

AT THE BENCH – Tips on Bite Registration Materials and Techniques

An inaccurate articulation can turn a promising result into a nightmare. Casts that are mounted even slightly out of occlusion, or are mounted out of centric occlusion, can create tedious adjustments. Reworking anterior bridges can occur if the horizontal plane is not accurately recorded, resulting in a misplaced midline and vertical axis. Accurate bite registrations are very important, though obtaining a reliable bite record can be a challenge. Not all cases require a bite; a single unit restoration in an ideal occlusal scheme can generally be hand articulated. However, with bridges or large cases, bites are just as important as the impression. Following are a few tips on materials and techniques regarding bite registrations:

Choose a bite material that is accurate and stable. Materials that are rubbery or spongy create an inaccurate compression and rebound when the models are articulated. In other words, use hard or rigid materials.

Do not use wax.

When packing the case to be sent to the laboratory, place the bite in a separate container or plastic box to prevent bending or breakage.

When doing posterior restorations, in which posterior stops are being eliminated during prepping, take the bite before the most posterior stop is reduced. For example, teeth # 12 -15 are restored; tooth # 16 has been extracted and is not being restored. The teeth being crowned oppose a full complement of mandibular teeth. Reduce teeth # 12-14. Place the registration material only over the prepared teeth. Once the registration is set, remove it, and then prep tooth # 15. This procedure prevents the patient from over closing when the bite is being taken because the most posterior occlusal stop still exists. If both posterior sections of the same arch are being prepped at the same time, do not reduce teeth # 15 and 12 until the bite on the opposite side is taken.

When prepping opposing posterior arches, prep the mandibular arch first, leaving the most posterior tooth on the maxillary arch in occlusal contact with the most posterior tooth on the mandibular arch. Take a bite registration of the prepped teeth only. Remove the bite registration and trim the buccal and lingual of the bite so that only the occlusal surfaces remain. Prepare the maxillary teeth in the same way. Place the bite registration back in the mouth and evaluate the occlusal space between the maxillary preparations and the bite registration. Prepping both arches at the same time can be deceiving, because there may appear to be more reduction than there really is. When the maxillary reduction is adequate, remove the bite registration and take a new one that registers both the mandibular and axillary preparations. Remove the bite and measure its thickness. If you normally reduce 2 mm occlusally for 1 arch, there should be a minimum of 4mm of space between opposing prepped teeth. If more reduction is needed, take a final bite after the reduction is complete. Prepare the remaining 2 posterior teeth. Place the final bite registration on the mandibular posterior preparations and place a small amount of impression putty over the most posterior mandibular prep. Have the patient close their mouth. After the putty has set, remove it and measure the bite thickness. It should be the same as the final anterior to it. If it is less, more reduction is necessary. Once the desired reduction is achieved, remove all of the bite registrations and proceed to impressions. Send the bite that incorporates the prepped teeth of both arches to the laboratory.

When doing a full arch restoration, prepare the 4 anterior incisors first. Take a bite registration of the anterior preparations while the patient has full posterior occlusion. Then prepare the posterior teeth, leaving the most posterior tooth on both sides unprepared and in occlusion. Position the anterior bite registration on the unprepared arch. Position bite material in both posterior prepped sections and guide the patient's mandible closed, using the anterior bite and the remaining posterior unprepared teeth as a guide. Make sure the patient is in contact on the posterior unprepared teeth and unprepared cuspids. Once the registrations are complete, finish preparing the remaining teeth. Send posterior and anterior bite registrations with the case.

When doing a full mouth reconstruction at the same appointment, follow the preparation order and guidelines listed in number 6. Prepare the corresponding maxillary and mandibular teeth at the same time, taking bites in the same order as listed. Measure the occlusal thickness of the bites to ensure that there is adequate reduction for both arches.

Use a face bow registration whenever possible on larger cases.

If you are mounting the opposing casts or the entire case, make sure that the occlusal plane is parallel to the tabletop and perpendicular to the articulator's incisal guide pin. This aids in creating the proper horizontal plane, vertical axis, and curve of spee. To do this, use a piece of 8-1/2 x 11 paper with horizontal lines drawn on it. Tape the paper on the wall behind the articulator. The casts can now be mounted with the occlusal plane parallel to the horizontal lines on the paper by looking directly at the front of the articulator. The lines provide the horizontal guide, and the incisal guide pin is the vertical guide, which should be parallel to the midline.

If the patient is edentulous in the posterior and the anterior teeth are being restored, make posterior wax bite blocks over acrylic tray material on a study cast. If the opposing arch has teeth over the edentulous area, cut the wax on the block so it is at least 2mm short of touching the opposing dentition. Cut retentive grooves in the top and sides of the blocks. Then make a custom impression tray that covers the anterior teeth and the edentulous areas. At preparation, before the patient is anesthetized, place polyvinylsiloxane impression material into the retentive grooves and on top of the bite blocks. Polyvinyl material also can be injected into the underside of the acrylic tray of the bite block, creating a more accurate reproduction of the edentulous ridge. Before the material sets, position the bite blocks in the mouth and have the patient close to the desired vertical. After the impression material has set, remove the bite block and prepare the anterior teeth, including the edentulous areas. Because the bite block is relined with impression material, it will give the same landmarks that the impression gives, making transfer of the bite block to the model more accurate.

If the patient is edentulous in the posterior of both arches, use the same procedure as in number 10, but make bite rims for both arches. With the bite blocks in position, inject polyvinyl material into the retentive grooves of the wax bite blocks and guide the patient to bite down to the proper centric relation and occlusion. Once set, remove the fused rims and prepare the teeth. The fused rims provide all of the information for mounting the casts accurately. While triple trays are designed to save time and material, they are not accurate if the patient does not bite through the mesh at the occlusal contact points of surrounding unprepared teeth. Also, when the patient bites into a triple tray, it naturally bends and distorts. If the tray is not loaded with enough impression material to hold it in position, the tray could rebound towards its original position, distorting the impression. Unfortunately, there is no way to determine if the tray distorted until the case is completed and the problem is discovered when the restorations don't seat or the occlusion is too high.

The best triple tray in my opinion is the dead soft aluminum tray by Clinician's Choice to solve this previous problem.

Finally, usually an impression for a bridge is not a surprise or an emergency appointment. I suggest that at the diagnostic appointment or treatment plan; have your staff take an alginate so a custom tray will be cured and ready for the new impression at the prepping appointment.

These techniques may add a few minutes to the appointment, but the accurate results you achieve in terms of fewer chair side adjustments will be worth the effort.

About the Author – Bill McCormick, CDT is the owner of Heritage Dental Laboratory, Inc. in Arlington Heights, IL, Illinois leading cosmetic dental lab. He is also a frequent lecturer for continuing education courses on subjects such as All-Ceramic Restorations, Shade Taking and Selection of Trays and Bites.