

Bleaching Children's Teeth: Questions and Answers

by Dr. Van B. Haywood, Professor, MCG School of Dentistry

I am often asked if I bleach children's teeth. This question arises because some of the bleaching product manufacturer's instructions cite ages below which they recommend not to bleach. In fact I do bleach children's teeth, especially in the 10-14 age range and older. Not all children are concerned about discolorations on their teeth. However, if the child is self-conscious about their teeth and smile, they may not properly develop good social interactions or confidence in their personality. Bleaching should be performed if the child is having social/personal problems, not just because the parents want their child's teeth to be whiter. Since compliance is an important component in this bleaching technique, whitening the teeth should be the desire of the child. It is especially important in our culture to have attractive teeth during teenage years, so this age group is especially interested in bleaching. Bleaching is often the sequel to orthodontic treatment, and even can be accomplished using the orthodontic positioner rather than a bleaching tray.

Are there concerns for the young tooth? Although there has been concern expressed about the large pulp chambers and sensitivity, I have not seen any problems associated with this age group. It may be due to the large apices and considerably good blood flow that accompanies this age. We know that peroxide goes through the enamel and dentin to the pulp in 5-15 minutes, which is apparently the cause for sensitivity. However, possibly the good blood supply and resiliency of children allows sensitivity not to be a problem. We at MCG have published several papers showing the use of potassium nitrate containing products (such as Sensodyne toothpaste), either as a pre-brushing for two weeks, or as a 10-30 minute application in the tray, can alleviate sensitivity in most patients should that occur.

How young can the child be for bleaching? Typically the youth would have permanent teeth, which places them in the 10-14 year old range. Since the primary teeth are called "milk teeth," they are usually very white and not a problem. We have reported one case of bleaching the primary teeth of a four-year-old darkened by trauma. Trauma has been the only indication

for primary teeth bleaching, and should only be done if all other reasons for discoloration are eliminated (abscessed teeth, caries, resorption, etc.). Bleaching is certainly easier, more esthetic and more cost effective than bonding or placing stainless steel crowns with esthetic facings for the short life of the primary tooth. Bleaching



Dr. Van B. Haywood

is more indicated in the mixed dentition stage. Although teeth may still be erupting, orthodontists have indicated that wearing of the tray will not impede eruption in the short time needed to bleach. However, it is best not to have a tray seated on gingival areas where a tooth is almost ready to suddenly erupt. The youngest children with permanent teeth I have bleached have been 10 years of age. The indication usually was for brown stains from fluorosis. I have bleached my three children's teeth when they were in their teenage years.

What about safety to the child from swallowing the product? The questions of safety to the young child have been answered in literature prior to bleaching, as well as current literature. Prior to bleaching and even today, 10% carbamide peroxide is used in new born infants, 10 drops in their throat every two hours for 7-8 days, to treat candidias or thrush. Urea peroxide was also used in 1800's to stop caries in children with pitted teeth. Several papers cite the use of 10% carbamide peroxide as a rinse, in the form of Glyoxide, in orthodontic patients during three years treatment to prevent white spot lesions. We at MCG are currently pursuing this option of oral hygiene for the orthodontic patient with tray application of carbamide or hydrogen peroxide. The CP material appears the most favorable at this time.

What does the ADA seal offer? The strongest position for safety is that of the American Dental Association's seal of approval. To obtain the seal, the company must demonstrate both laboratory and clinical safety through a series of stringent safety studies, as well as show the product works and lasts at least six months in two clinical double blind studies. Although the ADA is discontinuing the seal program in 2006 for dental products used in the office, they will retain the seal for products that are either sold over the counter, or taken home from the dental office for home application. This includes home bleaching kits and fluorides. At this time, four bleaching materials have the ADA seal: Rembrandt by DenMat (which has been recently acquired by Johnson & Johnson), Platinum by Colgate Oral Pharmaceuticals, Opalescence by Ultradent Products Inc. and NiteWhite by Discus Dental. Some of these products are no longer available to the dentist in the form that the safety data was generated, so we will have to wait to see who in the new



continued on page 6

Bleaching: from page 4

seal program retains the seal. However, it is safe to say those concentrations of 10% carbamide peroxide are the most well researched products on the market, and would be safe for youth and children. Only 10% CP products have ever had the ADA seal, and the bulk of research in the world is on 10% CP.

What type of tray design do you use?

Typically an alginate impression is taken, and a cast generated in a horseshoe shape. Many articles and bleaching companies have information on the fabrication of the tray, with various design features. I believe the non-scalloped, no reservoir tray design is the most desirable, since this design provides a better seal against the gingiva to retain the material in the tray, and uses less material per application. Since it has been shown that reservoirs are not needed to bleach teeth, this design is also the most comfortable to wear and the easiest to fabricate. Additionally, I use a "boil and form" tray design available only to the dental profession when the discoloration is isolated to the front two or four teeth. This is especially helpful in the mixed dentition stage, since any tray will no longer fit in six months or less due to loss or primary teeth and eruption of permanent teeth. MCG did the early research on these in-office boil and form trays. Originally a two-ply tray, they evolved into a thin facial, thick lingual tray. The cost is roughly \$1.40 per tray, and they can be bought in bulk lots of 1,000 (Sure Firt-Ultra Thin Tray 10135-OT) from oraltech.com.

What reasons would you have to bleach a young person's teeth?

There are several areas of discoloration for children's teeth. The first to consider is the child who is born with yellow teeth. Children whose teeth are more yellow than normal are often teased about not brushing, or called "butter teeth." For this child, the use of nightguard vital bleaching can easily remove the yellow coloration in a matter of days or weeks. A second area for consideration is white or brown discolorations, which are often associated with high fluoride ingestion.

What about using microabrasion?

Many dentists are more often familiar with abrasion techniques for white or

brown discolorations. Abrasion techniques pre-date the recent home bleaching era. The most popular abrasion technique is called microabrasion, as made popular by Dr. Ted Croll. Microabrasion involves the softening and removal of the enamel with hydrochloric acid and pumice. The teeth are isolated with a rubber dam, and a special geared-down handpiece is used. Microabrasion is not bleaching, but the removal of enamel along with the surface defect. Twelve to 26 microns of enamel are removed per five-second application.

What is macroabrasion? There is also the sister abrasion technique called macroabrasion. Macroabrasion uses rotary instruments for enamel removal. As described by Dr. Harald Heymann, this can involve the use of a carbide bur in a high speed handpiece, followed by polishing with composite finishing disks and polishing points or pastes. We published a paper showing the sof-flex disk (black and three blue) by 3M, followed by composite polishing instruments such as Enhance points and diamond polishing pastes work well on enamel, especially when a rubber dam is not easily applied for microabrasion.

However, the advent of the nightguard vital bleaching has offered a more conservative option to be considered first in certain areas. If the enamel surface is intact and hard, then nightguard vital bleaching should be the first choice for brown discolorations, or minor white areas. This whitening technique avoids the removal of the fluoride rich enamel layer, does not alter the line angles or shape of the tooth, and still leaves the abrasion technique as an option should it be required.

What response can be expected from brown discolorations?

Brown discolorations can be removed approximately 80% of the time. One case report took 4-6 weeks to remove an isolated brown discoloration on a central incisor. This brown discoloration has remained absent for seven years with no further treatment. Most other brown areas are showing similar patterns. Only a few brown areas have required re-treatment in 1-3 years.

How different is bleaching the white discolorations?

White discolorations

behave entirely different. The white cannot be removed, but the background is lightened to make the white spot less noticeable.

If the white area is a single isolated spot or a few spotty areas, then it is better to bleach first to lighten the background of the tooth, rather than try microabrasion. Often this bleaching may make the white areas less noticeable, and no further treatment is needed. White spots do not actually disappear, but the background gets lighter to make them less noticeable. Sometimes the original white spots gets more noticeable during the first few days of bleaching (called the "splotchy stage"), but generally revert back to their original color after stopping the treatment. This temporary lightening of white spot is due to the differently formed portions of enamel which are responding to the carbamide peroxide faster.

Do you use microabrasion before or after bleaching?

If there is an unsightly, rough, white, poorly-formed discoloration covering the entire tooth surface, then microabrasion may be the first treatment of choice for smoothness. However, generally the teeth are more yellow after the white surface is removed, and the bleaching technique may be still required after the abrasion. Hence I generally bleach first, then consider abrasion techniques.

If the white spots are still a distraction after bleaching has been completed, then micro or macro abrasion can be performed. However, the abrasion techniques should be done with the explanation to the parents that if the isolated defect gets worse sub-surface, the defect may have to be aggressively removed and the defect covered with a composite restoration. By bleaching first, the color for the composite can be properly selected the day the abrasion is used. Bonding or abrasion should be delayed for two weeks after bleaching, for the shade to stabilize and for the bond strengths to reach the original level. There is a 25% reduction in the bond strength of composite to etched enamel if applied immediately after any type of bleaching.

Bleaching: from page 6

How effective is bleaching of the single dark tooth? Another familiar situation to the general dentist is the child who has a single dark tooth which may still be vital, usually resulting from trauma. The brown discoloration of the tooth is a result of the iron pigments in the blood which have been aspirated into the dentinal tubules. This single brown discolored tooth is very responsive to nightguard vital bleaching, and should be considered the first and best treatment of choice. The dentist may either elect to only try to change the one tooth, or may involve all the teeth in the arch.

If only one dark tooth is to be treated, the tray is fabricated, and the tray material

covering the teeth on either side of the dark one is removed. Then the bleaching material is placed only on the dark tooth.

If the other teeth are somewhat yellow and need bleaching in addition to the single dark tooth, or if the remaining teeth are already very white, then the typical bleaching tray is fabricated. During the typical bleaching process, all teeth go to a certain level of whiteness, and then they do not change any further. What this level of whiteness is to be varies from patient to patient, and cannot be predicted. However, when one tooth is darker, treatment can be continued on that tooth after the other teeth are no longer changing color. The

dark tooth will eventually match the other teeth, or be very close. When the other teeth are already very white, the child merely places the bleaching material in the space for the dark tooth only. Marking that tooth on the tray with an indelible marker is helpful.

What is your summary? Nightguard vital bleaching using a 10% carbamide peroxide in a non-scalloped, no-reservoir custom fitted tray is one of the safest procedures available to dentistry. When indicated in children and youth, NGVB is an excellent treatment choice for discolored teeth.