

## A Precise Bite Registration Technique

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*One of the* earliest courses that the author taught, called “6 Steps to Esthetic Restorations,” was a 6-hour presentation that covered diagnosis, preparation, impression, temporization, try-in, and cementation. None of these steps were more important than any other because a successful prosthetic esthetic restoration requires attention to detail in every phase of the procedure. Mistakes or omissions in any one of these steps could lead to esthetic failure. In fact, an error in any one step can have a major effect on the next phase of treatment. This article concerns the third step in the procedure, the all-important “impression phase,” which includes the occlusal registration technique.

Regardless of what type of prosthetic treatment is being performed, it is essential to provide the laboratory with precise impressions of the prepared teeth. Understandably, much of the literature is about this aspect of the procedure;<sup>1-11</sup> it is also emphasized by many clinicians in

their lectures and workshops. However, it is the latter part of this step that is so often neglected, and at times even eliminated: bite registration. The author has had many conversations with laboratory owners who say they continue to get work orders specifying: “Mount the models in your hand for the bite.” Still other dentists send in a wax-bite, which may have been taken by the dental assistant. This seems to indicate that this step is just not that important, but nothing could be further from the truth.

It is essential to provide the laboratory with an accurate occlusal registration for them to fabricate ceramic restorations that require minimal adjustment. However, no matter which articulator is used, the mouth must be the true test in the final analysis.<sup>12</sup> Although facebow registrations help orient the master casts to the face, the problem remains to accurately record vertical dimension to any type of articulator being used to help fabricate the restoration. Failure to do so can create

a dentist’s most frustrating problem during try-in—that is, receiving beautiful crowns but fitting totally out of occlusion. Or the opposite could occur, where the vertical dimension is much too open, requiring significant laboratory or adjustment time and possibly even a remake of the restoration. If the procedure concerns anterior ceramic crowns, the incisal surfaces may have to be altered to the point that esthetics become compromised. If the restorations involve all-ceramic crowns, especially the newer zirconia-based cores, this factor is all the more important because the shape of the core needs to mimic the anatomy of the finished crown to support the built-up porcelain. Therefore, if the bite registration is off in either direction with too much or too little supporting porcelain, it could lead to fracture or chipping of the finished crown.

Although there are multiple techniques to make the bite registration,<sup>13-30</sup> this article concerns one technique the author has used successfully for many years. The procedure involves using 0.0005-inch thin occlusal registration strips (Artus Corporation, Englewood, NJ) to help verify that the patient is actually closed in centric occlusion. A major requirement for this technique is to have one or more posterior or anterior occlusal stops that need to be verified even before anesthesia is administered. This way the dentist can predict which occlusal contacts will still be present after final tooth preparation. If the patient is under local anesthesia or conscious sedation, it makes it much more difficult for patients to provide the dentist with the correct registration. Patients who have been anesthetized with mandibular blocks lose their proprioception ability to close accurately, so it is up to the dentist to help guide them into centric occlusion.

First, have the dental assistant stand behind the dental chair and hold the occlusal registration strips attached to articulating paper holders on each side of the dental arch between the previously verified occlusal stops. Next, have the patient close in centric occlusion. If the patient has closed in proper centric occlusion, the occlusal registration strips should be held tightly in place.

Next, apply bite registration paste between the arches and around the prepared teeth while the patient’s bite is closed (Figure 1 and Figure 2). By slightly tugging on the occlusal registration strips, the dental assistant will continue to know if the patient is opening the jaw and distorting the registration. Once set, remove the occlusal registration and check to see if there are sufficient tooth images for the laboratory



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**Figure 1** The best and most accurate technique is to have the patient close into centric occlusion with the assistant prelocking the occlusal registration strip in the preselected place. Then, the dentist syringes in the bite registration material without the patient moving. If the strip loosens, it means the patient has opened slightly and the bite registration is not accurate.



**Figure 2** The final bite registration shows a good bucco-occlusal relationship and is ready for the mounting of the final materials.



**Figure 3** This patient has had anterior crown preparations; the assistant is holding the occlusal registration strips on the non-prepared posterior teeth on each side.



**Figure 4** The hardened polyvinylsiloxane material is removed after 3 minutes. Note the presence of the occlusal registration strips incorporated into the bite registration material. The strips can either be removed or remain during the mounting of the models.

technician to mount the stone master casts accurately (Figure 3 and Figure 4). This generally provides what the author refers to as the “bite check,” and should be the most accurate registration of the various types described in this article.

A second bite registration is taken with basically the same procedure; only this time the bite registration paste (Futar®, Roydent Dental Products, Johnson City, TN) is applied with the jaw opened slightly, and then the patient closes into centric occlusion (Figure 5 through Figure 9). The dental assistant should again hold the occlusal registration strips in place. If one of the bite registration strips comes out when the assistant tugs on it, then the bite registration is inaccurate and the previous step must be repeated.

The safest sequence of therapy to maintain and record the patient’s existing occlusal relationship is to use existing landmarks, either by measurement or by quadrant tooth preparation. For instance, if the entire arch is to be restored for full crowns, the teeth in one of the posterior quadrants should be prepared first, and then accurate quadrant bite registrations should be made to be used later. Next, the opposite posterior quadrant or the teeth in the anterior quadrant should be prepared and the procedure repeated using the previously recorded quadrant bite registration. If the opposite posterior quadrant is used, then the anterior stops can help to preserve accuracy in the second bite registration. Then the anterior teeth would be prepared and both of the previously recorded quadrant bite registrations would be in place and linked together by incorporating the prepared

anterior. In this fashion, the patient's original occlusal relationship is preserved, and can be used for mounting the models in the laboratory.

Another technique that has proven effective in the author's practice is the employment of acrylic (GC Pattern Resin LS, GC America, Inc, Alsip, IL) to create anterior stops (Figure 10). Nevertheless, with this technique the author still uses the occlusal registration strips to verify that the patient is accurately closing into any remaining posterior centric contacts. For a procedure that involves the reconstruction of a full arch with no alteration of the occlusion, the dentist should try to temporarily leave the second or third molars untouched, and reconstruct them at a later date. Thus, the dentist always has a posterior natural occlusal stop to verify the occlusion throughout and even after seating the final restoration.

Regardless, if vertical dimension is to be altered, it is essential to make sure the recorded bite registration is accurate to begin with. This article suggests an easy method to help in the goal of precise bite registration. This simple technique has been effective in improving the author's accuracy in solving simple-to-complex prosthetic bite registration problems.

## DISCLOSURE

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**Figure 5 through Figure 7** After the patient practices closing into centric occlusion, the material is syringed into place from one quadrant across to the other side, making certain there is sufficient material to index both maxillary and mandibular teeth.



**Figure 8** The assistant has preplanned exactly where the occlusal registration strips will be placed.



**Figure 9** The patient closes into centric occlusion and the assistant pulls the strips tight to maintain contact until the material is set firm.



**Figure 10** When no anterior occlusal stops are present, it is helpful to use one or two acrylic (GC Pattern Resin LS) stops.

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