

Perfect Bleach - Whitening results

VOCO GmbH, Department of Knowledge Communication

Anton-Flettner-Str. 1-3
Postfach 767
D-27472 Cuxhaven

Tel.: +49 (0)4721-719-0
Fax: +49 (0)4721-719-109

info@voco.de
www.voco.de



More and more people are showing an increased awareness in their health, for which they would like to convert into a concrete attitude towards life with an emphasis on wellness. Visual, aesthetic aspects thus also belong to self-confidence and vitality in this context. An increasing number of patients believe that the teeth are a central, aesthetic feature. Bleaching has found great approval as an uncomplicated, aesthetic measure. Under the supervision of a dentist and with correct application, bleaching with preparations that contain a moderate concentration of carbamide peroxide is not harmful to one's health; it represents a safe way to whiten teeth.^[1, 2] As with all aesthetic measures, the patient's satisfaction is ultimately the main focus. Treatment success is measured by the visible result, a limited amount of paraesthesia and the lowest amount of subsequent darkening effect possible.

The maxillary and mandibular anterior teeth of a total of 30 test subjects were treated with either Perfect Bleach 10%, 17% or a placebo 3 hours a day for 7 days in a double-blind study at the University of Bonn (Germany). After a professional cleaning, each test subject received a custom, plastic tray with a vestibular reservoir with the marginal gingiva blocked out to use at home. The patients were examined daily during the application and then after 1 and 2 weeks.

Whitening success

Lightness, saturation and shade were determined by visual comparison with the VOCO Perfect Bleach shade guide and also spectrophotometrically. The measured CIE-LCH colour values were transferred into the Vita shade levels that are commonly used in literature (Fig. 1).

B1 - A1 - B2 - D2 - A2 - C1 - C2 - D3 - A3 - D4 - B3 - A3,5 - B4 - C3 - A4 - C4

Figure 1: Vita shade groups according to lightness (Vita Tooth Manufacturer, Bad Säckingen, Germany)

The whitening success is the change in the tooth shade before and after the treatment and it is stated in Vita shade scale levels. A lightening from A3.5 to A3 means a change by 3 Vita shade levels or to A2, 7 shade levels.

As a primary finding of the study, it was initially clear that both bleaching gels effectively lighten the tooth shade. As expected, the whitening success was greater with the higher concentrated gel (Fig. 2). In addition to the absolute degree of the whitening, the retention of the natural shade grading is also important. If all of the teeth are bleached to an identical shade, the result is a visibly unnatural and undesirable shade impression. Figure 3 shows how the use of Perfect Bleach results in a considerable reduction in dark tooth shades A3.5 and D3 and a significant increase of light shades A2 and A1, while no significant change occurred with the placebo.

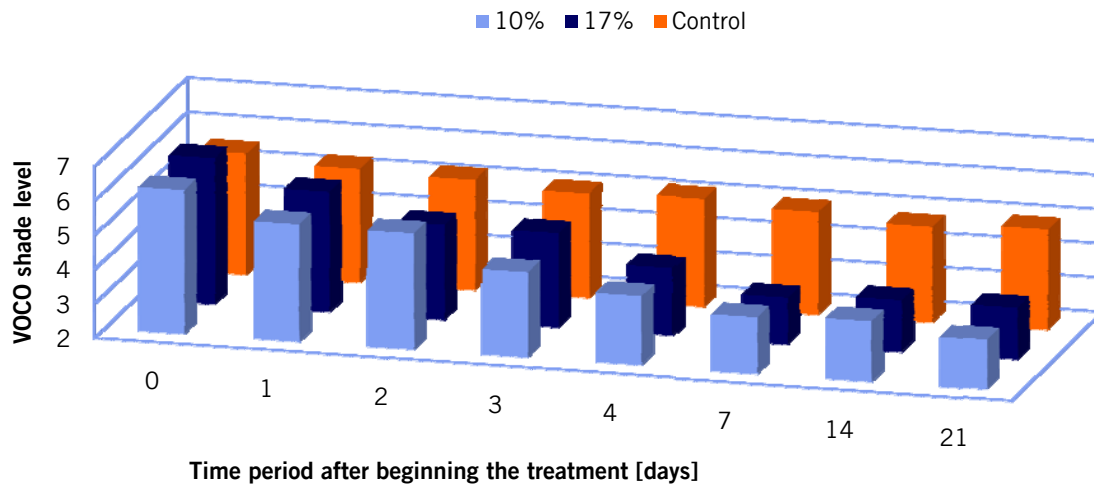


Figure 2: Whitening results of the bleaching gel with 10% and 17% carbamide peroxide as well as the placebo, according to the Perfect Bleach (VOCO) shade guide over the application time period and 1 and 2 weeks afterwards [highlighted] (Dr. Krause, University of Bonn, Germany).^[3]

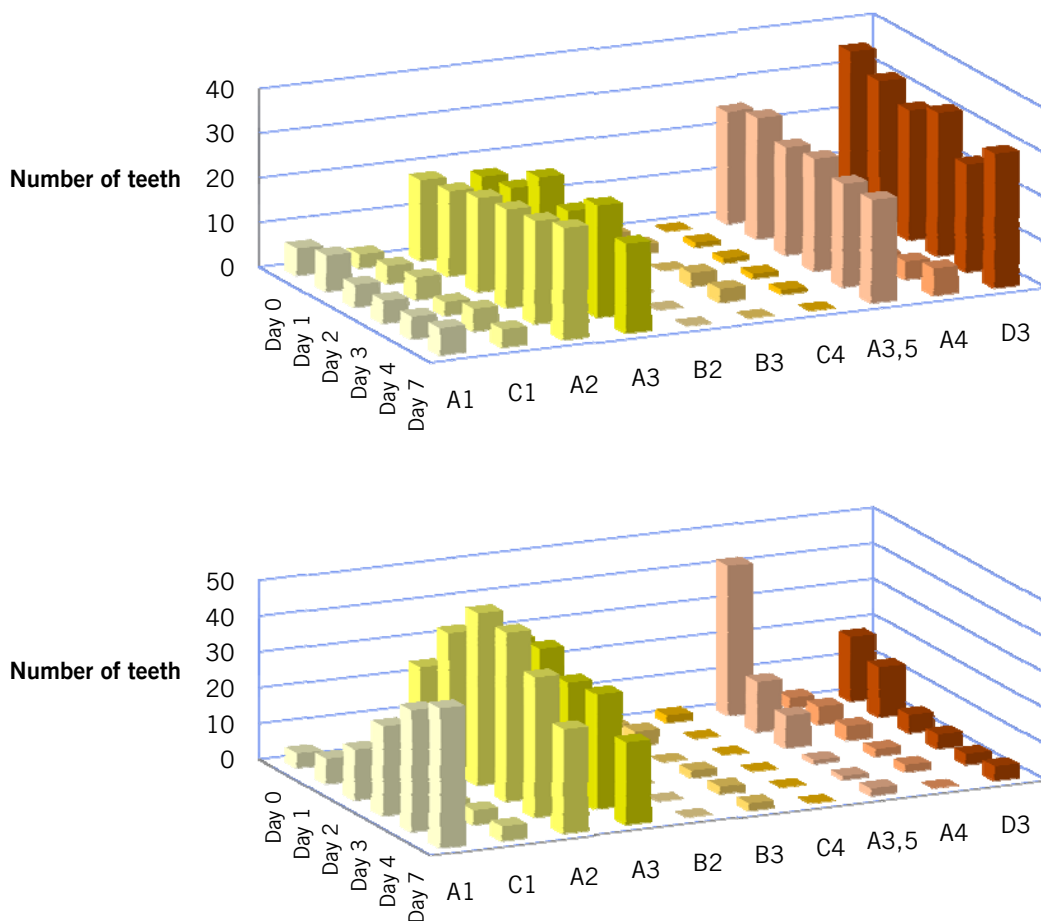


Figure 3: Changes in the tooth shades over the 7 day time period with application of carbamide peroxide 0% and Perfect Bleach 17% (Dr. Krause, University of Bonn, Germany).^[3]

The bleaching effect of Perfect Bleach 10% and 17% was clearly visible, once the changes in the tooth shades were broken down according to the initial shades. The comparison demonstrates how, for example, teeth with an initial shade of A3 (Fig. 4, middle) are distributed by shade after the application: More teeth were moved from A3 to A2 and A1, in terms of shade, with the higher concentrated preparation than with Perfect Bleach 10% during the treatment period. This finding was also reflected with the other tooth shades. The whitening was an average of 3.2 Vita shade levels with Perfect Bleach 10% and 3.6 shade levels with Perfect Bleach 17%. The higher concentrated product did not cause a difference in the whitening. It achieved the same result, only quicker. The shade distribution is quite similar and also natural.

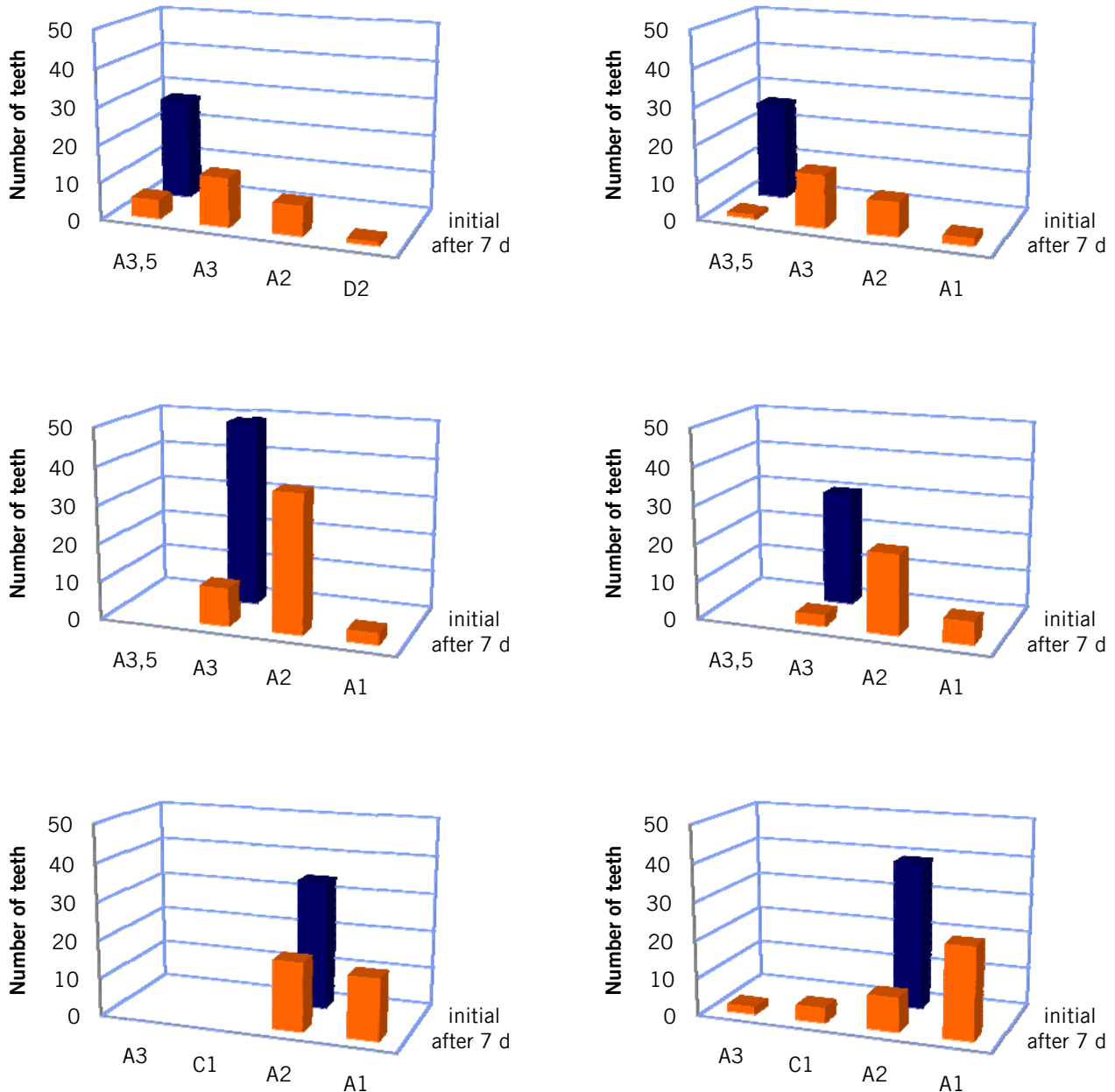


Figure 4: Whitening effect in Vita shades after 7 days of application of Perfect Bleach 10%/17% on the initial shades A2, A3 and A3.5 (Dr. Braun, University of Bonn, Germany).^[4]

Subsequent darkening

Pure glycerin-based preparations particularly dehydrate the tooth, which initially appears white after the treatment, but subsequently darkens again after a short amount of time. More pigment is possibly embedded during rehydration than would

occur in the normal oral flora. This can cause a subsequent darkening effect with these types of preparations within a few days after therapy is ended. The bleaching result may be decreased or even completely compensated from this effect. Perfect Bleach, in contrast, contains enough water to effectively prevent dehydration. Only a minimal post-darkening effect could consequently be observed two weeks after application of Perfect Bleach, which did not lead to a statistically significant change in the tooth shade, in comparison to the result immediately after the end of the treatment (see Fig. 2).

Paraesthesia

It is known that patients with sensitive teeth reported paraesthesia during the bleaching. There were also isolated incidents of light irritation in the study, in both the test groups and the control group (Figure 3). These were traced back to excess gel or an application tray's overlapping edges and were completely reversible.

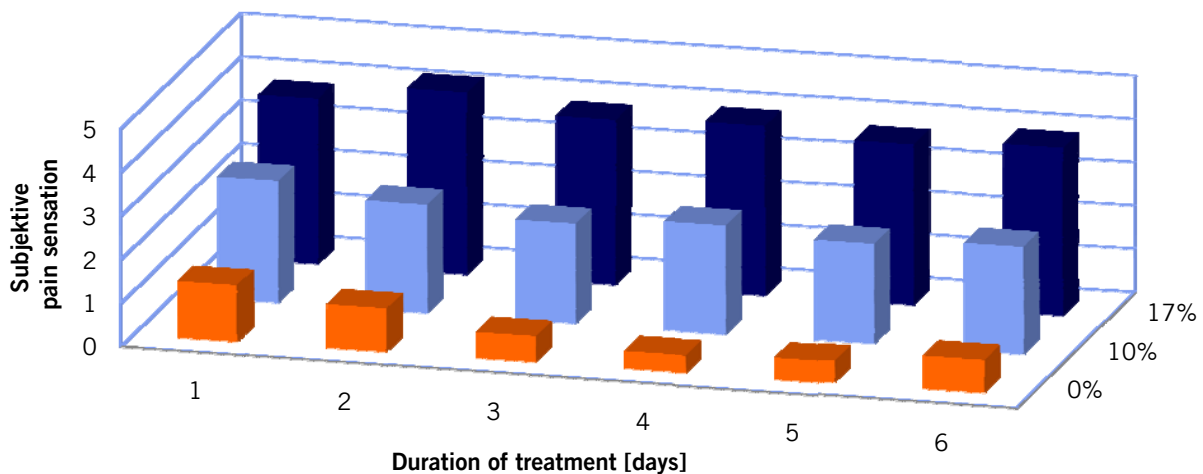


Figure 5: Subjective pain sensations during the use of Perfect Bleach 10%, 17% and a placebo (Dr. Krause, University of Bonn, Germany).^[5]

The paraesthesia cases were not cumulative and they completely disappeared immediately after the bleaching. A significant percentage of the complaints resulted from wearing the tray. Overall, the paraesthesia consistently proved to be easily bearable. The study nevertheless recommends cutting away the interdental area of the application tray as much as possible to avoid this problem. This prevents extended contact between the mucosa and gel and ensures a tight marginal attachment.

By increasing the concentration of the active ingredient, the occurrence of paraesthesia rises faster than the degree of whitening. A longer treatment time with the lower concentrated preparation is thus recommended for hypersensitive patients. The whitening result is identical in the end and limited to returning the teeth to their natural shade in both cases.

Patient satisfaction

At the beginning of the study, there were no differences between the test subject groups concerning the assessment of their present tooth shade. After an initial increase in all three groups, only the values in the test groups (10% gel, 17% gel) rose significantly in the following days. These values changed only slightly in the 2 week time period after the treatment ended, which was consistent with the actually measured tooth shade.

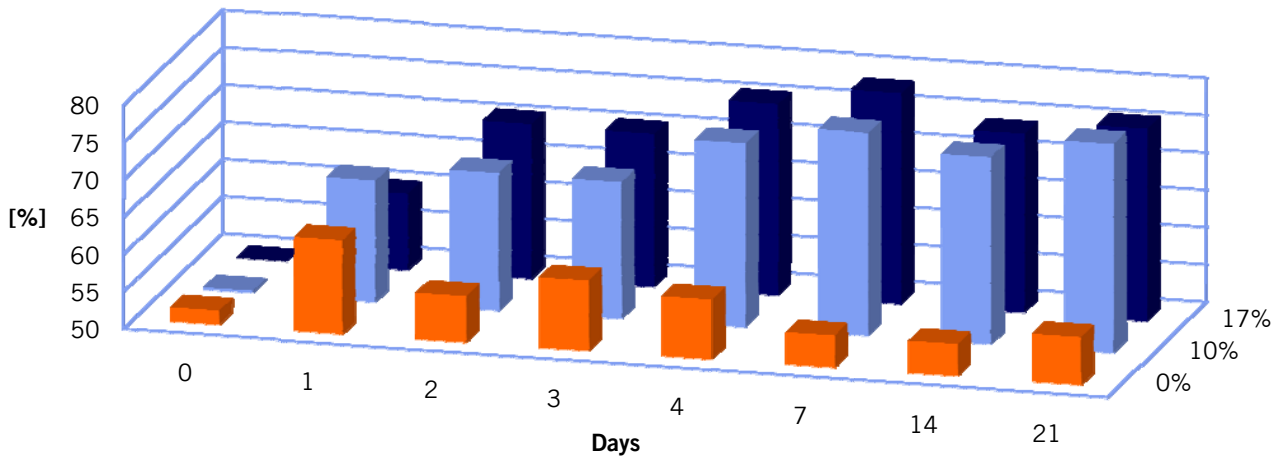


Figure 6: Patient satisfaction regarding the personal whitening result during the application of Perfect Bleach 10%, 17% and a Placebo 0%.^[4]

The present study shows that the subjective satisfaction of the patients with the result does not depend on the concentration of the bleaching agent used. Even hyperalgesic patients can thus be treated to their satisfaction with the lower concentrated preparation.

Conclusion: Perfect Bleach delivers:

- a significant and natural whitening result
- no severe or completely irreversible paraesthesia or damage
- high patient satisfaction

[1] Fugaro, J.O. et al., *Oper. Dent.* **2004**, *29*, 363-368.

[2] Attin, T. et al., *Zahnärztl. Mitt.* **2001** Mai: 32 ff.

[3] Braun, A. et al., *J. Dent. Res.* **2004**; *83* Spec. Iss. A, Abstract 3213.

[4] A. Braun, S. Jepsen, F. Krause, *Dent. Mater.* **2007**, *23*, 165-169.

[5] Krause, F. et al., *J. Dent. Res.* **2004**; *83* Spec. Iss. A, Abstract 3212.