

## **In-office bleaching versus take-home bleaching: Two new products and guide for clinicians.**

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The public demand for whiter teeth through vital tooth bleaching has been high since its inception well over 100 years ago.<sup>1</sup> Early systems and techniques involved the use of high concentrations of hydrogen peroxides, usually in the range of 35-50%, professionally applied to the teeth for multiple applications in 1- 2 hour time frames, often with the addition of a heat catalyst. Since the establishment of the efficacy of nightguard vital bleaching (NGVB) by Haywood and Heymann in 1989, this method of tooth whitening has become the most commonly administered cosmetic dental procedure by dentists and is the most requested esthetic procedure by patients.<sup>2,3</sup> Currently, the bleaching of teeth with peroxides can be accomplished through myriad of chairside, professional-administered take-home, and retail modes of delivery.

The inundation of the both the private dental and retail marketplace with new bleaching products, concentrations and methods of delivery have left many clinicians confused about the appropriate indications for the various products and systems available. Recently, several over-the-counter bleaching strips, paint-on gels, and “whitening” toothpastes have entered the retail marketplace, further confusing the role of dentist-supervised bleaching regimens in the minds of patients and some dentists. The efficacy, safety of long-term unsupervised use and the role this newly created access to these retail products plays concerning patients delaying care for dental disease is not within the scope of this article. However, Dr. Van Haywood points out that there is strong marketplace for these products especially if they cost less than \$50, because in his opinion “... people will not return a product – even if it does not perform according to the advertised claims – if it is priced below \$50.”<sup>4</sup> While many of these changes in the bleaching market may be described as negative by many dentists, the positive spin-off of retail whitening is an increased awareness of bleaching and its benefits of improving the beauty of a smile by consumers. As with any consumer driven market, the trend will gravitate towards achieving consistent results the fastest way possible. Much as consumers were initially satisfied with the speed and performance of the early desktop computers of the 80’s, the market quickly moved, and continues to move towards doing more work in less time. The same holds true in the minds of patients and dentists concerning bleaching. Speed and efficiency will prove to be the driving force in the future direction of tooth whitening.

Obviously, when patients choose to seek professional advice and a thorough dental diagnosis prior to beginning any bleaching regimen, many important obstacles to bleaching success can be addressed and removed. Often patients are not aware that the stains they see between or on their teeth are in fact carious lesions, superficial tobacco or other chromagenic drink or food stains, stained/failing composites, or advanced calculus accumulation, and may be inclined to believe that retail bleaching products are the remedy to these problems. It is only when these issues are professionally addressed that the patient can have any hope in achieving success in having a whiter smile by any bleaching formulation or method of delivery.

Pursuant to fact that the efficacy and safety of dentist administered/ dentist supervised vital and non-vital tooth bleaching is well established, many dental

manufacturers have begun to focus on improving the speed in which teeth can be lightened, and the comfort of the patient during treatment. In order to expedite results and possibly shorten the time patients must spend wearing nightguard trays, some manufacturers have begun to offer increased concentrations of hydrogen peroxide either in its nascent state or in bound in the form of carbamide peroxide which breaks down to form hydrogen peroxide and urea upon contact with the moisture and heat of the mouth.

Chairside or in-office bleaching, once the only bleaching regimen available, took a back seat to night guard vital bleaching in the mid-nineties. However, recent improvements have been introduced to in-office bleaching systems including light-cured gingival isolating resins instead of ligated rubber dams, calibrated mixing syringes instead of hydrogen peroxide liquids, and systems that employ light or laser accelerated gels. All these improvements have lead to a resurgence of interested in chairside bleaching, with the objective of “jump-starting” or expediting the bleaching process with the objective of either accomplishing the desired result in one office appointment, or shortening the time required to complete the bleaching process with a subsequent nightguard bleaching regimen.

Several manufacturers have introduced in-office systems that employ a peroxide formulation that is “activated” with an energy source. Argon lasers, CO2 lasers, plasma arc lamps, quartz halogen lamps, incandescent lamps, infrared lamps as well as hand-held heating instruments have all been introduced, with the theory that their proprietary formulations of peroxide dissociate faster to liberated free radicals or penetrate the teeth more effectively as a result of the energy emitted by these devices.<sup>4,5,6</sup> The actual role these high-tech devices play in the bleaching process has not been without controversy. Clinical Research Associates continues to maintain that some energy sources play little to no role in expediting the bleaching process.<sup>7</sup> Yet independent research labs using more rigorous testing protocols speak to the contrary.<sup>8,9,10</sup> Clearly, both public and professional interest in chairside bleaching has increased with the resurgence of these high tech devices, and many clinicians are seeking appropriate protocols for use of these methods of delivery.

The focus of this article will be to highlight 2 recently introduced products designed specifically to expedite the bleaching process, and discuss the appropriate bleaching protocols for successful results. These are **Zoom! Chairside Whitening System** (Discus Dental, Culver City, Ca), and **Zoom! “Weekender” Take-Home Whitening System** (Discus Dental, Culver City, Ca).

### **Zoom! Chairside Whitening System**

This in-office, chairside bleaching system employs the use of a mercury metal halide lamp filtered to emit light in the 350nm-400nm range. The lamp is mounted in a proprietary light that allows both the upper and lower arch to be treated at the same time. The light incorporates an IR (infra-red) filter and emits insignificant amounts of UV (ultra-violet) emissions to minimize heat at the surface of the tooth for better patient comfort.

The proprietary whitening gel is provided in a two-part system for greater stability and is conveniently dispensed in a twin-barrel syringe and mixed through a spiraled mixing tip mounted on the end of the syringe. During this mixing process, a 32%

hydrogen peroxide gel is mixed with an activator to create a 25% hydrogen peroxide solution that is buffered to a pH ranging between 7.5 – 8.5 to prevent damage to the teeth. Protective sunblock for the patient's lips and lower 1/3 of the nose, a syringe-dispensed Liquidam resin designed for quick application and protection of the gingiva surrounding the treated teeth, protective face bib, a unique combination tongue/cheek retractor, foam bite blocks with light placement guides, as well as a 1.1% neutral sodium fluoride gel for post-treatment application to the teeth are all included in the professional kit.

The primary indications for the use of Zoom! Chairside Whitening System are based on both the clinical presentation of the teeth, and the personality or disposition of the patient desiring treatment.

Congruent with the protocol advocated for over 30 years by Goldstein and Garber<sup>6</sup>, patients presenting with generalized, single-hue yellow staining in the range of Vita A3 and beyond, and extrinsic chromagenic tooth stains not successfully removed with a thorough prophylaxis typically respond well to a single in-office Zoom! chairside regimen. This protocol involves three separate 20 minute applications of the 25% hydrogen peroxide gel, agitated periodically during each application, and activated by the Zoom! lamp which is pre-programmed for these cycles. Patients presenting with multiple hue, intrinsic stains in the gray or brown range are candidates for either a series of in-office Zoom! treatments, or a combination of a single Zoom! treatment spaced several weeks apart, followed by a prescribed home bleaching regimen with either the Zoom "Weekender" take-home whitening system, or longer sessions with 10 – 16% Nite-White (Discus Dental, Culver City, Ca). The decision of which protocol to use depends on the severity of the intrinsic staining. Multicolored or "banded" discoloration patterns are less successfully whitened with any single in-office regimen, and blue-gray, tetracycline or deep brown intrinsic staining as often seen in fluorosis may require a combination of 1 or more in-office "jump-start" sessions, followed by home nightguard treatments for 1 – 6 months.<sup>4,11</sup>

The more subjective, non-clinical variables that must be included in the decision of which bleaching protocol is best for a particular patient are the patient's personal bleaching goals, personality, willingness to take or relinquish responsibility for the bleaching process, time available to achieve the desired results, and economic considerations. Though vital nightguard bleaching has proven to be a successful protocol to lighten teeth, many patients lack the motivation, diligence, and patience required to achieve a successful result when the regimen involves weeks of wearing trays. In our modern, fast-paced "instant gratification" society, there is an increasing appeal to achieve results faster. When given the choice of completing their bleaching sessions in just one appointment, or merely "jump-starting" the bleaching process in conjunction of a reduced take-home regimen, these less-than-patient people will elect to undergo in-office modalities for the sake of speed alone. Additionally, many patients will choose to defer the responsibility of the outcome to the professional by electing to undergo in-office bleaching rather than assume the responsibility themselves with traditional lengthy nightguard sessions. Let's face it, it is a common scenario for patients who initially intend to complete 2 weeks of nightguard bleaching who discontinue the process prior to effectively whitening their teeth. Reasons for lack of compliance range from sensitivity, tissue irritation, and uncomfortable trays, to lack of motivation and forgetfulness. Obviously, once identified, these patients will hold high value for the in-office bleaching

procedures such as Zoom! and may be willing to pay extra for the luxury of expediting the process.

### **Zoom! Take-Home Whitening System**

Recently, Discus Dental (Culver City, Ca) has release their latest generation of bleaching products called Zoom! Take-Home Whitening System. The primary objective of this product formulation was to increase the speed in which bleaching can occur and the subsequent reduction in the amount of time patients must wear nightguard trays. Rather than being composed of carbamide peroxide, this formulation consists of a highly proprietary 6% hydrogen peroxide in the form of a white paste that is combined with surfactants and thickeners allow sustained release and accelerated bleaching. Classified as a “Weekender” kit, this product is dispensed in an upscale, fluorescent colored acrylic bubble and is designed to be used for only 4-6 hours per day for 3 days. An independent pilot laboratory study by Nachani, Marinho, and Ohja et al. out of the University Health Resource Group demonstrate an average shade improvement of 6.4 shades (on a Vita shade guide arranged in order of value) with only 3 nights use as directed. Shades were compared at completion of treatment and at the 7 day mark with no regression of shade. This study concludes that this formulation and protocol is not only effective at significantly whitening teeth, it did so with minimal adverse effects.

The primary indication for the use of Zoom! Take-Home Whitening System is the same for more traditional formulations and regimens of take-home, professionally supervised products. Shades in the yellow A3 or darker range, extrinsic stains not removed by prophylaxis, and mild brown stains should respond well to the abbreviated protocol offered by this product. Darker, brown, blue/gray, or fluorosis stains may require additional treatment time. It is important to note that though the recommended treatment time is only 3-4 sessions, additional material is provided in the “Weekended” kit so that the treatment time can be extended up to 6 nights for tougher cases.

The subjective appeal for the Zoom! Take-Home Chairside Whitening System is; to address the bleaching needs of patients who may be uncomfortable sitting in the chair or having a retractor in their mouths for the time required for the in-office Zoom! procedure; those that have had poor success with compliance with longer at-home regimens; refuse to wear trays for extended periods of time; lack value for instant gratification found in the in-office treatment; lack the economic resources required for lengthy in-office bleaching; and desiring the greatest whitening in the shortest period of time. Additionally, this product may be ideal for those patients who have bleached in the past and are looking for an abbreviate regimen for “touching-up.”

### **Conclusion:**

The safety and efficacy of both in-office and vital nightguard bleaching with a variety of carbamide peroxides and hydrogen peroxides are well established. Building on this technology, Discus Dental has recently introduced two new systems that address the primary focus of accomplishing the most bleaching effect in the shortest time possible. By appropriately selecting clinical cases and taking in consideration the personal goals and desires of the patient, both Zoom! products discussed in this article can prove to be an integral part of the dentists bleaching armamentarium.

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