One of the primary reasons I embraced CAD/CAM dentistry 20 years ago was the promise that the chairside digital workflow offered in exercising more control over every aspect of the restorative process. Even today, the idea of creating quality dental restorations in one visit for my patients is quite appealing. I have found, however, that in order to cause the vision to crystalize into a beautiful IPS e.max CAD restoration for a patient, I need more than just the furnace required to crystalize the restoration. I need a clinical technique that is precise, repeatable and efficient.

While the CAD/CAM workflow is composed of many steps, each essential in their own respect, this “quick tip” will focus on establishing clear, clean and dry preparation margins in support of the digital impression and restoration bonding processes.

Preparation before preparation

Before we spin up the turbine on the handpiece, two steps will lay the foundation for success. The first is to evaluate the patient’s periodontal status and consider any treatment required to achieve periodontal stability, because we know that excessive bleeding during the procedure will place the outcome at risk (Figs. 1 and 2). The second is to consider whether the preparation margins are to be subgingival and, if so, place a length of dry, knitted retraction...
As a guide for what size cord to use, determine the minimum probing depth in the region of the sulcus that will adjoin a subgingival margin and then subtract that number by “1” to arrive at the cord size. So, for instance, in Fig. 3, the minimum probing depths for the facial and interproximals for the teeth to be veneered was 2 mm so #1 cord was placed. It is important to place the required cord prior to beginning the preps as they will provide some protection against soft-tissue trauma imparted by the bur during preparation.

Another hedge against insulting the gingiva during preparation is to use a finishing grit diamond bur (round-end taper 782.8F, Premier Dental Products) to finalize the position of subgingival margins (Fig. 4). Even with these hemorrhage prevention measures, some bleeding may occur and/or the tissues may become edematous during the preparation process (Fig. 5). If nothing is done to mitigate the bleeding or edema, the quality of the digital impression and, later in the procedure, the adhesive bond will both be compromised.

The next line of defense against these clinical complications is application of a hemostatic retraction paste for two minutes (Fig. 6, Traxodent, Premier Dental Products). This is followed by copious rinsing and thorough drying. When drying the area, care should be taken to thoroughly dry each sulcus as the
cord in place acts as a wick for moisture, and it will require more time to dry than the teeth themselves.

It is also helpful during the procedure to use a soft-tissue retraction device to gain better access and to prevent the retraction paste from being displaced during the two-minute material action period (Comfort-View, Premier Dental Products).

After rinsing and drying, one should inspect the margins carefully and expect to clearly see them from the occlusal and/or facial aspect (Fig. 7).

At this point, the digital impression may proceed with ease. In the case pictured, the veneer preparation impression was captured using the Planmeca PlanScan scanner (Planmeca USA, Roselle, Ill.). During live scanning, the margins are clear and visible on the screen, just as they were in the mouth (Fig. 8).

A quality digital impression will carry over to a higher degree of confidence in subsequent steps, such as marking the margins on the virtual model. Note in Fig. 9 how using the ICE view in the PlanCAD software (Planmeca USA) allows one to clearly distinguish between hard and soft tissues and thus click through the margination step with speed and precision.

Preparation is critical to achieving the final result for a patient. While the design process is not shown here, you can see the precision of this patient’s restoration, milled with Planmeca PlanMill40.

Re-application of Traxodent (Premier Dental Products) prior to bonding, using the same technique previously described, will help to ensure that the marginal areas of the teeth are dry and exposed (Fig. 10).

The combined use of a general soft-tissue retractor (Comfort View), dry cord (Knit-Pak) and hemostatic retraction paste (Traxodent), described herein, have the combined effect of supporting an ideal treatment outcome as illustrated in the post-treatment appearance of these veneers (Fig. 11).

While this clinical workflow was presented in the context of chairside digital CAD/CAM dentistry using the Planmeca FIT system (Planmeca USA), one should appreciate its application for all types of digital or physical fixed restorative impressions as well as adhesive bonding procedures.

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**Fig. 9** ‘ICE View’ demonstrating the distinction between marginal hard tissue and adjoining gingival.

**Fig. 10** Adhesive bonding proceeding without complications because of proper isolation.

**Fig. 11** Postoperative appearance of patient.

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**about the author**

Dr. Alex Touchstone has 20 years of experience in clinical application of digital dentistry in his dental practice. He holds two U.S. patents in the area of shade control for translucent dental restorations. During the past several years, he has had the privilege of teaching hundreds of dentists, per year, how to grow their practices through proper integration of carefully selected technologies. Touchstone also serves on the Clinical Advisory Board for Natural Dental Implants, AG and as an adjunct assistant professor at Tufts University School of Dental Medicine in the Postgraduate Prosthodontics Division. He is also the founder and editor-in-chief of the online education and networking portal, LearnDigitalDentistry.com, created for the benefit of dentists and team members who are driven to excellence in the digital restorative community. He can be reached at alex@learndigitaldentistry.com.