

*ALL YOU NEED
TO KNOW ABOUT
**WHITENING OF
NON-VITAL TEETH***



WHY MAY ENDODONTICALLY-TREATED TEETH GET DARKER?

There are several reasons for the color change in endodontically-treated teeth. Those reasons may be associated or not and, therefore, increase or decrease the complexity and predictability of each case. **Among those reasons, we can point out the following:**



Reason 1

Degradation of pulp tissue after necrosis: pulp hemorrhage after a trauma or during treatment where erythrocytes invade dentin tubules and their degradation generates a dark pigment (sulfate + iron), which impregnates.

Reason 2

Insufficient endodontic access, making irrigation and cleaning more difficult. Some types of intracanal medications, coronary remains of endodontic cements with silver and/or zinc oxide and eugenol in contact with the walls of the pulp chamber for a prolonged time. It is important to thoroughly clean the pulp chamber, leaving it free of debris and residue in between sessions and after the end of the endodontic treatment.

Reason 3

The absorption of external pigments resulting from diet and/or use of tobacco.

There is also the loss of shine (luminosity) after the endodontic treatment, caused by the removal of the pulp tissue and loss of the hydrodynamic flow, leading to a minor color change.

A few requirements have to be met for the recommendation of the classic whitening therapy of non-vital teeth. If these requirements are not met, other clinical approaches may be recommended.

Requirements for the Whitening of Non-Vital Teeth:

- Well performed endodontic treatment and absence of periradicular lesions.
- Periodontal health.
- Removal of any remains of cavity tissue, restorative material and endodontic material from the pulp chamber.
- Teeth with conservative access and without big structural loss.
- Pulp chamber free from retentive areas that make cleaning harder.



Once the above prerequisites are met, another key factor in non-vital whitening therapy is the need for a cervical sealing or sealing plug to prevent leakage / penetration of peroxide through the tubules to the periodontal region. **On the next page you will find some tips to perform this procedure effectively.**

Hints for plugging the seal or cervical sealing:

- Measure the height of the tooth crown with a periodontal probe.
- Remove the endodontic restorative material up to a height of approximately 2 to 3 mm, beyond the length of the crown (heated manual instrument, long low-rotation spherical drill-bits, ultrasound bits).
- Apply adhesive restorative materials (Opallis, Vittra APS, Llis, Opallis Flow, Opus Bulk Fill Flow APS + Ambar Universal APS) or glass ionomers (Maxxion R or C).



- *On the vestibular wall, the seal has to allow for the exposition of that wall close to the cervical area.*
- *On the proximal walls, it should be more extended towards the coronary direction, protecting the periodontal area, which is*

deeper in those areas than in the vestibular areas.

- *In the case of an ionomer seal, wait at least 24 hours to start the treatment.*
- *Any excess sealing material covering non-desired areas must be removed.*

For the whitening of non-vital teeth, there are several techniques and approaches, different whitening agents and application forms, with the purpose of offering convenient options for the professionals and for the patient, in longer or shorter therapies and safety based on the existing literature. Find as follows, a few of those approaches with detailed considerations.

Techniques or Strategies:

“Walking Bleach” or Mediate Technique

The product is inserted in the pulp chamber, covered by a layer of cotton or non-oven fabric, and sealing must be done with glass or composite ionomer cement. The reassessment and exchanges occur within three to seven days and, in average, up to four sessions (a greater number of sessions may be attempted depending on clinical criteria). **Options:**

More convenient for application

- *Whiteness Super-endo; carbamide peroxide at 37%.*
- *Whiteness Perborato: Sodium perborate (powder) + hydrogen peroxide (20%) in the proportion 1:1 or 2:1.*



Traditional

- *Whiteness Perborato mixed with saline solution or distilled water – slower but with a higher pH than the previous one.*



It is not recommended to use hydrogen peroxide at 35% with this technique, because the high release of O₂ may cause discomfort due to pressure and greater risk of radicular penetration of the peroxide.

Immediate technique:

Hydrogen Peroxide at 35% applied internally and externally in the office with Whiteness HP or HP Maxx: 3 applications for 15 minutes each or Whiteness HP Blue 40 minutes or Whiteness HP Automixx 50 minutes.



Generally, more than one session will be necessary, therefore, it is worth using mixed techniques.

Mixed Technique: (mediate + immediate and external + internal)

- **Technique 1:** One clinical session with hydrogen peroxide internally and externally, as described above + Walking Bleach technique, as described above. Maximum of 4 sessions with exchanges and applications.
- **Technique 2:** One session with hydrogen peroxide externally and carbamide peroxide at 37% internally (reduced risk of radicular penetration of the hydrogen peroxide) + Walking Bleach technique as described above. Maximum of 4 sessions with exchanges and applications.
- **Technique 3:** Same as techniques 1 and 2 + whitening tray for the teeth treated, the others being cut out, and use of more concentrated at-home whiteners such as Whiteness Perfect at 22% - for 60 minutes – or White Class at 10% O- for 30 minutes/day between sessions.



In more severe cases and/or with lower progression, that technique may be interesting. In the long term, the whitening with the molding tray may be recommended as an option if the patient is interested.

When there is a need to whiten the vital teeth adjacent to the endodontically-treated teeth, one good strategy is to start the whitening from the non-vital teeth and, after some progress in that one, start a supervised whitening treatment with a molding tray (with the chosen concentration of Whiteness Perfect or White Class) and monitor to avoid any relevant color disparity.

If the desired result for the whitening therapy for non-vital teeth is not achieved, the complementation with restorative dentistry may be used. Any degree of whitening obtained facilitates the esthetics in the restorative process. Adhesive procedures must be carried out at least 7 days after the end of the whitening treatment not to compromise adhesion.

To facilitate esthetics with increased luminosity, the use of shades with that characteristic to substitute part of the internal dentine can be applied (Vittra APS DAO or Opallis OW) to favor the esthetic result.

Relapses may happen between 3 to 5 years after treatment. The professional may perform a new treatment (usually shorter) or rely on restorative dentistry.



Problems related to whitening of non-vital teeth:

One of the problems related to the whitening of non-vital teeth is the external cervical absorption. That problem is also associated to the dental trauma such as a concussion and it is very important that the professional assess if that fact was the reason for the endodontic treatment (generally, this happens 1 year after the trauma).

In the case of the whitening of non-vital teeth, that happens, probably, due to the penetration of the hydrogen peroxide into the tubules until the periodontal area (a flaw in the cement-enamel bond) leading to a reabsorption inflammatory process. The cases that are covered by the literature are normally associated to the absence of a seal and to the Thermo-catalytic technique (use of heat) and high-concentration hydrogen peroxide (30% or higher) associated to sodium perborate through the Walking Bleach technique.

Considering that the penetration of the hydrogen peroxide for periodontal tissues is related to:

- pH.
- Peroxide concentration.
- Time.
- Permeability of tissues.
- Morphology of the cement-enamel bond.
- Absence of cervical seal.
- Thermo-catalytic technique.



In order to carry out a safer and faster procedure, these are the recommendations:

- A well-developed cervical seal.
- Not to use the thermo-catalytic technique.
- In the Walking Bleach mixed technique
 - *Prefer to use Whiteness Super-endo or*
 - *The mix: Whiteness Perborato + Whiteness Perfect at 10%.*

Regardless of the technique chosen by the professional, FGM offers a complete line of whiteners, with solutions to all the techniques proposed in the literature. That means freedom of choice.



Whitening of darkened teeth after endodontic treatment.

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