

# Clinical Showcase

## The Diagnostic Wax-up: The Key to Success

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Every successful journey should start with the goal in sight. In dentistry, when treating patients who require major cosmetic or functional changes, this means that knowing the final desired appearance and function of each patient's mouth is crucial to a successful outcome.

The diagnostic wax-up can be the single most useful tool in this type of work, not only for helping to determine how the patient's mouth should look and function, but also for communication with the patient and implementation of the treatment.

In my practice, all treatment planning begins with the acquisition of complete diagnostic records. I also carefully document the patient's "wish list" of treatment objectives. But of all the diagnostic information obtained from the patient, I believe that the mounted models and photographs are the most crucial for the work of the cosmetic dentist. It is the photos and models together that allow me to physically, in 3 dimensions, determine ideal tooth positioning and occlusal scheme, as well as the shape and size of the teeth in the restored smile. With the models properly mounted, I can dictate this information to the technician so that he or she can actualize these changes in wax directly onto a duplicate set of mounted diagnostic models.

Directions given to the technician may include any or all of the points listed below:

- position of incisal edge of maxillary central incisors (overbite and overjet)
- length of central incisors
- inclination of maxillary teeth to be restored
- amount (if any) by which the gingival line is to be raised (crown lengthening or "gum lift")
- relative lengths of lateral incisors, canines and bicuspids
- inclination of incisors
- occlusal scheme (canine guidance or group function)
- shape of teeth (oval, square, triangular, etc.)
- correction of occlusal plane (best demonstrated by facial photographs and a stick bite)
- amount by which vertical dimension is to be increased by opening the bite (if necessary).

At the consultation appointment, the completed, professionally mounted diagnostic wax-up is presented to the patient and sufficient time is allowed for him or her to examine the proposed changes. The patient is encouraged to comment on the proposed result and to state whether the wax-up accurately depicts how he or she would like the teeth to appear. Many patients comment that the teeth are

too square, too round, too long or too short. If possible, adjustments to the wax-up are made on the spot, but if the requested changes are too numerous to carry out chairside, the patient is asked to return for another consultation appointment, at which time he or she can examine the wax-up models modified according to the requests. Allowing my patients this opportunity for input gives them confidence that their wishes are being followed and removes fear of loss of control and suspense over the final outcome. It is at this consultation appointment that patients will truly make the commitment to treatment if their concerns are heard and addressed. Patient involvement and approval at this stage is crucial in avoiding costly remakes.

The following is an example of use of the diagnostic wax-up in treatment of a patient wishing to not only improve the health of his mouth, but also show his teeth when speaking and smiling.

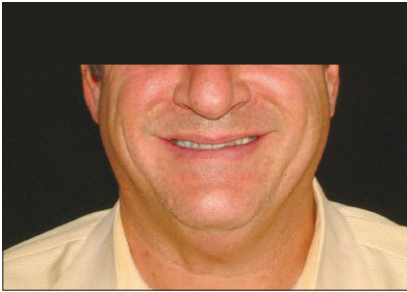
After carefully discussing the patient's goals and desires, as well as all diagnostic data, I sent instructions to my laboratory technician to fabricate a diagnostic wax-up for all maxillary teeth from the second bicuspids forward. (The molars were slated for extraction and replacement with implants.) **Figures 1** through **5** show the patient's pretreatment condition, and **Fig. 6** shows the diagnostic wax-up.

After the patient had been fully consulted with regard to treatment goals, costs and scheduling and had signed an informed consent agreement, the initial appointment for tooth preparation was scheduled.

During this tooth preparation appointment, the diagnostic wax-up again proved useful. My assistant fabricated a putty matrix over a model of the diagnostic wax-up, which was used as a stent from which the temporary restorations were created (**Fig. 7**). These temporary restorations were a duplicate of the "after models" that the patient had already approved. Indirect use of the wax-up for fabrication of the temporary restorations allowed the patient to experience directly the changes anticipated with the final restorations. As seen in **Fig. 8**, the patient was able to "test drive" his new teeth for esthetic and functional satisfaction.

At this point in the process, the patient should be directed to undergo a series of speech tests. Should the patient be uncomfortable with the pronunciation of any sounds, adjustments in the temporary restorations should be made accordingly. The adjusted temporary teeth will then be used for creating the final restorations (**Fig. 9**).

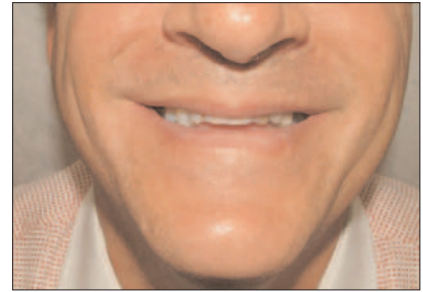
One of the greatest advantages of this technique for the fabrication of diagnostic temporary restorations is the



**Figure 1:** Lack of tooth display at rest and during normal speech.



**Figure 2:** Lack of upper lip support because of skeletal Class III condition.



**Figure 3:** Reverse smile line with the posterior teeth appearing lower in the occlusal plane than the anterior teeth.



**Figure 4:** End-to-end occlusion and dental trauma because of existing occlusal scheme.



**Figure 5:** Occlusal view showing heavy wear on anterior incisors and cantilever bridge replacing impacted tooth 23.



**Figure 6:** Diagnostic wax-up.



**Figure 7:** Putty matrix formed from the diagnostic wax-up and trimmed for fabrication of temporary restorations.



**Figure 8:** Improved smile line and tooth display after placement of the temporary restorations.



**Figure 9:** Smile with final restorations in place.

ability to make desired changes directly to the temporary restorations. For example, the temporary restorations can be shortened or lengthened incisally. I use a shade of flowable composite material that is compatible with the temporary acrylic, which is easily added and which readily adheres to the temporary restorations. Through a process of removal or addition of material, the clinician and the patient can together fine-tune the temporary restorations to represent the desired design for the final restorations.

Once the patient and I are satisfied with the appearance and function of the temporary restorations, my assistant makes a final alginate impression of the temporized teeth, which is sent to the laboratory as a guide for the final restorations. My technician then uses this “test driven” model as a guide for creating the final restorations.

Use of a diagnostic wax-up removes the guesswork from the fabrication of permanent restorations. Working out the

ideal parameters of the final restorations while the temporary restorations are in place not only allays the patient’s concerns regarding the final restorations but is crucial to the prevention of costly remakes that might be needed to address aspects of the structure that are unacceptable to the patient.

Today, patients rightfully expect the best in all aspects of treatment. The diagnostic wax-up facilitates that goal and maximizes predictability and patient satisfaction. ♦



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