



## Benefit of Light vs No Light

in vivo study

# Photo-Fenton and Conventional In-Office Dental Bleaching

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### Objective

To evaluate the results of two in-office whitening treatment methods, one based on the Photo-Fenton reaction and the other a conventional in-office system, verifying shade change ( $\Delta E$ ) and color stability.

### Materials

- 25% hydrogen peroxide with ferrous gluconate (Discus Dental) and ultraviolet (UV) light (Zoom AP Light, Discus Dental)
- 38% hydrogen peroxide (Opalescence Xtra Boost, Ultradent)

### Methodology

Forty healthy adult volunteers were randomly divided into two experimental groups of 20 subjects each (Group 1: ZAP; Group 2: OPX). The whitening treatment for both groups was performed with three consecutive 15-minute applications. The ZAP group received treatment with 25% hydrogen peroxide and ferrous gluconate and ultraviolet (UV) light (Discus Dental and Zoom AP Light); the OPX group received treatment with 38% hydrogen peroxide (Opalescence Xtra Boost, Ultradent).

Experimental	Description
ZAP (n=20)	25% hydrogen peroxide with ferrous gluconate ultraviolet (UV) light (Discus Dental +Zoom AP Light)—1 treatment session
OPX (n=20)	38% HP-Opalescence Xtra Boost (Ultradent)—1 treatment session

The shade of superior incisors and canines was assessed for each subject using a digital Vita-Easyshade Spectrophotometer immediately before and after the whitening treatment at 7, 14 and 30 days.

The Vita-Easyshade device measures the color based on a tridimensional system that supplies numerical values, which are inserted into a formula to provide color or shade variation (also known as  $\Delta E$ ). A custom clear EVA tray was used to ensure that measurements were taken at the same spot on each tooth. Holes in the tray on the labial surface of incisors and canines were made with a specially designed 6 mm bur corresponding to the size of the tip of the optical spectrophotometer reader.

### Results

Homogeneity and homoscedasticity tests were applied to the data obtained which indicated that two-way ANOVA and Tukey test were the best tests to treat the results. Statistical analysis comparing the results obtained for shade change over time (pre- and post-whitening treatment after 7, 14 and 30 days) demonstrated that ZAP Group presented a superior whitening result when compared to group OPX. Shade change stability was observed for both groups.

### Conclusion

This clinical trial indicates that even though a lower concentration HP (25%) is employed by the whitening system that uses the Photo-Fenton reaction, it presented a superior performance when compared to the conventional in-office whitening system using a higher concentration HP (38%), which indicates the efficacy of the Photo-Fenton process. Both systems presented color stability during the 30-day evaluation period.

### Whitening Results After One Treatment

Change in Tooth Color

