

DENTAL BLEACHING

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GROWING DEMANDS

- Health, neatness
- Youth, eternal youth
- Self-confidence, self-esteem
- White teeth...

Genuine tooth shade

- Teeth color changes in accordance with the location and thickness of enamel and dentin within a tooth as well.
- Enamel/dentine rate decreases with age.
- The colors of different teeth are not the same in a mouth, the canines are usually darker.
- Depending on localization of discolouration internal and external discolorations are differentiated.
- Poor oral hygiene.

Etiology of tooth discolourations

- Exogenous factors:

CAUSES OF DISCOLORATIONS

Endogenous factors I.:

- **During development**
 - Structural abnormalities: amelogenesis imperfecta, enamel hypoplasia, enamel hipokalcifikáció, dentinogenesis imperfecta.

CAUSES OF DISCOLORATIONS

Endogenous factors II.:

- Systemic drugs: tetracycline before the age of 8, excessive fluoride intake.
- Systemic diseases: erythroblastosis fetalis, thalassemia, hyperbilirubinemia, porphyria (erythrodontia) alkaptonuria.

CAUSES OF DISCOLOURATIONS

Endogenous factors III.:

■ After the eruption:

- Age
- Tertier dentin, calcific metamorphosis
- Tooth decay
- Trauma
- Pulp necrosis,
- Internal resorption
- Iatrogenic: amalgam fillings, metal posts, inadequate root canal treatment

Treatment of tooth discolorations

- Professional teeth cleaning, polishing
- Microabrasion
- **Teeth whitening**
- Direct composite veneer
- Ceramic veneer
- Ceramic crowns

Indications of teeth whitening

- Patient is dissatisfied with his/her own tooth color.
- Metal-free restoration is planned on discolored tooth/teeth.

Contraindications of teeth whitening

■ Absolute:

- Severe tooth malformations, deep micro cracks, too broad pulp chamber.
- Allergy to any of the whitening substances used.
- Light intolerance (only for photocatalytic methods).
- Psychologically unstable, having excessive expectations, not cooperative patients.

■ Transitional:

- Teeth are being treated by conservative/orthodontic dental care.
- Gingival pathology.
- Taking photoreactive medicine.
- Pregnancy, during lactation.

Tooth whitening timeline

Initial attempts at bleaching

1877 Chapple - oxalic acid

Modern bleaching techniques

1918 Abbot - superoxol and heat

Non-vital bleaching

1967 Nutting and Poe - „walking bleach“

Modern techniques

1989 Munro - nightguard vital bleaching

Bleaching agents in practice I.

- **Materials containing hydrogen peroxide:**
 - Hydrogen peroxide (H_2O_2)
 - Carbamide peroxide ($\text{CH}_4\text{N}_2\text{O} \cdot \text{H}_2\text{O}_2$)
 - Sodium perborate ($\text{NaBO}_3 \cdot 4\text{H}_2\text{O}$)
 - Sodium percarbonate ($2\text{Na}_2\text{CO}_3 \cdot 3\text{H}_2\text{O}_2$)

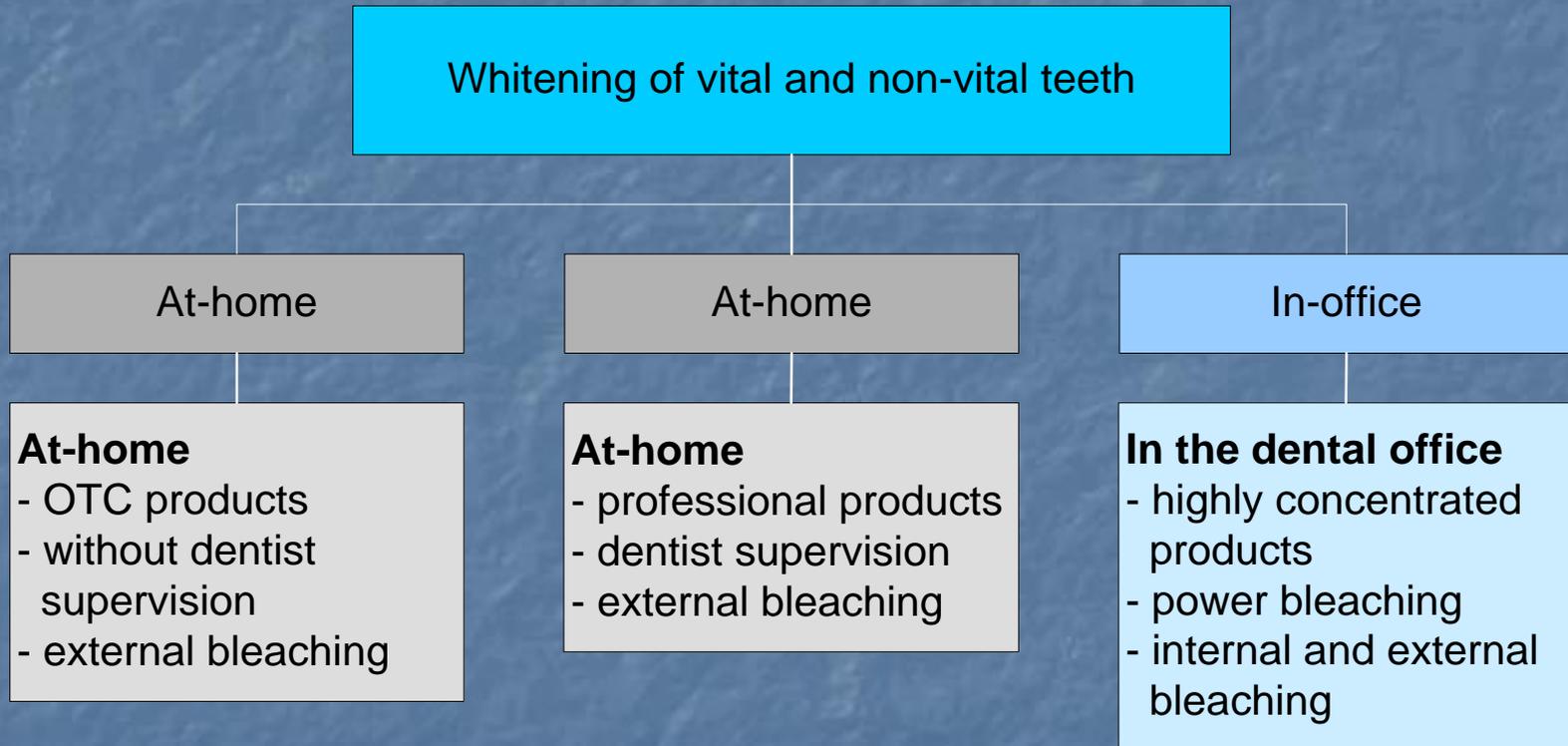
Bleaching agents in practice II.

- Hydrogen peroxide-free materials:
 - Titanium dioxide (TiO_2)
 - Chlorine dioxide (ClO_2)
 - Ozone (O_3)
 - New developments ...
 - Combinations...

Mechanism of action

The released free radicals by oxidation of unsaturated double bonds of the color pigments causing their fading and etiolation respectively.

Bleaching techniques



Types of teeth whitening methods

- **Vitality point of view:**
 - Living tooth (external)
 - RCT tooth (internal)
- **Place of execution:**
 - In office
 - At home, but directed by a dentist, combined
- **Activation mechanism:**
 - Chemical
 - Thermocatalytic
 - Photocatalytic
 - Photothermic
 - Photochemical
 - Ultrasonic

§ NEW REGULATIONS §

< 6 % Hydrogen peroxide!!!!

VITAL TEETH BLEACHING IN OFFICE

1. Medical/dental history, patient examination, dg, treatment plan.
2. Extensive information about treatment.
3. Photodocumentation of teeth color.
4. Professional teeth cleaning, dental treatments.
5. Precise isolation of soft tissues.
6. Bleaching material preparation, application to the teeth.
7. Illumination.
8. Repeat of 6. and 7. according to manufacturer's instructions.
9. Reducing tooth neck sensitivity.
10. Information, photos taking.

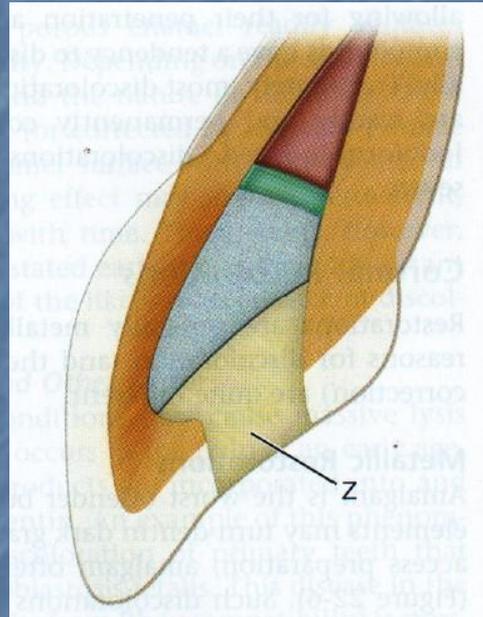
VITAL TEETH BLEACHING AT HOME

- Reduces time spent in the office, cost-effective.
- Degree of whitening can be adjusted.
- Complete the in office treatment, for color retention.
- Selective whitening.

BUT:

- Gradual whitening is less noticeable.
- Slower.
- Patient is responsible for execution.

BLEACHING OF ROOT CANAL TREATED TEETH



SIDE EFFECTS

Tips

During the treatment interval avoid



Final thoughts

- Many whitening options are available.
- Accurate history, correct design and implementation are essential.
- Compliance with existing regulations makes bleaching safer, however, reduces the effectivity of the bleaching substances!
- Large transformation: new products and techniques are expected.

Thank you for your attention!

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