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Over 120 articles related to the practice of clinical dentistry in peer-reviewed journals

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Another White Lie?

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Are light-activated chairside bleaching advertisements intentionally misleading, a lie? Or are they merely exaggerations, marketing fluff, rhetorical excesses, and so on?

For the purpose of inductive reasoning, let us look at the claim "8 shades in 45 minutes," which is a typical rider accompanying the preternatural models bearing bright smiles in bleaching advertisements. Clearly, the advertisements suggest to the reader that treatment is completed in 45 minutes. This implied message is supported by the words "immediate," and the role of light in the success of the treatment outcome is likewise implied by the ubiquitous presence of light units in the advertisements.

For the advertising claim to be true, the teeth should be an average of 8 shades whiter following chairside bleaching accompanied by light activation for 45 minutes. Objectively, following observations and comparison to baseline measurements, this would qualify as an absolute truth as the teeth *are* remarkably whiter at the end of a chairside bleaching procedure. However, if the teeth are *not* 8 shades whiter because of bleaching but rather as a result of desiccation, does this mean that the advertisement is false, misleading, or simply a lie? This is an interesting paradox. What if the intention is to deceive; is it fraudulent? Fraud implies that the deception has the intent to delude (mostly for personal gain). Taking it further, although misleading statements are normally condemned, it is generally accepted that some falsities are worse than others, consequently (the argument would go) if the bleaching claim is not true but nevertheless good for all concerned, then it may qualify as a "white lie." Are the claims apropos of light-activated chairside bleaching systems white lies?

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Let us examine the components involved in light-activated chairside bleaching: isolation of the teeth, application of the bleaching agent, and the use of light.

ISOLATION

It is well recognized by clinicians that the dehydration that accompanies isolation, particularly dental dam isolation, dramatically whitens teeth. It comes as no surprise therefore that teeth are distinctly whiter when the isolation combination of cotton gauze and liquid dam is removed (a good time to take a posttreatment marketing photo). Essentially, the question is whether the initial 8-shade color shift is a function of the isolation and not the application of light.

BLEACHING AGENT

Bleaching is not a new treatment modality. There is ample scientific and empirical evidence to support the notion that bleaching is time and dose dependent. It is therefore to be expected that remarkably brightened teeth will completely revert back to their baseline color within a short period of time if the whitening effect is exclusively a consequence of dehydration. Undoubtedly, there is a whitening effect from the application of the high-concentration bleaching solution, which is once again time dependent, and therefore modest at most. There might even be an accelerated effect of the heat from the light on the decomposition of the bleaching gel. The issue is whether this effect is 8 shades whiter as claimed in the advertisements or are the advertisements misleading as the color shift is a result of the dehydration of the teeth and therefore transient. My argument is not with chairside bleaching per se (although Al Shethri and others have shown that one in-office bleaching procedure does not result in maximum whitening),[1] but rather with the validity of using a light unit (discussed hereafter), and more specifically with the advertising tactics employed.

LIGHT APPLICATION

What role does light play in light-activated chairside bleaching procedures? Manufacturers would have us believe that the light activates a chemical reaction which intensifies the bleaching procedure, and this may or may not be true as the chemistry is a closely guarded secret. The question is whether the use of light significantly adds to the efficacy of the bleaching procedure (8–12 shades in 45–60 minutes), or are the advertisements simply false. It was not so long ago that a few high-profile para-university lecturers continued to support the use of light (and laser) as a means of accelerating the bleaching process, while acknowledging in private that it was nothing more than a marketing gimmick to attract patients (personal experience at the Chicago Midwinter Clinic in 2004). To quote a protagonist of the use of lights in a 2000 publication: "both anecdotally and in side-by-side evaluation, these powerful light sources have been found to have little or no effect on the actual speed or the extent of bleaching. They remain a very important part of the marketing of in-office bleaching, however. There is greater patient acceptance and greater satisfaction with tooth whitening when a strong light source is made part of the bleaching process."[2] It is my opinion that patients are best served when their dollars are spent on efficacious procedures that work without deception. It is to be hoped that the profession has moved beyond the need for illusion.

SCIENCE

It is interesting to note that the rebuttal of an article published in the *Journal of the American Dental Association*[3] has not appeared to curtail interest on (nor advertisements of) bleaching lights. Clinical Research Associates (CRA) has gone to great lengths to try to validate the claims of manufacturers of bleaching light units without success (Rella Christensen, the CRA Foundation personal communication, September 2002). CRA is a nonprofit organization dedicated to serving dentists by evaluating dental materials, devices, and concepts for efficacy and clinical usefulness. CRA has stated, in writing, numerous times that they are unable to confirm manufacturers' claims for

their bleaching lights (Rella Christensen, personal communication, January 2006). There have been at least five CRA newsletters[4] making this statement, and an article was published in the April 2003 issue of *Compendium* as part of a published symposium in which the methods and results were elucidated.[5] Moreover, recent double-blind objective studies[6,7] show that there is limited short-term color change when using light-activation units with in-office tooth whitening systems. As would be expected (from the increase in temperature) there was a significant increase in sensitivity with the use of lights.

Manufacturers have in their favor the fact that measurement of tooth color, particularly in the evaluation of the efficacy of a system intended to enhance tooth whiteness, remains a challenge. From a scientific research standpoint there is definitely a need to develop instruments and techniques that allow for reproducible quantitative measurement of changes in tooth color. Instruments such as the Minolta Chroma Meter CR-321 (Konica Minolta, Ramsey, NJ, USA) are tedious to use. Diligent application is imperative as slight shifts in alignment with the positioning stent can produce drastically different results, as can operator bias in uncontrolled studies.[8] As a clinician the results I am interested in seeing are the prebleaching and 30-day postbleaching images brightly projected side by side. When I personally viewed the cases from Dr. Gerard Kugel's studies, I struggled to find even a single shade change, let alone 8 to 12 shades as claimed by manufacturers.

ACHIEVING EIGHT SHADES

So if a majority of scientists agree that lights do not significantly add to the bleaching process,[9] then how do the manufacturers of light-activated bleaching products achieve the promise of 8 shades of whitening? They dehydrate the teeth for 45 to 60 minutes and then rely on the time-proven custom-fitted tray technique[10] and supply patients with a take-home bleaching kit, thereby satisfying the requisites of time and dosage. Does this make the advertisements false, misleading … a lie? Eight shades are achieved, albeit not from the bleach and light, and bleaching is maintained, albeit from a take-home tray and further at-home bleaching.

TRUTH OR WHITE LIE?

The truth is that teeth do bleach up to 12 shades with the subsequent application of the custom tray bleaching sequence with or without the use of a light at the initial chairside appointment. The light source does not occupy a pivotal role in the bleaching sequence. The white lie is the advertising! Manufacturers benefit (millions of dollars worth of light units have been sold), and the profession (dentists and patients) pay the price. Should the profession be questioning deceptive advertising? There will surely be retorts of "what's the fuss, white isn't even a color," or "it's only an advert, what did you expect, the truth?" Many clinicians believe they can resist the effects of advertising (although research indicates that our ability to do so is considerably more limited than we might like to think), but no one believes that new graduates have the experience necessary to resist the lure of misrepresentation.

The Lanham Act was passed in 1946 pursuant to US Congress's power to regulate commerce; Section 43 prohibits false and misleading advertising. The protection of the First Amendment includes inherently misleading advertising. Yet there is no government office that reviews advertisements before they are released. The American Dental Association (ADA) requires a review of advertisements for all ADA-accepted products, but this practice is not policed by them and it is a shrewd shortcut to forgo application in anticipation of rejection. In short, the dental industry is essentially self-policing.

An example of self-policing is the recent injunction against Pfizer, Inc., the makers of Listerine mouthwash. McNeil-PPC, Inc., the market leader in the sale of dental floss, filed a suit against Pfizer for claiming that Listerine is a replacement for floss and that all the benefits of flossing may be obtained by

rinsing with Listerine. The Federal Court enjoined Pfizer from communicating these claims in its advertising materials.

Should the dental profession exercise their "policing" prerogative, and if so, then how will it be done. I think it is time to draw attention to manipulative and/or misleading advertisements that negatively affect our practice or the health of our patients. An advertisement of one of the leading manufacturers of chairside bleaching systems includes the slogan "Your patients have seen the light, have you?" This confirms the notion that their marketing efforts have extended directly to patients: it could be argued that direct marketing is good for the profession, and regardless of where you stand on that issue, surely you would agree that it should center on truth and not on deception. This advertising strategy is far more than covert manipulation; it is practically coercion, as dentists are bullied into purchasing bleaching lights in order to meet the demands of duped patients. Bleaching results featured in the episodes of the reality television show *Extreme Makeover* (originally aired on ABC on December 11, 2002) imply that the bleaching is achieved with a single bleaching appointment: the public clearly comes away with the impression that the bleaching (dehydration) was achieved after a single treatment episode. I would advocate that it is very likely that patients were given a custom tray to complete the bleaching procedure (unless 16 makeover veneers were part of the treatment!). It should come as no surprise that the majority of dentists featured on the ABC's *Extreme Makeover* Web site include a light-activation device in their practice. The question is did they purchased the units because they assumed them to whiten 8 shades in 45 minutes (the promise of immediate long-lasting results) or were they encouraged by the demands of patients for the new 1-hour bleaching treatment "as seen on TV."

REGULATORY CONTROL

It would seem prudent to ask why light-activation units are available if they are not performing as claimed. Surely any device used in dentistry would have to pass the regulatory control of the US Food and Drug Administration (FDA). Well, yes and no. Many of the devices we use in dentistry are classified as Class 2 by the FDA. These devices are subject to special controls and one of the first requirements for manufacturers is the filing of a FDA 510(k) Premarket Notification. Part of the submission process includes a safety and efficacy summary. Most of the devices we use in our clinics are classified as Class 1 devices (dental hand instruments) and are subject to "general control," which is the least regulatory control. Polymerization lights fall under the category of Class 2 devices while it seems as if bleaching lights have slipped under the radar into the Class 1 zone by entering as an accessory to a bleaching product. The FDA currently considers bleaching products as cosmetics under the Food, Drug, and Cosmetic Act. The statute defines cosmetics as products that promote attractiveness or alter the appearance. If the FDA decides to change the categorization of whitening products (a change to drugs as they tried in 1991), then we may well see the bleaching industry suffering the same fate as the unwitting element fluoride. The FDA would then only approve bleaching products for marketing upon showing, based on sound scientific evidence, that they are safe and effective for their intended use. It is prudent to acknowledge that the higher concentration of peroxides used in chairside bleaching procedures[11] carry an extraordinary risk of injury (as revealed in Figure 1, the immediate view of a peroxide burn following a breach in dental dam isolation). It is therefore

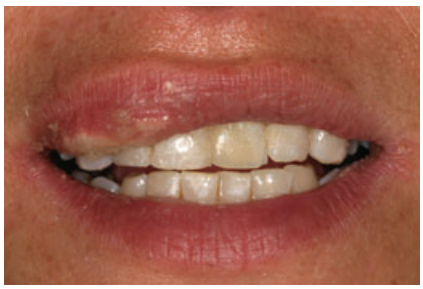

Figure 1. Immediate view of a peroxide burn following a breach in the isolation during a chairside bleaching procedure (photo courtesy Dr. H. Hecker).

imperative that we, as a profession, stringently regulate ourselves as the bleaching issue continues to lie in wait in the recess stowage of the FDA.

VERIFICATION OF EFFICACY

It is an old fudging tactic to keep moving the goal posts as manufacturers resort to the introduction of new formulations and models in an effort to avoid valid criticism. Another tactic is to shut down critics with the perfunctory cease and desist letter (a number have already been delivered to teachers who openly question the need for bleaching lights). Justifiably, manufacturers adopt the adversarial stance when protecting assets, and that is more than reasonable as the baroness in Leo Tolstoy's *Anna Karenina* tells Vronsky, "You see, I'm engrossed with business! I want a lawsuit, because I must have my property."

It is hoped that manufacturers will see beyond the "property," refrain from adroit maneuvers, and openly participate in the verification process. It would be wise for all parties to remember that extraordinary claims require extraordinary proof.

An interesting thing happens when you take the truth and distort it with one of the various forms of intentional deception; the slippery slope to wealth appears more and more alluring but inescapably gets steeper and deeper. Taking the light-activation ruse to the next level, patients can now purchase their own light and a bleaching kit for as little as $29.95 (http://www.whitelight.com). The Web site claims one million units sold; evidently advertising is working for this company as one out of every 300 Americans has bought a kit. Each kit includes the bleaching gel, dental tray, light transmitter, and batteries. As with all advertisements, to ensure purchases are sustained, the marketers have created a cultural dependency by relating a value system to customers, one by which the public can define themselves. In the case of WhiteLight (Telebrands, Fairfield, NJ, USA) it is a testimonial from Miss USA 2004, accompanied by her resplendent smile—ABC's John Stossel says it best: "give me a break."

One of the most powerful effects of advertising has been to teach a national tolerance of deceit, embellishment, misrepresentation, and distortion; it is the norm to expect advertising to be deliberately manipulative. It is only ever half truth, telling a few favorable aspects of a product or procedure that deserves greater scrutiny. At its worst, it is simply a cunning deception. Regrettably, in no case is it the truth. Advertising's *raison d'etre* is to separate the public from their money. Through this process, a symbol of value (payment) is passed and an exchange of values is made. It will be a sad day indeed in the dental profession when deception becomes the intermediary in this exchange. This is more than *another* white lie. The profession would be diminished—stained far more than 8 shades, perhaps permanently—by it.

DISCLOSURE

The author does not have any financial interest in the companies whose materials are discussed in this paper.

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