

Tooth whitening: facts and fallacies

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Since the introduction of nightguard vital bleaching (tray bleaching) in 1989, dentistry has witnessed an astronomical rise in the interest in tooth whitening.¹ As a result, the most frequently asked question is, 'what bleaching technique works best?' Virtually all of today's whitening approaches work, because bleach is bleach. Whether a nightguard bleach is used with only 10% carbamide peroxide (which contains only 3% hydrogen peroxide), over-the-counter (OTC) whitening strips are applied containing 6% hydrogen peroxide, or an in-office bleach is employed using 25–35% hydrogen peroxide, the end results can potentially be the same. Similarity of results is possible because the mechanism of action is the same: oxidation of organic pigments or chromogens in the tooth. Granted, some bleaching approaches are more expeditious than others, owing to differences in concentration or exposure time. But as just noted, the most important factors in the efficacy of any bleaching treatment are concentration of the bleaching agent and duration of the exposure time.

Three fundamental bleaching approaches exist: dentist-supervised nightguard bleaching, in-office bleaching, and OTC bleaching. The most popular dentist-administered technique clearly has been nightguard vital bleaching (Fig 1). This approach typically uses a relatively low concentration of whitening agent delivered in a custom fabricated tray. In-office bleaching, by contrast, generally involves the use of 25–35% hydrogen peroxide, but requires only short treatment times. It is important to note that in-office tooth whitening usually requires multiple treatment appointments.⁴ It is a rare for one in-office treatment to result in maximum whitening. OTC whitening is less costly than either of the two dentist-supervised bleaching approaches, but can be equally effective if products from reputable manufacturers are used.

One reason bleaching has been less popular in Europe, in my opinion, is because of lingering concerns about safety. Literally hundreds of millions of teeth in the US have been bleached over

the past 15–20 years without one credible account of any significant untoward effect appearing in the literature. Dozens upon dozens of clinical trials over this same time period also have affirmed the safety of vital tooth whitening when used in a short-term treatment duration according to manufacturer's instructions. There have even been long-term clinical trials by Dr. Van B. Haywood and others that have evaluated the safety and efficacy of bleaching. One such study involved daily bleaching in patients in whom tetracycline-stained teeth were treated for a period of approximately six months.² No clinically significant prob-



Figure 1. Significant whitening of the maxillary arch following nightguard vital bleaching is readily evident when compared to the untreated lower arch and a pre-op shade tab.

lems were noted even when long-term results were reported after 7½ years.³ Although this study involved a fairly small sample size, it nonetheless is one of the first to document long-term safety of tooth whitening even after daily use of a 10% carbamide peroxide material for a period of six months.

That being said, valid concerns still exist regarding individuals who may ignore manufacturer or dentist instructions, and overuse whiteners for months or years. Long-term adverse effects on soft tissues or hard tissues cannot be totally ruled out when these products are badly abused or overused. However, as noted above, clinical experience and a very large number of clinical trials conducted over the past 20 years have demonstrated that these products are indeed quite safe and effective when used properly. In my opinion, vital tooth bleaching, when administered correctly, is one of the safest, most effective conservative aesthetic procedures available to patients today.

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4. Shethri S A, Matis B A, Cochran M A, Zekonis R, Stropes M. A clinical evaluation of two in-office bleaching products. *Oper Dent* 2003; **28**: 488–495.
5. Tam, L. Effect of potassium nitrate and fluoride on carbamide peroxide bleaching. *Quint Int*. 2001; **32**: 766–770.

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