

The "Point of Care" section answers everyday clinical questions by providing practical information that aims to be useful at the point of patient care. The responses reflect the opinions of the contributors and do not purport to set forth standards of care or clinical practice guidelines. Readers are encouraged to do more reading on the topics covered. If you would like to submit or answer a question, contact editor-in-chief Dr. John O'Keefe at [jokeefe@cda-adc.ca](mailto:jokeefe@cda-adc.ca).

## QUESTION 1

A large proportion of the patients who undergo teeth-whitening procedures in my office experience sensitivity. How can I minimize this side effect?

### Background

The incidence of sensitivity during dental whitening procedures is high. Haywood and others<sup>1</sup> reported an incidence of tooth sensitivity of 53% using 10% carbamide peroxide in custom-fitted trays. Haywood<sup>2</sup> has also reported an overall general sensitivity rate to whitening of 75% of patients. Browning and others<sup>3</sup> reported that 67% of patients experienced transient sensitivity during bleaching. Transient tooth sensitivity in the presence of hydrogen peroxide or carbamide peroxide is related to both dose and time: the higher the dose or concentration of the whitening agent and the longer the teeth are exposed, the greater the risk of tooth sensitivity. If such sensitivity occurs, the easiest way to address the problem is to decrease the treatment time or the dosage of hydrogen peroxide or carbamide peroxide. For whitening agents delivered with a tray, it is critical to trim the tray accurately, not only to ensure that it accurately reflects the position of the gingiva, but also to position the tray border at the cemento-enamel junction.

### Strategies to Reduce Sensitivity

Many whitening products, such as Opalescence (Ultradent, South Jordan, Utah) contain water to decrease the dehydrating effects of the agent on tooth structure, which can cause sensitivity. Fluoride and potassium nitrate are included in several products to decrease the risk of tooth sensitivity. Fluoride acts by accelerating the formation of new mineral, which combines calcium, phosphate and fluoride to form a low soluble veneer.<sup>4</sup> Potassium nitrate penetrates the dentinal tubules and depolarizes the nerves, decreasing the painful stimulus.<sup>5</sup>

The inclusion of potassium nitrate in whitening products has had mixed reviews in the literature. Browning and others<sup>3</sup> reported that 36% of the

patients in their study experienced sensitivity even if potassium nitrate and sodium fluoride had been added to the whitening gel. Gerlach and others<sup>6</sup> observed sensitivity in 13% of patients who used 6% hydrogen peroxide bleaching strips and in 22% of patients who used 5% carbamide peroxide with potassium nitrate in a custom tray. Comparing NiteWhite Excel 2Z (Discus Dental, Culver City, Calif.) and Rembrandt Xtra-Comfort (Den-Mat Corp., Santa Maria, Calif.), Pohjola and others<sup>7</sup> reported that all of the subjects had some degree of sensitivity. Tam<sup>8</sup> found that 10% carbamide peroxide with potassium nitrate and fluoride produced less tooth sensitivity than the control substance after 2 weeks of bleaching at home.

However, treating the teeth with potassium nitrate *before* whitening seems to decrease sensitivity dramatically. Brushing with potassium nitrate dentifrice such as Sensodyne (GlaxoSmith-Kline, Parsippany, N.J.)<sup>9</sup> or applying potassium nitrate-fluoride gel in custom-fitted trays before whitening can reduce the sensitivity in a majority of patients.<sup>1</sup> Potassium nitrate gels for use in bleaching type trays include UltraEZ (Ultradent), Den-Mat Desensitize (Den-Mat Corp.) and Relief (Discus Dental). An example of tray-delivered fluoride ion is FlorOpal (Ultradent) which results in slower but longer-lasting desensitization than with potassium nitrate.

Because sensitivity is experienced by such a large percentage of patients, it is best to identify those most likely to experience discomfort before treatment. Does the patient have deep Class V abfraction lesions? Does the patient have discomfort with heat, cold, sweets or air flow over the teeth? Does the patient avoid certain foods because of sensitivity? Does the examination reveal active caries or leaking restorations? For these patients, it is best to apply desensitization beforehand and treat any decay or defective restorations, even tem-

porarily, until the final tooth colour is achieved. Desensitization may be achieved by potassium nitrate, fluoride gels, oxalates or dentin bonding agents. If the patient's teeth are desensitized before treatment begins, it is more likely that he or she will continue the process, with minimal side effects, until the desired colour is achieved. ♦

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