you.”

Thank you very much for the interview.

Editorial note: This interview was supported by an educational grant from GlaxoSmithKline. For more information on sensitivity please read Pashley DH, Tay FR, Haywood VB, Collins MA, Drisko CL. Dentin Hypersensitivity: Consensus-Based Recommendations for the Diagnosis & Management of Dentin Hypersensitivity. Inside Dentistry, October 2008, Volume 4, Number 9 (Special Issue).