

The Problems With Tooth Whitening: Preventing Sensitivity While Improving Patient Compliance



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What's the biggest problem with tooth whitening? If you answered anything other than "Sensitivity!" you haven't been paying attention. What's the second biggest problem? *Compliance!* The question is, "Why?" I suggest there are 2 reasons: the first is obviously sensitivity; the second is the patient's inability to appreciate that anything significant is being accomplished. In this article I will address both of these challenges and make many suggestions as to how we have successfully dealt with and/or prevented these issues in my office.

SOLVING THE CHALLENGES: COMPLIANCE

Let's start with patient compliance. If patients could see the results happening right in front of their eyes, they would be more pleased and would certainly be more compliant. That's only human nature. We are all more likely to follow someone's suggestion if we see proof that it is working.

First, make what you are doing important. Take pre-op photos, and plan on midway and post-op photos also. Take a pre-op shade. Establish realistic expectations.

Take-Home Bleaching

Most dental offices are still doing tooth whitening treating both arches at the same time. Unless there is an extreme time deadline, I never do that. We do a few other things differently also, and we are about to examine each of them.

First, make what you are doing important. Take pre-op photos, and plan on midway and post-op photos also. Take a pre-op shade. Establish realistic expectations. Then quote a longer treatment time frame. In my office we say, "The average treatment time is about 2 to 3 weeks for the upper teeth, and another 2 to 3 weeks for the lowers, but it's possible yours could take a little longer." Set your fee so you don't have to



Figure 1. Upper model.



Figure 2. Block out added.



Figure 3. Tray on model.



Figure 4. Reservoir tray showing gingival extension. Trays like these hold the bleaching gel intimately against the entire buccal surface of the teeth, but because the margin of the tray is extended on to the gingiva, there is no leakage at the gingival margin.

increase it if you need a little extra time or some extra materials. Then you can promise to "stick with it" even if this patient is a resistant case, and you are a hero if it takes less time to get the desired results.

Bleaching Trays

Get accurate impressions to fabricate your trays. (We use a polyvinyl alginate substitute). Remove all bubbles from the models to make sure that you have sharp gingival margins and clear occlusal surfaces for accurate seating of the trays. Most offices are using scalloped trays so that the tray roughly follows, but does not touch, the gingival margins. Unfortunately, this method allows excess whitening material to escape into the mouth, and often leaves no whitening product at the gingival margins. Since

this is the darkest part of the teeth and the hardest to whiten, why would one want to allow less material to be held there? Therefore, a different design is required. In our office, we end the buccal margin of our trays in a straight line approximately 2 to 4 mm beyond the zenith of the gingival margin (Yes, that's right, *on the gingival tissue.*)

We also use reservoirs. Certainly, I have heard the same statements that you have—that reservoirs are unnecessary—but that just doesn't apply to this technique. (If you have a scalloped edge, those statements are correct: reservoirs don't matter because the gel is going to escape no matter what you do since the tray can not be well enough adapted to the teeth). However, since we have *sealed the gingival margin of the tray*

continued on page ##

CLINICAL MANAGEMENT

against the gingival tissue, making reservoirs to hold the whitening gel against the teeth makes perfect sense. We place a thin layer of light-cured blockout material on the buccal surfaces of the teeth to be bleached. Then, we vacuum form a tray over the model and use a heat knife to cut the flat margin against the gingiva (no blockout there). Next, we smooth the cut tray edge by slightly heating it with a flame and then pressing it with a sliding finger against the stone model. The result is a pocket that holds the bleaching gel completely against the buccal surface of the teeth and disperses the gel right up to (yet stopping at) the gingival margin. In this way, the whitening gel is kept exactly where it needs to be during the entire treatment time. In the rare instance when the patient gets sensitive gingival tissue, the tray is cut back in those areas into the more common scalloped shape (Figures 1 to 4).

(Here is a challenge to try on yourself: Take an impression of your own mouth and make a bleaching tray. Construct one side as described above with block out, reservoirs, and the tray edge a few millimeters up on the gingiva; and then fabricate the other side in the "normal" [no reservoir, scalloped edge near the gingival crest] way. Put some whitening gel in the tray, insert it into your mouth, and look in the mirror. Watch the gel ooze out of the scalloped side. If you need further convincing regarding this design's advantages, go ahead and use it personally for a couple of weeks. You will have to go back and help the scalloped side catch up to the "better-bleached" side done with the tray design fabricated using this method. You will be absolutely convinced of the effectiveness of this method.)

Bleaching Protocol

We then deliver *only the upper tray*, giving instructions, and asking the patient to return in one week for a check of how they are doing. If they have any problems in the meantime, they are to call and return to the office immediately. Within a week, the patient can see a difference between their upper and lower teeth. As each day progresses, they can see an even greater contrast. If both arches are done at the same time, the daily difference is too subtle for most patients to discern, so they may perceive this as no improvement and gradually quit. So, you can understand how *you* have ultimately caused their noncompliance in this way.

After the one-week check, we then (usually) have the patient

return 2 weeks later. The ever-increasing contrast between the arches in our patients, they have the incentive to keep bleaching as instructed so they can get the lower tray (which we withhold until we and the patient feel they have bleached to the desired level) as soon as possible. At this point, the patient will be a great ambassador for your office. They typically show everyone how becoming brighter and more attractive and explain how you have helped them accomplish this goal. We then take a mid-treatment photo with the upper teeth white and the lower teeth unbleached (Figure 5). The lower tray is then delivered. The patient is brought back once again for one week to monitor the progress of the lower teeth, and then typically a final check, 2 weeks later. At this final check appointment, post-op photos are taken. The patient is reminded that touch-ups are inexpensive and are expected at about 6 month to one year intervals. ("Why not plan on it at each 'cleaning' appointment?") With this method, you will get compliance, and your patients will get whiter teeth for life.

SOLVING THE CHALLENGES: SENSITIVITY

A significant number of patients develop temperature sensitivity during the whitening process. First, reassure them that it is transient. It always goes away within a couple of days of discontinuing the bleaching. Some patients develop such intense sensitivity that they would rather stop the process than to put up with the discomfort.

Chemical Treatments

There are many methods for dealing with sensitivity. One of the first methods was the use of fluoride applications, either in the trays or in prescription-level fluoride toothpastes. Potassium nitrate is an excellent desensitizer and is of enormous help. More recently, amorphous calcium phosphate has also proven to be quite an effective additive. All of these chemicals help to reduce bleaching-related sensitivity. They have also been incorporated in many of the currently available whitening products.

Preventing Sensitivity

How about preventing the sensitivity in the first place? In my opinion, *dehydration* is the primary cause of whitening sensitivity. Picture your last visit to the hygienist. They are trying to be extra careful and to remove even those tiny little specks of calculus just subgingival on the lingual surfaces of your mandibular

anterior teeth. Then they blow some air on the area to better visualize the calculus, and then blow a little more. The teeth are dried out and they give you a "zing"—which you interpret as sensitivity to cold. When we bleach, the evaporation of the nascent oxygen produced from the peroxide dehydrates the teeth. That is why the teeth always look a little chalky right after bleaching—they are dehydrated.

To solve the dehydration problem, we use a prewhitener (Power Swabs [Power Swabs Corporation]) that performs 3 functions. First, Power Swabs include solvents that help clean the teeth (like prewash stain removers help in cleaning grass stains off trousers). It doesn't take a rocket scientist to realize that clean teeth should get whiter faster than dirty teeth. Second, since there is less debris on the enamel, the bleaching can penetrate deeper—again resulting in faster and greater whitening. Third (and most important), the swabs contain a surfactant (wetting agent). The surfactant allows the bleaching gel to dissipate all over the teeth keeping them hydrated, and since the teeth are not allowed to dehydrate (keep bleaching times short) the teeth do not get sensitive. Thus, the simple use of this prewhitener produces results that are whiter and faster while eliminating a main cause of sensitivity.

Prewhitener Technique

The Power Swabs prewhitener comes in a tube within a tube applicator. Slide the lower tube up over the upper tube, and it soaks the swab at the end (Figure 6). Then, all it takes is to apply the soaked Power Swab with a swirling motion on the surface of the teeth for 30 seconds immediately before applying the whitening agent (Figure 7). Since the prevention of sensitivity is linked to the ability of the surfactant to keep the teeth hydrated, the sensitivity-prevention trait *diminishes with the amount of time the whitening agent is in contact with the teeth*. Thus, the swabs work with *short duration* whitening procedures, and I have not found them to be very effective for overnight bleaching.

So, let's go back to compliance for a moment. If you can show the patient that their teeth are getting whiter, and they can see it every day, and their time of application is reduced, and they have no sensitivity, why wouldn't they do what you ask to help them improve their appearance?

POWER BLEACHING

The good news is that the prewhitener also works extremely



Figure 5. Midbleaching documentation photo. Upper teeth have been completed; the lower teeth are yet to be done.

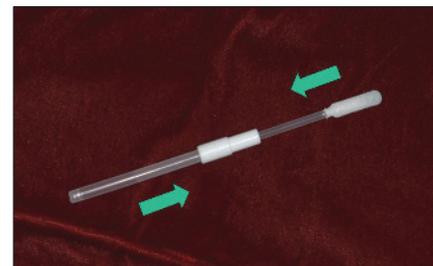


Figure 6. The applicator.



Figure 7. Applying a prewhitener with a soaked swab (Power Swabs [Power Swabs Corporation]).



Figure 8. Before whitening.



Figure 9. After whitening.

well with power bleaching. Whether or not you use a light source, power bleaching involves a dental professional applying a stronger whitening agent for a shorter period of time than when using trays. To shorten the time even more while improving the results, just swirl the soaked Power Swab all over the surfaces to

continued on page XX

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continued from page

be bleached for 30 seconds immediately prior to each application. I typically cut my time for application of the whitening agent down to 3 sets at 10 minutes each. It is amazing, but when the final coat is rinsed off with cold water, the patients do not wince because the prewhitener prevented any sensitivity.

I typically follow power bleaching with a week of take home tray treatment, still using the prewhitener before every application. For maximum compliance, you can use the one-tray-at-a-time method, but I only do in-office power bleaching for those who are in a hurry—so they usually get both trays at once.

In rare instances, a few patients still get a little sensitivity with 30 minute tray applications of peroxide whiteners at home. If this happens, I just reduce the time to 15, or even 10 minutes, and have the patient take one day off. This does extend the total time to get the whitening results we desire, but at least we can bleach these folks who would otherwise be unwilling to complete the process.

SUMMARY

So there you have it—a system to guarantee compliance and to eliminate the sensitivity that often accompanies bleaching treatment. Give the patients control so they can see and celebrate their improvement (Figures 8 and 9). Most importantly use a protocol and methods that get the job done faster and better with an absolute minimum of discomfort. ♦

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DISCLOSURE: Dr. Zase is the professional advisor for Power Swabs Corp, the manufacturer of the Power Swabs.

continued on page ##

ANALYZE YOUR OWN SMILE

1. Do you have any concerns about your smile?
2. Do you cover your mouth with your hand when you smile or talk?
3. Are some of your teeth darker than the others?
4. Do some of your teeth have white or brown stains?
5. Are you self-conscious about smiling in front of other people?
6. Would you like a whiter, more youthful smile?
7. Do you see any defects in the appearance of your teeth or gums?
8. Are there spaces or gaps between any of your teeth?
9. Are your teeth crowded?
10. If you have crowding or spaces, is it getting worse?
11. Are any of your teeth too long or too short?
12. Are any of your teeth crooked, jagged, worn, or chipped?
13. Do you have old fillings or bonding that are chipped, discolored, misshaped, worn, or otherwise in need of upgrading?
14. Do you have old veneers or crowns that need upgrading?
15. Do you have missing teeth that you would like replaced?
16. Is the appearance of your smile out of balance from one side to the other?
17. Is there anything else about your teeth or your smile that you would like to change if it were possible?

If you answered “Yes” to any of these questions, you may want to discuss your options for cosmetic dentistry with us. Call us for a consultation at (860) 537-2351 or email us at info@ColchesterDentalGroup.com

PROTOCOL FOR IN-OFFICE WHITENING

Dr. Marty Zase, DMD, MAGD, FACD, AAACD

When doing in-office bleaching, there are three goals:

- 1) Lighten the teeth quickly.
- 2) Cause no damage.
- 3) Prevent sensitivity.

In all of my years doing tooth whitening, I have never seen an in-office product work exceptionally well, for a long period of time, so I always recommend take home tray bleaching as a follow-up to the in-office procedures.

First and foremost the dental professionals must protect the patient from the powerful chemicals we are using. We use eye protection, cheek, lip and tongue retractors, and excellent gingival isolation. The latter is provided by using magnification while accurately applying photo-initiated block out materials to cover the gingiva that could be accidentally touched or sprayed with the whitening agents. Covering the gingiva so NONE of it exposed is mandatory. I carry that block-out material at least down to, and often well beyond, the muco-gingival junction of the teeth to be treated and one additional tooth posteriorly.

In my office, we use whitening products that do not require the use of a light to be effective and I make sure I explain that to my patients. The following procedures work just as well with products that do suggest the use of a special light. Pre-op photos are always taken.

POWER BLEACHING: The good news is that the pre-whitener Power Swabs work extremely well with power bleaching also. Whether or not you use a light source, power bleaching involves a dental professional applying a stronger whitening agent for a shorter period of time than when using trays. To shorten the time even more, while improving the results, just swirl the soaked Power Swab all over the surfaces to be bleached for 30 seconds immediately before each application of the whitening agent. I typically cut my time of exposure to the whitening agent down to three sets of 10 minutes each. It is amazing, but when I rinse the final coat off with cold water, the patients don't even wince, because the surfactant in the pre-whitener prevented the sensitivity that otherwise would occur due to dehydration.

I typically follow power bleaching with a week of take home tray treatment, thirty minutes a day, still using the Power Swabs for 30 seconds just prior to every application. (See my Protocol for Take Home Whitening.)

In rare instances, even with the pre-whitener, a few patients still get some sensitivity with 30 minute tray applications of peroxide whiteners at home. If this happens, I have the patient take the next day off from whitening and then just reduce the time to 15 or even 10 minutes at a time. This does extend the total time to get the whitening results we want; however, at least we can bleach these folks who otherwise would be unwilling to complete the process.

Don't forget to take post-op photos and keep them accessible along with the pre-op photos. At some time in the future you may want to remind the patient how far they have come, and the before and after whitening photos are a terrific form of reinforcement as well as marketing.

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PROTOCOL FOR TAKE-HOME TOOTH WHITENING IN MY OFFICE

TRAYS: We make our take-home bleaching trays from excellent impressions made with alginate substitute materials (polyvinyls or A-silicones) because they have better properties in my opinion including greater accuracy and the fact that they can be repoured. We use .050 soft tray material. Reservoirs in whitening trays are not supposed to be necessary, but we use them anyway. We also extend our trays about 4 mm. on to the gingiva instead of scalloping the edges. This technique seals our trays which prevents the whitener from oozing out on to the gingiva. By keeping the whitening material in the reservoirs and in contact with the teeth, there is greater efficiency and therefore faster results.

PRE-WHITENING: We suggest a complete prophylaxis before beginning the whitening process. We often begin with night time whitening. If there is any sensitivity, we switch to short duration day time whitening with the use of a pre-whitener, Power Swabs, (formerly Pre-White and GRINrx Whitening Stain Remover Swabs) for 30 seconds prior to every application of the whitener. The pre-whitener contains aqueous chemical cleaners (solvents and detergents) that dissolve some of the debris on the enamel and, therefore, the enamel is significantly cleaned. Obviously, clean teeth will whiten easier than dirty teeth. Power Swabs also contains a surfactant (wetting agent) that dissipates the whitening gel immediately, and most important, helps keep the teeth hydrated so sensitivity is reduced to zero or near zero if used according to the timetable below.

WHITENING: We use hydrogen peroxide (or short duration carbamide peroxide) whiteners. The Power Swab is applied first. It cleans and wets the teeth, and then the whitener, already loaded in its tray, is immediately inserted. The whitener gel dissipates due to the surfactant in the Power Swabs, spreads out and permeates more evenly over the teeth, and now keeps the teeth moist instead of dehydrating them. In the rare instance when gingival irritation occurs, the tray can be cut back to a scalloped edge to avoid having the whitener contact the soft tissue.

ONE ARCH OR TWO?: We do something else differently in our office. We whiten one arch at a time, almost always the maxillary arch first. This method takes longer, but it gives the patient a control arch to see and appreciate how much they are whitening. As a result, they are very compliant with our instructions. They are also terrific marketers for whitening by our office since the dramatic difference they achieve between arches shows the effectiveness of what we are doing and is often shown off by the patient. And these patients are continually looking at their mouths, watching the changes, making observations, and therefore becoming more aware of the need for other cosmetic dentistry.

TIMETABLE: The first day, we suggest 30 seconds of Power Swabs and 15 minutes of whitener. Assuming there is no sensitivity after the first day (normal), on the second day we increase to 30 seconds of Power Swabs and a half hour of whitener. If there is still no sensitivity, continue with single 30-minute daily applications or increase to twice a day for faster results. If sensitivity occurs at any stage, skip a day and revert back to the next lower time. Thirty-minute applications can be reduced to 15 minutes, and 15-minute applications can be reduced to 10 minutes. (In very rare cases you might need to reduce to 5 minutes for a few days). Always use Power Swabs for 30 seconds prior to applying the whitener. The idea is to get the teeth lighter while keeping the patient happy, well cared for, and sensitivity free. Superb results can be achieved in 2 to 3 weeks per arch.

RESULTS: Spectacular. No sensitivity. Patient feels in control. Teeth get whiter without pain. Patients talk about what is happening and market your practice. More cosmetic dentistry is scheduled since more attention to the mouth is generated. Everybody wins !!!

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STEP BY STEP TOTAL-ETCH BONDING TECHNIQUE FOR POSTERIOR COMPOSITES

- 1) Etch with 37% phosphoric acid.
- 2) Rinse thoroughly and blow off residual water.
- 3) Rewet with Gluma desensitizer.
- 4) Blot Gluma with a microbrush (on the patient's bib) leaving moist dentin.
- 5) Do not thin out with air.
- 6) Apply multiple coats of 5th generation (prime and bond together) bonding agent according to manufacturer's instructions being sure to air dry off solvent if appropriate.
- 7) Cure
- 8) Apply and cure thin layer of flowable composite over all dentin.
- 9) Apply and cure dentin shade hybrid, microhybrid or nanofil composite.
- 10) Apply and cure enamel shade hybrid, microhybrid or nanofil composite (these two steps could be combined depending on the brand of composite you use).
- 11) Apply translucent layer for top 1/2 to 1 mm. (eg: Heliomolar HB Shade TW.)
- 12) Shape and cure.
- 13) Adjust occlusion, polish, and finish.

STEP BY STEP SELF-ETCH BONDING TECHNIQUE FOR POSTERIOR COMPOSITES

- 1) Rinse thoroughly and blow off residual water.
- 2) Apply 6th generation bonding agent (etch and prime together) according to manufacturer's instructions being sure to agitate for at least 20 seconds, then be sure to air dry off solvent if appropriate.
- 3) Apply the bond, thin and cure.
- 4) Apply and cure thin layer of flowable composite over all dentin.
- 5) Apply and cure dentin shade hybrid, microhybrid or nanofil composite.
- 6) Apply and cure enamel shade hybrid, microhybrid or nanofil composite (these two steps could be combined depending on the brand of composite you use).
- 7) Apply translucent layer for top 1/2 to 1 mm. (eg: Heliomolar HB Shade TW.)
- 8) Shape and cure.
- 9) Adjust occlusion, polish, and finish.

I'll be glad to respond to any questions by email



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COSMETIC PEARLS FOR THE GENERAL PRACTITIONER

PRODUCT LIST

Microprime G (like Gluma)		Centrix
Wedjets	HDiqDental.com ←	AMD Lasers
Zase Miniprep Kit	(some web sites) →	PowerSwabs
8392.016 fine diamond	Danville	
8392.016 ss fine diamond	Hygienic	AAACD.com
7404 finishing carbide	Brasseler	↔
OS2UF finishing carbide = 9803		800.822.9294
8379.014 fine football (double chamfer)		800.321.2135
8845KR Flat end finishing diamond		800.841.4522
DiaComp Finishing Points		
Almore articulating film (8 micron)	Brasseler	
Composite shaping and finishing burs	Brasseler	
7103, 7404, 7803, 7901 (12 fluted)	Brasseler	
9103, 9406, 9803, 9903 (30 fluted)	Almore	800.841.4522
Contact Pro 2	Midwest	800.841.4522
Composi-Tight Systems		800.841.4522
Contact Matrix		800.547.1511
First Quarter Impression, Fifth Hand	CEJ	800.800.7202
Microetcher, MacroCab	Garrison	
Flexi-Wedge	Danville	
Herculite XRV Enamel/Dentin/Med.Incisal	Danville	800.999.0827
Kolor Plus, OptiClean	Danville	888.437.0032
Maxcem Elite	Commonsense Dental	800.822.9294
Expa-Syl, Hemostasyl	Kerr	800.822.9294
Embrace Esthetic Opaquer Kit, TuffTemp	Kerr	800.822.9294
Oraverse (anesthetic reversal agent)	Kerr	888.853.5773
Night White; Day White	Kerr	800.521.2854
Opalescence Boost PF, Endo, PF20	Pulpdent	or Dealer
UltraTemp, Opal Dam	Novalar	or Dealer
Vita Bleachedguide 3D Master	Discus	or Dealer
Multicore Flow and Pack (HB)	Ultradent	Dealer
Heliomolar Flow & HB Shade TW	Ultradent	888.888.1441
Straine Consulting	Vident	800.422.9448
Renamel Tints/Opaquers and Microfills	Ivoclar	888.230.1420
Insure/Prevue	Ivoclar	888.230.1420
IPC-OA S/L Composite Carvers (Marty)	Straine Consulting	Dealer
RelyX: ARC, Unicem, Luting Plus	Cosmedent	Dealer
Co-Jet Sand, Filtek Supreme Ultra	Cosmedent	Dealer
Symmetry Facial Plane Relator	Cosmedent	800.568.7200
Zekrya Gingival Protector	3M/ESPE	800.621.6729
SmileVision	3M/ESPE	800.621.6729
Creation Shade Tabs	Clinician's Choice	800.621.6729
Bident 3308 and Tweezer E-Surg tips	Zenith/DMG	800.634.2249
Clearfil S-E Bond	SmileVision	or Dealer
Tokuso Ceramic Primer	Jensen Industries	800.265.3444
No-Mix Temporary Cement	Bident	800.662.6383
Picasso Diode Lasers	Kuraray	800.634.3480
PowerSwabs, WiteRx	Tokuyama	800.243.2000

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Dealer
Dealer
800.235.5862
866.999.2635
866.966.SMILE

AGD.org