

## A CAD/CAM convert



**JAMES KLIM, DDS**

Dr. Klim maintains a private practice, The Gallery of Fine Smile Design, in Santa Rosa, Calif. He focuses on high-tech restorative and cranio-neuromuscular reconstructive esthetic dentistry. Dr. Klim is an accredited member of the American Academy of Cosmetic Dentistry and a fellow of both the Academy of General Dentistry and International Academy for Dental-Facial Esthetics; he was formerly a clinical instructor at LVI. He speaks around the country on practice management, high-tech dentistry, and esthetics. He's been using CEREC in his practice since October 2004.

With advances in software and milling materials, the newest generation of chairside CAD/CAM technology can produce restorations with lifelike esthetics and optimal fit.

By James Klim, DDS, FAGD, FADFE, PC

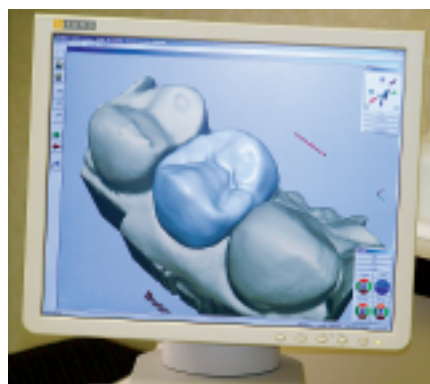
I'll admit, I was originally skeptical about the ability to produce a restoration that met my esthetic and fit standards with a chairside CAD/CAM system. The first time I looked at the CEREC system more than a decade ago, the refinement of the fit was not there and esthetic options were limited.

I've been using the CEREC 3D system now for about a year, and this latest generation has definitely addressed my concerns, for a number of reasons. Advances in both the system's software and the materials used for milling have allowed vast improvements in both fit and esthetics. Take a look at the photos within this article to see some examples of what I'm able to achieve. Keep in mind, I've only been using CEREC for just over one year.

### Software

Perhaps I'm not the best barometer, because I am somewhat of a computer junkie. But I found the software very easy to master...much easier than something like PowerPoint. There are only a few primary tools you need to work with. And the system is set up to take you through each step in sequence—and, it won't let you override any steps. Additionally, each window has instructions at the bottom explaining what to do next. I was doing cases the day after my orientation.

Not only is the software simple to learn and use, it's very sophisticated. Preps are captured at very high resolution, enhanc-



CEREC 3D software can adjust the database tooth and establish proper occlusal contacts.

ing the precision—if you take a good optical impression, you're going to get a good virtual die. And I can design a three-dimensional prototype on the screen, so what you see is what you get.

### Materials

Another reason for my decision to use CEREC now is the availability of new milling materials. The newer-generation ceramic and resin blocks are strong and esthetic. I like leucite-crystal ProCAD blocks (Ivoclar Vivadent, [www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com)) as well as the Paradigm composite blocks (3M ESPE, [www.3MESPE.com](http://www.3MESPE.com)). Additionally, Vita trilayered blocks (Vident, [www.vident.com](http://www.vident.com)) actually incorporate cervical, body, and incisal colors within the block; you can orient on the screen



This patient didn't like her gummy smile and prominent centrals (A & B). CEREC veneers for the laterals were designed, milled, stained, and glazed (C). The veneers, along with gingival recontouring and whitening, dramatically improved the smile (D & E).

exactly where you want these colors to be on the restoration. There's a great choice of materials that we didn't have just a few years ago.

All these new materials are easy to polish and wear similarly to enamel. Also, they offer the chameleon effect and blend in with surrounding dentition.

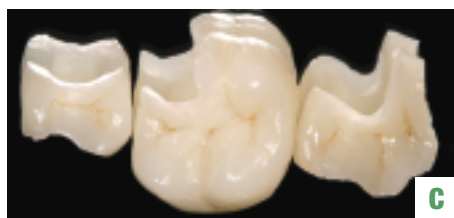
### Manipulation

Perhaps the most dramatic advancement is the ability to enhance esthetics even after restorations are milled. There are three levels.

First, polishing—and the majority of CEREC users do this. Once you learn how, you can polish a beautiful restoration in four to five minutes. And with some of the layered blocks, this is all you have to do.

The next level up, if you are not ready to dive into full-blown staining and glazing, is to use composite stains. They're not particularly helpful on the labial surface in cervical areas. For thin areas, or with a transparent block, I can use stain within the tooth. While I typically only get a 10% to 15% shift in shade, the chameleon effect kicks in again, and the restorations melt in the mouth.

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This patient wanted these three worn amalgam restorations (A) replaced. They were removed and the teeth were prepped for

conservation (B). Stained and glazed CEREC inlays and onlays (C) provide seamless and natural esthetics (D).



**A**



**B**



**C**

First molar exhibited cracked tooth symptoms **(A)**. Both amalgams were removed **(B)**. The CEREC inlays strengthened the teeth and provided optimal esthetics **(C)**.

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I take 80% of my cases to the third level...staining and glazing. This adds some time to the processing, but the esthetic improvement is dramatic. It's particularly helpful for challenging cases, especially when I'm trying to blend a single restoration in with surrounding dentition. I can control features like incisal transparency better than a lab because the patient is right there.

Staining and glazing has an added value—it makes the restoration that much stronger by sealing potential microfractures that might result from the milling process. Additionally, studies have shown that staining and glazing significantly increases shear resistance. Finally, because I do a lot of single-appointment quadrant cases, staining and glazing is truly time efficient. I can work on the first three units while the molar is being milled.

### Beyond computers

Perhaps even more than being computer savvy, I think the key to success with CEREC, as it is with lab-fabricated metal-free restorations, is a basic understanding of adhesive dentistry. I have heard from CEREC trainers that some of the new CEREC users they are working with don't have a lot of experience with the particular intricacies of metal-free dentistry—preparation design, occlusion, soft-tissue management. These issues are common to all non-metal indirect restorations, and once the practitioner knows all the requirements, the learning curve for mastering CEREC will be a breeze. **DPR**

## Temrex

Standard Page



**A**



**B**



**C**

This patient's smile was uneven **(A)** and he wanted a fuller smile with teeth in more ideal proportions. We fabricated eight CEREC veneers **(B)** and vastly improved his smile **(C)**.

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