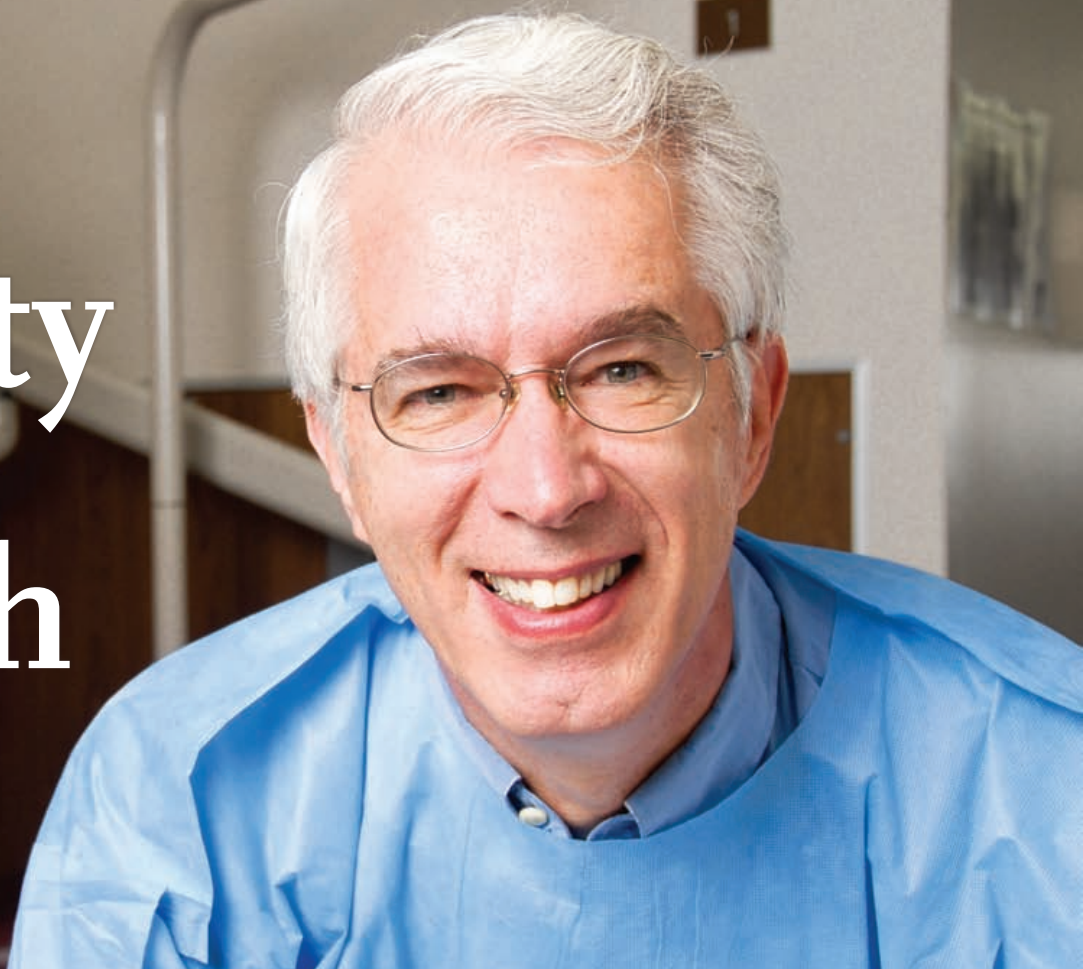


Beauty *and the* Bleach



Bruce Matis is a dentist and the director of the clinical research section for the IU School of Dentistry at Indiana University Purdue University Indianapolis.

by **Kay Kenney**

The tooth-shade guide is a homely tool. Eighteen incisor-like tabs, progressing from a grayish red-brown to a pearly yellow-white, are mounted onto a small platform. Dentists have used the guide for nearly 50 years to precisely match the color of a patient's surrounding teeth when performing a reconstructive or tooth-whitening procedure. Among the 18 shades, dentists have regarded "B1" on the guide as the universal standard for translucent perfection.

Recently, however, the tooth shade guide got an upgrade. Now, whiter tabs extend beyond B1 into shades that, to the untrained eye, have none of the transparency of B1 and look as though the shade tab has been painted with Wite-Out™. The upgrade is partly in response to patients' interest in getting a blindingly bright "Hollywood" smile, the kind favored by today's celebrities and politicians.

Bruce Matis, a dentist and the director of clinical research section for Indiana University School of Dentistry in Indianapolis, understands this pursuit of whiter teeth and the appeal of a beautiful smile. "I see patients, many who are in their 60s and 70s, coming into the dentist's office to simply find out how they can improve the brightness of their smile," says Matis. "And it is satisfying to see patients get excited about their whitening results."

For nearly three decades, Matis has studied the effects of whitening products on teeth, the problems of tooth sensitivity

caused by the peroxide within a product, and the realistic whitening outcomes depending on the original hue of a patient's teeth. As cosmetic dentistry has escalated in recent years, Matis's research has been widely cited in national media, from *Consumer Reports* to the *New York Times* to *U.S. News & World Report*. "Cosmetic dentistry has become a very large part of dental practice," he says.

Studies bear out Matis's view. Many people consider white teeth the most important facial feature. Other research has shown that a lovely smile is perceived as one of the most important assets in communication. "Tooth whitening does enhance self esteem, confidence, and a feeling of attractiveness," says Matis.

And in today's cultural pursuit of a youthful appearance, teeth whitening provides that beauty boost at a cost that, while not inexpensive, is more affordable than a series of Botox injections or a nip-and-tuck procedure. For around \$500, a patient can have a mouth tray made from a model of his or her teeth in the dentist's office. The patient then uses the tray to hold a peroxide gel against the teeth for a prescribed time each day for about two weeks. Most patients can expect to see an improvement of two to eight shades lighter in tooth color.

It's a procedure that makes for a more attractive appearance, but hardly the bling-like smiles deployed by even the scruffiest celebrities. And for this reason, Matis sounds a cautionary note. The media's portrayal of a beautiful smile is unrealistic, and even undesirable, for most people, he says. What appears as a healthy and flawless smile in a picture has

often been digitally manipulated to increase whiteness and eliminate shadows. In person, the Hollywood smile can appear even more artificial and unnatural. Matis says dentists have an ethical responsibility to talk to patients about their expectations and educate them about reasonable outcomes in whitening teeth. “It’s the dental professional’s role to bring patients back to reality,” he says.

HOW IT WORKS

The first documented case of tooth whitening was in 1877 when dentists experimented with oxalic acid on extracted teeth. In the late 1960s, Arkansas orthodontists found that pediatric patients’ teeth became two shades whiter after wearing orthodontic positioners filled with an oral antiseptic that contained carbamide peroxide. Those findings led the Federal Drug Administration to step in and put a stop to the practice of using carbamide peroxide while the FDA investigated possible side-effects of tooth bleaching, such erosion of the tooth enamel.

In 1991, the FDA released a report stating that although the carbamide peroxide may cause tooth sensitivity, it did not unduly harm enamel. At the time, the FDA decided against classifying carbamide peroxide as a drug, but the American Dental Association stepped in to establish its own safety and efficiency guidelines for tooth-bleaching agents under its seal of approval program. Now, any company that seeks the ADA seal of approval must prove that its product follows strict ADA guidelines, which were updated in 2006.

Scientists don’t fully understand how carbamide and hydrogen peroxide work to whiten tooth dentin and enamel. Most agree that at some point the peroxide dissolves into a simpler molecule that breaks up staining compounds. This allows light to be better reflected, creating a whiter appearance. Whiteners can both penetrate the tooth surface to affect the color inside the tooth and lighten stains deposited on the outside of the tooth surfaces.

HOLLYWOOD WHITE?

Matis began his research career into tooth-bleaching agents in the early 1990s, the same time the market opened up for new professional and over-the-counter tooth-whitening products. Today, he researches new products for in-office bleaching that boast hydrogen peroxide concentrations of up to 38 percent – all with the marketing promise of greater bleaching power.

As a clinician, Matis uses products with only a 10 percent concentration of carbamide peroxide when recommending that a patient whiten his or her teeth at home. He says the lower concentration can achieve the same level of tooth-shade brightness as higher concentrations of peroxide. The lower concentration can also reduce tooth sensitivity, a common side-effect of tooth bleaching. Even with the use of the lowest concentration, Matis finds that about 50 percent of in-office patients will complain of some degree of tooth sensitivity, and about 30 percent will complain of some gum sensitivity.

Matis points out that numerous factors determine whitening outcomes. A patient’s age is one of them. Over time, tooth color darkens from wear and tear and stain accumulation, making it more difficult to whiten teeth. Consumption of red wine, coffee, tea, cola, carrots, and other highly pigmented food and beverages leave more residual stains, as does nicotine. Also, enamel erosion, caused by such things as eating acidic foods, decreases the surface of tooth enamel and allows the yellow or gray-colored dentin to show through. Some medications can cause gray staining in teeth, which is more difficult to remove.

The most significant factor affecting the level of whiteness that bleaching procedures can achieve is a person’s original tooth color. “A patient whose teeth have yellow undertones” Matis says, “will whiten more successfully than a patient who has gray undertones.”

It is difficult to predict the exact degree of whitening a procedure can achieve. “Overall, about 20 percent of patients will achieve a ‘Hollywood white,’” Matis says. “About 60 percent of patients will be pleased with the result of a brighter smile, 20 percent will say they expected more whitening, and for five percent of patients, there will be little or no change in tooth color.”

WHEN LESS IS BETTER

Matis’s research has shown that custom tray whitening procedures done in a dentist’s office appear to be the most effective at bleaching the teeth and keeping tooth sensitivity to a minimum. He says over-the-counter procedures have the advantage of being less expensive but are less effective at whitening teeth. Matis dismisses the practice of applying light to the teeth during in-office bleaching because he has not seen evidence that the practice whitens more effectively.

Even though there are no studies that show the use of carbamide peroxide on the teeth to be harmful to a fetus, Matis discourages its use during pregnancy or for any woman who is lactating. He also cautions patients about the limitations of whitening. “Patients who have had white fillings in their front teeth may need to have them replaced after tooth whitening because fillings will not change color,” he says.

Ultimately, dentists have a responsibility to consider a patient’s overall dental health before beginning the bleaching process. “When a patient comes in requesting a bleaching procedure, the dentist is obligated to restore the teeth to health before beginning the bleaching process,” says Matis. “Bleaching is an optional procedure. Getting rid of decay is not.”

He also counsels that the definition of a beautiful smile is a personal one. “Sometimes we dentists can be picky about outcomes. It’s not up to us to define another person’s aesthetic.”

Matis has one final bit of advice for those of us who aren’t completely satisfied with the color of our smile. “Don’t look at your teeth in the bathroom light,” he says. “The ultraviolet light makes teeth appear more yellow than they really are.”

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