



# Clinical Evaluation of a Chairside Whitening Lamp and Bleaching Efficacy

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## Objective

To evaluate the effectiveness of a 25% hydrogen peroxide (HP) in-office tooth whitening system, with and without the use of a Chairside Whitening Lamp.

## Methods

Twenty subjects were treated with two separate 45-minute exposures of 25% HP (Zoom2). At the first appointment, half of the subjects received treatment of the 6 maxillary anterior teeth with light (ZoomAP) and the remainder of the participants received treatment of the same teeth without light. One week later, all subjects received treatment to the 6 mandibular anterior teeth according to the contra assignment of the first appointment. Visual and instrumental color matching were performed before bleaching and 7 days after. The visual color matching was conducted by three color normal evaluators using the Vitapan Classical (VC) and the Vita Bleachedguide 3D-Master (BG) to determine the best match. An intraoral spectrophotometer (Vita Easyshade) was used for the instrumental color measurements. Each subject had a custom positioning jig made for each arch to provide a repeatable area for placement of the instrument tip.

## Fabrication of a custom positioning jig



A. Acrylic rod attached to the tooth



B. Initial injection of clear silicone registration material



C. Clear silicone registration material set



D. Custom made jig with the acrylic rod removed for probe placement.

## Introduction

In the context of presenting a technique for bleaching discolored teeth, the 19<sup>th</sup> century dental researcher, E.P. Wright stated, “there is no higher glory for one who professes the healing art [of dentistry] than that of preserving the natural tissues.”<sup>1</sup> Aside from the obvious desire to improve the appearance of teeth, the conservative nature of in-office bleaching remains one of the primary reasons why in-office bleaching is appeals to both patients and dentist alike. Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) has been used to treat discolored teeth as early as 1884.<sup>2</sup> Throughout the 1960’s and 70’s, techniques were introduced using direct or indirect heat in attempt to accelerate the oxidation process.<sup>3-6</sup> The direct application of heat soon fell out of favor, because of evidence which suggests that it may cause cervical resorption. Techniques using chemicals alone, such as sodium perborate and, or superoxyl followed with some success on non-vital teeth. While these techniques have proven to be helpful for single non-vital teeth, accelerated techniques for multiple vital teeth were still lacking. In the mid 1990’s improvement in bleaching products and delivery systems, such as light-cured barrier materials increased the usage of in-office bleaching for multiple vital teeth among dentists.<sup>7</sup> Combined with the then recent introduction of the at-home bleaching tray, bleaching emerged among the most sought after procedures in dentistry.<sup>8</sup>

## Results

Means and (sd) for visual and instrumental whitening-dependent color changes “With“ and “Without“ light are listed in the table; SGU=shade guide units

Light	ΔE*	ΔL*	ΔC*	Δh°	SGU
With	6.0(2.6)	2.3(2.6)	-4.4(2.8)	3.2(2.6)	VC 6.1(3.1)
					BG 3.8(1.4)
Without	4.7(2.2)	1.8 (2.3)	-3.3(2.4)	2.9(3.0)	VC 4.5(3.0)
					BG 2.8(1.5)

Wilcoxon Signed Ranks Test Statistics for ΔE\* values for light comparisons was Z=-2.168, p<0.05, while visual finding for VC and BG were Z=-1.913, p=0.56 and Z=-2.646, p<0.01, respectively.

## Conclusions

Treatment with Zoom AP light showed significantly higher whitening dependent color changes compared to treatment without light for instrumental findings, p<0.05 and visual findings using the BG. Supported in part by Discus Dental.

## References

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