

Volume VI, Issue III
newsletter@youngdental.com
US \$10.00

In This Issue:

Abstract:

Although whitening is the most commonly requested dental procedure, it is important to consider the potential success for a patient before beginning a treatment plan. The care provider must assess the condition of a patient's teeth, baseline color, diet, aging, and tooth health, and consider these factors when determining the possible whitening benefits for the individual. Some patients are better whitening candidates than others, so the patient must know all of their options and limitations for whitening success including sensitivity and post-whitening procedures before the treatment begins.

Learning Objectives:

After reading this article the reader should be familiar with:

- ▼ The major factors which determine the overall condition of a patient's teeth, and therefore the potential success of whitening for the patient.
- ▼ The drawbacks to whitening and factors that prevent a patient from achieving the desired whiteness for their teeth.
- ▼ The need to consider all of the variables when designing a whitening plan for a patient, including the estimated results and the proper at-home care for the patient's teeth.

Editor:

Margaret J. Fehrenbach, RDH, MS, is an Educational Consultant in dental education. She earned her Master of Science in Oral Biology from the University of Washington Dental School.

Provided as a professional service by:

The Richmond Institute
for Continuing Dental Education

A division of Young Innovations, Inc.

In Conjunction With:



Qualifying Candidates for Whitening

Margaret J. Fehrenbach, RDH, MS

Whitening is the most commonly requested and performed dental procedure.¹ Even though whitening can be a quick and safe means of improving a patient's appearance, it is important to first consider if whitening would benefit the patient. When a patient inquires about whitening, there are two important pieces of information that must be obtained to qualify the patient:

- 1) Has the patient experienced noticeable tooth discoloration over time?
- 2) Are the patient's anterior teeth healthy and free of any restorations, bonded veneers or crowns?

If both questions can be answered "yes," the patient may benefit from a whitening procedure.

Discussing Whitening with the Patient

As a general rule, if you think a patient could benefit from whitening, it may be beneficial to ask them if there is anything about their smile that they would like to change.² According to one survey by the ADA, the most common response given to this question is, "I'd like to have whiter teeth."³ A response such as this can allow you as a professional to offer the patient a whitening consultation. The patient may want to make an appointment for his or her consultation, or if time permits, they may want to discuss whitening options right away. Regardless of the patient's desire to discuss whitening, it can be beneficial to let them know if your office offers services such as whitening consultations and procedures, or whitening gift certificates, etc.

Factors for Whitening Success

Whitening procedures will provide a higher degree of benefit to some patients than others. The potential benefit of whitening to a patient is an important factor which makes some patients good or great

candidates and others fair or poor candidates.⁴ But when a patient inquires about whitening, how can you determine if they are a good or a poor candidate? Certain factors such as baseline tooth color, wear and aging of the teeth, tooth health, and the prevalence of restorations all contribute to a patient's whitening "rating." The patient's own level of responsibility taken for their oral health is another important factor in the potential success of a whitening procedure. Categorizing each patient based on these factors will allow you, the professional, to predict the level of success whitening will have, which will then allow the patient to have a realistic expectation of change in the whiteness of their teeth.

Baseline Color

The color of a patient's teeth is influenced by a multitude of factors. It is important to determine the possible causes of tooth discoloration in order to estimate how much change a whitening procedure can be expected to achieve. The length of time it takes for teeth to change color varies with the individual. All patients should be informed that varying results can be expected with respect to time.

Teeth display a wide range of shades of white. There is no specific "target" color for teeth; some teeth are naturally lighter in color than others. Gray is perhaps the most difficult color to remove from teeth and is often found in older patients. Satisfactory whitening results may still be achieved from grayer teeth, but extended time may be required.

Teeth also tend to become stained or discolored over time. The degree to which a patient's teeth darken is often related to the amount of repeated exposure they have to chromogenic agents. Tobacco, coffee, red wine, tea and dark colas are all chromogenic agents known to have a darkening effect on teeth, giving them shades of yellow and brown. However, the stains caused by these agents can

be lessened by whitening, with yellow stains having better results than brown. However, heavy smokers, and coffee and tea drinkers are less likely to achieve good results if they do not discontinue these habits during the whitening period.

Childhood exposure to certain medicines can be a cause of intrinsic stains as these medicines can be absorbed while tooth enamel is initially forming. One family of antibiotics, the tetracyclines, is known to cause yellow and brown stains which can be particularly resistant to whitening (see Figure 1.).⁵ Additionally, excessive ingestion of fluoride during tooth development can cause dental fluorosis. This can also be resistant to whitening; however the difference in shade between the stained and unstained regions can be greatly reduced with whitening.

Figure 1.



Systemic exposure to certain medicines as a child such as tetracyclines can cause yellow to brown intrinsic stains that can be resistant to whitening.

Tooth Wear and Aging Factors

As teeth age, their outer layer of enamel is worn away at the cutting edges (attrition), eventually revealing the dentin underneath. In addition to being naturally darker in color than enamel, dentin can also become stained by chromogenic agents. Whitening success tends to be variable with this staining.

Some teeth appear translucent, often at the incisal edge of the anterior teeth (see Figure 2.). Whitening can actually increase this translucency, creating the appearance of gray teeth due to the darkness of the oral cavity behind them. Younger patients' teeth tend to lighten more easily. As teeth age dentin gradually obtains

Figure 2.



Anterior teeth can be very translucent teeth at the incisal edge and the whitening procedure can actually increase this translucency which can create the appearance of gray teeth.

a yellowish hue from underneath the intact enamel. We do not yet know what chromophore(s) cause this tooth yellowing, and whitening has varied success on this effect.

Tooth Health

Sometimes a single tooth can become darker than its neighboring teeth. For example, it is very common that a tooth which has had endodontic treatment will darken as years pass (see Figure 3.). Teeth which have been traumatized will often darken over time too. These can be resistant to whitening, and other procedures such as internal bleaching or restorations need to be considered. In addition, areas of recession show variable compliance to whitening.

Figure 3.



Endodontically-treated teeth will darken over time and can be resistant to whitening and may need internal treatment.

Sensitivity: The Major Drawback of Whitening

Older or periodontally-involved teeth with exposed cervical dentin due to gingival recession may be at risk for post-whitening sensitivity, which is usually only temporary (see Figure 4).⁶ This risk needs to be considered and dealt with after discussion with the patient.⁷

Figure 4.



Older or periodontally-involved teeth with exposed cervical dentin due to gingival recession may be at risk for post-whitening sensitivity.

It is important to note that sensitivity may increase with concentration of whitening product and that a patient's motivation to continue with the procedure can decrease if he or

she experiences sensitivity. The use of a neutral fluoride product immediately following the procedure can help decrease sensitivity as well as the continued use of a less concentrated home product. Another way to combat sensitivity is to slow the procedure down. Usually tooth sensitivity decreases as the whitening treatment progresses.

Other Roadblocks

Whitening may prove ineffective if the patient has had veneers, bonding, or composites placed on his or her anterior teeth.⁸ Because the whitener will not change the color of these materials, they may stand out in the newly whitened smile. In these cases, it is recommended that the patient may want to consider other options like porcelain veneers or dental bonding.

Before any whitening procedure is begun the dentist should discuss with the patient how much post-whitening dental work will be needed. The time and cost associated with replacing dental work can be significant. In most cases, a patient's teeth should be whitened first and their dental work replaced afterward to match the new shade of their teeth. The whitening procedure should cease at least two weeks before restorative procedures are begun. After a thorough dental examination, removal of deposits, restored health of the periodontium, and consideration of an overall treatment plan, the patient is ready for the procedure. Many options for the procedure are available and each one that fits into their treatment plan should be outlined for the patient to consider.⁹

Whitening Abuse

Many people compare their teeth to the teeth of those they see featured in films, television programs and magazine advertisements. It is appropriate to discuss with patients that the shades of the teeth of many models and actors can be considered "unnatural." Let them know that often these extreme shades of white have been achieved by means other than whitening such as placement of crowns or veneers, or simply by digital enhancement!

Figure 5.



Touching up photographs of models and actors so that teeth are extremely white leads to unrealistic expectation by patients and possible whitening abuse.

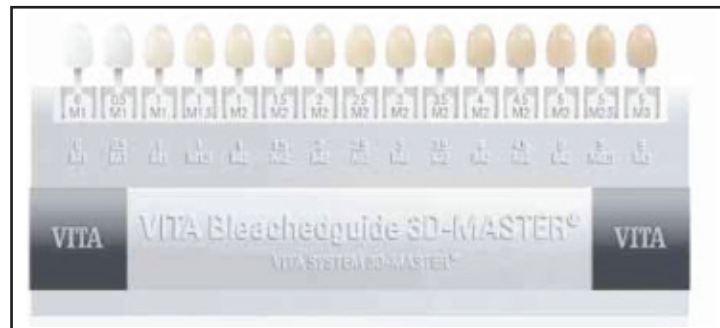
Touching up photographs of models and actors so that teeth are extremely white leads to unrealistic expectation by patients and possible whitening abuse.

Patients expecting to achieve extreme shades of white run the risk of over-exposing themselves to tooth whiteners and damaging their teeth. Gordon Christensen, an expert in clinical matters, feels that abnormally white teeth draw attention away from the remainder of the face, distracting others from the overall beauty of the person and wreaking havoc on the patient's treatment plan.¹⁰ To avoid this, he recommends taking a pre-procedure photo to help the patient recognize the lightening effects achieved by whitening and supervising and post-procedure whitening initiated by the patient before otherwise acceptable restorations are replaced. The most natural look for most patients is achieved when the color of the teeth matches the sclera (white) of the eyes.

Whitening Evaluations

Teeth need to be clean and hydrated for optimum matching to a shade guide, such as the one below.¹¹ When performing the evaluation, the patient should be upright, and matching should be done to the cervical portion of the teeth. Match one tooth at a time while one to three feet away from the patient.

Figure 6. Sample Whitening Shade Guide



Shade Guide distributed by: Vident Inc. Manufactured by: Vita Zahnfabrik, H. Rauter, GmbH & Co. KG, Bad Säckingen, Germany.

First, determine the value (lightness) of each tooth by selecting the closest match. Value is the degree of brightness or darkness of the tooth related to a scale of white to black. Second, determine the chroma within the value group. Chroma is the intensity of the color (hue) within each tooth. Third, pick the hue by determining if the tooth has a more yellow, brown, or red cast. The inclusion of realistic bleaching shades in the shade guide can serve as a complement to your evaluation.¹²

Long Term Success the Patient's Responsibility

Long term results of whitening depend on the individual's consumption habits (tobacco, coffee, tea, red-wine, dark colas, etc.) and oral hygiene.¹³ One study showed that with good post-procedure oral hygiene and dental care, favorable results lasted up to 47 months for 82% of patients.¹⁴ Follow-up whitening procedures are usually necessary, as whitened teeth are not impervious to future staining. These realities should always be communicated to the patient.

To keep the smile bright as long as possible it is recommended that the patient follow the "white teeth diet." This consists of

drinking white wine instead of red, cappuccino instead of espresso, and grapefruit instead of cranberry. This is especially important during the first 24-48 hours after the procedure due to

the loss of tooth moisture that occurs during whitening. In addition, the use of a straw for most drinks and rinsing with water after consumption of staining foods help keep teeth whiter.

Great	Good	Fair/Poor
Strong, noticeable discoloration over time	Slight noticeable discoloration over time	Teeth have always been darker colored
Yellow hue, no intrinsic staining	Strong yellow, brown, or red hue, slight intrinsic staining	Grey hue, heavy intrinsic staining
Healthy, non-restored anterior teeth	Few anterior restorations (may be brighter than enamel)	Older, darker anterior restorations, caries, attrition, recession or Temporomandibular Syndrome
Moderate change desired (1 or 2 shades)	Significant change desired (at least 2 shades)	Unrealistic expectation of change (5 shades or more)
Patient shows high level of oral responsibility, follows "white teeth diet"	Patient shows acceptable level of oral responsibility	Patient shows low level of oral responsibility, may be prone to whitening abuse

Table 1. Classification of Expected Whitening Outcomes

References

- Kihn PW. Vital Tooth Whitening. *Dent Clin North Am.* 2007, 51(2):319-31, viii. Review.
- Bernie KM. "Advantages of Expanding the Role of the Registered Dental Hygienist in Tooth Whitening." *Dentistry Today.* 2001, (7):56-61.
- American Dental Association 2003 Public Opinion Survey. "Oral Health of the U.S. Population." Accessed at www.ada.org/public/media/releases/0404_release02.asp on November 28, 2007.
- Nathoo SA. "The Chemistry and Mechanism of Extrinsic and Intrinsic Discoloration." *J Amer Dent Assoc.* 1997, 128: 6-10.
- Matis, BA, et al. "Extended bleaching of tetracycline-stained teeth: a 5-year study." *Oper Dent.* 2006 Nov-Dec, 31(6):643-51.
- Leonard RH Jr, Haywood VB, Phillips C. "Risk Factors for Developing Tooth Sensitivity and Gingival Irritation Associated with Nightguard Vital Bleaching." *Quintessence Int.* 1997, (8):527-34.
- Hasson H, Ismail AI, Neiva G. Home-based chemically-induced whitening of teeth in adults. *Cochrane Database Syst Rev.* 2006 Oct 18;(4):CD006202.
- Swift EJ, Perdiago J. "Effects of Bleaching on Teeth and Restorations." *Compend Contin Educ Dent.* 1998, 19 (8): 815-822.
- Samorodnitzky-Naveh GR, et al. "Patients' Satisfaction With Dental Esthetics." *J Am Dent Assoc.* 2007, 138(6):805-8.
- Christensen, GJ. "Are Snow-White Teeth Really So Desirable?" *J Amer Dent Assoc* 2005, 136, 933-5.
- Sensabaugh, C and Goodacre, CJ. "Understanding Tooth Color and Shade," Access (ADHA), September/October 2006 and January 2007.
- Paravina RD, et al. "New Shade Guide for Evaluation of Tooth Whitening- Colorimetric Study." *J Esthet Restor Dent.* 2007;19(5):276-83.
- Leonard RH Jr. "Efficacy, Longevity, Side Effects and Patient Perceptions of Nightguard Vital Bleaching." *Compend Contin Educ Dent.* 1998.19 (8):766-781.
- Leonard RH Jr, et al. "Nightguard Vital Bleaching: A Long Term Study on Efficacy, Shade Retention, Side Effects, and Patients' Perceptions." *J Esthet Restor Dent.* 2001;13(6):357-69.

Additional Resource

Haywood V B, et al. "Efficacy of Six-month Nightguard Vital Bleaching of Tetracycline-Stained Teeth." *J Esthet Dent* 1997. 9 (1):13-19.

Websites

- ADA
www.ada.org/public/topics/whitening.asp
- ADA Statement on Safety
www.ada.org/prof/resources/positions/statements/whiten2.asp
- ADHA
www.adha.org/oralhealth/whitening.htm
www.adha.org/downloads/tooth_whitening_factsheet.pdf
- DH Links
www.dhed.net/dhlinks.htm
- e-Medicine: Tooth Discoloration
www.emedicine.com/derm/topic646.htm
- Vident: Understanding Color
www.vident.com/product_t2.php?id_pages=114

Continuing Education Credit

One hour of CE Credit is available with this newsletter through the Richmond Institute for Continuing Dental Education. Please see opposite side for details.

Address Change, Subscriptions, or Comments

To report address changes, to request additional subscriptions, or to make comments, please write, fax or email the Richmond Institute at:

The Richmond Institute for Continuing Dental Education
2260 Wendt St.
Algonquin, IL 60102
Fax: (847) 458-0063
E-mail: newsletter@youngdental.com

©2007 The Richmond Institute for Continuing Dental Education

The Richmond Institute for Continuing Dental Education
2260 Wendt St.
Algonquin, IL 60102



The Richmond Institute
for Continuing Dental Education
is an
ADAC·E·R·P[®]
CONTINUING EDUCATION RECOGNITION PROGRAM
recognized provider

Provided as a professional service by:
The Richmond Institute
for Continuing Dental Education
A division of Young Innovations, Inc.

In Conjunction With:



PRESORTED
STANDARD
U.S. POSTAGE
PAID
ELGIN, IL
PERMIT #9

CE Questions:

Qualifying Candidates for Whitening

Test Instructions—Please fill in the bubble corresponding to the answer you believe to be correct for each question. Mail or fax completed tests to the Richmond Institute to receive CE Credit.

- | | | | |
|---|--|---|--|
| <p>1. Which of the following usually happens to teeth as they age?</p> <ol style="list-style-type: none"> Turn more yellow Increase biting edges Turn redder Increase gingival coverage <p>2. Which tooth hue shows the least compliance with whitening procedures?</p> <ol style="list-style-type: none"> Red Yellow Brown Gray <p>3. In regard to staining teeth, tobacco, coffee, red wine, tea, and dark colas are considered which of the following?</p> <ol style="list-style-type: none"> Systemic agents Intrinsic agents Chromogenic agents Whitening agents | <p>4. The most natural look for most people is when the color of the teeth match the:</p> <ol style="list-style-type: none"> Whitest shade on the Shade Guide Sclera of the eyes Yellowiest shade on the Shade Guide End of the fingernails <p>5. What shade can translucent teeth appear due to the darkness of the oral cavity behind them?</p> <ol style="list-style-type: none"> Red Yellow Brown Gray <p>6. Which of the following is part of the "white teeth diet" for maintaining white teeth?</p> <ol style="list-style-type: none"> Red wine Grapefruit juice Espresso Cranberry juice | <p>7. How long prior to restorative procedures should the whitening procedure should cease?</p> <ol style="list-style-type: none"> One day Two days One week Two weeks <p>8. Which of the following expectations of whitening is characteristic of a "great" candidate?</p> <ol style="list-style-type: none"> Okay with 1 or 2 shade difference Wants more than 2 shade difference Wants minimum 5 shade difference Wants darker teeth | <p>9. Which of the following candidate groups is prone to whitening abuse?</p> <ol style="list-style-type: none"> Great candidates Good candidates Fair/Poor candidates None- teeth can never be too white! <p>10. When noting the color of a patient's teeth, what is important to keep in mind?</p> <ol style="list-style-type: none"> Always tell the patient they need whitening Teeth need to be clean and hydrated for optimum matching Teeth should never need maintenance whitening Always involve the patient in shade matching |
|---|--|---|--|

How to Obtain CE Credit:

Successful completion entitles respondent to one hour of CE credit through the Richmond Institute. There is a \$10.00 processing fee for each test submitted.

- 1) Please complete the answer section to the right.
Incomplete tests will not be processed.

2) Submission:

A) Via Mail (with Check or Credit Card Information)

Mail completed test, address form, and \$10.00 fee (no cash, please) to The Richmond Institute for Continuing Dental Education, 2260 Wendt St., Algonquin, IL 60102.

B) Via Fax (with Credit Card Information ONLY)

Fax completed test and address form along with cover sheet marked "Attn: Richmond Institute" to (847) 458-0063.

- 3) Please indicate your preference for receiving your CE certificate.

Mail Email

CE Answers For: *Qualifying Candidates for Whitening* *Volume VI, Issue III*

- | | |
|--|---|
| 1. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 6. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 2. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 7. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 3. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 8. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 4. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 9. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |
| 5. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D | 10. <input type="radio"/> A <input type="radio"/> B <input type="radio"/> C <input type="radio"/> D |

(Please PRINT)

Name: _____ Date: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone: _____ Email: _____

Practice Name: _____

VISA MasterCard American Express

Credit Card Number: _____ Expiration Date: _____

Name that appears on Credit Card: _____

Signature: _____

(Required for Processing)