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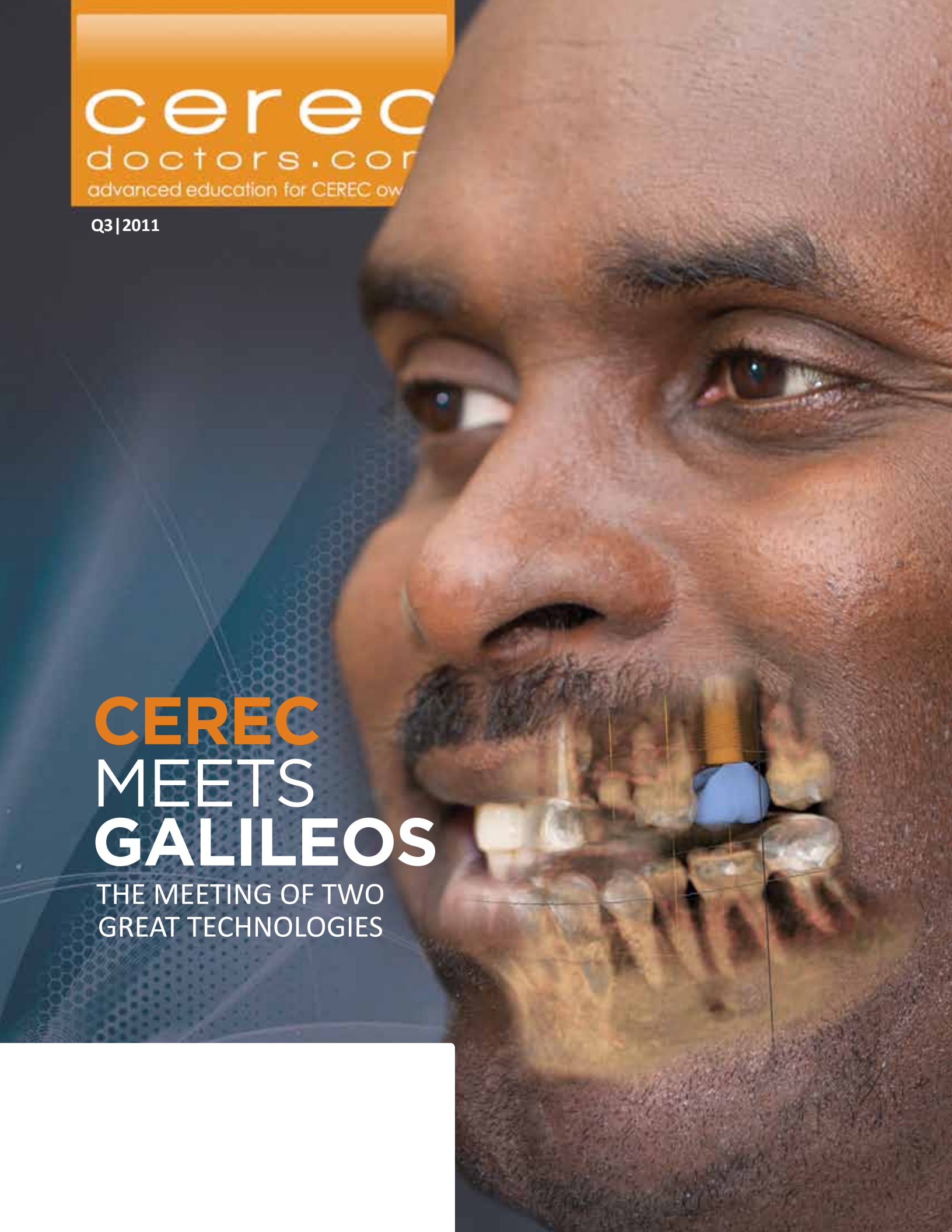

# CEREC MEETS GALILEOS

## THE MEETING OF TWO GREAT TECHNOLOGIES

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FROM THE EDITOR

# In Your Hands

BY MARK FLEMING, D.D.S.

I have been hearing a lot of excitement concerning the new 4.0 software. As you may remember, it was first shown at the International Dental Show in March. We at *cerecdoctors.com* magazine gave you a glimpse of several of the software's features in our last issue.

Recently I was part of four transformative days of meetings at Scottsdale Center. The CERECdoctors.com Mentor Group annual meeting dovetailed two days of the 3rd Annual CEREC Owners Symposium. I would like to share a little about both.

The mentor meeting was filled with information. Christopher Goodson, global product manager for CEREC, presented an overview of 4.0 software and the rationale behind its creation. Russell Giordano gave a very informative lecture on new dental materials and how they will impact the CAD/CAM world. Major manufacturers including Ivoclar, Vita, Heraeus Kulzer and Kerr presented workshops on their products. We received a lot of great feedback, including, "the meeting was beyond my expectations" and the often-repeated, "it is good to be a mentor."

The CEREC Owner's Symposium was two days packed with great content, including the new software, the latest materials and debating whether to restore dental cases using digital or conventional methods. Lectures included the marriage between CEREC and GALILEOS, anterior CEREC dentistry, quadrant workflow, and utilizing advances of CEREC in complex restorative cases. Ingo Zimmer, manager of the programming team of the CEREC software, gave the attendees a look behind-the-scenes at CEREC, and he and Goodson took questions about what is and what will be for CEREC.

Another highlight was Imtiaz Manji's inspirational presentation on the new Open Wide Foundation, which provides dentistry to underserved communities internationally. (There's more about the Foundation in the following pages.) One idea especially caught my attention: Real abundance isn't a magic number that a person chases after. Real abundance is a mindset that we create in existing circumstances that allows us to experience the fullness of life that comes from giving ourselves in a really meaningful way. Mr. Manji's presentation was truly moving.

At the symposium, I shared a story about a wise man who was challenged by a young person with a riddle. The young person asked the man if the bird he was holding behind his back was alive or dead. If the wise man guessed that the bird was alive, he would crush the bird; if he guessed the bird was dead, he would let it go. The wise man answered he did not know whether the bird was alive *or* dead. He told the young person that he *did* know that the fate of the bird was in the young person's own hands.

Whether or not you share your abundance is in your own hands. Your success with the CEREC technology is also in your hands. We hope we are continually giving you resources to help you with this success. As always, we are here to help during these exciting times. ❖

» The cerecdoctors.com Mentor Group.

# The Leadership Revolution

**A SPECIAL MESSAGE | BY IMTIAZ MANJI**

PHOTOS COURTESY OF THE OPEN WIDE FOUNDATION

**SOMETHING INCREDIBLE IS HAPPENING** in the world that I think we should all find inspiring.

It used to be that revolutions needed a galvanizing leader — a Nelson Mandela or a Mahatma Gandhi. Now, as we look around the world at the recent uprisings against tyrannical regimes, we still see people taking big risks to create big change. But instead of being led by one great person with a powerful speech, the movements are fueled by thousands of people through Facebook updates, video uplinks, and Twitter feeds. This, I think, is one of the truly inspiring benefits of the information age: we have democratized greatness. The leaders, it turns out, are all around us.

I certainly get a sense of that whenever I find myself among a group of like-minded dentists like the ones in our Spear Faculty Club, and those I presented to at our recent CEREC event. Anyone who is interested in advancing the cause of great dentistry, and anyone who is pursuing clinical excellence, is by definition a leader in the profession.

So when I look around a room filled with dentists like that, and when I think of all the others out there like them, I am in awe of the possibilities. All these exceptional men and women, all of them dedicated to improving lives, all of them committed to personal success and fulfillment. Imagine what this community of natural leaders could do if they put their knowledge and their energies to work for a common cause. Imagine the impact we could have, not just on dentistry, but in the world.

That's why the Open Wide Foundation was born.

For some time now at Spear Education, we've been thinking about how we could leverage our influence in a philanthropic way. I talked about it with my friends, Dr. Frank Spear and Dr. Glen Wysel, who were hugely supportive, as were the rest of our partners. We knew we wanted to do something that could amplify the capabilities of the leaders we knew were all around us.

The goal of the foundation is simple: to get 1,000 dentists to commit $1,000 and one week of their time to change one community. We're going to provide quality care to people who need it most desperately. We're starting with a clinic in Peronia, Guatemala, where there are 75,000 people with no access to any kind of dental or medical care. It's being built right now.

## A HAND UP, NOT A HANDOUT

Growing up in Kenya, I saw a lot of crushing poverty. I felt overwhelmed knowing I could give everything I had and still not make a dent in the problem. One thing I learned is that handouts are not the answer. The only way to break the frustrating cycle of poverty is to provide a hand up, and give people the means to achieve a better, independently sustainable standard of living.

This foundation is how we can do our small part, and use our special expertise to help achieve that. We're not just donating dental care, we're helping create a platform for the future in the community. A dental school in Guatemala City will have students work alongside our volunteers to get hands-on experience, mentoring and training. Over time, we'll turn the clinic over to the local community, which will allow us to move on and apply our resources to making a difference in other communities where we're needed.

## LEADERS DON'T WAIT FOR "ONE DAY"

Here's a secret anyone with a truly winning mindset understands: Giving doesn't follow after success. Giving is a vital part of what creates personal success. A commitment to giving teaches us how to think with real vision, how to indentify needs and solve problems. It encourages us to explore the far reaches of our abilities. It inspires others to follow and support us. An inextinguishable capacity to give is what makes a leader a leader—and it is available to anyone at any time.

Contributing to an effort like this doesn't take leave you with less, it enriches you. In fact, the sense of purpose it provides may be exactly what it takes to complete you.

To get this project thriving, we're asking you to pledge $1,000 for the clinic, and one week of your time. You actually only need to spend four days in the clinic—the rest of the week you can be off exploring the beautiful surroundings and getting to know the community you'll be helping. (We've also made arrangements with a fine nearby hotel to provide excellent accommodations at a very competitive rate.) I guarantee it will be one of the most rewarding weeks of your life.

If you really can't commit to the trip, I urge you to make the donation — we'll save your place for later. And please know that my partners and I have provided $100,000 to cover administrative expenses, so every dollar of your contribution goes straight to the clinic.

## THIS IS WHAT HAPPENS WHEN GOOD IDEAS MEET GOOD PEOPLE ...

The response when we launched the foundation was phenomenal. Within a few hours, the commitments started rolling in, and today we have pledges approaching $200,000 and 168 weeks of volunteer time! We're also having encouraging discussions with our industry partners—Sirona, for instance, is generously outfitting the facility with digital radiography technology. We now also have a medical clinic joining us on-site in Peronia, and we are talking with others who are interested in providing eye care and even microloans to the residents we'll serve. We didn't plan on that when we started, but that's the thing with good ideas: once you get the ball rolling, they attract other good ideas.

We have the vision. We have the support of the big players. We have a community in need. We have other interested parties ready to join us. All we need now is to find the other leaders among us, and they must have two special qualifications: a dental degree and the willingness to take action.

All we need now is you. ❖

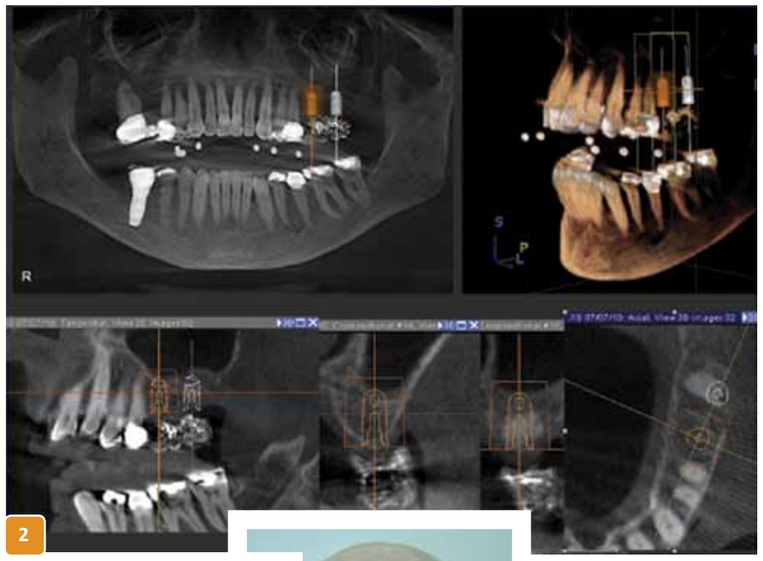
*For more information, contact Open Wide Executive Director Kim Knotter at 855.843.8444 or visit www.speareducation.com/openwide.*

CASE STUDY

# Computer-guided Surgery: The Future of Implant Dentistry

BY AMARIK SINGH, D.D.S., M.S.

The team approach concept to implant dentistry has always been promoted as the ideal standard of care in the treatment of implant patients. The surgeon and restorative doctor have one common goal: to restore patients with optimal esthetics and function. However, despite this goal, when evaluating implant patients, the surgeon and restorative doctor typically have different thoughts and concerns.

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The restorative doctor is concerned with inter-arch space, emergence profiles of the restorations, length and shape of the teeth, lip support, smile line, phonetics, and the type of provisional and final restoration.

The implant surgeon is concerned with bone height and width for implant placement, the need for bone grafting (sinus graft, ridge augmentation, block graft, etc.), number of implants to be placed, quality of bone, soft tissue concerns and when the implants can be loaded.

With these different concerns and to incorporate the patient's desires and laboratory input, one can see how the planning phase of implant treatment can become challenging. The development of computer-guided surgery has now enabled the entire implant team to complete a thorough evaluation of the implant patient and communicate both the surgical and prosthetic viewpoints to then create the most ideal treatment plan. This technique minimizes surgical and prosthetic complications, increases predictability and accuracy of treatment, decreases treatment time, allows for minimally invasive surgery (thereby decreasing patient post-operative discomfort), in some instances allows for the prefabrication of interim and final prosthesis and can be used as a case presentation tool, thereby increasing case acceptance and the profitability of the case.

The process of computer-guided surgery begins with a laboratory wax-up or a virtual wax-up with the CEREC, which is made to ascertain the ideal esthetics and function of the final prosthesis. A scanning appliance is used to scan and eventually fabricate the surgical guide using the GALILEOS CBCT Technology (Figure 1). Implant planning is completed with the GALILEOS Implant software. Although several scanning devices and implant software programs are available on the market today, GALILEOS scanner and Galaxis implant planning software has the combination of the scanner and software in one machine. This combination expedites and facilitates the implant-planning process. With other machines and software programs, the scans are imported to the software (which can sometimes compromise the quality of the scan and be very time-consuming, taking 30 to 60 minutes). With the two-in-one package of the GALILEOS scanner and Galaxis implant-planning software, scans can be taken and the implants virtually placed in minutes, which therefore allows the scan to be used immediately as a case presentation tool to help increase case acceptance.

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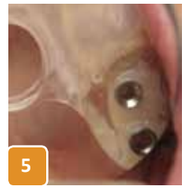

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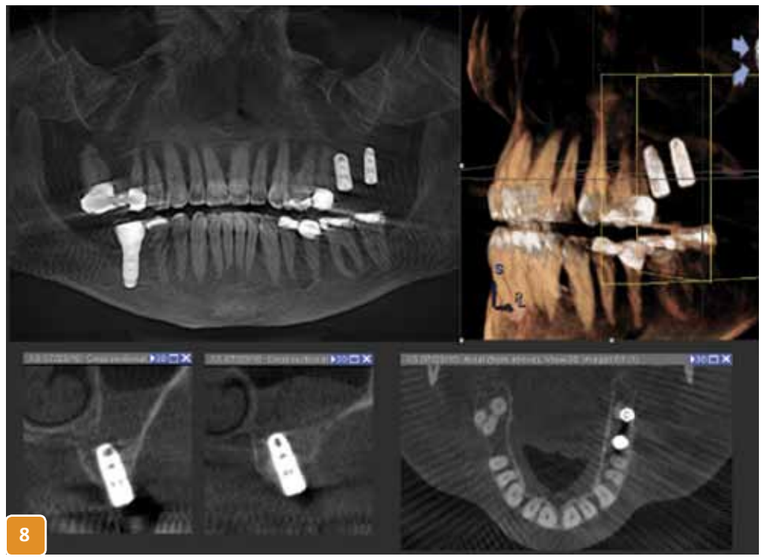


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Simulated implant surgery is now performed with both restorative doctor and surgeon agreeing on the ideal final implant placement (Figure 2). Following placement of the implants in the scan, the scan and the scan appliance are sent to the laboratory to fabricate a surgical guide (Figure 3).

Once the guide is fabricated, it is mailed to the implant surgeon and used during surgery, allowing the implants to be placed in a minimally invasive (flapless), efficient and precise manner (Figures 4-7). Because of the workup on the pre-surgical diagnostic phase of the case, the restorative doctor and laboratory can have their input on the implant surgery without actually being present during the procedure. The implants will be placed in the best surgical and prosthetic positions, and there is no fear of violating vital structures such as nasal cavity, maxillary sinus, bone concavities, IA nerve or mental foramen. The implant positions will allow for predictable restorative treatment, and not force expensive and challenging laboratory procedures on the prosthetic end of the case. (Figure 8: GALILEOS CBCT showing placement of Zimmer TSV 4.7 x 10 implants in sites 14 and 15).

To summarize, computer-guided surgery will facilitate the communication between the lab, restorative doctor, surgeon and patient, increase predictability of the case, shorten surgery time, in some cases allow for prefabrication of lab- processed interim or final prosthesis, can be utilized as an educational tool to increase case acceptance, ensure ideal implant placement (avoiding key anatomical structures) ensure ideal prosthetic results and increase the overall profitability of the case. ❖

*For questions and more information, Dr. Singh can be reached at amarikdds@yahoo.com.*

SOFTWARE

# CEREC SW 4.0

## AN IN-DEPTH PREVIEW

BY SAMEER PURI, D.D.S.

The Q2 issue of *cerecdoctors.com* magazine showed you a preview of the upcoming 4.0 software with some simple screen shots and generic features. By the time you read this article, the 4.0 software should be arriving at the doorsteps of CEREC owners everywhere. We want to give you a more in-depth look at the software and provide a printed tutorial on how to use it.

All CEREC BlueCam owners who are members of the service club will automatically receive the software starting in September. RedCam owners will receive the updated software in early 2012.

1| The most remarkable feature of the new interface is how the entire user experience has been recreated from scratch. From the patient entry screen to every single icon and graphic, the software has been redesigned from the ground up. Intuitive graphics help the user to understand what each tool and icon does.

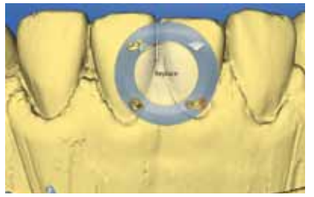
2| The updated Restoration Selection screen shows an entirely new interface. Clinicians have the opportunity to select either a single restoration on a single tooth or multiple restorations on multiple teeth. Multiple restorations can also be selected on opposing arches. Users can also select restorations for bridges.


3| Once the teeth are selected, the type of restoration – as well as the design technique – is now selected for each restoration created. The user can select Biogeneric Individual, Biogeneric Copy (the new name for Correlation) or Biogeneric Reference. This is done for each restoration that is selected in the previous screen.

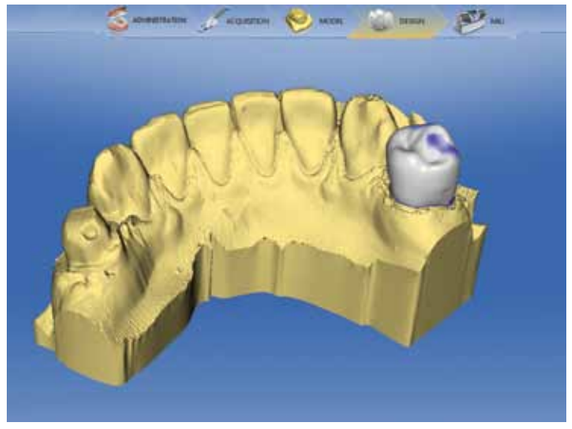

4| When the type of restoration has been selected, the material that will be used to mill the restoration is also selected prior to designing the restoration. By selecting the material ahead of time, the software is able to use the properties of the material in determining the initial proposal.

5| (Right) Once the tooth number, restoration type and material are selected, the user moves to the Acquisition screen where they take their images. An entirely revamped interface allows the user to take the traditional images in the image catalogs, as well as add additional catalogs as needed. By moving the cursor to the bottom of the screen, additional choices in adding image catalogs for the Biogeneric Copy and Biogeneric Reference for both upper and lower arches are displayed.

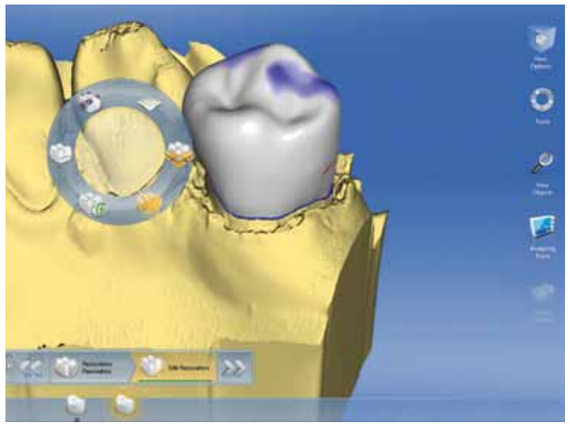
6| (Right) Once all the appropriate images are taken, the user moves to the Model phase, where in addition to the buccal bite matching, the user now has the ability to modify the model. Similar to the "Correct Optical Impression" feature of previous versions, users can now activate a "Tool Bagel" by right-clicking on the model. The tools allow the user to cut part of the model away or use the same form tool that is used to modify a restoration to modify the actual model.



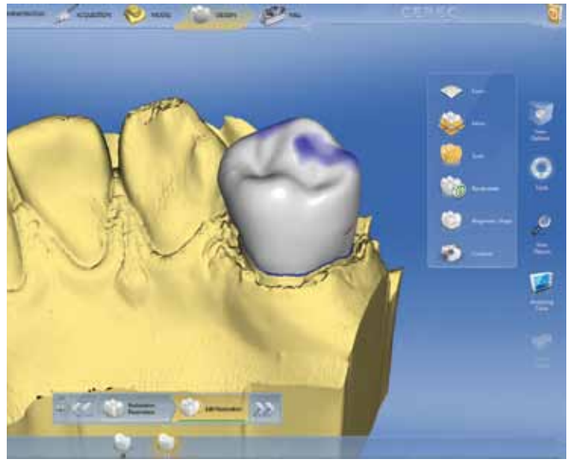
7| (Above) Two of the key features of the software are the "Step Menu" and "Dock Bar" seen at the bottom of the image. The Dock Bar houses all of the restorations that are being worked on in that particular case. Each restoration has its own unique "Step Menu," which outlines the mandatory and optional steps that must be completed for each restoration prior to moving forward to the next step.



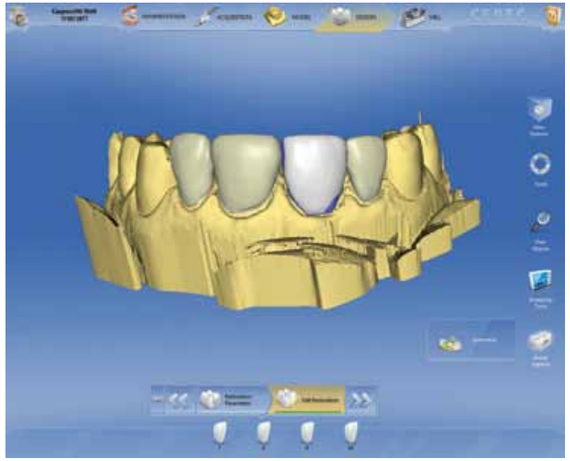
8| The "Phase Bar" at the top of the screen shows all of the major steps in fabricating the restoration. Unlike previous versions of the software, the user can jump back and forth at any step. For example, if you are in the Mill tab and a new restoration needs to be added, simply click on the Administration tab without losing the design for that restoration.



9| The design of the restoration is more easily completed by the use of the Tool Wheel or Design Wheel. By right-clicking on the restoration, the Design Wheel appears and allows the user to select from new and existing tools to modify the restorations. The tools include Move, Rotate, Form, Contacts and Biogeneric Shape.

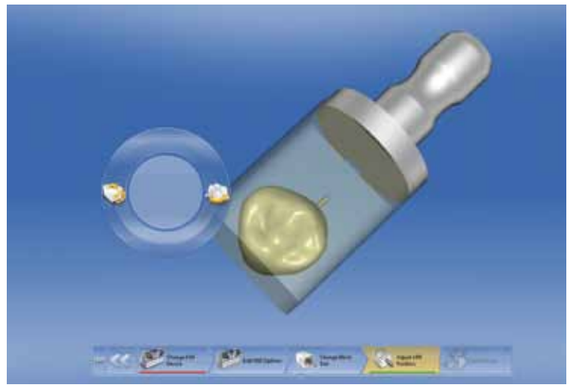


10| The tools can also be activated by clicking on the Tool icon on the right side of the screen. All of the same tools are available here. Other icons on the right side include View Options, View Objects and Analyzing tools, as well as grouping options.



11| The new Grouping tool works great for multiple restorations, especially anteriors. You can group multiple teeth, and whatever design tool you use for one becomes active on all the teeth. In addition, when working on like pairs, such as #8 and #9 or #7 and #10, you can make the tools symmetrical, in that what you do to the distal of one tooth you do to the distal of the next tooth.





12| In the redesigned Mill Preview, the user can have unlimited positions on the sprue and put it anywhere that they wish. In addition, the user can select the milling unit, adjust the speed of mill, and a multitude of other changes as needed.

13| The completely redesigned parameter dialog shows visual cues as to the effect of each parameter on the restoration. In addition, the user is able to set the parameter for each type of restoration without having to change it (for example, between a crown and an onlay).

We hope that this preview gives you an insight into the workflow of the software. As always, hundreds of videos are available on www.cerecdoctors.com, as well as an interactive discussion forum to help you learn the nuances of the platform. ❖

CASE STUDY

# CEREC & GALILEOS – Together for Better Patient Care

BY TARUN AGARWAL, D.D.S.

One of the catch phrases of the CEREC/GALILEOS Integration is, "Together for better patient care." And it's true: the more information you can acquire, the better the outcome for the patient.

Max has been coming to our office for several years. At a recent hygiene recall appointment he mentioned that his front tooth was loose. Clinical evaluation confirmed that tooth #9 was actually a retained primary tooth F that had fractured in half (Figures 1-3). The treatment plan was simple – extraction and an implant-supported tooth.

What wasn't simple was the patient plan (finances) and steps of execution. Would this need a bone graft? Would this need a custom abutment? Would we place a provisional the day of surgery? Would we do immediate placement? How would we correct the gingival asymmetry between the central incisors? These questions can easily be answered with the use of CEREC/GALILEOS Integration.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» Fig. 1: Pre-operative smile showing discolored tooth
» Fig. 2: Pre-operative retraced photo showing gingival discrepancy
» Fig. 3: Pre-operative radiograph showing retained primary tooth F with fracture
» Fig. 4: SiCAT Bite Plate relined with bite registration
» Fig. 5: Dental assistant taking scan of patient wearing bite plate

## TREATMENT PLANNING

The first step in our office is a GALILEOS CBCT scan with SiCAT bite plate (Figures 4, 5), which can be converted to a surgical guide if necessary. Since the workflow uses a standardized bite plate relined with bite registration material, it is possible to do his implant work-up at the same visit instead of having the patient return.


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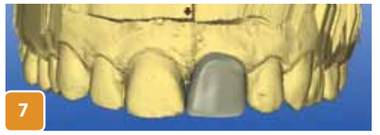
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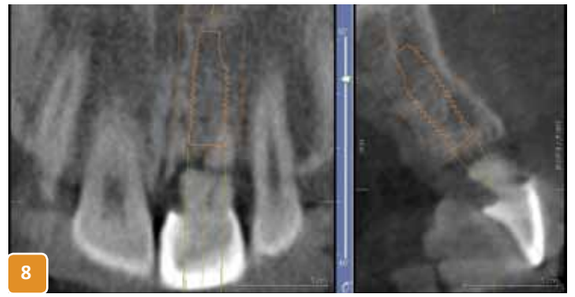
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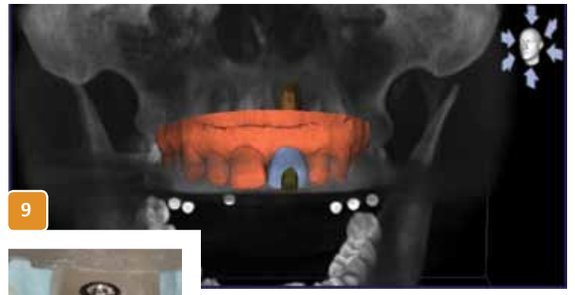
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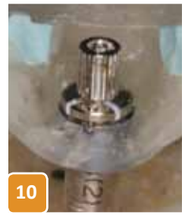
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» Fig. 6: Stone model adjusted to level gum tissue between #8 and #9
» Fig. 7: CEREC design of proposed tooth #9 to use with GALILEOS implant planning
» Fig. 8: Final implant planning. Note depression in bone facial apical third.
» Fig. 9: View showing implant position coming through facial of proposed tooth.
» Fig. 10: Surgical guide fitted with implant analog
» Fig. 11: Stone model with implant analog in place to make provisional restoration
» Fig. 12: Final provisional restoration polished

The most critical aspect for Max's case was the gingival discrepancy. To help accommodate for this, I took a stone model and simulated the final outcome by forming an ideal gingival contour (Figure 6). Once this was done, the model was scanned with CEREC and a tooth was designed (Figure 7). Now I had a prosthetic plan of his final outcome which could help plan the final implant placement position.

The CEREC information was merged with GALILEOS information, resulting in a 3-D view of the hard and soft tissues (Figures 8, 9). I was able to plan the implant to be 2 mm to 3 mm apical to the proposed CEJ, since we were technically moving his CEJ apically to even the gingival contours. We were also able to visualize a position that would allow an adequate implant size (3i Certain 4.1 X 11.5) without a bone graft. However, in an effort to avoid this bone graft, the implant had to be tilted to the labial. This meant we would need to utilize a custom abutment.

With all the information together in one place at one time, we were able to formulate an exact treatment plan. The patient was aware of his financial obligations in advance without any surprises (to the patient or practice) partly through treatment.

## TEMPORIZATION

Max didn't want to go without a tooth during the implant integration, and his preference was not to utilize any type of removable prosthetic. It was decided to do an immediate placement with immediate provisional (out of occlusion) restoration. As I've outlined in a previous series of articles, we are able to pre-fabricate a custom provisional restoration using the SiCAT GALILEOS surgical guide and CEREC (Figures 10-12). The surgical guide is fitted with an analog and placed into the stone model to simulate an implant-level impression. A temporary plastic abutment is placed, scanned with CEREC, and a provisional restoration is designed to ideal contours, milled with material of choice (3M Paradigm in this case), and finalized for delivery at time of surgery (Figures 13, 14).

The process of immediate temporization accomplishes the patient goal of having a 'fixed' tooth.

Additionally, it helps to guide the tissue to maintain papillae and push the tissue apically to level out the gingival discrepancy. By utilizing a screw-retained provisional we are able to easily remove the provisional and add additional composite, if necessary, to get ideal tissue form (Figures 15, 16). Remember, the provisional must be completely out of occlusion (centric and excursive movements) and the patient must be informed to be very careful.


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## FINAL RESTORATION

With implant integration complete, it is time to restore the tooth. With ideal tissue form already accomplished through the provisional phase, the next step was an implant-level impression (Figure 17) and shade information (Figure 18). A custom CAD abutment was created and scanned with CEREC to design and mill the final restoration (Figures 19, 20). The abutment was tried in, verified, and torqued into place (Figure 21). The final CEREC restoration was seated with implant cement with careful attention to complete cleanup (Figure 22).

Together for better patient care isn't just a saying, it's a reality. Hopefully this final outcome (Figure 23) is proof that having all the information leads to better patient care and patient outcomes. ❖

*For additional information or questions, contact Dr. Agarwal at dra@raleighdentalarts.com.*


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» Fig. 13: View of provisional restoration in place two weeks after implant placement
» Fig. 14: Radiograph of immediate implant and provisional placement at two weeks
» Fig. 15: Screw-retained provisional allows for easy removal for adjustments and impression
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» Fig. 17: Radiograph showing full seating of implant impression coping
» Fig. 18: Shade tab photography to assist in final restoration characterization
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» Fig.20: Custom CAD abutment with milled CEREC restoration complex
» Fig. 21: Abutment being torqued into place
» Fig. 22: Radiograph showing successful integration of implant and full seating of final restoration
» Fig. 23: Post-operative smile of happy patient!

CASE STUDY

# A New Paradigm in Surgical Guides

BY JAY B. REZNICK, D.M.D., M.D.

I have been told that I am the head cheerleader for CBCT-guided dental implant surgery. There must be some truth to that, since, according to SICAT, the Sirona subsidiary that developed the GALILEOS Implant software, and manufacturer of GALILEOS surgical guides, I am the number-one user of their product in the world. I have to say I was sold on the concept of CBCT-guided surgery back in 2005, and currently place 99 percent of my implants using this technique.

There are a number of deterrents for the typical implantologist, whether they are a specialist or GP, for switching to guided surgery. The first is the requirement to learn a new way of doing things and to learn a new technology. For those of you familiar with GALILEOS diagnostic and implant-planning software, you already know how intuitive the user interface is and how easy the workflow is. Second is time and cost of fabricating a radiographic template and surgical guide. With most guided-implant surgery systems, this involves a diagnostic wax-up, lab-made template for scanning, and then an expensive surgical guide that can only be made in one place in the world.

For GALILEOS when combined with CEREC, the scanning template is a simple bite wafer filled with bite registration material. CEREC creates a virtual wax-up (prosthetic proposal) that gets exported in to GALILEOS for treatment planning the implant position.

The third barrier is the time it takes to have a surgical guide made: usually about one to two weeks. For extraction of a tooth with immediate implant placement, this time delay may not be acceptable. If the patient is in pain or there is risk of development of infection, it may be necessary to remove the tooth as soon as possible. Under ideal conditions, placement of the implant at the time of extraction is preferable, as this helps to preserve bone and soft-tissue anatomy better than delayed placement. That may make guided-implant surgery impractical, as the study model, radiographic bite plate and data CD must be physically sent to SICAT in Germany for processing. There is a significant amount of labor required to fabricate the surgical stent, and then it must be sent back to the doctor for surgery.

For years, those of us who are "Key Opinion Leaders" for Sirona and SICAT have been asking for a way to shorten the turn-around time in surgical guide processing, eliminate the need for having to scan the patient with a scanning bite plate in place, and be able to send the treatment planning data to SICAT over the Internet. We reasoned that with the integration of CEREC and GALILEOS – which merges bony radiographic information with an optical scan of the dentition and oral soft tissues – this should be an easy task for the engineers to accomplish. Of course as dentists, we had no idea how complicated it really was.

You can imagine our excitement earlier this year when we heard that our wishes were about to become a reality. In March, at the International Dental Show (IDS) in Cologne, Germany, SICAT announced the arrival of the OptiGuide. This surgical guide was manufactured completely from digital data, using the CEREC optical scan data to create a virtual model of the surface anatomy of the dentition, and the planning data from GALILEOS Implant to define the placement of the surgical guide master sleeve. Now we were able to immediately upload all required data instantly to SICAT, eliminating the two to three days for shipping the stone model, bite plate and CD to Germany. Also, the manufacturing process was significantly more automated, reducing the technician labor time and thus reducing the turnover time for the surgical guide to be returned to the clinician.

I was very privileged to be able to perform one of the first guided implant surgeries using the new Sirona/SICAT OptiGuide. And to make this event even more noteworthy was the identity of the first patient. He was a 42-year-old gentleman who spent his college days as a competitive wrestler. As a result of a blow to the mouth he suffered a subluxation of his maxillary central incisors, resulting eventually in endodontic treatment of both teeth. The left incisor failed a number of years later, and was subsequently extracted and replaced by a dental implant. Now, the right central incisor was failing and had a large periapical abscess (Figure 1).

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The patient was Mr. Michael Augins, president of Sirona Dental Systems, LLC, USA. When removal of the tooth and replacement with an implant-supported fixed prosthesis became the treatment of choice, I could think of no one more apropos as the first clinical patient for the OptiGuide. Of course, we had our work cut out for us, since Mr. Augins, as a busy executive of a major U.S. corporation is constantly on the move, travelling all over the world almost all the time. His home base is Charlotte, N.C., home of Sirona USA, nearly 3,000 miles from my office. Coordinating his treatment was no easy task.

The first step for him was to get a GALILEOS CBCT scan, so I could evaluate the clinical situation. He was able to get this done locally in Charlotte. When I first saw Mr. Augins for consultation, I was hoping I could extract the tooth and place the implant and provisional restoration all at one time. However, one look at the GALILEOS scan showed that this was not possible. There was a large periapical area of radiolucency at the apex, along with significant bone loss on the palatal aspect of the root (Figure 2).


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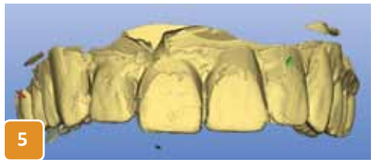
The only option was to remove the tooth, and then rebuild the alveolar ridge with a bone graft. He was placed on cephalexin 750 mg and chlorhexidine oral rinse twice daily, starting two days before surgery, and continued for five days afterwards. The tooth was easily removed and the socket was thoroughly debrided and irrigated. About 1 cc of Straumann Allograft was placed in the socket defect, and then protected with a polytetrafluoroethylene (Cytoplastâ) barrier membrane, which was contoured to the shape of the mucosal opening and tucked under the palatal and facial periosteum. A PTFE suture was used to secure the membrane in position (Figure 3).

The crown was removed from the left central incisor and a new provisional prosthesis was made by Dr. Sameer Puri to provide a cantilevered pontic over the extraction site (Figure 4). He did well postoperatively. The suture was removed at two weeks, and the membrane at six weeks after surgery. I had the opportunity to examine the patient during the four-month healing phase at various Sirona 3-D Summits that we lecture at throughout the country. He was always anxious to move on to the next phase of the implant surgery and provisional restoration.

With the clinical testing of the OptiGuide underway in a few select

locations, the patient's timing was perfect. One of the challenges all along had been his busy travel schedule, so the capabilities of the fully digital workflow were ideal in his case.

Once we were ready to proceed with the next phase of treatment, I had the patient obtain a GALILEOS scan of his jaws, along with a CEREC optical impression of his maxillary and mandibular dentition (Figure 5). This was again done locally in Charlotte. The cone beam (GALILEOS) scan was sent via FTP transfer to me, and Dr. Puri received the CEREC optical scan data (Figure 6).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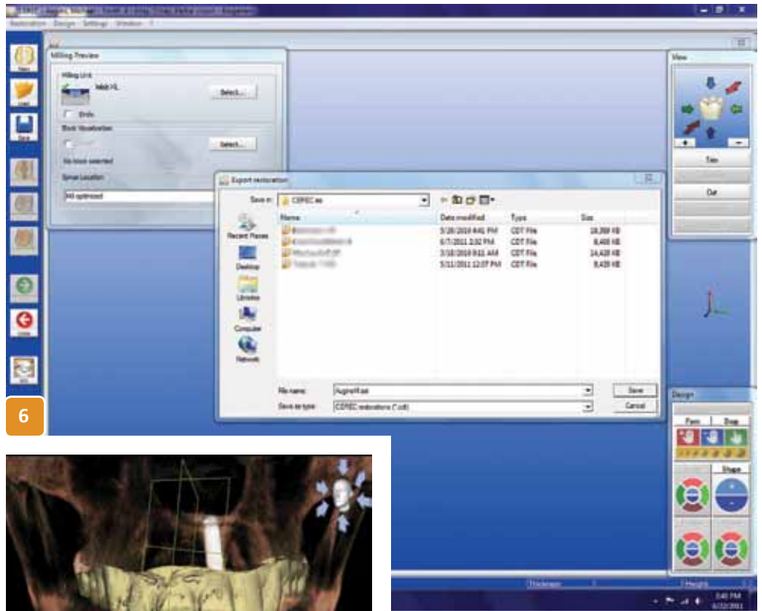
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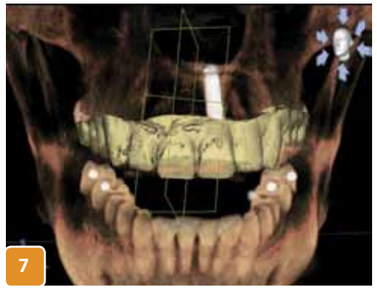
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Dr. Puri then created the prosthetic proposal and sent me the Sirona-SICAT Integration (.ssi) file containing the prosthetic planning data. I imported this into my GALILEOS Implant software, so that I could treatment plan the best position for the implant fixture to facilitate prosthetic restoration (Figure 7).

The GALILEOS scan demonstrated that there was very good integration of the bone graft and that a nice dense alveolar ridge had been developed at the extraction site. Following the principles of "prosthetically-driven" implant planning, the best location, depth and angulation for implant fixture placement was determined. An Astra OsseoSpeed S (f4.3 x 13mm) dental implant was chosen (Figure 8). This means that the size, shape, and dimensions of the ideal final restoration are used to determine the best location for the implant placement, rather than the more traditional "surgically-driven" placement, where the prosthetic restoration is more of an afterthought. If placement of the implant fixture in the ideal position requires augmentation, either at or before implant placement, this is determined at consultation and discussed with the patient.

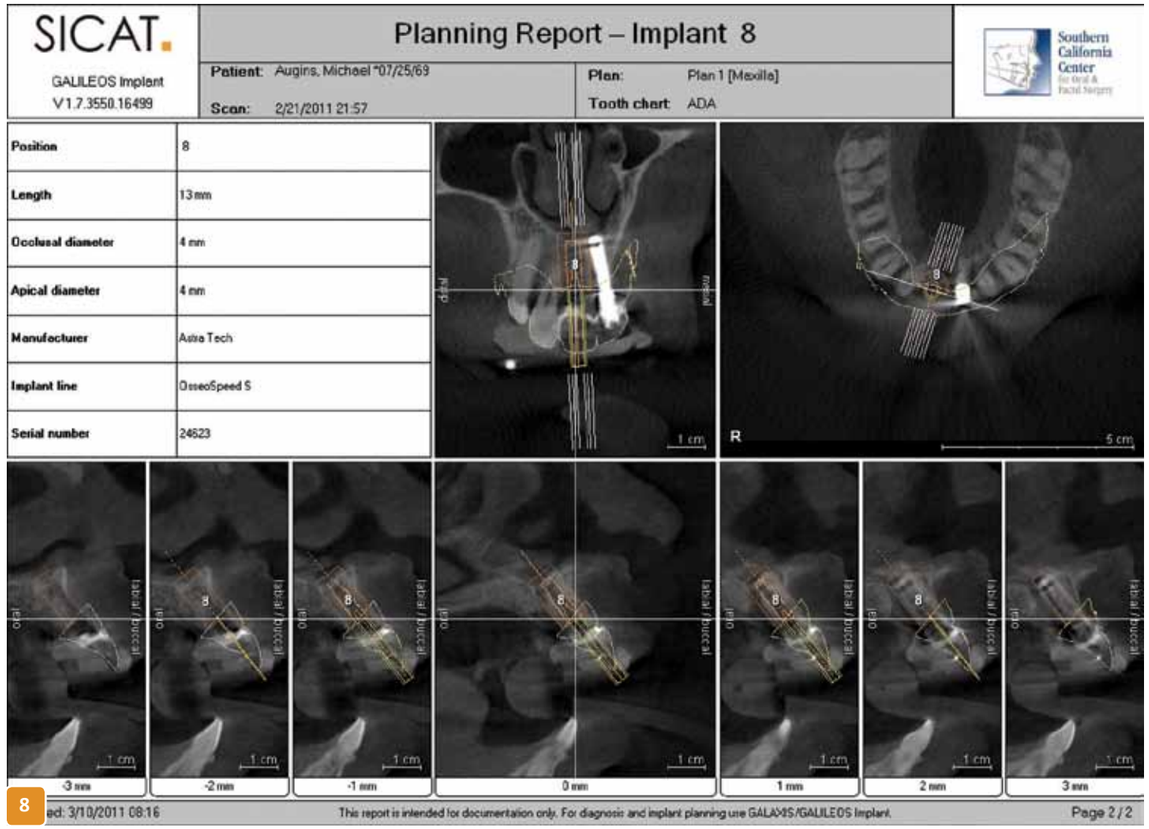
Following the traditional CEREC/GALILEOS integrated protocol, it would have been necessary to make a stone model of the patient's maxillary arch, and send that, along with a surgical guide data CD and the indexed GALILEOS bite plate to SICAT for surgical guide processing. That generally takes two days to ship to Germany, three working days to process, and another two days to ship back to the clinician. This is essentially a two-week turnaround time for scheduling surgery.

The development of the SICAT OptiGuide has tremendous benefits. First, because it uses a CEREC optical scan as a "digital impression," it eliminates the need for both a physical study model and the indexed SICAT scanning template. The merging of the CEREC surface data with the GALILEOS 3D bone data provides a very accurate representation of the patient's occlusion, and the relationship of teeth and soft tissues to the underlying bone.

The distortions of the CBCT scan due to metallic dental restorations are negated by the optical surface data. A highly accurate intaglio surface of the surgical guide can be created from digital data alone. Likewise, the size and position of the guided implant surgery master sleeve can be included in this digital plan, so that the surgical guide can be milled from a solid block of acrylic with a high degree of accuracy.

The milling unit that creates





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the surgical guide is too large and expensive for the dental office, so the appliance is manufactured at SICAT in Bonn, Germany, and then shipped to the implant dentist. Because this process is highly automated, a day of processing time is eliminated. These two factors reduce the turnaround time for the OptiGuide from seven, down to four working days. It is now possible to schedule patients for fully-guided dental implant surgery one week from the consultation appointment.

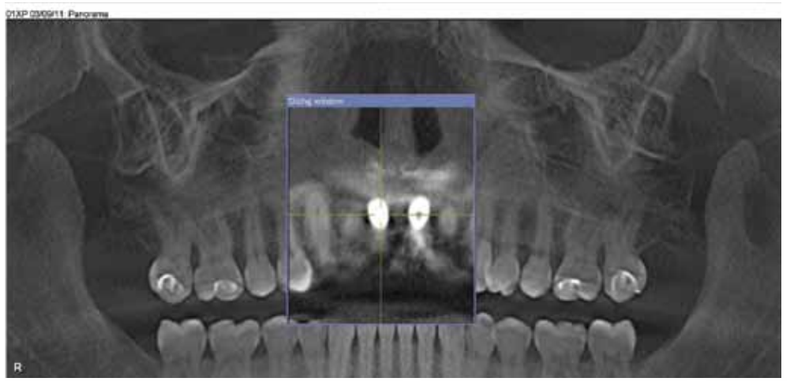
The digital treatment planning data was uploaded to SICAT, and less than one week later, the patient's surgical guide arrived in my office. Using the

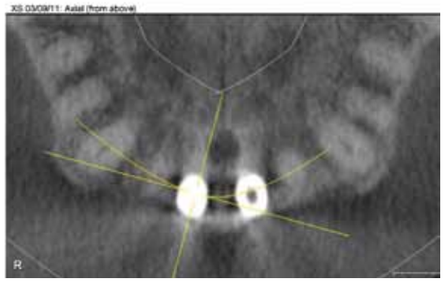

9

OptiGuide surgical stent, the master model was retrofitted with an implant replica (analog) and the immediate provisional prosthesis was fabricated in the lab (Figure 9).

The patient arrived in my office for surgery and the procedure was done under local anesthesia. The Astra Facilitate guided surgical kit was used for implant placement. Because of the cooperation between SICAT and a majority of the major implant manufacturers, the exact Facilitate surgical protocol is followed with the SICAT surgical guide. The Facilitate drill sequence "recipe" to be followed comes packaged with the surgical guide.

Because the patient had an adequate amount of keratinized attached gingival around the edentulous site, a tissue punch could be used to expose the bony ridge. The Facilitate drilling protocol was followed, and the implant fixture was delivered into place (Figure 10). The implant insertion torque was greater than 35Ncm, and the implant was clinically stable, so the provisional restoration could





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be placed (Figure 11). Had this not been the case, the provisional cantilever bridge would have been re-cemented.

A postoperative GALILEOS CBCT scan showed that the implant placement using the OptiGuide had been exactly where planned in the GALILEOS Implant software (Figure 12). Immediate postoperative esthetics was good. The provisional restoration was adjusted so that it was completely out of contact, both in occlusion and with excursive movements (Figure 13). At four months post-operatively, the provisional restoration was replaced by the final CEREC crown.

The OptiGuide is the most recent innovation in the evolution of GALILEOS Guided dental implant surgery and CEREC/GALILEOS integrated workflow. This technology now allows clinicians the ability to treatment plan for implantology using exclusively digital data, as well as perform implant placement surgery with precision that is unrivaled. Because of the elimination of analog models and shipping of planning data on CDs, the turnaround time for surgical guide manufacture has been significantly reduced. Soon, a SICAT surgical guide manufacturing facility will be located in the continental United States, further shortening the time from treatment planning to implant surgery for every type of surgical situation. And, if that is not enough, someday soon, using the manage-a-trois of GALILEOS, CEREC and an MC XL milling unit, clinicians will be able to create custom surgical guides for simple implant cases. The future for CEREC and GALILEOS Integration is incredibly exciting. ❖

*For questions or more information, Dr. Reznick can be contacted at jreznick@sccofs.com.*

Discussion Board

cerecdoctors.com DISCUSSION FORUM

# Single Central Group Exercise

COMPILED BY CERECDOCTORS.COM

» In this re-occurring section of *cerecdoctors.com* magazine, we like to share a sample of the different conversations that are occurring online.

**Mike Skramstad**
Faculty

There has been a lot of talk recently about materials, color, etc., for anteriors. There are lots of ways to skin a cat for sure, but let's brainstorm on a case I did this morning.

Single Central #8
What shade would you use and what guide/method would you use to take it?
What design mode would you use? What block would you use, and why?

Here is the pre-op: Old (large) composite bonding; 18-year-old girl.

Here is the prep. I only reduced the facial about .7 mm.

**Sameer Puri**
Faculty

- Take the shade before you give anesthesia.
- TriLuxe RealLife block or an Empress block, but because the margin is so thin, lean toward a TriLuxe.
- 100% Biogeneric Reference for me. Occlusion currently with a bite and in 4.0 combine buccal bite and Biogeneric Reference.
- Capture from lateral to lateral with the mesials of the canines.

**Sameer Puri**
Faculty

Rather than start a new thread, I'm gonna jump in and post a photo. It will kind of supplement what Mike is doing.

So, patient has had veneers for about 10 years. He broke one and we replaced it with CEREC. Which one?

**Brad Dorsch**
Cincinnati, Ohio

I would use either Correlation (altering the line angles prior to scan) or bio-ref off of 9.

I do like the translucency of the TriLuxe block ... e.max never looks good for me on a single anterior unit – the HT are too grey, the LT are too opaque.

I do like those cases – you can usually impress your patient pretty well if you nail the shade.

**Mike Skramstad**
Faculty

I have some time between patients, so I'll post this now.

Here is how I handled this case ... some of you have already stated exactly what I did.

**Step 1: Shade ... right away prior to prepping**

I used the new Easyshade Advance unit (coming out in a few months) on tooth #9. This new unit will give you the classical and 3-D shade, plus has a new block mode that will tell you exactly which block to use, assuming that your stump is good.

The shade was:
Classical: B1
3-D: 0M2
Block mode: 0M1

Thus, I knew that I needed to use a 0M1 CEREC block.

**Step 2: Design Mode**

For single central incisors, my method of choice is always Biogeneric Reference. One of the things I learned from Bob Winter is that the incisal edge is rarely straight or concave. You should have a little irregularity in it for the most natural look. Biogeneric Reference can handle this by copying the incisal irregularities of #9.

**Step 3: Block Choice**

Here is where I went a little against the grain from what you guys suggested. Here are the things that went into my decision:

1. The facial and margin are very thin. Vita tends to mill a little better in these thin scenarios... e.max does good too, but e.max is not the right answer for esthetics in this case ... too opaque.
2. It was between Vita TriLuxe, Vita Forte, Vita RealLife, or just regular Vita (multiblocks are a little opaque to me at this thinness). When I looked at the adjacent tooth (#9), I didn't see a lot of cervical color ... nor did I see a ton of incisal translucency. I felt at this thinness, that the natural dentin shade shining through would provide the "chroma" for the tooth. I really didn't find it necessary to use TriLuxe or Forte. Looking at the RealLife block, what is the purpose of the block? You want to position the restoration in the block to get the "dentin effect," but not see the dentin. With all the trouble and long milling times of RealLife, I didn't see the benefit when I can get all the "dentin affect" I need from the actual dentin.

So ... my block choice was just regular Vita 0m1 block. I did do some staining and glazing around the incisal edge with blue and white to create a small "halo" effect.

**Here is the immediate result:**

I see a couple minor changes that need to be made (can be accomplished by minor recontouring). I never do this at the seat appointment. I schedule them to come back in 2 weeks after full tissue healing to make these adjustments. I will play with the distal line angle to make it appear a little thinner, the mesial incisal point angle, and will make a decision on the mesial emergence after the papillae comes back fully. This will be easy.

Before:

After:

I cannot say enough about the new Easyshade advance ... just a huge winner product in my book.

**Gregory Mark**
Forest Hills, NY

Mike, excellent result. I was right about shade, I missed the block. Sam, I think #7, that is my guess.

**Bob Conte**
Warwick, RI

Mike: If we currently have an Easyshade Compact unit, will we be able to add on the block shade feature via new software? Nice crown btw.

**Mike Skramstad**
Faculty

There will be an upgrade available that is $55. You should be able to request it any day now. I would contact Vita.

The actual Easyshade advance will not be available until quarter 4 of this year. It will be $2,449.

You can buy the Easyshade compact NOW for $2,295 (~$200 less) and receive the upgrade to block mode automatically (shipped within 30-45 days).

**Mike Skramstad**
Faculty

Another note on this case: Notice the "dull finish." We have nice reflection from the surface texture, but it doesn't appear overly "shiny." This is the goal of anteriors. You don't want a "super glaze" because natural teeth aren't shiny. You want to stain and glaze, then use wheels and polishing paste to "dull" out the glaze.



**Damien Jose**
Phalsbourg, Mouselle, France

Which wheel and polishing paste are you using?

**Mike Skramstad**
Faculty

Personally, I like the yellow CeraGlaze cup from Axis and Diashine Soft from VH Technologies.

**Sameer Puri**
Faculty

Does this help?

**Sameer Puri**
Faculty

Does this help?

Or this?

**Daniel Rovirosa**
Coral Springs, FL

Nice case, Mike! When you guys say you need to take a bite for Biogeneric reference, does that mean a bite reg or buccal scan? I haven't fiddled with anteriors enough to know all the ins and outs, and I could probably go right now to my machine and find out, but I rather you guys spoon-feed it to me.

**Richard Rosenblatt**
Faculty

Rovster,

In the present software, the only design mode that you can use buccal bite with is Biogeneric in the present software. if you want to do Biogeneric Reference, you need to use bite registration material. This will change in the future.

**Mike Skramstad**
Faculty

Rich is right, you cannot use buccal bite with Bio Reference in 3.85. ... You will be able to in 4.0.

Here's how I manage these ...

• I don't take a bite

• Prior to prepping and anesthetizing, I check occlusion (with articulating paper), so I have an idea on what the occlusion is.

This is actually very helpful in designing the prep as well and something that gets overlooked a

lot. You obviously don't want your centric contact on the margin and sometimes with anteriors, I see that happening. In this case, she had a deep bite. I marked with articulating paper prior to prepping and made sure I kept the lingual margin 1 mm above the contact point. If it would have been higher, I would have prepped below.

**Doug Sakurai**

Did you discuss ortho to optimize the space? Having two different widths always makes a central incisor case difficult.

**Bradley Sutton**
Pocatello, ID

Very Nice!! Did you consider using some resin polishing burrs to shape #8 (especially the mesial and incisal) the way you wanted and then carry it out 100% Correlation? The shape of the original resin is actually not bad, except for that crazy mesial area. I have had mixed luck with Bio Ref and so I instantly thought of Correlation. Thanks again for the cases.

**Mike Skramstad**
Faculty

Brad:
I didn't consider it because in my hands referencing #9 was a faster, better option
Doug:
I don't recommend ortho to anyone because I'm so sick of my own Invisalign :) I want to rip these SOB's out of my mouth ... only five months left, then veneers. After that I'll recommend ortho again.

**Sameer Puri**
Faculty

I think one of the most important things that people have to realize with anteriors is that you have to have your contours and surface texture correct. Too often the restoration comes out of the milling unit and they simply glaze it and bond it in place. Or some don't even glaze and they just polish and cement it.

Now glazing is fine, but the issue with it is that you leave all the bur marks in the porcelain and your surface texture doesn't match the adjacent teeth.

Polishing only is even worse, in that you completely remove all surface texture and anatomy and just have a flat, dull surface that doesn't look good at all. It looks lifeless and the light does not reflect back properly.

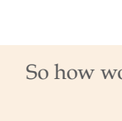
Now take a look at the case that I posted:
While the shade match is pretty good, the anatomy is ok; I completely missed the surface texture. I actually over-polished this restoration a bit too much and have lost the anatomy that is present in the adjacent central incisor. A bit of surface texture and we would have 100% nailed this case. As it is, in my opinion, it's an 80% - 85% match.

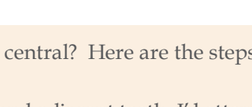
So how would I approach a single central? Here are the steps I would take.

1. Take your images of your prep and adjacent teeth. I'd attempt to get maybe 7-10 and a bit of the mesials of the canines.
2. Take your antagonist image. In the current version of the software, you cannot do buccal bite with Biogeneric Reference (in 4.0, this is easily possible because of the multiple windows).
3. Do your case in Biogeneric Reference and copy the adjacent tooth. Mill the restoration in the material of your choice.
4. This is where it really starts getting critical. After you mill, try in the restoration and use your handpiece to mimic the anatomy and contours of the adjacent teeth. No matter how good your design is, there will need to be some modification needed with your fine diamond to capture the intricate details.
5. Now using the polishing wheels (Axis CeraGlaze works well). I use the blue and the yellow wheels – on the convex surfaces only. Don't make the entire surface flat and shiny. Only polish the convex surfaces and leave the concave surfaces dull.
6. After getting the bur marks out and getting a decent polish, put your stain and glaze on the restoration and run it in the appropriate firing cycle.
7. Now – get a rubber polishing wheel and remove some of the super-high shine as Mike suggested. Teeth are not naturally shiny; look at a tooth that has been extracted. It doesn't have a super-duper high shine. This is not what we want to create.
8. Cement your restoration and do your final touch-ups.

Hope this helps.

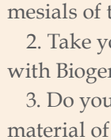
**Mike Skramstad**
Faculty





Final before (far left) and after. Patient was thrilled with result and I didn't touch it a bit.

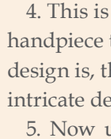
**Sameer Puri**
Faculty

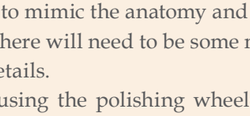


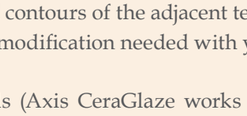
Contours: A+ | Shape: A+ | Surface anatomy: A+ | Symmetry: B | Color Match: B

Man, if this was a bit higher in value and you didn't have the spacing issue to deal with – you would have 100% nailed it. I love the surface anatomy.

**Mike Skramstad**
Faculty







I think some of the value issue is the picture because it looked perfect in the mouth.

Maybe just slightly off though ... a picture tells 1,000 words :)

Here are the other pictures I use to look at color and value: Black and white for value (above left). Increase contrast/decreased brightness for chroma and color. ❖

# CEREC® Software 4.0
## Features & Benefits Overview

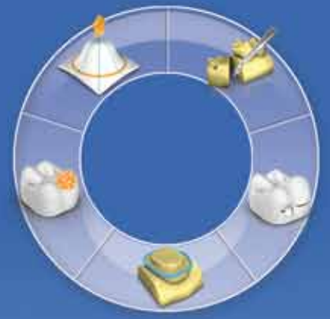
### Intuitive Workflow


- It's always clear where you are in the process and what step comes next
- Allows jumping from one design step to the next without the linear approach of "Next" and "Undo"
- Going back to a different design step(s) does not undo the work you've already done

### Multiple Restoration Design

- Work on as many different restorations as you wish (even in different quadrants/arches)
- Restorations do not have to be designed in the same design mode, allowing complete freedom to choose the ideal design mode for each restoration

### Work Direct on the Tooth



- Adjust and refine your restorations by executing design tools direct on the tooth, such as adding or removing material, rotating or positioning, or expanding or reducing tooth size
- Provides greater control and adds an intuitive "hands-on" feel to the design process

### Streamlined Restoration Design


- At the bottom of the design window, each step is clearly defined, showing you the current step as well as what step came before and what comes next
- Can move backward and forward without undoing previous design steps

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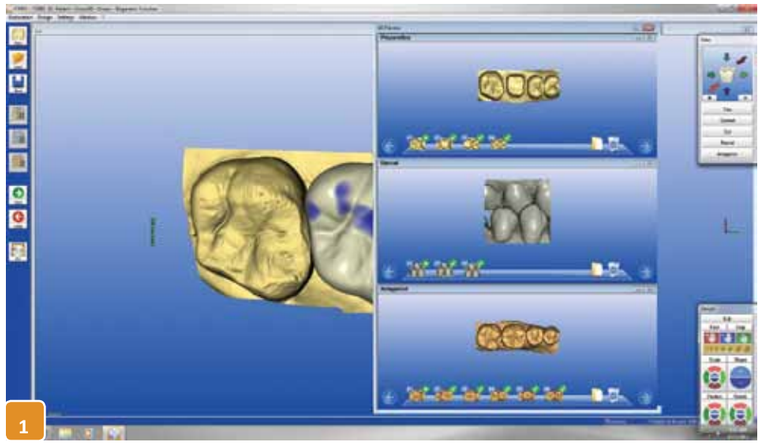
SOFTWARE

# Multiple Teeth: Multiple Designs

## UTILIZING THE FLEXIBILITY OF THE 4.0 SOFTWARE

BY SAMEER PURI, D.D.S.

One of the features that CEREC users enjoy is the ability to do multiple restorations in an arch. Not only is this productive for the practice, it's also convenient for the patient to have multiple needed restorations completed in a single visit.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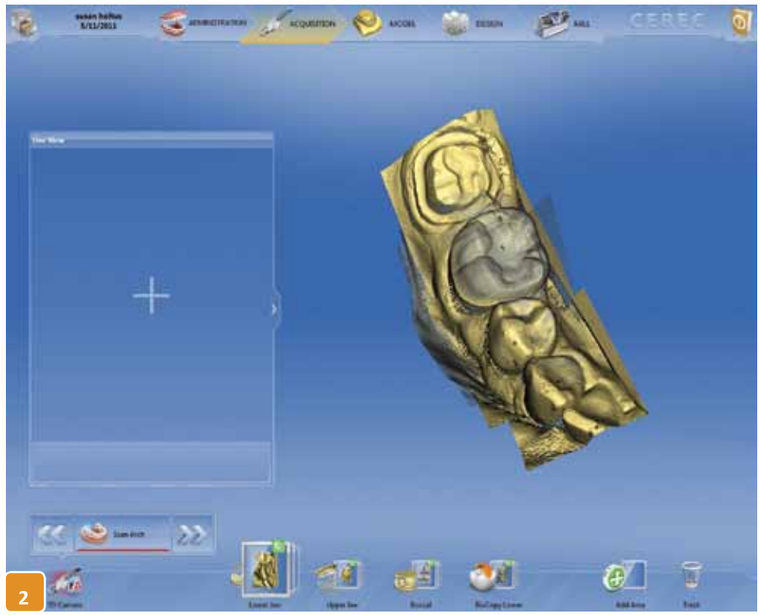
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As easy as it has been to work on multiple teeth with the CEREC, the challenge has always been to be able to do these restorations in different design techniques. If a clinician was restoring two teeth, both with Correlation or both with Biogeneric, the process was fairly easy. Simply take the appropriate images and follow the design sequence for that particular process.

However, combining two different techniques makes the design process more challenging for the doctor. Due to the static number of image catalogs in previous software versions, users needed an in-depth knowledge of the software and had to have the knowledge to manipulate images in the image catalog to do a case with Correlation and Biogeneric combined (Figure 1).

With the introduction of the 4.0, this has completely changed. The new 4.0 software for the CEREC system allows the user to have a virtually unlimited number of image catalogs, which means that combining design techniques has become much more simple (Figure 2).

In the 4.0 software, the user must simply decide what technique they are using for that particular tooth and make sure the appropriate images are taken in the appropriate image catalogs. For example, if the user is designing two teeth, one using the Biogeneric Copy technique (this is the new name for Correlation) and the second tooth in regular Biogeneric, then the user must have the preoperative images and the preparation images for the Biogeneric Copy case and the prep, buccal bite and opposing images for the Biogeneric case. By having the appropriate images, the software will allow the user to combine any design technique they wish regardless of the images needed.


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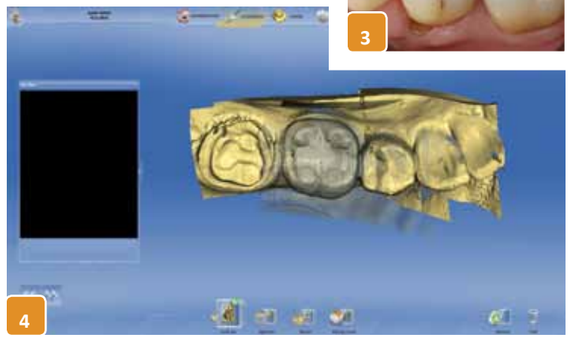
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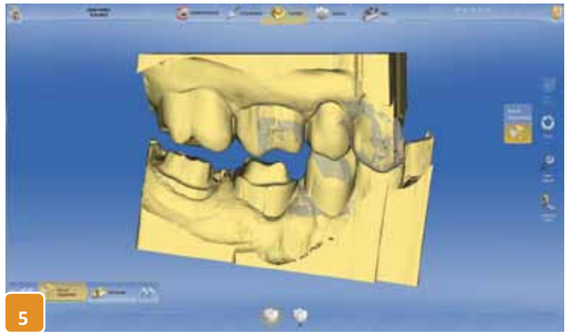
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## CLINICAL EXAMPLE

An emergency patient presented to the office with the chief complaint of a broken crown on tooth #31 (Figure 3). The restoration had been placed at another office approximately six years ago and fractured the tooth while chewing on ice. Radiographic examination revealed no pericapical pathology on the tooth, but did reveal recurrent decay under an existing amalgam on tooth #30. A treatment plan of two crowns was presented to the patient and she was appointed to restore the teeth.

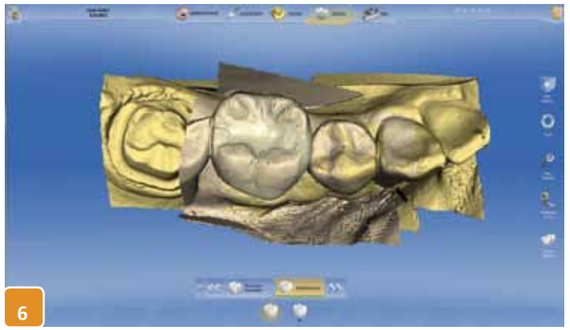
At the restorative visit, the decision was made to restore tooth #31 using e.max in Biogeneric with buccal bite because there was not sufficient tooth structure remaining to copy the existing crown. However, because the patient wore a retainer with the clasp on tooth #30, Biogeneric Copy was needed to restore tooth #30 so that the existing retainer for the patient would not have to be modified and would fit around the new crown.

One carpule of Septocaine was given in a mandibular block injection and anesthesia was achieved. While the patient was getting numb, pre-operative images of tooth #30 were taken and stored in the appropriate image catalog. The opposing images of the upper arch were also taken along with the buccal bite images, so that we could restore #31 with proper occlusion and function.

After anesthesia was given, both teeth were prepared for full-coverage restorations and the margins were exposed by packing a single piece of 000 cord soaked in an aluminum chloride solution (Hemodent). Optispray from Sirona was used to cover the preps and the preparation images were taken.

Once all images were taken, it was determined that the pre-op model for #31 correlated with the prep model for #31, and that the buccal bite contained enough information to be able to properly stitch the maxillary and mandibular models (Figure 4). While there are additional image catalogs to keep track of, the concepts of the model stitching in 4.0 are no different than previous software versions other than the user must keep track of all the different catalogs needed for each case.

After all images are captured, the Progress arrow is clicked and the user moves to the next step, which in this case is the buccal bite stitching. This stitching occurs the same way as in previous software versions in that the buccal bite matches the buccal surfaces of the teeth (Figure 5). The correlating of the models will happen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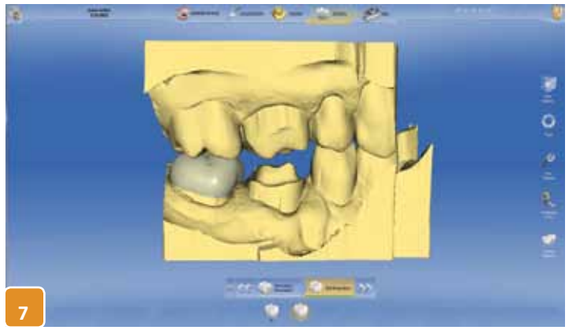
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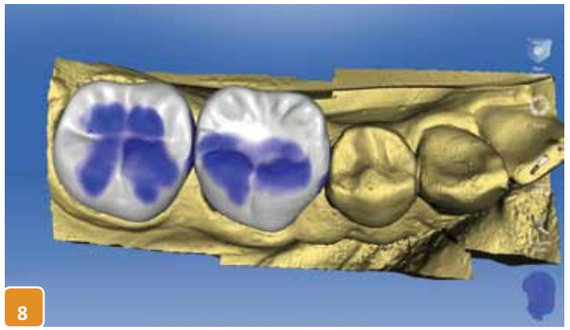
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automatically as before, and requires no input from the user, as the software does the whole thing.

As the models are stitched, the user will then fabricate each restoration individually while completing the steps required for each design technique. By selecting the tooth being worked on at the bottom of the Step bar, the appropriate steps are selected by the user (Figure 6). For example #30 is being completed in Biogeneric Copy and the steps required are:

- Marginate the preparation
- Adjust the insertion axis
- Draw the copy line
- Modify the proposal using the design tools
- Verify the occlusion by turning on the pre-op model to see relationship of the proposal to the pre-op
- Check contacts

Once tooth #30 is designed, the user can complete the steps for tooth #31 (Figure 7), which include:

- Marginate the preparation
- Adjust the insertion axis
- Modify the proposal using the design tools
- Verify and adjust occlusion by turning on the opposing arch and adjusting the occlusion colors

Because there is no copy line in the regular Biogeneric design, this step is skipped. The versatility of the software allows the user to design both restorations at once (Figure 8), and then send the restorations to the milling unit together, or design one restoration, send it to the milling unit, and while that restoration is milling, design the second restoration (Figure 9).

The finished case was cemented with Multilink cement (Ivoclar) and the patient was restored to full function (Figure 10). The versatility of the software allowed the patient to not have to modify the existing retainer that she wore by simply copying the existing contours of the tooth and creating #31 from scratch, as there was nothing to copy.

The 4.0 software is a major step forward and gives the user a tremendous amount of flexibility to design multiple teeth using multiple design techniques. The challenges for the user are to keep track of the various techniques and make sure that the appropriate images are present and the user follows the appropriate steps to complete the restoration. ❖

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CASE STUDY

# Challenging One-day Cosmetic Restoration

## ALL-CERAMIC RESTORATION UTILIZING CEREC CAD/CAM VENEERS WITH VITABLOCS®REALLIFE, TRILUXE FORTE AND MARK II/TRILUXE

BY MIKE McINTEE, C.D.T.


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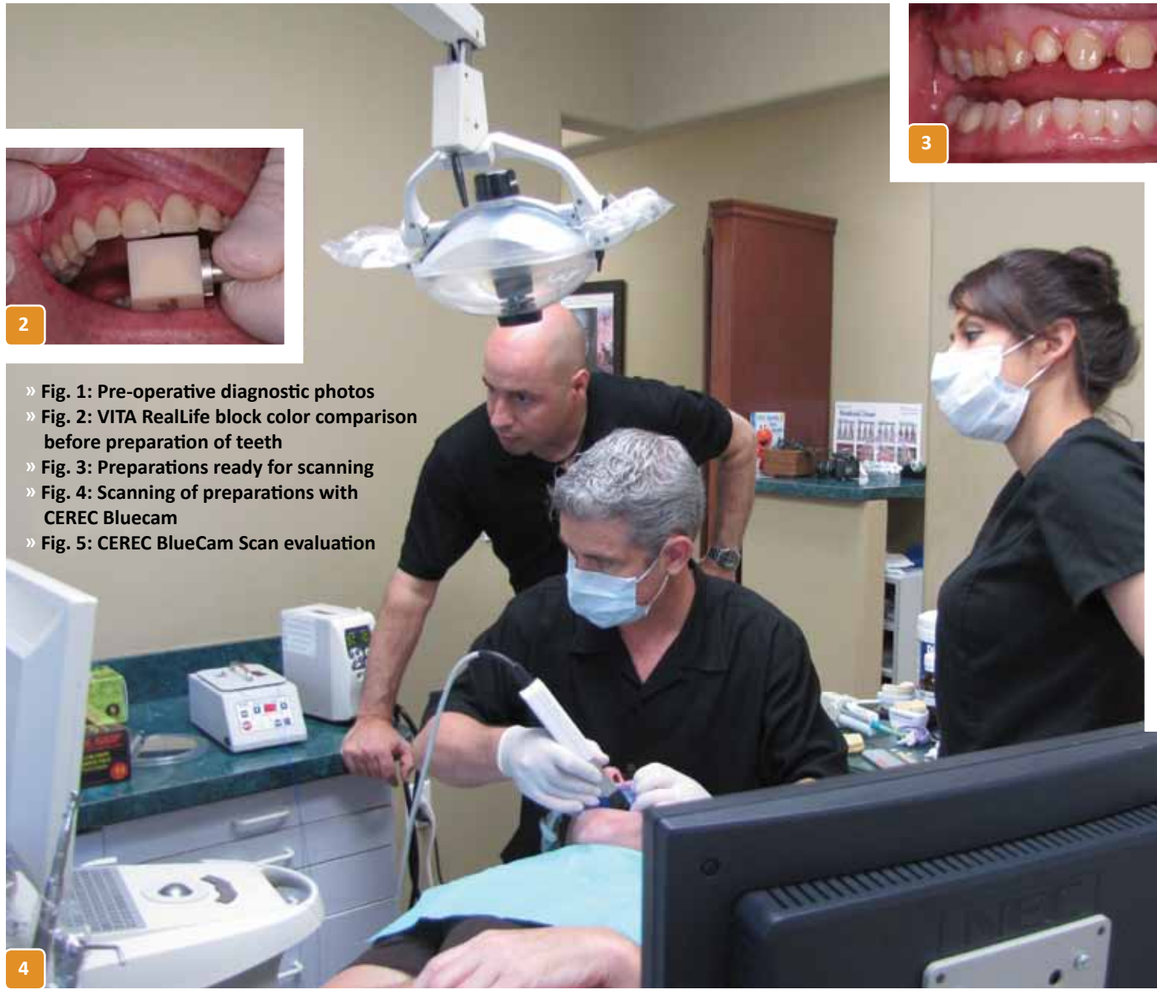
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» Fig. 1: Pre-operative diagnostic photos
» Fig. 2: VITA RealLife block color comparison before preparation of teeth
» Fig. 3: Preparations ready for scanning
» Fig. 4: Scanning of preparations with CEREC Bluecam
» Fig. 5: CEREC BlueCam Scan evaluation

PHOTOS BY MIKE McINTEE, C.D.T., AND EDDIE CORRALES, C.D.T.

Our challenge: Prep, scan, design, mill, layer, glaze and seat 12 veneers in one day.

### CASE PRESENTATION

In our featured case, we have a 48-year-old patient who presented with an older set of veneers that he wanted restored. The patient requested a 10-unit veneer restoration that stretched from maxillary second pre-molar to second pre-molar (Figure 1). During the examination, it was determined that the lower canines should also be restored for proper restoration and function, bringing the total restoration to 12 veneers .

"This case was unique in that we needed to complete a complex cosmetic restoration in just one visit," recalls Dr. John Cross of OC Lifesmiles in Newport Beach, Calif. "The patient and the restoration team were up to the task and worked together to make it happen. Having access to leading CEREC technology and reliable VITA products made the one-day restoration possible. While the process isn't right for all patients, it is a fantastic tool to use for those patients who do require or prefer a one-day restoration."


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### TREATMENT PLANNING AND PREPARATION

The material the team chose to restore the case was CEREC CAD/CAM veneers with VITABLOCS RealLife, TriLuxe forte and Mark II/TriLuxe ceramic blocks. The VITABLOCS machinable ceramic blocks were chosen for their quality, three-dimensional esthetics for anterior chairside restorations and for their high level of individualization. The unique characteristics of these blocks provided proven clinical reliability and allowed for efficient production and reduced design time, making it the ideal solution for this case.


5

Using Sirona CEREC V3.85 software, the technology made it easy to change the position of the restoration in the block to reproduce the individual requirements for translucency, chroma and lightness. Composed of the fine-structure, 4 micron particle size feldspar ceramic, RealLife VITABLOCS offered excellent polishing properties and abrasion resistance with reduced wear on the grinding tools, margin chipping and polishing time.

After selecting the materials (Figure 2), the patient had impressions taken for diagnostic models.

A diagnostic wax-up was fabricated by Eddie Corrales, C.D.T., owner of Downtown Dental Designs and CAD Smiles in San Diego, Calif. "In my years of experience," he says, "I have found that VITABLOCS RealLife materials are the best for anterior restorations, primarily due to their natural color and quality esthetics."

After approval of the wax-up by the patient, an impression was made for future use in creating a temporary bridge. An appointment was then made to have 12 veneer units prepped, scanned, designed, milled, layered, glazed and seated – all in one day.

### OCCLUSION

The patient arrived and was seated at 7:30 a.m. Six old veneers, originally

» Fig. 6: Temporary bridge in place. Ready to release the patient for lunch
» Fig. 7: MC XL milling unit in Dr. John Cross' office with blocks ready to mill
» Fig. 8: Eddie Corrales adjusting milled units on working model
» Fig. 9: RealLife units seated and prepared for layering of PM9 Window porcelain
» Fig. 10: PM9 Window Porcelain layered on adjusted VITA RealLife blocks
» Figs. 11-14: Completed Veneers seated


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done in 1990, were removed from teeth #6 through #11. Pre-molars #4, #5, #12 and #13 had the labial surfaces only prepped. Teeth #22 and #27 were readied as half-prep veneers (Figure 3).

After all the preps were completed, a full-arch scan was made of the maxillary arch using the CEREC BlueCam acquisition unit (Figure 4). Next, scans of the lower prepped teeth were acquired and saved.

Once all the preps were completed, a full-arch triple tray impression was acquired and a working model was poured for use in adjusting the milled restorations. When the preps and scans were completed, the earlier impression of the wax-up was filled with Luxatemp (an injectable temporary material), and inserted over the preps to fabricate a temporary bridge on the maxillary preps, duplicating the diagnostic model. Next, composite mock-ups were fabricated on teeth #22 and #27.

The maxillary temporary bridge and lower canine build-ups were checked and adjusted for bite and group function through lateral excursion. When the bite and function were confirmed, correlation scans were acquired for build-up for the maxillary full arch and single lower canines (Figure 5). At this point, the patient was dismissed until the restorations were completed (Figure 6). The time was 11:00 a.m.

Once the patient was dismissed, the first step was to use Correlation mode to fabricate the lower canines. They were milled using VITA Mark II/TriLuxe blocks 2M1C. Due to the very small size of the restorations and high translucent quality of the VITA material, a Mono colored block proved to be the best choice for optimal color match.

As the lower canines were being milled in the CEREC MC XL milling unit), the maxillary pre-molars were designed and milled using VITA TriLuxe forte blocks, shade 1M2C (Figure 7). The lower restorations were completed and seated on the working model. After seating and contouring, the restorations were polished using Vident restoration polish.


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14

## DELIVERY APPOINTMENT (ADHESION)

At 2:30 p.m., the patient was called back to the office to start seating the restorations. First, the composite on the lower restorations was removed. The restorations were tried in for proper fit, etched and prepared for bonding, then bonded in place and polished. Once the pre-molars completed the milling process, they were seated and contoured using the working model. The next step was to glaze the restorations using VITA's Akzent LT Glaze in the VITA 6000M oven. They were then delivered chairside for try-in on the patient. Minor adjustments were made on the restorations and then set aside until final seating.

The six maxillary anterior restorations were completed using VITA's RealLife blocks in shade 1M1C. They were then adjusted on the working model (Figure 8). A putty matrix was made for length verification and an incisal cutback was done to enhance mamelons and a translucent incisal halo (Figure 9). VITA PM9 Add-on Window porcelain was then fired for effect (Figure 10). After baking, the anterior restorations were contoured and glazed using VITA Akzent LT Glaze. When completed, they were positioned on the working model. The anterior restorations were then transferred along with the pre-molars to the patient for try-in. At this point, they were adjusted and approved by the patient for final seating (Figures 11-14). The meticulous attention to detail that the restoration team exhibited in the preparation of the teeth and function of the completed restorations led to an extremely smooth design and milling process.

After approval, all maxillary veneers were etched and bonded into place using Variolink veneer bonding cement. A rubber dam isolation for rapid cementation technique was used to bond all the veneers at the same time. Once bonded, the bite and lateral movement were checked and adjusted to the new lower canines. The restorations were then cleaned of excess bonding material and polished.

## CONCLUSION

The fabrication of esthetic and durable restorations is now made possible through the combination of modern technology and new materials. Using CEREC technology and the all-ceramic material VITABLOCS RealLife, TriLuxe forte and Mark II/TriLuxe machinable blocks, the team was able to create natural-looking veneers that were esthetically pleasing and durable for the patient. At the completion of treatment, the very satisfied patient gained a successful cosmetic restoration consisting of 12 quality veneers. With a teamwork approach, it was completed in one day's time. ❖

PROFILE

# How CEREC Inspired PDS to Take Action

BY MARK FLEMING, D.D.S.

In 1994, Pacific Dental Services (PDS) opened with a very specific and intentional business purpose. Although founder Steve Thorne is not a dentist, he wanted to become involved with dentists to help them succeed in private practice.


Unlike other dental companies, Thorne did not hire dentists as employees, but rather, wanted dentists to become his business partners. What began with humble beginnings in Southern California quietly and continually expanded throughout the Southwest. Today, PDS has more than 250 offices in six states.

Despite their size, a PDS affiliate practice is indistinguishable from a typical private dental practice, with very few recognizing the affiliation. Representing a true partnership, PDS has brought the best of both the business and clinical worlds of dentistry together. A group of affiliated practices individually branded to the communities in which they serve, PDS offices focus on offering innovative services and dental technologies to the dentists/owners who provide amazing results for their patients. Based on the idea of supported autonomy, the concept of Private Practice +™ was developed during one of the company's monthly meet-and-greet events to welcome new dentists. Looking for a way to further describe the company, Joe Feldsien, senior vice president of professional partnerships, found himself asking new team members why they decided to join the company. Among the many responses, the resonating message was that PDS delivers private practice made simple. Offering all the benefits of owning a private practice, dentists feel that joining PDS offers them everything they felt they never had (in other words, the "+").

Striving to maintain the highest level of clinical excellence in each affiliated practice, PDS makes available to its affiliate dentists/owners cutting-edge dental technologies. However, the company does not incorporate technologies that are not well-tested and widely available. Instead, PDS-affiliated dentists/owners utilize proven technologies, which would otherwise be unattainable in many instances, in order to offer patients the highest level of care. Among these proven technologies, computer-aided design and manufacture (CAD/CAM) systems have remained a main focus of PDS.

In late fall of 2005, Feldsien began looking more seriously at CEREC. From his previous experiences in the dental field, he recalled his exposure to one particular CAD/CAM system, CEREC. The system is easier and has the potential to be more profitable because it takes a digital image and assists completion of the full procedure in the office in a single visit. Realizing the potential of the CEREC system to provide a digital solution, Feldsien approached two PDS owner/doctors, Dr. Brian Buehler and Dr. Darin Reagan, with the concept. After some discussion on the topic, Feldsien and Buehler decided to approach CEO Thorne.

Thorne had previous experience with CEREC in the late '90s in one office, but had never implemented it fully in all PDS offices. He was, however, continuously monitoring the technology waiting for the right time to incorporate it into the entire organization. Prior to the conversation with Feldsien and Buehler, Thorne had multiple discussions with Dr. Charles Goodacre, dean of Loma Linda University School of Dentistry, for his perspective. Goodacre gave Thorne the confidence that the technology was ready for the company. Therefore, with the encouragement of the CEO of PDS, Feldsien, Buehler, Reagan and dental assistant Allen Baker were sent to a CEREC training program. Shortly thereafter, the PDS-affiliated practice in San Clemente, Calif., received the organization's first CEREC unit. Confirming the belief in the technology, the practice successfully completed 68 CEREC restorations in the first month.

PDS began to explore options that would allow them to implement CEREC technology throughout the organization. PDS began developing an implementation strategy, which included combining CEREC technology with IPS e.max CAD lithium disilicate glass-ceramics. Offering greater strength and esthetics than other glass-ceramic materials, PDS-affiliated clinicians began seeing promising results.

Among the many added benefits of combining CEREC technology with IPS e.max CAD lithium disilicate, clinicians began to appreciate the ability to customize restorations to meet the specific case requirements. Although there was a learning curve to the new processes and materials, the dentists improved each day. Additionally, PDS-affiliate offices noticed a reduction in laboratory costs when CEREC was implemented, from 9 percent to 11 percent of gross revenue, to 6 percent to 7 percent, which added four to five points to an offices' bottom line.

## CEREC IN PRACTICE TODAY

Currently, 99 percent of PDS affiliate practices are equipped with a CEREC machine and the machines are used daily. Seventy-one percent of all single-unit crowns are CEREC-designed and milled from a variety of blocks, including IPS e.max CAD. PDS affiliate practices are believed to be in the top 1 percent of CEREC users country-wide, in many affiliate practices use of CEREC is near 90 percent, and some fabricate more than 100 CEREC crowns per month. Widely successful within the PDS organization, affiliated clinicians have since experienced significantly reduced incidences of fracture and failure.

Recently, these numbers have further improved through the advent of CEREC 3D and BlueCam. Offering greater ease-of-use, these new systems are widely favored and have enabled many practices affiliated with PDS to complete up to 97 percent of their single-unit restorations with CEREC technology.

As the confidence of the clinicians affiliated with PDS has increased with the use of CEREC, they have moved from completing only posterior full-coverage restorations, to full-coverage anteriors, and even anterior veneers. Additionally, clinicians have begun using CEREC technology as an alternative to traditional fillings, because many clinicians believe that restorations designed and milled with the system demonstrate better results.

In the future, clinicians affiliated with PDS believe that the CEREC system will be used for full-mouth reconstruction and high-esthetic cases.

Patients have also become more accepting of these types of treatments and have come to understand the value of the treatments they receive, which has resulted in them being more willing to pay extra for the services rendered. Additionally, these factors have contributed greatly to the recent increases in the number of dentists choosing to affiliate themselves and their practices with PDS.

When looking at the various offices of PDS, Feldsien often refers back to the story of Dr. Eric Swensen when discussing the implementation of CAD/CAM in PDS offices. Previously a private practitioner in Utah, where the number of patients per dentist is less than 1,000:1, Swensen was looking for an opportunity to expand his practice and expertise. After coming across a PDS advertisement, Swensen drove to Tucson to meet with Feldsien

about possibly affiliating with the organization. After a brief meeting, it became apparent that Swensen was a true believer in the system and in CEREC. Using CEREC for seven years prior, Swensen had experienced all the benefits CEREC had to offer and could not imagine practicing dentistry any other way. He is now a successful PDS owner dentist with two offices in Tucson, with CEREC being 95 percent of all single-unit restorations.

## TWO SUCCESS STORIES

Brian Beuhler, D.D.S., of Laguna Beach, Calif., was in private practice for 10 years prior to joining PDS. Now in his tenth year with the company, Dr. Beuhler is a firm believer in the Private Practice +™ model. As owner and doctor, he makes all clinical decisions and purchases the equipment he deems necessary. Offered through PDS at a better price point, he now has the ability to obtain the advanced technologies necessary to provide his patients with better service.

Bradford O'Neill, D.D.S., B.S., of Aurora, Colo., was in private practice for 16 years prior to joining PDS. Now in his third year with the company, Dr. O'Neill has also become a strong supporter of the Private Practice +™ model. As a private practitioner and owner of early CAD/CAM, laser, and digital radiography technologies, he was often hesitant to commit the capital required to upgrade his systems. As an owner and dentist with PDS, he is able to have the most advanced systems and updates as soon as they are released, while the company handles the logistics of maintenance costs. Saving him time and money, he now has the ability to provide his patients the best treatments for a fraction of the cost.

» Above: Bradford O'Neill, D.D.S., B.S., and his staff at his practice in Aurora, Colo. Left: Brian Buehler, D.D.S., practices in Laguna Beach, Calif.

PDS has continued to pursue Thorne's vision to become one of the great dental companies in America, with CEREC as an integral part of those plans. Expanding beyond its Southern California and Southwestern roots, within the next year alone the company plans to add 40 affiliated practices. Growing at a rapid and dramatic pace, the following year will see the addition of 50 more offices, then 60 offices in the next, and 70 offices after that.

Utilizing CEREC technology including both CEREC chairside and CEREC Connect, PDS' main focus remains being on the leading edge of innovation in the dental industry. The clinicians at PDS have a near-term goal of greatly reducing or completely eliminating the use of traditional impression materials. Utilizing CEREC Connect and digital impressioning, the organization believes, at a minimum, that it can reduce current use of these materials by up to 90 percent to 95 percent.

The clinicians at PDS have in the center of their target clinical excellence, which they are defining as the endless pursuit of perfection in dentistry. These clinicians have experienced that the implementation and incorporation of CEREC technologies within their affiliated practices has greatly enhanced their ability to get closer to their ultimate pursuit. ❖

HAPPENINGS IN THE WORLD OF CAD/CAM

# An Amazing Year

BY SAMEER PURI, D.D.S.

This has been an amazing year in the world of CAD/CAM. It started with the introduction of the 4.0 software and I was chosen to be one of the select few privileged enough to beta test it. No doubt this software upgrade will have a profound impact on CEREC users worldwide.

In April, I was invited to the International Dental Show in Koln, Germany. In all my years of dentistry, I've never seen anything like it. It's a trade show that happens every other year, and every dentist should plan on attending at least once in their career. No lectures, no seminars - just thousands of vendors and all the exciting things they have to offer. Not only that – at 5:00 p.m., all the booths convert into bars, where attendees enjoy a nice cocktail to wind down the evening. The entire focus of the meeting was CAD/CAM and digital impressioning, with dozens of devices (some good, some not so good) from different manufacturers on display.

In July, at the 3rd Annual CEREC Owners Symposium, we introduced the 4.0 software to the masses with clinical demonstrations and great lectures by the CEREC Doctors faculty. It was one of the best meetings that I have attended. The enthusiasm and excitement of the attendees as they witnessed the 4.0 software was a sight to behold.

Hundreds of doctors stared in amazement as speakers and beta testers demonstrated the nuances of the new software. We even had the opportunity to fly out Sirona's Ingo Zimmer and Chris Goodson from Germany. These are the guys who are in charge of the programming and marketing of the software worldwide.

2011 has also been a breakthrough with the cerecdoctors.com Mentor Group. Our inaugural mentor meeting occurred at the same time, piggy-backing the annual symposium. The excitement and enthusiasm of the mentors was contagious – you could see great friendships developing and new bonds forming as our mentors were exposed to the variety of manufacturers present at the meeting.

The CEREC courses at Scottsdale Center have also been very well received. The demand has been so great that we have had to add additional courses and dates. Dr. Mike Skramstad did a great job with the InLab program, which teaches doctors who have the inLab software how to get the most out of it and create things like bridges, implant abutments and layered restorations.

While all these events have been milestones for our CEREC Doctors, nothing this year tops the biggest event and change in my life: selling my practice and relocating to Scottsdale full time with my family. Over the past five years since Scottsdale Center opened, both Armen and I have been commuting to teach our courses and be at the Center for the work that goes into running the courses and the website. With all of the travel, I became a favorite customer of Southwest Airlines. Even the valet parking guys at Burbank airport got to know me by first name. It came time to make a decision and to commit to teaching without all the travel and time away from the family.

While it was an extremely difficult decision to leave all of my family and friends back home in Los Angeles (my home for the last 30 years), it was even more difficult for my wife and kids, who now have to adapt to new schools, new surroundings and new environments.

For me, the transition should be easier. I will be busy in work, running the CEREC programs, managing the website and seeing patients, as well as taking care of all of the other things that are part of the daily grind of work.

But for my wife, a whole new house, new schools for the kids, a new social circle. I have to say that if it were not for

the support of my family, this move would have been all the more difficult to accomplish.

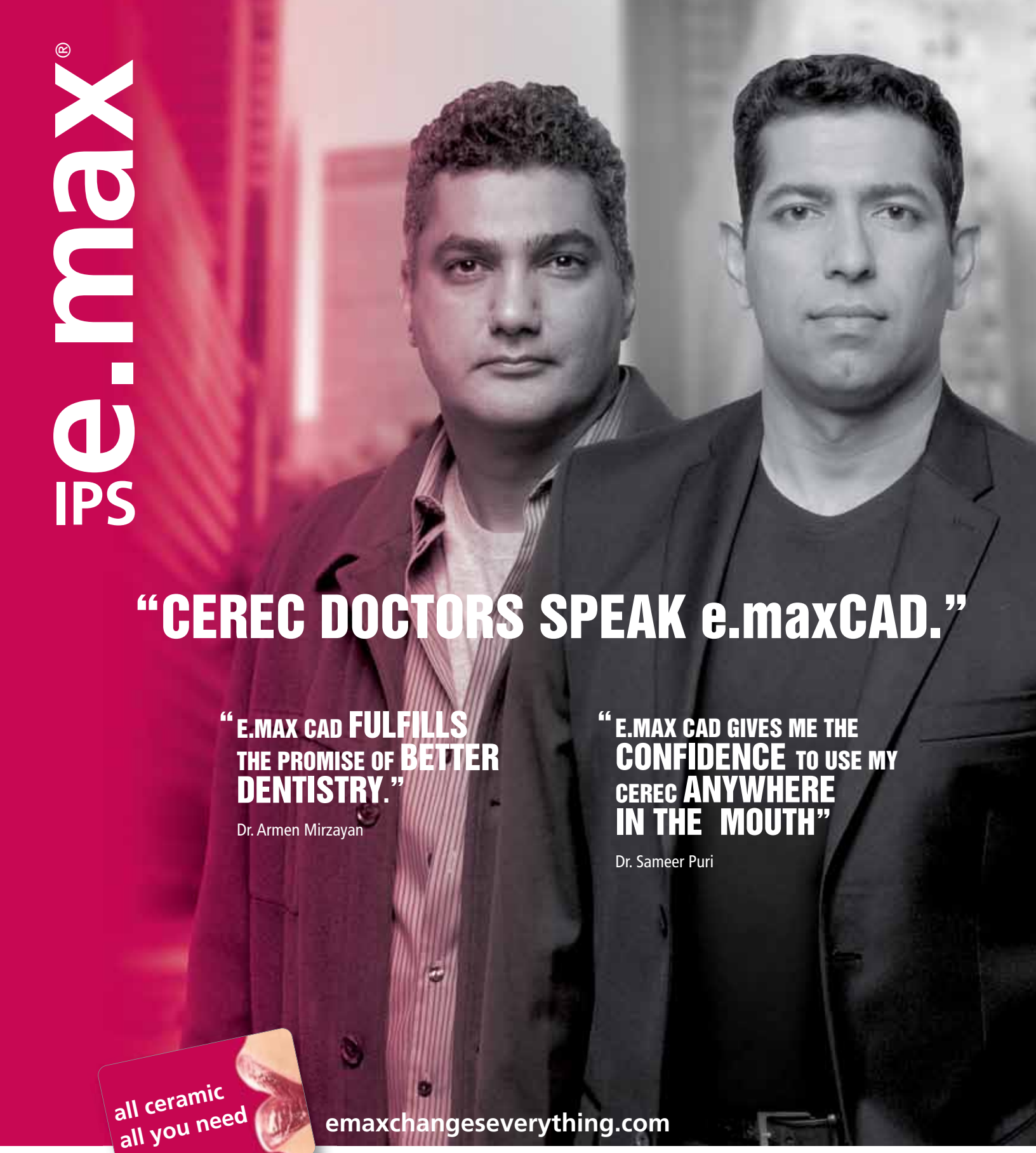
The bottom line is, if we are to meet the goal of keeping Scottsdale Center the premier destination for CEREC education anywhere in the world, this wasn't going to happen via telecommuting. My wife and I discussed long and hard how it would affect the family, the kids and the patients that I've spent the past 14 years treating in my current practice.

We decided that it would be worth the decrease in travel – as well as the opportunity to work full-time with guys like Dr. Frank Spear, Dr. Gary DeWood, Dr. Bob Winter and of course the rest of the Spear Education group.

As much as I loved my private practice and enjoyed working on the patients, I welcome the challenge to slow down and do dentistry in a different light – one where I am treating the patient not so much for the sake of getting the treatment done and the production on the books, but making every case an educational experience for the doctors in our courses, as well as those doctors on cerecdoctors.com.

I'm excited about the future and excited about the challenge of a new career. This is a good move not only for me and my family but also for CEREC owners, as I hope to be able to make CEREC more mainstream by introducing it to the masses.

2011 has been a great year. 2012 will be even better, as we look forward to the future. And the future is bright! ❖

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