THE MEDICAL COLLEGE OF GEORGIA
Department of Oral Rehabilitation
706-721-2554 FAX 706-721-6276 or 721-8349

School of Dentistry AD 3144
Augusta, Georgia 30912-1260

The following information is adapted from
Dr. Van B. Haywood, Professor

NIGHTGUARD VITAL BLEACHING ISSUES

INDICATION/ISSUE | PROGNOSIS | COMMENTS
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teeth discolored by aging, inherit discoloration | Excellent in 1-6 weeks treatment for 9/10 patients | Dentin and enamel change in color: Removes stains & changes inherit color of tooth; All teeth may be darker and need whitening, or only the canines markedly darker than incisors

teeth discolored by smoking or chromogenic materials | Excellent: make take from 2 weeks to 3 months to eliminate discolorations | Heavy nicotine stains take longer (3 months of nightly treatment); patients should not smoke and bleach at the same time if possible

teeth discolored by tetracycline ingestion | Favorable outcome: make take 2-6 months of nightly treatment | Never get as white as non-tetracycline, but all improve. Patient compliance/expectations important; dark gingival 3rd has poorest prognosis: program like weight-loss or exercise regime

Single dark teeth | Generally lightens almost as much as other teeth; radiograph important for pulp size & status, and periapical status | Can make tray for single tooth (NS/NR and remove tray over adjacent teeth), or use conventional design tray for all teeth and apply material longer on darker tooth

Brown fluorosis or isolated brown discolorations | about 80% of teeth will respond, but others may need microabrasion. Also brown due to trauma will respond. | Removal of this brown fluorosis stain may be permanent; bleach prior to microabrasion to get color stable in case composite is required to mask unremovable stain. Use UltraLight composite shades.

White spots | Are not removed, and may get lighter during tx (Splotchy look). Return to original color after bleaching | If remainder of tooth is darker, white may be less noticeable after bleaching. If not, microabrasion is treatment of choice, with possible composite bonding to mask. Use UltraLight composite shades.

Surface changes | No clinical or reasonable SEM evidence | Random tooth variation exceeds reported effects on tooth structure

Tooth hardness | No change in hardness | No changes on surface, or in subsurface enamel to the DEJ with neutral pH solutions.

Sensitive teeth | 2/3 patients have 1-4 days sensitivity, some throughout treatment. Can be sporadic, and helped by reduction in tx time or frequency of application. | Sensitivity ceases with termination of treatment with no sequela; only predictors are history of sensitive teeth and increased frequency of applications in one day. Potassium Nitrate 3-5% 30 minutes prior to tx or alternating nights with treatment beneficial.

Cracks in teeth | No evidence of increased sensitivity, but patient should be warned of possibility | Although cracks may provide a channel for faster ingress, they are not a contraindication. Stained cracks are cleaned well.

Caries | Bacteriostatic properties of 10% CP inhibit caries during treatment | Sensitivity may require caries-control restoration, but final composite should be done after bleaching for color match

Exposed dentin | No evidence of increased sensitivity | History of sensitive teeth and too frequent applications are only predictors of sensitivity

Splotchy teeth | Different parts of the tooth may respond as different rates | Continue bleaching and other parts will "catch-up". Apparently enamel formed in different ways (like knots on tree)

Non-responsive teeth | Either extend treatment time, or if patient is tiring, use in-office bleaching as a booster | Consent forms should always include subsequent treatment options, such as microabrasion, bonding and veneers

Initial color relapse | After bleaching, there is a small immediate relapse as oxygen trapped in tooth (which changes optical properties) diffuses out of tooth | Do not encourage regular touch-up treatment. 74% patients stable after 1.5 years with no touch-up; 62% patients still stable after 3 years with no touch-up; 35% stable after 7 years. Wait 2 weeks for shade stabilization prior to restorative treatment.

Longevity of color change | 1-3 years duration, although some may be permanent (7 year recalls 35%) | Touch-up generally requires only 1 day per week of initial treatment; examine patient to insure no other cause for darkening.

Age range for treatment | 10-14 years for younger, generally done on permanent teeth; no limit on older persons. | No correlation with age and sensitivity or treatment success; root surface in older teeth does not lighten as well as clinical crown

Pregnant patients | No known concerns, but do not recommend treat pregnant or lactating women due to normal precaution and no reason not to wait | If patient becomes pregnant during bleaching, no cause for alarm; no evidence of any problem, although generally stop treatment for peace of mind of patient and dentist, as well as gingival reponse.

Radiographs taken | One periapical to evaluate for periapical pathology and pulp chamber size | Dissimilar pulp chamber sized may result in different rates of treatment; look for internal resportions or periapical abcess.

Restorations on teeth | Neither composites or porcelain will bleach; large color shifts will require replacement | Contraindication to bleaching may be amount and cost of restorative work that would be needed after bleaching

ADA-ACCEPTED PRODUCTS (10% carbamide peroxide only)

<table>
<thead>
<tr>
<th>PRODUCT NAME</th>
<th>COMPANY</th>
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<tbody>
<tr>
<td>Rembrandt (fluid gel in tube)</td>
<td>Denmat</td>
</tr>
<tr>
<td>Opalescence (viscous gel in syringe)</td>
<td>Ultradent Products Inc.</td>
</tr>
<tr>
<td>Platinum (white paste in tube)</td>
<td>Colgate Oral Pharmaceuticals</td>
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<tr>
<td>Platinum Overnight (white paste in syringe)</td>
<td>Colgate Oral Pharmaceuticals</td>
</tr>
<tr>
<td>NiteWhite (viscous gel in syringe)</td>
<td>Discus Dental Inc.</td>
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<tr>
<td>Patterson’s Toothwhitening Gel</td>
<td>Patterson Dental Supply Co.</td>
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ADA Guidelines for the Acceptance of peroxide containing 
Oral Hygiene Products: JADA 125, Aug 1994

<table>
<thead>
<tr>
<th>SAFETY DATA REQUIRED</th>
<th>EFFICACY DATA REQUIRED</th>
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<tbody>
<tr>
<td>acute toxicity</td>
<td>two double-blind studies</td>
</tr>
<tr>
<td>subchronic toxicity</td>
<td>2-6 wks treatment</td>
</tr>
<tr>
<td>chronic toxicity</td>
<td>2 color measurements</td>
</tr>
<tr>
<td>genotoxic potential</td>
<td>soft tissue measurements</td>
</tr>
<tr>
<td>carcinogenic potential</td>
<td>3 &amp; 6 mo. color duration</td>
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ADA acceptance policies updated May 1998

**TRAY DESIGN FEATURES**

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<thead>
<tr>
<th>Feature</th>
<th>Advantages</th>
<th>Disadvantages</th>
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| Reservoir | - tray puts no pinching pressure on teeth  
- aid in seating tray with highly-viscous materials  
- design allows seat against gingival of tooth  
- no evidence that bleaching is any faster  
- some evidence material may be active longer (4-10 hrs) | - loss of retention must be compensated by thick and sticky material  
- added thickness of tray may irritate lips and cheek  
- potential occlusal interference on mandibular arch  
- requires additional time & products to make |

| Scalloped | - no soft tissue contact  
- minimal gingival irritation  
- minimal material use | - saliva ingress removes material at neck of tooth  
- tongue or lip irritation from edges  
- requires additional time to fabricate |

**TRAY DESIGN OPTIONS**

<table>
<thead>
<tr>
<th>Design</th>
<th>Indication</th>
<th>Comments</th>
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| S/R    | - where minimal tissue contact is desired  
- for highly viscous materials which supply retention  
- maxillary arch to conserve material use | - saliva ingress a problem unless relatively insoluble material is used (thick and sticky)  
- special trimming scissors facilitate fabrication |
| non-S/ non-R | - for maximum retention of tray  
- for maximum retention of material at gingival of tooth  
- for fluid and honey-like materials  
- for mandibular arch where occlusion contacts facial of tooth | - allows tissue contact which may cause gingival irritation  
- cannot extend into undercuts  
- should not terminate on soft tissue peaks such as rugae or impinge on frenum movement or canine eminance |
| facial-S/ R | - where taste is a problem to patient  
- where tongue irritation from edges of tray a problem | - avoids spill-over of material onto tongue from lingual  
- provides smooth edge for tongue contact |
| S/ non-R | - for fluid materials when tissue avoidance is desired but with maximum retention of tray | - no apparent difference in bleaching rate with and without reservoirs |
| non-S/ R | - for seating of tray with viscous materials when a better seal is desired | - mandibular arch best with non-scalloped for material retention/ tissue comfort |

**BLEACHING TETRACYCLINE-STAINED TEETH**

<table>
<thead>
<tr>
<th>QUESTION</th>
<th>ANSWER</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>TIME TEETH STAINS OCCUR</td>
<td>Children from birth through elementary age; adult teeth now reported to stain from tetracycline ingestion in adult years</td>
<td>Adults deposit in secondary dentin; Minocycline stains cited from acne treatment</td>
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<td>TREATMENT TIME</td>
<td>-2-6 MONTHS average; Some have taken as long as 12 or minimal of 2; Patients should be willing to go at least two months</td>
<td>- Nightly wear if possible, but requires compliant patients with realistic expectations; best presented as program like &quot;weight loss&quot; or &quot;exercise&quot; regime</td>
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| PROGNOSIS | - all have some lightening  
- depends on the severity of color and compliance | - Discoloration at gingival of tooth has worse prognosis  
- Color seldom as light as non-involved teeth |
| LONGEVITY | @ 4.5 years, 83% still perceived as color stable by patients | At 1 & 4.5 year recalls, all patients felt their teeth were lighter than before treatment; none back to original shade |
| PATIENT SATISFACTION | All patients who were able to complete treatment were glad they bleached their teeth | Patients would repeat treatment and recommend it to a friend |
| EFFECTS ON TEETH | No detrimental effects either clinically or under SEM viewing (200 and 2000X) different from untreated teeth | No patient had a crown or endodontic therapy related to the bleaching |
| SENSITIVITY | Ranges from none to through-out treatment. Average similar to 2-wk NGVB (1-6 days). | Treatment must be either Passive (less time or longer intervals between Tx) or Active (5% potassium nitrate or neutral fluoride in tray). |
| FEE | - Consider initial regular fee with slight increase for one month's material  
- Additional fee for each monthly recall required | - Monthly recalls for examination and material  
- Continue recalls until patient unable to detect color change (after 2-3 months initial treatment) |
| TRAY DESIGN | Depends on viscosity, stickiness, and water solubility of material  
- want material to be held against neck of tooth | For very thick materials, scalloped trays work well. More fluid materials require Non-Scalloped tray +/- reservoirs to seal against tissue |