**Home fee:**
Description: $248 ($175–$335) per arch (second arch is usually less)

**No. of appointments: 1–4**
**Length of time for each appointment:**
10 minutes

**Insurance Codes:**
D9940 Occlusal guard, by report
D9972 External bleaching — per arch
D9973 External bleaching — per tooth
D9974 Internal bleaching — per tooth

**Comments**
We suggest you require payment in full prior to making the bleaching tray. If the patient is not prepared to pay for this treatment, it is still prudent to take the impression of the arch to be bleached at this time. This gives the patient the feeling that treatment has already begun, which is a gentle encouragement to complete the treatment. The patient is then informed that the bleaching tray cannot be made until you receive payment. In addition, home bleaching is controlled by the patient. If you have not collected your fee in advance and your patient is not very conscientious in wearing the bleaching tray, it may be difficult to receive payment after the fact.
### Office Assisted Fee:

2/3 current prophy fee per appointment

**No. of appointments:** Variable  
**Length of time for each appointment:** 40 minutes

**Insurance codes:**  
- D9940 Occlusal guard, by report  
- D9972 External bleaching — per arch  
- D9973 External bleaching — per tooth  
- D9974 Internal bleaching — per tooth

**Comments**  
This option is only available to patients who have paid for home bleaching. Procedure can be good income source if delegated entirely to an auxiliary, especially an assistant.

### Office Vital (Power) Fee:

$430 ($210–$750) per appointment/each arch

**No. of appointments:** 1 or 2  
**Length of time for each appointment:** 45 minutes–1 1/2 hours

**Insurance codes:**  
- D9972 External bleaching — per arch  
- D9973 External bleaching — per tooth  
- D9974 Internal bleaching — per tooth

**Comments**  
Procedure can be good income source if delegated entirely to an auxiliary, especially an assistant.

### Office Nonvital Power Fee:

$338 ($107–$750) (does not include restoring the access opening)

**No. of appointments:** 1–3  
**Length of time for appointment per tooth:**  
1st: 30–45 minutes (this assumes you do not restore the tooth at this appointment)  
2nd: 20–30 minutes (this assumes you do not restore the tooth at this appointment)  
3rd: 20–30 minutes (this assumes you do not restore the tooth at this appointment)

**Insurance codes:**  
- D9973 External bleaching — per tooth  
- D9974 Internal bleaching — per tooth

**Comments**  
This is not a good income source since the dentist must do many of the procedures, but does provide a valuable service to our patients.
Power Bleaching without Proper Soft Tissue Protection

Photo 1 Patient who had been bleached without proper gingival protection. Note necrotic papillae caused by the caustic bleaching solution. Patient stated that staff member performed the bleaching and that dentist was not even present in the office.

Bleaching combined with Orthodontics

Photos 2 & 3 Patient presents with misaligned, moderately dark yellow teeth. Note asymmetry in gingival line due to misaligned teeth.

Photos 4 & 5 Posttreatment views after orthodontics and bleaching (power plus home). Maxillary teeth have been lightened several shades. Note how orthodontic treatment created a significantly more symmetrical gingival line. Patient chose orthodontics plus bleaching due to its lower cost and conservative nature (no need to prepare teeth) compared to porcelain veneers, which would have also required periodontal surgery to create gingival symmetry.
Bleaching

Bleaching before Restorations

Photo 6 Patient with ceramic crowns on maxillary central incisors that have been in place for almost 13 years. However, patient decided she wanted whiter teeth. After home bleaching, the natural teeth are substantially lighter than the crowns, which are scheduled to be replaced. However, patient must accepted the fact that if crowns are fabricated to match the newly whitened natural teeth, then she will need to periodically rebleach when relapse occurs.

Prophylaxis before Bleaching

Photo 7 Patient presents for bleaching due to the darkened maxillary right central incisor, which was also in linguoversion.

Photo 8 Prophylaxis reveals that superficial stain was the main reason the right central incisor was dark. The tooth being in linguoversion caused it to be cleaned by the patient less thoroughly. Patient can now make a more informed decision on whether to bleach or not. This is one of the reasons that OTC bleaching is not prudent for most patients.
Home Bleaching — Tray Fabrication and Results

Photo 9 Alginate impression has been taken for the fabrication of a maxillary bleaching tray.

Photo 10 Impression is poured in quick set stone. Note that the palate is not covered with stone.

Photo 11 Model as it is recovered from the impression.

Photos 12 & 13 Model after trimming.

Photo 14 Small bubbles are chipped off model with a #15 scalpel blade.
**Bleaching**

**Photo 15** Patient had bleached maxillary arch with Opalescence PF 20% for 12 days. The right side of the tray was made with reservoirs, while the left side was made without reservoirs. No difference between the two sides can be seen.

**Photo 16** Patient from Photo 15 one year later. Maxillary arch has relapsed slightly, but is still lighter than untreated mandibular arch.

**Photo 17** Patient presents for home bleaching.

**Photos 18 & 19** Patient from Photo 17 after bleaching the maxillary arch with Opalescence PF 15% for 12 days. The right side of the tray was made with reservoirs, while the left side was made without reservoirs. Even though both sides lightened significantly, the incisal thirds of the right lateral incisor, right canine, and right premolars developed white frosted areas that are not seen on the left side.

**Photos 20 & 21** Patient from Photos 18 & 19 after one year. The maxillary arch remains lighter than the untreated mandibular arch. In addition, the white frosted areas in the incisal thirds of the right lateral incisor, right canine, and right premolars have disappeared.
**Bleaching**

**Photo 22** Model is lubricated. No reservoir is being used.

**Photo 23** Tray material is being secured in the vacuum-forming machine.

**Photo 24** Model is placed on vacuum table of vacuum-forming machine.

**Photo 25** Tray material has been heated and is ready to be lowered over model for the vacuum-forming process.

**Photo 26** Tray has been lowered over model and vacuum-formed.

**Photos 27 & 28** Bulk-trimming of the tray.

**Photos 29 & 30** Bulk-trimmed tray on and off the model.

**Photo 31** Tray is being scalloped to prevent soft tissue irritation.

**Photos 32 & 33** Scalloped tray on and off the model.
**Bleaching**

**Photo 34** Patient is shown how to load the bleaching tray by only injecting a small amount of bleaching gel against the facial of each tooth to be bleached.

**Photo 35** Tray has been seated in the mouth by the patient.

**Photo 36** Excess bleach is wiped off the soft tissue with a clean, moistened finger.

**Photo 37** Bleach tray in mouth, ready to work its wonders.

**Photos 38 & 39** Two weeks of home bleaching produced this change from A3.5 to B1.
Assisted Combined with Home Bleaching for Nonvital Tooth

Photo 40 Patient has discolored maxillary left central incisor.

Photo 41 Temporary restoration in endodontic access has been removed along with about 2.0mm of gutta percha.

Photo 42 Gutta percha and cervical tooth structure are sealed with a 1.0-2.0mm thick layer of resin ionomer.

Photo 43 Tray is filled with assisted bleach and inserted.

Photos 44 & 45 Results of combined home and assisted bleaching after two weeks of treatment.
**Home Bleaching for Nonvital Tooth**

*Photos 46 & 47* Patient presents with a discolored, endodontically-treated mandibular right lateral incisor.

*Photo 48* Endodontic access was at the incisal edge due to the orthodontic retainer interfering with the more typical mid-lingual approach.

*Photo 49* Temporary restoration in endodontic access has been removed.

*Photo 50* Clinical crown height is measured with a periodontal probe.

*Photo 51* Gutta percha has been reduced 1.0–2.0mm apical to clinical crown height.
Photo 52 Gutta percha and cervical tooth structure have been sealed with 1.0–2.0mm thick layer of resin ionomer.

Photos 53 & 54 Results of home bleaching after two weeks of treatment. Tooth has lightened substantially. Tooth is now ready for restoration.
Power Bleaching Using Rubber Dam for Soft Tissue Protection

Photo 55 Pretreatment view with teeth in the A3.5 range.

Photo 56 Water-soluble gel is applied to the soft tissue. Orabase can also be used.

Photo 57 Waxed floss is used to push rubber dam through interproximal spaces.

Photo 58 Slipknot is tied around each tooth.

Photo 59 A plastic instrument is used to push the floss below the cingulum while pressure is maintained on the facial extension of floss in a gingival direction.

Photo 60 Slipknot is being tightened.
Bleaching

Photo 61  Floss is trimmed as close to knots as possible.

Photo 62  Teeth are cleaned with prophy paste.

Photo 63  Dam covering papilla between maxillary right central and lateral incisors has a small tear.

Photo 64  Orabase is applied to protect the papilla.

Photo 65  Bleach is applied for time specific for the bleach being used. Note that, with the rubber dam as the isolation device, bleach can be applied to both the facial and lingual surfaces, which may be more effective than just applying it to the facial surface only.

Photo 66  After the specified bleaching time, the bleach is suctioned and another application is begun.
Bleaching

**Photo 67** #12 scalpel is used to carefully cut the floss prior to removing the dam.

**Photo 68** Shade change is dramatic after two power bleaching sessions.

**Photo 69** After five years, there has been some relapse, but teeth remain lighter than baseline. It is patient’s choice to have a touchup.
Power Bleaching with Light-Cured Resin as Soft Tissue Protection

Photo 70 Cheek/lip retractors and biteblock/tongue retractor/saliva ejector are placed.

Photo 71 Light-cured resin shield is applied directly from its syringe.

Photo 72 Resin shield has been applied to two teeth, but not cured quickly enough to prevent its flowing excessively over the teeth.

Photo 73 Resin shield has been applied to two additional teeth, with small increments cured for a few seconds as it is extruded to prevent its flowing excessively over the teeth.

Photo 74 Resin shield is definitively cured for 10–20 seconds per section of the mouth. Two lights reduce curing time. If exothermic heat produced by curing produces a painful response from the patient, stop curing. Check to be sure all areas of the shield are cured enough. (If the explorer can penetrate the shield with little or no pressure, it’s not cured enough.) If necessary, cure more but only expose each section of the mouth to the light for a few seconds.
Bleaching

**Photo 75** Excess resin is carefully removed with #15 scalp blade.

**Photo 76** Resin shield completed.

**Photos 77 & 78** Explorer is used to dislodge resin shield.

**Photo 79** Resin shield dislodged in one piece.
Additional Examples of Soft Tissue Protection for Power Bleaching

**Photo 80** Resin shield, retractors for lips and tongue, and cotton rolls.

**Photos 81 & 82** Resin shield, retractors for lips, separate biteblock/tongue shield (secured by floss), and 2x2 gauze rolled up. Gauze is better than cotton rolls if patient has a shallow vestibule, since it can be customized quickly by cutting off with scissors any excess that makes it too bulky. Blockout resin can also be flowed over the gauze to help secure it. Note how it adheres to the gauze when it’s removed.

**Photo 83** Resin shield, retractors for lips and tongue, gauze over lips and tongue, and rubber dam napkin totally isolates soft tissue. If both arches are not being bleached at the same time, covering the untreated arch is also prudent.
Power Bleaching of Nonvital Tooth

Photo 84 Patient presents with discolored maxillary left central incisor.

Photos 85 & 86 Chamber and entire external facial and lingual surfaces are bleached using a catalyzed gel.

Photo 87 Three power nonvital bleaching sessions were necessary to lighten discolored tooth.
Bleaching

**Photo 88** Pretreatment view of patient with darkened, nonvital maxillary right central incisor.

**Photo 89** Postoperative view after three internal/external power bleachings using a catalyzed power bleach with heat plus one week of “walking” bleach. Lightening remained stable for three years. The MiFL restoration in the maxillary left central incisor was replaced with a combination of composites.

**Photo 90** Same patient from Photo 89, seven years later. Tooth has relapsed and is tender to pressure. Clinical exam revealed external cervical root resorption.

**Photo 91** Immediate postoperative X-ray of patient with the nonvital maxillary right central incisor. Resin ionomer liner over gutta percha lacks radiodensity of adjacent materials.

**Photo 92** Postoperative X-ray of the nonvital maxillary right central incisor seven years later. Note external cervical root resorption. Due to the incidence of root resorption during nonvital bleaching, heat should only be used as a last resort and only after explaining all the negative sequelae if root resorption occurs.

**Clinicians:**

VITAL POWER BLEACHING BY I. CASTELLANOS AND M. MILLER
NONVITAL POWER AND ASSISTED BLEACHING BY M. MILLER
RESTORATIVE DENTISTRY BY M. MILLER
Bleaching has become an accepted procedure by the profession and the public. Patients want white teeth and dentists are only too happy to oblige. With ads in lay publications, commercials on TV, infomercials, etc., bleaching (or whitening as it is also called) is more popular than ever.

**Types of Bleaching**

**Home Bleaching**
Home bleaching, having been validated through numerous studies and thousands of case histories, continues to be the method of choice by both dentists and patients. Its simplicity, minimal dentist time, and profitability make it popular with the profession, while being in control of the process, the reasonable cost, and effectiveness keep patients happy and coming back for more. Of course, compliance is always a factor — the results will only be as good as possible if the patient is conscientious when it comes to wearing the bleaching tray. Even though we have not seen any published dropout rates from home bleaching participants, anecdotal feedback from patients suggests it could be as high as 50%. And some patients could experience TMD due to the bleaching trays.

The trend is to use stronger bleaches, but have patients wear their trays for less time. Indeed, 30% carbamide peroxide products, once thought to be acceptable only for in-office, assisted bleaching, is now being promoted by a handful of companies as the ultimate in convenience when it comes to home bleaching.

**Power Bleaching**
Fueled by the media blitz initiated by BriteSmile, power bleaching is experiencing a tremendous surge in popularity. With at least six new products released recently, dentists now have plenty of options to the contractual and procedural constraints of BriteSmile.

There are certain technique aspects of power bleaching that can apparently affect the results. Many of the details of these protocols, however, seem to be based more on empirical voodoo than solid clinical evidence.

**Do you need to use a light?** This is, by far, the most controversial of all issues facing power bleaching. While our own studies (in vitro) and others have suggested that the lights are just marketing glitz and do not contribute to efficacy, most (if not all) of these tests (including our own) have been done with different products and not those that are currently available. In addition, it is uncertain whether an in vitro bleaching test can really simulate the intraoral environment. Nevertheless, at least one manufacturer of a product in this category still excludes the requirement of using a light, although it is listed as an option. Our clinical evaluations at this stage have basically followed each manufacturer's directions. Therefore, we can't categorically state that lights don't work, but we also don't know if they, indeed, catalyze the bleaching effect.

**Is sensitivity inevitable?** In the bygone days of power bleaching, heat lamps were used to catalyze the bleach. Unfortunately, the heat also caused significant levels of sensitivity. Since the current systems use little or no heat as a catalyst, any sensitivity experienced now should be less sensitivity. Since the current systems use little or no heat as a catalyst, any sensitivity experienced now should be virtually nonexistent after 24 hours. Nevertheless, most of the systems have companion products for desensitization to be on the safe side.

**How important is application time?** With manufacturers' suggested bleaching times being quite variable, we continue to advise as long an application as most patients will tolerate. From our clinical evaluations, 60 minutes of bleaching is the limit for most patients.

**Does concentration of peroxide matter?** With BriteSmile using just 15% hydrogen peroxide, what is the optimal concentration? Most current products range from 25%-38%. But, if “more is better”, why would some manufacturers choose a concentration lower than others? There are two possible reasons: sensitivity and enamel damage. As the percentage of peroxide increases, the probability of sensitivity goes up proportionally, everything else being equal. It follows, then, that lower concentrations should result in less sensitivity.

The same applies to enamel damage, the incidence of which has been reported periodically in the scientific literature. Even though the evidence for this damage is anything but definitive, using a potentially less destructive product (lower concentration) could help to silence the naysayers.

On the other hand, higher concentration products may be more effective and could minimize application time.

**How thick does the layer of bleach need to be?** With manufacturers again disagreeing on this topic, the optimal thickness (even if you were inclined to measure it) still needs to be determined. However, we believe you should cover the facial surfaces of the teeth completely and keep the gel from drying out.

**Does the isolation method matter?** Gel-type resins combined with retractors for soft tissue for protection have basically sent the patient-displeasing rubber dam back to the restorative area. However, anecdotal observations indicate that bleaching from both the facial and lin-
gual, which is possible with the rubber dam but can’t be accomplished with a resin shield, is more effective compared to facial-only application.

Effectiveness is still the main issue with power bleaching. Even though it seems to work on some patients, dramatic results may still require multiple appointments, not the one-appointment “dazzling smile” promoted by most companies marketing a power bleaching system. And, most patients still leave their power bleaching appointment with a tray and syringe of home bleach to maximize the whitening effect.

**Assisted Bleaching**

To give patients even more options, you can also perform a third type we named assisted bleaching. This type of bleaching was invented by Den-Mat when they introduced their strong, carbamide peroxide product, Quik Start. It is typically done in addition to home bleaching. However, as indicated previously, several products for home use are nearly as strong as most assisted bleaches, presumably without any negative sequelae. This latest development has basically rendered this category as obsolete. We still include it as an option, but fully realize its use is dwindling fast.

**Financial**

On the economic side, home bleaching still wins out. However, some patients are more likely to accept power bleaching if they can get substantially lighter teeth in only one to two short (one hour) appointments instead of having to wear a bleaching tray for one–two weeks. So, it seems like a win-win for both you and your patients. But is it really?

Depending on the fee you charge, the win-win for you may only count if one of your staff does the bleaching. This means you must spend time training at least one staff member everything necessary to power bleach teeth. If this procedure is delegated to an untrained auxiliary, only disaster can result *(Photo 1)*. However, if you must spend your time performing the procedure, the financial incentives of power bleaching may not give you an adequate return on your investment.

**Warning:** Unfortunately, power bleaching may be considered an irreversible procedure, thereby making it illegal for anyone other than the dentist in some states. We strongly recommend checking with your state board before delegating this procedure to an auxiliary.

**Safety**

With literally thousands if not millions of patients having had their teeth bleached, primarily using a tray at home, safety concerns have been largely dismissed. However, we still believe that bleaching is not completely innocuous and should be carefully monitored.

**Marketing**

**Treat Your Staff** Bleach one arch (usually maxillary) and leave the other for a control. Staff members will then be able to demonstrate its lightening effect very graphically by showing patients the difference between their bleached and non-bleached teeth. And don’t charge your staff as an extra incentive.

**Options**

At the cosmetic consultation appointment, the patient is introduced to bleaching options. They are:

- Power bleaching only
- Home bleaching only
- Power bleaching plus home bleaching
- Assisted bleaching plus home bleaching

**Indications and Contraindications**

Bleaching, in general, is mainly indicated to lighten uniformly yellow or yellow-brown teeth, regardless of whether they are very dark or not. Some patients who have quite acceptable color (to us) still desire to have their teeth lighter. Bleaching can lighten the blue-gray staining caused by tetracycline, but it typically will not change the basic hue or the banding that these teeth usually exhibit. Teeth stained by tetracycline usually require veneers to improve their appearance. Teeth with numerous restorations that would remain the same color while the teeth become lighter are better treated with veneers or crowns. Lastly, teeth that are fractured, spaced, or misaligned are better treated with orthodontics and/or veneers.

**Nonvital Teeth**

Bleaching darkened, nonvital teeth has been done for many years and a much lighter tooth can be expected immediately following this procedure. However, the hue of the tooth may still be different from the adjacent, vital teeth and regression to its previous darkened state can occur.

Our advice is to recommend nonvital bleaching when the darkened, endodontically-treated tooth is intact on the facial surface and the patient completely understands that regression is a possibility. However, we know that some patients
will accept a less than perfect result due to the simplicity and cost savings as compared to a veneer or a crown. Therefore, this technique has a definite place in your esthetic armamentarium and could be a part of any treatment plan designed to lighten nonvital teeth.

Bleaching before Veneers
This is an unnecessary procedure if you prepare dark teeth with enough reduction to esthetically mask them. We have found that 1.0mm thick veneers will be esthetic without being too opaque or lifeless. In addition, bleaching has been shown to negatively affect the bond strength of composites to bleached enamel if the bonding is done shortly after the bleaching. If you still choose to bleach and then veneer, wait for at least one or two weeks after the end of bleaching to allow the enamel to remineralize.

This recommendation against bleaching before veneering does not apply to a single, nonvital, darkened tooth that is to be veneered with the remainder of the teeth. In this instance, bleaching the nonvital tooth to a level where it matches the rest of the teeth seems to be advantageous.

Bleaching Dark Veneers
Veneers tend to darken over time. Patients should be told of this probability when the restorations are done and informed that replacing the veneers will be a necessity some time in the future. However, with all the information in the lay press about bleaching, patients are increasingly asking if their veneers can be whitened rather than replaced.

Even though there is some evidence that bleach can diffuse through teeth, we would not want to depend on whitening from the lingual to pacify an unhappy patient. In addition, bleach can affect resin cement negatively and possibly lead to increased microleakage under veneers. Therefore, prior to attempting to bleach through teeth to lighten veneers, make sure your patient understands the possible negative sequelae.

Bleaching Dark Teeth Prior To Restorations
Dark teeth that require restorative treatment can certainly be bleached and then restored. However, you should make sure your patients understand that the bleached teeth may regress and may need rebleaching after the restoration is placed. Even with rebleaching, there can be no guarantee that the tooth will match the restoration like it did originally. In addition, bleaching has been shown to increase the microleakage of the existing restorations.

Expectations
Despite these drawbacks, many patients will still want to try bleaching because of its conservative nature (no addition of artificial tooth structure, i.e., veneers, and no tooth preparation). Therefore, we recommend bleaching as a viable procedure for patients with realistic expectations (Photos 2–5).

However, due to increasing media hype, all patients think they should be candidates. When told that other procedures (usually more expensive and time-consuming) are more indicated for them due to existing restorations, carious lesions, etc., they could react as a customer experiencing “bait and switch.” And, even though it is very effective, level of whitening cannot be guaranteed. If, for whatever reason, patient is not pleased, he or she could blame you for selling them something that doesn’t work.

Handling Restorations and Exposed Roots
If any restorations are defective due to leaking margins, they should be replaced before bleaching. However, as the shade of the tooth is destined to change, this restoration should be viewed as only partially finished and not have a facial beveled margin. Once the bleaching is completed, you will need to remove about 0.5mm from the facial of the restoration, bevel the margins, and add a layer of composite to match the new shade of the tooth.

Note: If your patient has many restorations in the teeth to be bleached, they probably will have to commit to having these restorations replaced or at least resurfaced (if they have been placed within one to two years). This is necessary even if they are still functional without any clinical signs of leakage because of the impending color change. Depending on the number of these restorations destined to be replaced, the economics of bleaching and restorations must be weighed against alternate procedures, such as veneering.

It is probably also necessary to protect any erosion and abrasion area. This can be done during power bleaching with a dental adhesive followed by Orabase (Colgate/ Hoyt) when sealing the rubber dam (if used). With home bleaching, it is prudent to cover exposed dentin/cementum with a dental adhesive, especially if these teeth are sensitive prior to bleaching.

Nevertheless, 61% of the Editorial Team do not seal exposed root surfaces prior to bleaching.

Preliminary Procedures
Prior to bleaching, just like any cosmetic procedure, a complete examination, including radiographs, of the patient’s teeth and periodontium should be done. Preoperative photographs should also be taken at this time so they will be available for viewing before you begin the specific cosmetic procedure. This will confirm that the photos are adequate. If the photos are not sufficient, you would then have the opportunity to take new ones before you start treatment. This, of course, does not apply if you have switched to digital photography. In addition, shade determination should be done at the exam to give the patient a realistic expectation of the results that can be achieved with bleaching. Any planned cosmetic contouring and a thorough prophylaxis (Photos 7 & 8) should also be completed before bleaching.
Informed Consent
A bleaching information/informed consent should be signed by the patient. REALITY has an informed consent which doubles as an information sheet for power and home bleaching. For a free sample, please call our office.

Home Bleaching

This technique can be one or two appointments, with two to three follow-ups. If you have adequate personnel and your scheduling is very organized, it can be done in one appointment by scheduling a prophy during the time the lab work is being done. Other offices may feel less rushed if a two appointment protocol is followed.

FIRST APPOINTMENT

STEP 1: Take Impressions (Photo 9)
Make impressions of the arches you plan to bleach.

SECOND APPOINTMENT

STEP 1: Deliver Bleaching Tray and Dispense Bleach
Deliver tray(s) to patient and make sure they are comfortable to ensure compliance with the program. Also check to be sure that they do not overlap onto any soft tissue. Give patient a storage case for the trays.

STEP 2: Instructions to Patient (Photos 34–37)
Patients can either bleach while they sleep or during the day. The patient should receive the instructions both orally and in written form. Make sure patients understand how to load the tray with bleach and that, if the bleaching material inflames the gingiva, they should discontinue using it until they can be seen in the office.

BETWEEN APPOINTMENTS

STEP 1: Pour Models (Photo 10)
Pour impressions in stone. If you are going to deliver the trays at the same appointment you take the impressions, pour them using a quick-set stone or an auto-mix hard vinyl material. However, reservoir material (if used) does not readily stick to vinyl models.

STEP 2: Prepare Models (Photos 11–14)
Thin the base on the model trimmer to eliminate the vestibule and the palate, but don’t overdo it. Too thin a base can weaken the model and cause it to break. Then trim the facial and lingual aspects on a lathe to create a slight inward bevel from the occlusal table to the bottom of the base. This means that the faciolingual dimension of the base is less than that at the occlusal. The beveling of the model helps the vacuum (see next step) adapt the material to the model. The end result of this trimming is a horseshoe-shaped model with no palate or floor of mouth.

Note: Our own clinical study suggests reservoirs are probably not necessary in most instances and may even be contraindicated in some patients. (Photos 15–21)

STEP 3: Make Bleaching Tray (Photos 22–26)
Lubricate the model with any spray lubricant designed for models or use PAM. Place the model in a vacuum-forming machine and make a tray from one of the thin, soft flexible materials that is included in most home bleaching kits.

Note: Our own clinical study found that gingival soreness was virtually eliminated when the tray was properly trimmed short of the gingival margin.

STEP 4: Trim Tray (Photos 27–33)
To minimize or eliminate any potential soft tissue problems, “scallop” or festoon the tray to follow the gingival contours just short of the tissue with trimming scissors sold by several manufacturers. In other words, the tray should not be extended over any soft tissue. If the posterior teeth are restored, it is prudent to trim the tray so it does not cover these teeth. One study has found that bleach can release mercury from amalgams.

Note: Our own clinical study found that as little as 90 minutes per day for 10 days was able to lighten teeth seven shades.

STEP 3: Reappoint Patient
It is prudent to see the patient in seven days to check the tissue and bleaching effect (Photos 38 & 39).
Assisted Bleaching

Vital Teeth

**STEP 1:** Polish Teeth with Prophy Paste

**STEP 2:** Place Cheek/Lip Retractors

**STEP 3:** Fill Tray with Bleach

**STEP 4:** Insert Tray

Wipe excess bleach off gingivae with a cotton swab, brush, or your gloved finger.

**STEP 5:** Bleach for 30 Minutes

**STEP 6:** Remove Tray and Rinse

Suction bleach off teeth before rinsing. Then rinse each tooth, keeping the high volume evacuator adjacent to the tooth you are rinsing.

Nonvital Teeth

This technique combines home and assisted bleaching.

**STEP 1:** Make Bleaching Tray

This tray can be an anterior-only tray if the tooth you are bleaching is an incisor. Incorporating facial and lingual reservoirs for the specific tooth being bleached may have some efficacy in this instance.

**STEP 2:** Seal Gutta Percha *(Photos 41 & 42, 48–52)*

Use the technique described in Step 6 of NONVITAL BLEACHING.

**STEP 3:** Apply Bleach *(Photo 43)*

Fill the area of the tray corresponding to the one tooth you are trying to lighten with an assisted bleach material. The chamber of the tooth is also filled with this same bleach. Insert the tray and wipe off any excess on the tissue.

**STEP 4:** Bleach for 30 Minutes

**STEP 5:** Remove Tray and Rinse

**STEP 6:** Walking Bleach

The bleaching access is left open and the patient is given a syringe of home bleach. This type of walking bleach has the patient filling the tray (only in the area of the single tooth being bleached) and the bleaching access preparation directly from the dispensing syringe of the bleach itself, and wearing the tray in the same manner as conventional home bleaching.

**STEP 7:** Check Patient in 7 Days *(Photos 44 & 45)*

Repeat assisted bleaching if tooth is still dark and continue with internal home bleaching for another seven days.

Power Bleaching

Vital Teeth *(Photo 55)*

**STEP 1:** Protect Soft Tissue

In addition to intraoral and perioral protection, the patient should also be wearing safety glasses to protect his or her eyes from any bleach accidentally splashing into them.

**Rubber Dam *(Photos 56–61)*

Despite the fact that most patients do not appreciate its benefits, the rubber dam remains the most reliable and safe method of protecting the soft tissue. It also allows bleaching from the facial and lingual surfaces, which may be more effective than merely applying the bleach on the facial surfaces only.

Cover all the soft tissues in the bleaching area including the facial, lingual, and interproximal gingiva as well as the mucosa with Orabase. Do not worry about getting any on the teeth at this time. Punch holes in a medium or heavy gauge rubber dam for each tooth to coincide as close as possible with its size. The second premolars are usually clamped.

After all the teeth have been isolated, ligate each tooth with a loop of waxed floss that has a slipknot on the facial. Pull the knot tight in a cervical direction while pushing the floss cervically on the lingual with a plastic instrument. Cut the excess floss at the knot on the facial.

**Light-Cured Resin *(Photos 70–83)*

Although the rubber dam is effective, its placement can be daunting for auxiliary personnel and uncomfortable for the patient. Instead, light-cured resin gels can be applied directly to the gingiva for protection. The advantages of this method include a relatively flat learning curve and less resistance from the patient. The disadvantages are no gingival retraction and no opportunity to apply the bleach to the lingual surfaces.

Place lip/cheek retractors and biteblock/tongue shield/saliva ejector. Apply the resin shield directly from its syringe onto the gingiva. Since some of these materials are somewhat runny, it is prudent to partially cure the material for a few seconds as you apply it around each tooth to keep it from flowing excessively onto the teeth. (For proper protection, the resin needs to cover a small amount of each tooth immediately adjacent to the soft tissue.) After the soft tissue investing all the teeth to be bleached is covered, the resin is definitively cured for 10–20 seconds. Two lights speed up the curing process.
While different manufacturers recommend specific light-cured resin shield material, the cervical areas of the teeth, cover it with Orabase or a non-etching gel. If any soft tissue is visible at the cervical areas of the teeth, cover it with Orabase or a light-cured resin shield material.

**STEP 2: Clean the Teeth** *(Photos 62)*

Use pumice or prophy paste to remove the excess Orabase (if used), wash and dry. If there are any erosion or abrasion areas exposed, reapply Orabase to cover those areas. If these erosion or abrasion lesions are sensitive, it is prudent to seal them with a dental adhesive prior to beginning the bleaching procedure. The sealing procedure should protect the pulp from the caustic peroxide gel. If any soft tissue is visible at the cervical areas of the teeth, cover it with Orabase or a light-cured resin shield material.

**STEP 3: Bleach the Teeth** *(Photos 65 & 66)*

While different manufacturers recommend specific protocols for their products, we continue to recommend 60 minutes of application time regardless of the material you are using. For the most part, this bleaching time should be acceptable, just as long as the patient doesn't experience any discomfort. Most patients, however, seem ready to end the bleaching session after 60 minutes of total application time, regardless of whether they are sensitive or not.

Cover both the facial and lingual surfaces of the isolated teeth with about a 2.0mm thick layer of bleaching gel. If you are not using a rubber dam, only apply the bleach to the facial surfaces. With some materials, you suction the gel off the teeth and reapply a fresh layer every 15-20 minutes, while others just want you to apply the gel once for the entire 60 minutes. We have no data supporting one approach over the other, although reapplying fresh bleach several times during the session seems to be more effective.

**STEP 4: Remove Soft Tissue Protection**

**Rubber Dam** *(Photo 67)*

After the final application of bleach, suction the bulk excess of the gel and then rinse thoroughly. Cut the floss ligating the teeth with a #12 scalpel, cut the interproximals of the dam with scissors, and remove it. Orabase is removed with a wet 2x2 and floss.

**Light-Cured Resin** *(Photos 77–79, 82)*

After the final application of bleach, suction the bulk excess of the gel and then rinse thoroughly. Dislodge the resin shield from one end using an appropriate instrument such as an explorer. The resin should peel off the tissue easily and cleanly.

**STEP 5: Polish**

Since you have not etched the teeth, it is not absolutely necessary to polish them after bleaching. However, some bleaching materials have a low pH and can lightly etch the teeth by themselves. Therefore, polishing with a fluoride prophy paste is probably a good idea.

**STEP 6: Desensitize**

Although the patient may not have experienced any sensitivity during the procedure, some may still occur post-treatment. Applying a potassium nitrate gel for five minutes could pre-empt sensitivity from occurring at all. This gel can be applied with a cotton-tipped applicator or disposable brush. After the five minute application period, suction the excess but do not rinse. Even after desensitizing the teeth, it is prudent to advise the patient that a mild analgesic (Tylenol, Advil, etc.) may be necessary for any residual discomfort.

**STEP 7: Next Appointment** *(Photo 68)*

Due to the unpredictable nature of power bleaching, one session may not provide the amount of lightening expected by the patient. Tooth desiccation during the bleaching procedure itself usually prevents any meaningful feedback on color change immediately after bleaching. Therefore, you may choose to reschedule the patient in 1-2 weeks for a shade change evaluation or proactively schedule another bleaching session in 1-2 weeks.

**STEP 8: Re-Evaluation** *(Photo 69)*

Patients should be checked periodically for relapse and for the need for touchups.

**Nonvital Teeth** *(Photo 84)*

**STEP 1: Check Endodontics**

Evaluate adequacy of the root canal treatment radiographically and clinically. Do not bleach if the tooth exhibits any negative signs or symptoms.

**STEP 2: Apply Soft Tissue Protection**

Cover all the soft tissues in the bleaching area including the facial, lingual, and interproximal gingiva as well as the mucosa with Orabase. Do not worry about getting this material on the tooth at this time.

**STEP 3: Place Rubber Dam**

If adequate access to the pulp chamber and facial surface can be obtained, only isolate the tooth you are bleaching. With limited access, it may be better to isolate the tooth to be bleached as well as the teeth on either side. When isolating more than one tooth, each tooth should be ligated with waxed floss that is secured with a slipknot on the facial. Before placing the frame of the dam, carefully fold back the dam and reapply Orabase to further seal the dam.
**Bleaching**

**STEP 4: Open Tooth**
Remove the endodontic access restoration and clean the chamber of all debris, including necrotic pulp remnants. Pay special attention to the pulp horns. Any discolored dentin should also be removed. Reduce the gutta percha 1–2mm below the gingival margin using a round bur in the slow-speed handpiece. If there are any restorations that extend to the facial and prevent the bleaching solution from saturating the tooth, they should be removed before beginning.

**STEP 5: Clean Tooth**

**STEP 6: Seal Gutta Percha and Subgingival Cervical Tooth Structure**
Fill the incisal 1–2mm of the canal as well as any other subgingival tooth structure with a resin ionomer, composite, or bonded composite. Be sure to remove any overflow of adhesive from the internal walls of the supragingival tooth structure with a slow-speed round bur. This overflow would prevent the bleach from penetrating into the tooth. Sealing the subgingival area of the tooth before bleaching is very important to prevent the bleach from perfusing through the root and possibly causing external resorption *(Photos 88–92).*

Despite your best efforts to seal the cervical tooth structure, there is still a risk of external resorption. Patients need to be fully informed concerning the risks. Latest research has suggested that sodium perborate mixed with water instead of a high concentrated hydrogen peroxide may lessen the risk of resorption.

**STEP 7: Bleach Tooth**

**Gel Bleaching Procedure**
1. Fill the chamber and cover the entire external surface of the tooth with gel. This includes covering the facial and lingual *(Photos 85 & 86).*
2. Bleach for 30 minutes.
3. Temporize.

Place a cotton pellet in the chamber and temporize the access opening with Cavit (ESPE) or Tempit (Centrix). As an alternative, use a light-cured, semi-flexible inlay provisional material. Due to its flexibility, you won’t have to use a cotton pellet prior to placing it.

**“Walking” Bleach Procedure**

**Note:** With the newer and safer “walking” home bleach technique described in Step 6 under NONVITAL ASSISTED BLEACHING, this technique could be considered obsolete. We have included it for those who still prefer to close the tooth in-between bleaching appointments.

**1. Place Bleach**
Make a thick paste by mixing Amosan (sodium perborate) and a gel bleach and place in the pulp chamber with an amalgam carrier or other suitable instrument. For more safety, mix the sodium perborate with water.

**2. Seal the Tooth**
Seal the access opening with a provisional restorative material. Caution the patient that the temporary may be loosened by the effervescent action of the bleach in the pulp chamber and to return to the office if this happens.

**Note:** If you choose a material such as IRM, please be aware that it contains eugenol and needs to be completely removed with no residue remaining when bonding the access opening since eugenol may interfere with the polymerization of the definitive restorative resin. IRM is used since it seals very well.

**3. Next Appointment**
Reappoint the patient in two to five days to evaluate the results and repeat if necessary.

**Combined Bleaching Procedure**
With this method, you will seal the Amosan/gel paste into the access opening after initial bleaching with the bleaching gel.

**STEP 8: Restore the Access Opening**
You can expect to achieve maximum bleaching in three appointments. If the tooth is still darker than the adjacent teeth, the tooth should be restored and plans made to veneer the tooth. *(The final assessment of the color of the tooth should be delayed until one week following restoration of the access opening since the restorative material may change the color of the tooth.) The shade of the restorative material will be determined by your success in bleaching.**
If you have achieved effective lightening, select a shade that matches the adjacent teeth. With a tooth that is still dark, you would select a light shade to attempt to further lighten the tooth. A hybrid is the classification of material best used to restore access openings since it is ideal for dentin replacement due to its opacity and superior physical properties compared to the microfills. It also polishes to a smooth finish pleasing to the tongue.

A. Remove the Temporary
Thoroughly irrigate the chamber with water. Bevel the margins.

B. Etch the Inside of the Chamber (See p.16)

C. Apply Dental Adhesive (See p.17)

D. Fill the Opening
Inject the restorative material in increments and light cure each increment from the facial and lingual (use of two lights is helpful).

E. Polish (See p.23)
Finish the restoration with finishing burs and polish with rubber instruments.

STEP 9: Next Appointment
Reappoint the patient in one week to assess the color of the tooth and the need for veneering.
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