



Chairside

PERSPECTIVE

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Prep & No-prep Comprehensive Porcelain Veneers Techniques

Porcelain veneers have become a standard procedure in many American practices, even though this technique is still not routinely taught in most dental schools. For example, I had the opportunity to do the first set of porcelain veneers in the history of my dental school back in 1988, yet I have never spoken with another graduate since then who had that same opportunity. It is therefore left for most dentists to teach themselves how to successfully accomplish this technique.

This issue of Chairside Perspective will serve as a review for what I have learned since that first nervous set of six veneers back in dental school.

While porcelain veneers are a great treatment modality for many patients, they need to be considered as part of a differential diagnosis in which traditional orthodontics, direct bonding, esthetic recontouring and bleaching are considered as options.

While some clinicians advocate a no-prep approach to porcelain veneers, my experience has been that some type of preparation gives a more predictable esthetic result. The most



Cindy presented with advanced wear on nearly all of her anterior teeth. In addition, she had lost almost a third of the facial enamel volume on her maxillary incisors. The teeth were prepped and Empress Veneers from Glidewell Laboratories were placed on teeth #5-12 and #21-28.



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This publication is designed to provide Glidewell customers with proven clinical tips and techniques. If you have any comments or suggestions, e-mail Dr. DiTolla at mditolla@glidewell-lab.com

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common problems I have seen with no-preparation veneers are overcontoured margins and bulky veneers. Unfortunately both of these conditions can make a case a failure and both doctor and patient unhappy. The biggest advantage of tooth preparation is that it gives you control over a number of factors that ruin a case if left unattended. Some of these factors include:

- Contour factors (emergence profile, facial profile, incisal third).
- Color change without over-bulking the ceramic.
- Margin placement for concealment.
- Definitive margin for technician to work with.
- Allows correction of greater misalignment.

On the other hand, no-prep veneers can work well in “additive” type esthetic cases. These would be cases where multiple diastema are present, the teeth are shorter than they used to be due to trauma or wear, cases where there has been a loss of facial enamel volume, and some cases where the only goal is the “permanent bleaching” effect achieved.

I believe no-prep veneers are an area where we need to have effective, written informed consent with the patient about the different veneer options available to them. The sound of “no-prep, no shots, no temps” is definitely music to any patient's ears, but you still need to talk with them about the downside of the no-prep veneers. If the patient still wants to go forward with the no-prep veneers after explaining



This patient was dissatisfied with her smile. She did not want to have any injections or tooth preparation done. Because of the multiple diastema present in the arch, this type of “additive” case lends itself well to no-prep veneers. Vivaneers made with PrismaTik ThinPress Ceramic were used in this no-prep veneers.

Veneer Indications

- Improve extreme discolorations such as tetracycline staining, flourosis, devitalized teeth, and teeth darkened from age.
- Repair chipped or fractured teeth.
- Closing of diastemas between teeth.
- Ability to lengthen anterior teeth.
- Improve the appearance of rotated or misaligned teeth.

Veneer Contraindications

- If little or no enamel is present, full crown should be considered.
- Certain tooth-to-tooth habits like bruxing or clenching, or other para-functional habits such as pencil chewing or ice crushing.
- Teeth that exhibit severe crowding.
- Certain types of occlusal problems such as Class III & end-to-end bites.

about the bulkier margins and the need for excellent oral hygiene habits on the part of the patient, you can go forward with no-prep with a good degree of confidence. Also, be prepared to recontour the gingival margin if it feels too bulky to your explorer. I prefer the Brasseler ET Carbide kit and using the ultrafine grit in an electric handpiece to smooth off any “speed bumps” that may be present at the margin. To protect the gingival you will need to use a cord packer to retract the tissue, or if you prefer, a Zekyra instrument to protect the tissue to ensure the bur does not contact tissue. The cord packer I use to accomplish this has many bur marks on it, which is much more preferable to leaving those marks on the tissue itself.

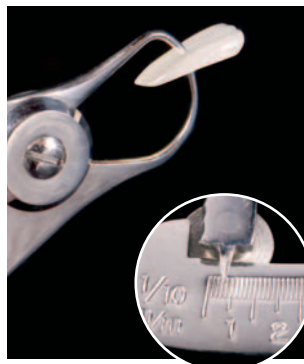
As always, be careful during any veneer try-in (including no-prep) not to try to push the patient toward accepting veneers they are on the fence about. It has always seemed like you have definitely “married” most veneer patients, and you want to make sure they love their veneers before they are bonded to place. I do not look at no-prep veneers as “reversible” at all. I make sure patients are happy with the veneers before proceeding. I have removed no-prep veneers without any damage to teeth before using my Waterlase YSGG laser from Biolase, but most dentists have not purchased this technology yet. I do not believe you can remove no-prep veneers bonded to enamel with a handpiece without doing some damage to the teeth. The only time I consider veneers

reversible is while they are still filled with try-in paste.

Most of the veneer cases I do have some aspect of preparation to them. I have a very definite preparation sequence that I use, and I actually have a checklist that I use to ensure that nothing is forgotten, which helps lead to predictability and better results. Even pilots who have been flying the same jet for 20 years use a checklist to ensure that nothing is forgotten. For them the results of not using checklists can be life and death, but for us it can be the difference between a patient who is ecstatic or merely satisfied. I have also found that when I do things in the same order every time I get faster at the procedure, which is good for me and the patients.

Preparation Technique

Step 1 The goal of this step is to create three planes of reduction: gingival, body (middle), and incisal. I find this is best accomplished



The patient above was dissatisfied with this smile due to the multiple diastema and darker shade of some of the teeth. No-prep PrismaTik ThinPress veneers were used to close the multiple spaces and whiten the smile. With no-prep veneers there is little to no worry about post-operative sensitivity.

At left, the key to the Glidewell PrismaTik ThinPress ceramic is the ability to press veneers 0.3 mm thick. This allows you to change tooth size, shape and alignment in one appointment for most patients.

with the use of a LVS bur set. These burs allow you to place depth cuts in all 3 planes, but the handpiece does need to be angled to ensure the gingival and incisal depth cuts are deep enough.

After observing thousands of veneer preparations here at the laboratory it becomes clear that many of these preps are reduced properly in the middle third, but are under-reduced in the gingival and incisal thirds.

For teeth that don't require major shade correction and are fabricated with feldspathic porcelain, a 0.3 mm depth cut is sufficient. An advantage of this minimal depth cut is that the resulting prep surface is all still in enamel, so the bond strength of the veneer to the tooth is excellent and the possibility of post-operative sensitivity is practically nonexistent. For a more dramatic shade change, or if you are using a pressed ceramic such as Empress, the 0.5 depth cut should be used.

Step 2 When you prepare the teeth make sure that the

Veneer Advantages

- Colors are natural looking and stable.
- Cementation strength permits tooth reshaping. Although veneers are somewhat fragile in your hand, once they are bonded to the tooth, they develop high tensile and shear strengths, allowing reshaping.
- The bond of etched porcelain veneers to enamel is measured from 2600 to 3200 psi, compared with composite resin veneer to enamel bonds, which range from 900 to 1400 psi.
- Long-lasting with exceptional resistance to wear, abrasion and stain. When bonded properly, veneers can last as long as other fixed restorations, while the highly glazed surface is very resistant to stain accumulation.

Veneer Disadvantages

- Color cannot be modified once veneers have been bonded into place. Use a bleach shade at try-in so patients can see what really white teeth look like and choose the shade from there.
- Not as easy to repair.
- More difficult to seat veneers due to bonding and clean-up compared to cementing a single crown.
- Technical difficulties in avoiding overcontours and obtaining closely fitted gingival margins.

axial inclination of the preps mimics the desired axial inclinations. To check the preps, face the patient and make sure that the axial inclinations of the preparations all meet at the belt buckle. This is possible because as you move more distally from central to cuspid, the axial reduction tips back more to the distal.

Step 3 To allow the technician to build an esthetic incisal edge, 1.5 mm of reduction is necessary. If you or your patient are not concerned with incisal edge translucency, white halo effect, or lobe development, this amount of reduction is not necessary, but to ensure ideal emergence profile and gingival health, I would suggest that you prep a gingival margin for the technician to finish the gingival margin too, which is step 5.

Step 4 Pack an Ultra-dent 00 retraction cord. If possible, you can floss the cord down through the interproximal contacts on the mesial and/or the distal. If the contacts are too tight to allow this, start

packing a free end of the cord under one of the contacts and pack across the facial surface. As you approach the other contact, cut the cord so that the free end will extend just under the contact area. Make sure both ends of the retraction cord are tucked under the tissue and not visible. The two free ends do not need to meet on the lingual, because the lingual surface will not be prepared. This cord will move the gingival back a half-millimeter and allow you to place your margin at the level of the gingiva so that when the cord is removed, your margin will be slightly subgingival without ever having taken the bur subgingival.

Step 5 Prep the gingival margin. You can either use your favorite chamfer bur or use a small, round diamond, like I typically use, right above the level of the gingiva, which cuts a perfect half-circle into the tooth. As this depth cut is blended into the axial reduction the perfect half-circle becomes a perfect quarter-circle. The margins I prep like

this end up being the best I ever cut. In fact, many times I will make this gingival reduction step 1 of the process so that I can make this depth cut with the rest of the tooth structure intact.

Step 6 Polish the preparations with a 30 micron (red stripe) diamond, especially around the margins. Take this opportunity to drop the margins all the way down to the gingiva if you haven't done so already. Coarse and medium SofLex disks are also helpful in removing sharp angles from the preparations, especially at the incisal edge.

Temporization Technique and Diagnostic Wax-up

I have always considered diagnostic wax-ups to be a critical part of the porcelain veneer process. A big reason why I always use diagnostic wax-ups is to give the patient an accurate idea of what their finished case could look like. In fact, I have always been suspicious of digital imaging

programs because of the way they show patients what their smile could look like. Many of these systems have a smile library in which a smile is somewhat arbitrarily taken from the library and "pasted" over the patients existing smile. Unfortunately, this method of imaging doesn't take the patient's tooth position, hard or soft tissue architecture into account, and can show the patient an "after" scenario that is literally impossible to achieve.

With the diagnostic wax-up the lab or dentist removes the desired amount of tooth structure from the pre-op model and then the veneers are waxed onto the patient's actual prepped teeth. This method accurately shows the patient, dentist and lab technician what is realistically available for this patient. In fact, one of my favorite things to do is to take a polyvinylsiloxane impression of a diagnostic wax-up, fill it with a bleach shade bis-acryl temporary material such as Temphase from Kerr, and place it over the patient's unprepped teeth and let it set



This patient presented with some extreme smile design challenges. Ideally, this patient would have been treated orthodontically prior to placement of the porcelain veneers. The patient, however, opted for "instant orthodontics." Precontouring of the teeth was accomplished prior to placing any depth cuts to ensure that the arch alignment would be as close to ideal as possible. In addition to gingival recontouring, Empress veneers were placed on teeth #4-13 to achieve this dramatic result.



The patient presented with an existing composite veneer on tooth #9, and multiple other esthetic problems with her maxillary anterior teeth. Empress veneers on teeth #5-12 were placed to solve the various esthetic problems.

to give the patient an intraoral preview of what their new smile will look like. Obviously it's not a perfect fit because no teeth have been prepped, but it is a nice way to transfer the information from the diagnostic wax-up to the patient's mouth.

The diagnostic wax-up also helps many patients make up their minds about treatment just by looking at the wax-up and comparing it to their existing smile. It is for this reason that I insist that all diagnostic wax-ups be fabricated from white stone models with white wax added for the veneers.

Yellow models and yellow wax just don't elicit the same emotional response from patients when they view them, even though darker models and wax may make it easier for the dentist and technician to see certain details such as surface texture, etc. The bottom line is if you are planning on showing the diagnostic wax-up to the patient or are going to let them take it home to show to their spouse, make sure your lab uses white models and white wax.

The diagnostic wax-up can also act as a financial screening tool. We charge \$20

per tooth for this service, but we have the patient pay for it. So for a typical 8-veneer case the diagnostic wax-up would cost \$160, and that amount is credited toward the overall case fee if the patient decides to have the treatment done. Years ago I would pay for the wax-up myself, only to find out that the patient wasn't that serious about having the treatment done.

After I became the owner of five or six wax-ups, the decision was made to have the patients pay for them. Any patient who balks at the \$160 fee for the wax-up to see what their new smile could look like is probably not that serious about having the treatment done. This keeps you from wasting \$160 on a wax-up you don't need.

From a clinical standpoint, the diagnostic wax-up is critical to doing the temporaries in a time efficient and meaningful way. Over the years there have been a number of ways to do veneer temps, although I finally have a technique that I am totally comfortable with because of its predictable nature. When I did my first set of veneers in dental school back in 1988 we did not place any temps because we didn't have a material that would hold up in that thin of a layer.

We then moved to free-handing composite material onto the preps, which had the potential to look very nice but could also be very time consuming and was hard to delegate. After that we started using diagnostic wax-ups but we would duplicate the model first and then do a suck down over the model to make the temps. The problem

with this technique was the amount of adjustments that were required intraorally after the temps were placed. This was not only time consuming but potentially iatrogenic, as we would trim the temp material trying to find the prep margins underneath.

Today we have a method that is simple, predictable and esthetic. I always start with a diagnostic wax-up and I make two small but important modifications to the wax-up. The first one is to take a sharp instrument such as a half-hollenbeck and use the tip to define the sulcus around the gingival margins on all of the teeth to be veneered. Typically a diagnostic wax-up tends to be a little sloppy in this area, so be sure to really define this area so that you can visually see the sulcus as though you were looking at the real teeth. The second modification I make is to now use the side of the half-hollenbeck to remove some wax in the cervical third of all the teeth you are going to prep. I remove just enough wax to remove any convexity from the cervical third of the teeth so that there is a flat emergence profile on the teeth to be prepped. These adjustments help to ensure that there will be little to no intraoral adjustments once the temps are placed.

Once these two modifications have been made to the wax-up, you are ready to take an impression of it. The best way to impress it is to start with a putty impression. Mix up regular impression putty, roll it into a hot dog shape and push it down over the diagnostic wax-up and let the putty set. It will take a



This patient presented with direct composite veneers on teeth #8 and 9. She did not like the diastema between teeth #7 and 8, and teeth #9 and 10. In conjunction with laser gingival recontouring, the entire smile was treated and Empress veneers were placed from teeth #5-12.

couple of extra minutes because this is taking place out of the mouth.

Remove the putty impression and reline it with light body or extra-light body impression material and reseat the impression back over the diagnostic wax-up and again let it set up outside the mouth. After it sets remove the putty/wash combo from the diagnostic wax-up and trim any areas along the periphery of the model that are unnecessary and could interfere with seating the matrix in the mouth.

When the preparations are

finished and the impressions are done, and a bite is taken, it is time to fabricate the temporaries. If you want, at this point you can place a desensitizer on the preps prior to placing the temps. Most of the time I will choose a bleaching shade bis-acryl material.

Because most people are convinced that they want a white smile, I find the two-week provisionalization period to be a perfect time to use a lighter shade of material to see if the patient really does want to have a bright smile. Since the veneer preps are fairly conservative, some of

the color of the stump shade shows through the bleach shade temp so that it is not as stark as it sounds.

The amazing moment is when you remove the putty/wash impression and see no flash around the margins of the prep if you have done it correctly. At this point it should need very little finishing. It is important, however, that if you are going to “lock” or “shrink-wrap” these temps into place, that you do not try to remove the temps at all, especially if they are 8 or 10 units splinted together. If it is a 4-unit veneer case, you may be able to remove the temps, trim the margins, and then cement them with TempBond Clear.

If you try to remove temps of any size and get them halfway off but are unable to remove them all the way, it has been my experience that the best solution is to cut them off and start again. Anytime I have removed veneer temps halfway and then tried to push them back down into place, they have leaked during the provisionalization period, leading to sensitive teeth and unhealthy gingiva. Commit yourself to locking the temps in place or cutting them off if they loosen. Again, with 4-unit cases it is very likely you will be able to remove the temps in one piece, shape and finish the margins, and cement them with TempBond Clear. The only caveat with TempBond Clear is that you should really wear loupes while using it because its clear nature makes it easy to leave excess around a papilla and inadvertently cause papillary recession.

Bonding Technique

Seating veneers is typically the most difficult part of the procedure, especially compared with cementing PFM restorations. Most of this difficulty is due to the increased difficulty in working with a resin cement as opposed to a resin-reinforced glass monomer (RRGI) cement for typical crown and bridge cases. Most dentists are comfortable “walking away” from cases where RRGI’s are being used.

For example, they will cement crowns on teeth 7,8, 9 and 10 and then exit the operatory, leaving their RDAs to do all the clean-up of excess cement. If you walk away from bonding veneers you will most likely bond all the anterior teeth together and spend the next two hours sawing through all the contacts, trying to make the teeth individual once again! As a result, the more clean-up you can do prior to curing the cement, the better the chance you won’t have to use burs and other potentially dangerous clean-up methods.

For color stability purposes, only light cured resin cements should be used when luting veneers. Dual cure and self-cure resin cements are not as color stable long term as light cure resin cements and typically are not the best choices for under porcelain veneers. If the prep shade is within normal limits I find I get the best results when using a translucent resin cement, such as clear Nexxus from Kerr. I use just the base, not the catalyst, to ensure the

cement will be as color stable as possible. Another good choice is Appeal from Ivoclar Vivadent. I use the clear shade almost exclusively, which is also known as the medium-value shade.

Step 1 Prior to cementation the provisionals are removed by cutting a slice into the facial aspect of the temps and then using a crown remover to break the temps into pieces. We locked the provisionals into place, so no effort is made to take them off in one piece, as that would be impossible given the thin, brittle nature of the bis-acryl material. However, because we saved the putty/wash impression we made of the diagnostic wax-up, we can quickly make another set of provisional veneers if there is a problem at the try-in appointment. So at the seat appointment the provisional veneers are basically just popped off the teeth as quickly as possible, unlike with provisional crowns and bridges that are removed with care in order to keep from damaging them.

Step 2 Magnification (4.5X loupes) is used to verify that no bis-acryl material is stuck on or between the preps. The veneers are then tried in one at a time without try-in paste to make it easier to evaluate the fit of the individual units. Once all the veneers have been tried-in and the fit has been verified, the units can now be tried-in together to check contacts. At this point we typically will try-in the restorations with a try-in cement (Nexus Clear Base Try-In) to help them stay in

place. Also, once all the restorations are in place we will give the patient a hand mirror so that they can take a look at the restorations as well. At this point I have also printed up an 8x11-inch picture of their “before” shot so they can remember what they used to look like. At this point they’ve been looking at their temps for two weeks, which usually look a lot better than their before shot does. It helps give the patient some perspective on where they started and where they are now.

Step 3 The try-in paste is water-soluble, so it is very easy to rinse out of the internal aspects of the veneers and off the preparations. At this point I like to clean the teeth with some fresh pre-mixed pumice (Preppies, Whip-Mix Corp) and then apply some liquid Consepsis (Ultradent) and air dry the preparations.

Step 4 If you have concerns about your ability to keep the preps dry during the seat appointment, you may want to consider the use of a rubber dam. Using the example of a maxillary 8-unit veneer case, the easiest way to place this type of rubber dam is to use a template and use a pen to mark the holes for the two maxillary molars and the two maxillary second bicuspids. Then use the pen to draw the arch form from first bicuspid to first bicuspid. With a hole punch, punch the holes for teeth #3, 4, 13 and 14. With a pair of crown and bridge scissors, cut from the hole for tooth #4 to the hole for tooth #13 along the arch form that you drew so that it creates a



This patient presented with multiple failing interproximal composites and alignment problems. She also did not like the black triangles between teeth #7, 8, 9, and 10. In addition to gingival recontouring, Vivaneers were placed on teeth #5-12 to correct the esthetic issues and improve her smile.

semi-circle. Place the clamps on the two maxillary molars and place the dam over the two clamps and attach a rubber dam frame. On the facial you can roll the rubber dam under the patient’s upper lip and on the lingual you will have a flap of rubber dam hanging down. Approximate the rubber dam flap to the patient’s hard palate and squirt some bite registration onto the free rubber dam flap and the palate to create a seal. Now the teeth are completely isolated and it allows you to turn your head for a second and not worry about possible salivary contamina-

tion if the patient’s tongue happens to go exploring.

Step 5 Your lab should have already etched the internal aspect of the veneers with 10% hydrofluoric acid. It is easy to verify this etch by the frosty appearance of the inside of the veneer. While you can use standard 37% phosphoric acid to clean the try-in paste and saliva out of the inside of the veneer, this acid that we use to etch teeth WILL NOT etch porcelain; you must use hydrofluoric acid to etch porcelain. We then apply a thin layer of Optibond adhesive to the inside

of the veneer, air thin it and place it under a protective box to keep it from curing.

Step 6 At this point you have an important decision to make about which dentin bonding philosophy you would like to follow: total etch vs. self etch. Total etch is certainly the more established way to place veneers and is the way I think every institute would teach you to do it. Since the thinking has always been that we need to attain maximum bond strength when bonding veneers, the total etch technique has always been used to achieve this strength. However, many dentists will tell you that they have had problems with total etch and post-operative sensitivity. In my mind, there is nothing worse than post-operative sensitivity associated with elective dentistry. Typically these patients begin treatment with no pain or sensitivity and to have them finish with pain or sensitivity creates buyer's remorse and can lead to patients not wanting to pay their balance.

Over two years ago I began placing all of my direct composites with self-etching primers, and I can tell you anecdotally that my post-operative sensitivity has nearly disappeared since then. Just over a year ago I began placing my veneers with self-etching primers and a light cured veneer cement, and again my post-operative sensitivity disappeared. To date I have not had one of these "self-etched" veneers fall off due to lack of bond strength. In my opinion, the additional bond strength we get from



This patient was unhappy with the looks of his pre-existing PFMs on teeth #8 and 9. He also wanted to improve the rest of his smile. In conjunction with laser gingival recontouring, Empress crowns were done on teeth #3, 8, 9, and 12. Empress veneers were done on teeth #4, 5, 6, 7, 10, 11, 13, and 14. You should not be able to tell the difference between adjacent all-ceramic crowns and veneers.

total etch does not appear to be clinically significant, given the additional potential for post-operative sensitivity.

That being said, if you are currently using total etch without any post-operative sensitivity, by all means stick with your current system. Since total etch is very technique sensitive, it is not surprising that some well-established products work well for some dentists, and other dentists hate that same product. My suggestion to you is if it's not broken, don't fix it. However, if you aren't happy with the product you are cur-

rently using, give self-etching primers a try.

Step 7 Since we mechanically locked the temps into place, to take them off we need to make some cuts into them with something like a 57 bur, either on the direct facial of the temps or in the interproximal area, and then use a crown remover to break off the temps. Make sure you still have the putty/wash impression from the prep appointment before you cut off the temps. If you don't, make sure you take a new putty/wash impression today

while the temps are still on, in case you need to redo the temps if the patient doesn't like the veneers at the try-in.

Step 8 After removing the temps, clean up the teeth with some pumice (Preppies, Whip Mix) and Consepsis (Ultradent). Anywhere the temps were leaking you will see some "black scuzz" on the tooth. This can easily be removed with just a little hydrogen peroxide on a cotton pellet in a reaction very similar to how hydrogen peroxide removes stains during vital bleaching.

Step 9 The next step is to try in all the veneers individually without any try-in paste to make it easier for you to identify that the margins fit properly. Once you are satisfied with the fit of the restorations, try them in together with try-in paste to evaluate contact, occlusion and color. I always start with a clear try-in paste because it gives us the best chance of having the most natural smile possible.

After placing the veneers in with the try-in paste, my assistant gives the patient a large patient mirror after I leave the operatory so they can look at the restorations together and talk about any possible changes. My assistant then comes and tells me what the patient thinks and I go back in the operatory and talk to the patient. Typically the only change the patient wants to make is something small, such as rounding off the cuspids.

Step 10 We then clean out the veneers and clean off the preps. We place silane into

the veneers, which have already been etched with hydrofluoric acid by the lab. After 60 seconds the silane is evaporated and a thin layer of bonding adhesive is placed in the veneer. The preps are treated with the self-etch bonding agent and the translucent veneer cement is placed in the veneer and the veneer is placed onto the tooth, ensuring that excess cement is visible around all the margins. If, for example, no excess cement comes out of the gingival margin when seating the veneer, I will quickly remove the veneer and add some more cement so that I can see the excess squirt out the margin.

Step 11 Every veneer case is done the same way with the central incisors (#8 and #9) placed simultaneously. I apply pressure at the incisal edge to make sure the veneers are seated all the way and I apply some pressure with a small condenser at the junction of the gingival and middle thirds of the tooth to make sure the veneer is all the way against the tooth here as well. Then my dental assistant takes our LEDemetron curing light and holds it about 5-7 mm from the excess cement at the gingival margin and cures it for about five seconds as she waves the light back and forth. The goal here is simply to get the cement to its gel state without completely curing it, since the more cleanup we do now, the less we will have to clean up with a hand-piece later.

Once the gingival margin is cleaned up, we place the light half on the gingival margin and half on the gingival

tissue in order to complete the cure at the gingival margin and tack the veneer into place. This allows us to use Glide floss interproximally to clean the excess cement out of the contacts before it cures completely. Once the contacts are cleaned, the light is held 5-7 mm away from the lingual surface and is activated for about five seconds to bring the lingual excess cement to the gel state and facilitate cleanup. Once all the excess is removed, final curing is completed.

Step 12 The centrals are placed first and simultaneous-

ly because they are so crucial to the overall success of an esthetic case. If they are wrong, the entire case will be wrong. One thing you need to watch out for however, is the excess cement that squirts out of the distal of tooth #8, for example. It has a tendency to accumulate on the mesial of tooth #7, which has not yet been self-etched or total etched. I prefer to wait until this displaced cement is in its gel state before removing it from the adjacent teeth. This helps ensure that it has all been removed. If you try to remove it in its more viscous state

you end up smearing it around the adjacent prep rather than removing it.

Step 13 After the centrals are fully cured I will place the rest of the restorations on one of the sides. I then self-etch the lateral, cuspid, 1st bicuspid, and 2nd bicuspid if it was prepped.

The contacts have already been adjusted at the try-in, so at this point all of the veneers should go right into place. My assistant will load the lateral incisor and the cuspid with cement and I will seat both of those veneers simultaneously using the same tack and wave method described for the central incisors. Once the gingival margin and the interproximal contacts are cleaned, the first and/or second bicuspids are placed and cleaned at the gingival margins and the interproximal contacts. The lingual surfaces of all three or four teeth are cleaned simultaneously after the gingival and interproximal surfaces have been cleaned.

The more patient and fastidious you are cleaning up the resin cement during the gel stage, the more you will be rewarded once the cement is rock hard. Spend an extra minute or two cleaning up extra cement in the gel stage at the gingival margin so that you won't have to do it with a bur later. For cement that has been smeared across the glazed ceramic surface, such as on the facial, my favorite way is to clean it up with a Brownie cup, from the Brownie/Greenie kits we use to finish and polish cast gold restorations. The neat thing about using a Brownie is that it does a great job of removing



This patient presented with pre-existing porcelain veneers on teeth #8-9. After getting her approval, I ordered a diagnostic wax-up to show her what her smile could look like if all the teeth were treated. We used a relined putty impression and some bleached shade bis-acryl to transfer the wax-up to her mouth. She immediately decided to treat her entire smile and Vivaneers were placed on teeth #4-13. Final veneers were an almost exact replica of the diagnostic wax-up.

cement but won't do a thing to porcelain. The Brownies also work very well when finishing composite inlays and onlays such as belleGlass™. The reason Brownies are so conservative is, because they are rubber wheels, they have no deleterious effects on the tooth structure at all, unlike almost any carbide or diamond finishing bur.

Step 14 Brasseler also makes some excellent safe-sided serrated metal strips that do an unbelievable job of cutting through contacts that have been inadvertently bonded closed with resin cement. Because they are safe-sided strips and only cut on the end, they do not create open contacts like a finishing strip can if used too aggressively. Once you have vertically cut through the excess resin cement, Glide floss can often be used to remove the excess. If you do need to use a finishing strip to remove excess resin cement from the mesial or distal surfaces of a tooth, start with a fine or superfine grit to make sure you don't inadvertently open the contact. This is especially true if you are using metal finishing strips rather than plastic strips. Again, the more cleaning you do with the Glide floss while the cement is in its gel state, the less cleanup you will have to do now that the cement is rock hard.

Step 15 Once the veneers are completely cured we can adjust the occlusion where necessary. As with any all-ceramic restoration, it is best not to put it under a lot of stress until it has bonded into place and gains strength from

the underlying tooth structure that it is bonded to, and can withstand full occlusal forces. So when we try in the veneers we have the patient bite down gently to verify that the occlusion is right on, or very close. If it is, we can then bond the veneers into place and adjust the occlusion after the cement is fully cured. If the occlusion is way off, we gently address those issues before the veneers are seated, just in case they cannot be corrected.

Step 16 Final polishing of all adjusted surfaces is done with Brasseler Dialite Ultra Porcelain polishing kit. These points and cups work extremely well for me intraorally because I use Kavo electric handpieces. Electric handpieces have so much torque that they can polish porcelain intraorally as well as a lab handpiece can extraorally, which is very important for PFMs as well as all-ceramic restorations. I used to be very hesitant to make any adjustments to porcelain intraorally because I knew I could never get that "lab finish" back on the restoration. That's no longer true with the Kavo electric handpiece. It has also freed me up to make many necessary adjustments knowing I can now get a "lab finish" on the restorations. Many dentists still seem to think that labs will re-glaze a restoration again if adjusted; in reality they use a high torque electric handpiece to get that high shine. There is simply too much risk of a fracture if they put that restoration back into the oven again.

One more tip

Hopefully you have taken advantage of digital photography and how it can instantly improve the quality of your restorative dentistry. Digital photography is so much easier than the days where we had to shoot slide film and wait for it to be developed. Today we see our photos in two seconds. Any time you send a clinical photograph to a technician, you are almost guaranteed to get a better result, because the technician has more to work with.

One of my other favorite things to do it to print up an 8x10 before picture of how the patient looked when they walked in the door. Then, after placing the veneers in the patient's mouth with the try-in cement and BEFORE the patient sees them, I show them the picture and remind them what they looked like before. The patient has been in nice temps for two weeks now and invariably is going to compare the veneers to how their temps looked. I want to remind them where we started, and remind myself.

Next, we look at the veneers in their mouth. We then snap a couple of pictures once the veneers are finished, although they usually aren't definite pictures because the gingival has been beat up just a little during the try-in and cementation. The patient continues to use the Tooth and Gum Tonic that they have been using since the prep date for another week to 10 days, at which point they come back in for final intraoral pictures and after portraits as well.

We print up the 8x10 portraits of the patient and send it to their work so all of their friends also get to see how beautiful we made them, which ends up being a nice little referral source, as well.

Free DVD

Please take some time to view the enclosed DVD on "Prep & No-prep Comprehensive Porcelain Veneers Techniques." This program is a thorough overview of all types of veneer treatments. Included are case studies and tips on successful treatments, as well as topics not included in this newsletter. When you watch the DVD, you can earn 4 Continuing Education credits. Glidewell Labs is here to help you implement porcelain veneer treatments at your practice. We offer design and planning services, and can assist you through every step in the process. Please contact us if you have further questions or would like to try a veneer case.

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