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THE NEXT STEP

By Mark Fleming, D.D.S.

By the time many of you read this, the CEREC 27 and a half Anniversary Celebration will be under way. I'm sure you would agree that it was an

incredible meeting filled with not only great education and entertainment, but also an invaluable opportunity to network with like-minded individuals who are ready to take the next step in their practice, utilizing digital dentistry and dental CAD/CAM, and all these technologies have to offer.

This meeting spoke to a bigger meaning, The Next Step. Sirona has not rested on its accomplishments of the past. Instead, it has chosen to build on those accomplishments which, in turn, benefits dentists and the people they treat.

Take a look at CEREC. It went from what is now considered raw technology in CEREC 1 to the latest in software and hardware that can help any practitioner do great dentistry. Sirona is always looking to what it can do next in the field of digital dentistry.

So, what are you doing now to accomplish *your* next step? At a recent advanced training course at Scottsdale Center for Dentistry, a group of us were talking about the beginnings in our CEREC travels. I was relating how my Basic Training was done in a CEREC user's office. This was the norm at the time. We must have been a pretty sharp group because the trainer exposed us to the advanced technique the second day. That advanced technique was Correlation (BioCopy). Oh, how things have changed!

> What are the "next steps" you have taken in your journey with this technology?

Now that things have changed again, what have you done to keep up? What are the "next steps" you have taken in your journey with this technology? I'm assuming that you are not using only what you learned in dental school in your practice today. So why would you then just rely on what you learned in Basic Training when using the CEREC technology? There is SO much more to take advantage of with this technology! Not only would it be beneficial to you and your practice to take advanced training, it would be beneficial for your patients as well.

But it's not just CEREC and digital technology that will help you take your practice to the next level. I don't know about you, but what I learned in dental school about the business aspect of a dental practice was pretty underwhelming. And, as I hope we all know, this is an important area that can affect our success. At the end of October, practice growth strategist Imtiaz Manji will present "*Practice Growth: Creating The Yes Practice*." This workshop will give doctors and staff the strategies to take their practices to the next level. Make plans now to attend. It is another great "next step" in your journey to success.

Remember, it is important to take that "next step" in everything you do. We hope that we can help you as you take that next step in your journey with CEREC and digital technology. Thanks.

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CONQUERING THE INCONVENIENCE MINDSET

How to Use CEREC to Change the Story of Dentistry

By Imtiaz Manji

Don't you hate all the trouble you have to go through to buy a new iPad? First, you have to make an appointment with your local Apple Store

and, because of their limited hours, it often means taking time out of your work day. When you get there, you have to sit and wait until you're called. Then, once it's determined exactly what you need, you have to schedule another appointment to come back and pick up the device in a couple of weeks.

Actually, I've just described a typical dental patient's experience. When, as most of us know, Apple's customer experience is far more enjoyable and convenient.

Apple does a lot of things really well — that's how they've gotten where they are — and one of those things is that they make it easy to buy. It starts with creating great products of course, and their marketing is outstanding, which drives people to their stores. But it's also about what happens when customers arrive at the Apple Store that really impresses me.

Their model is to have a team of experts on-hand to provide information and advice, and who make it clear they are there to help. When you make the decision to buy, there is no checkout line. You simply hand your credit card to the person who's been helping you. They swipe it and bag your purchase on the spot. Everything about their system is designed to eliminate any speed bumps between you and the purchase.

You might say that this is an unfair comparison — that there are some realities about dentistry that mean it will never be able to compete with the consumer appeal of Apple products, and that's true enough (I'll get to some of those realities in a moment). In fact, Apple products are so widely and eagerly desired that many, many people would gladly go through the dental-practice model I described in the beginning to get their hands on a new iPad. But they don't have to, because Apple hasn't just revolutionized consumer electronics, they've revolutionized the whole retail experience. They make it easy to buy.

So, you're not Apple. But you do have some advantages Apple doesn't, such as your re-care model that practically mandates that patients return, and your ability to build face-to-face relationships one at a time. And if you have CEREC, you have something else, too —something that gives you the potential to get a little closer to the Apple model of making it easy for people to say yes.

CEREC LETS YOU MEET THE PATIENT HALFWAY

What Apple is doing is telling a story — one that has obviously resonated in a huge way with consumers. But they had the opportunity to craft that story from day one. You, on the other hand, have to deal with the fact that most patients already have a story about dentistry: and that story is probably uncomfortable, potentially painful and possibly expensive.

Let's face it; even the best patients (the ones who value dentistry, always keep their appointments and accept your treatment recommendations) don't really enjoy dental visits. Lying on your back with someone's fingers (and various instruments) in your mouth is nobody's idea of a good time, even if you recognize that the result is worth it. Dropping off dry cleaning is a chore and a nuisance. A dental appointment is more personally invasive and time-consuming, and therefore more inconvenient.

This inconvenience has significant implications. When something is seen as uncomfortable and inconvenient, a whole set of negative mindsets get attached to it. Mindsets around cost and insurance get attached. Mindsets around pain get attached. Just look at how many people joke about the pain of going to a dentist. Most of them have probably never experienced any significant discomfort during dental treatment, it's just easy to play on that stereotype. It's the inconvenience that really bothers them. Most of the other issues are just along for the ride.

This is where CEREC can help re-write the story. If you can take that inconvenience issue and reduce it dramatically, you're halfway there in terms of dealing with all the other issues that get attached to dentistry. Make it easy for them, and a lot of other objections just fall away.

Look at the upside: you'll transform that patient's expectations and mindset about dentistry forever. You'll change the story. And that's the kind of thing patients talk about.

BE STRATEGIC AND DOUBLE THE CONVENIENCE

"With CEREC, you don't have to come back for a seating. We can do it all in one appointment, which saves you a visit." That's a good story that highlights the convenience of CEREC.

Here's an even better story: "We have CEREC here, so we can do this right now and have you on your way today." Now you're talking about saving *two* visits. Now you're eliminating a lot of the inconvenience, and the objections that go with it. You're making it really easy for a patient to say yes.

Being in a position to offer this convenience is simply a matter of being strategic with your patient base and your scheduling. For instance, if you have a re-care patient coming in who you know has a need that could be addressed using CEREC, schedule them when you know you'll have some flexibility: right before lunch, for instance, or at the end of the day.

I also know of CEREC practices that keep their eyes out for new patients who they know haven't had treatment for some time, or who self-identify as having a particular concern. They make sure they schedule extra time for that first appointment so they can be ready to present an "instant dentistry" solution if necessary. (If the patient doesn't end up going ahead with treatment, they chalk up that time as an investment.) I know practices that do so well with this strategy that they become concerned if their schedule is too full, because they worry about missing an opportunity to be spontaneous with CEREC when they need to be.

Sure, it might mean a late day at the office, or swapping a lunch hour for a PowerBar sometimes, but look at the upside: you'll transform that patient's expectations and mindset about dentistry forever. You'll *change* the story. And that's the kind of thing patients talk about.

YOU'RE ALREADY DOING IT

If that sounds like too much unpredictability and stress, consider this: you're already following this model, to some degree.

Dentists have always made it part of their professional obligation to accommodate unscheduled patients. They're called emergencies, and you do what it takes to serve them. You move appointments around, you work through lunch, you stay late. You do it because you understand they're in pain.

So, it's really just a matter of recognizing that inconvenience is a pain in itself; one that needs to be addressed whenever and however possible. And for that kind of discomfort, CEREC is the most powerful pain reliever dentistry has ever invented.

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O M N

THE NEXT GENERATION OF INTRAORAL SCANNING

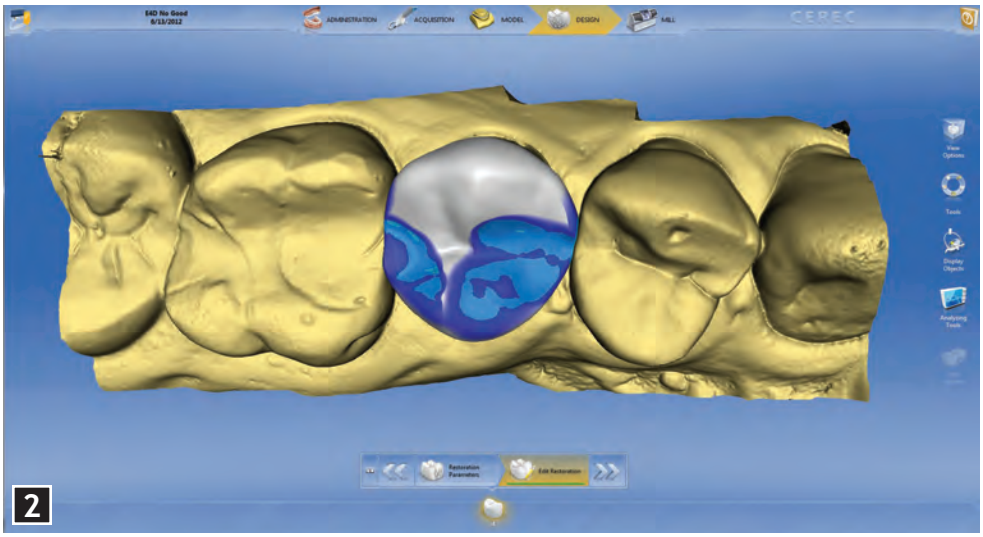
RELEASED IN AUGUST, THE OMNICAM represents the latest in technological innovation in intraoral imaging for CAD/CAM scanning and restoration fabrication. Part of the CEREC system by Sirona, the new Omnicam is the first intraoral scanner that is not only a powder-less camera, but also captures the dentition using live streaming in color.

The CEREC system is a combination of an intraoral scanner, with a milling unit, that is used to capture and send digital information to the lab. That same digital information can be used to fabricate one-visit chairside restorations. In its 27th year of existence, the CEREC technology has seen an evolution from the CEREC I to today — where we have the third generation in scanning technology and the latest in software design.

Used in dental offices for the fabrication of inlays, onlays, crowns, veneers, bridges and more, the CEREC system is used in more than 36,000 offices worldwide. One of the foundations of the system has always been the ease of imaging with all generations

I C A M

BY SAMEER PURI, D.D.S. & ARMEN MIRZAYAN, M.A., D.D.S.
CO-FOUNDERS OF CERECDOCTORS.COM



of cameras. Despite the fact that the system required an opaque powder to be applied to the teeth, the intraoral scanning with the previous generation of camera, the Bluecam,
was quite easy and set the standard for all other systems (Fig. 1). In a matter of seconds, users could spray a thin coat of powder on the teeth and use the Bluecam to capture individual images. Those images would then be processed by the software to create a virtual model on which the restoration could be designed allowing the clinician full control over the contacts, contours and occlusion (Fig. 2).

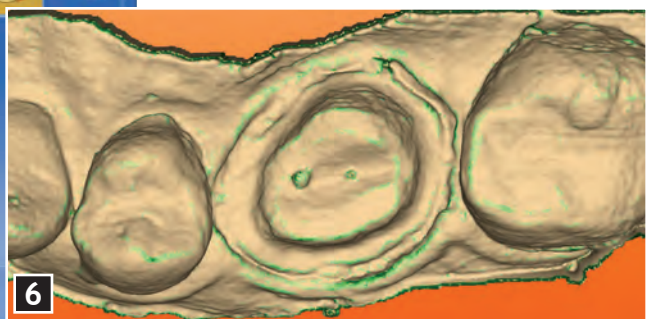
The Omnicam differs in three main ways from the Bluecam which, up to this point, was considered the gold standard in intraoral imaging in dentistry:

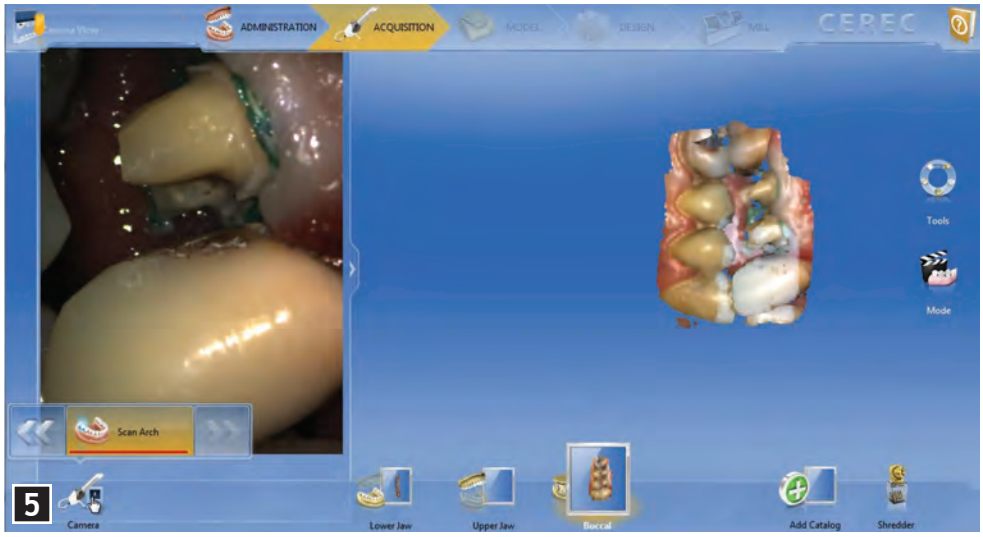
1 | The Omnicam is completely powder-less. Simply take the camera and use it in a similar motion to an intraoral camera to capture images in the mouth. The camera captures in vivid detail the hard and soft tissues and allows the user to differentiate the dentin, from enamel to the soft tissue. Figure 3 shows the actual scan of a prepared tooth as it's being imaged with the Omnicam. There is no powder required on the teeth prior to imaging.

2 | The Omnicam images in full color. Virtually every other intraoral imaging system takes its images in black-and-white and renders the virtual model in a graphical representation of the teeth. The Omnicam, on the other hand, not only allows the user to visualize the teeth in full color, it also renders the models in true photorealistic imaging. The models are not a graphical representation of the acquired information, but are in fact of the quality

Due to print deadlines, the Omnicam images shown are with a beta version of the software. Please visit www.cerecdoctors.com/omni for the most up-to-date videos and information.

Below: An intraoral image from a competing "powder-free" camera.





of a high-resolution photo. This allows the user to design the restorations on a true representation of the model. The color capabilities were already shown in Figure 3, and the virtual model that is created by the color capture is visualized in Figure 4.

3 The images that are captured by the Omnicam are in live streaming of data format, not as individual images. The advantage of this is that the user simply waves the camera over the area they want to capture — without any powder — and the live streaming of data feed fills in all the missing data to create a virtual model. No longer is the user dependent on individual images to fill in the missing data. The clinician can simply scan the desired arch without having to worry about any images stitching. Figure 5 shows the Omnicam capturing the buccal bite utilizing a live stream in color.

While other imaging systems have had one or two of these features, until the Omnicam, no other system has been able to combine all three features in a single system. Video capture has been done previously, but never with the ease of the Omnicam and with the absence of powder. Color has been present on other systems, but the systems that used color had a camera that was slow and clunky to use, and captured individual images, which require a long time to stitch together to form a virtual model. Some systems have had powder-free capabilities, but the imaging was archaic and the data captured rendered virtually useless models (Fig. 6).

Not until the Omnicam has there been a system that is powder-free, captures live streaming of data and is in color. The result is a system that is easy to use by clinicians and renders accurate and precise models quickly and efficiently.

Having used the Omnicam for several months now, the authors feel that it is a major step forward in the world of CAD/CAM dentistry.

For existing CEREC owners, it's important to understand that once the image is acquired with the Omnicam, the data is processed by the same 4.0 software that was released by Sirona in 2011 and used by Bluecam users. This ensures that the learning curve is minimal. The software is obviously modified to work with the Omnicam, but in all other aspects has the same tools and features as the regular 4.0 software that is currently available with the Bluecam — allowing users to easily and rapidly integrate it into their practices.

CASE STUDY

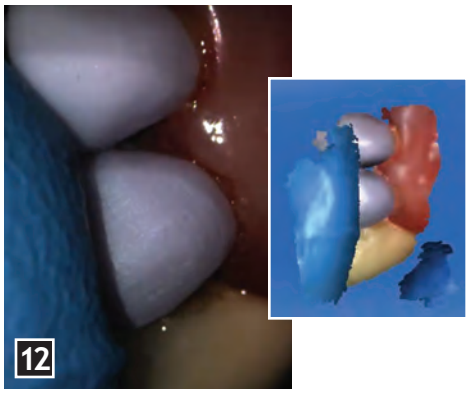
A patient presented to the office with decay of the pre-molars. The teeth were prepped and captured with Omnicam. Figure 7 shows the prepared premolar teeth captured with Omnicam.

After administering anesthesia, the teeth were prepared for full coverage crowns and imaged with the Omnicam. The preps, buccal bite and opposing teeth were captured using intraoral scanning and the models were digitally articulated in the software (Fig. 8).

After articulating the models, the

margins were drawn on the virtual models that were created with the intraoral scanning. The photorealistic models were a true representation of the preparations, where not only the preps were captured but also the surrounding tooth structure with their appropriate restorations such as amalgams (Fig. 9).

Once the margins were drawn, the software rendered the proposals (Fig. 10). The proposals were based on the same



Biogeneric principles that have been used in previous CEREC software versions. All of the familiar tools and menu items that are present in the Bluecam are available in the Omnicam software. The opposing arch was turned on to accurately modify the proposals as well as the occlusion (Fig. 11).

After completion of the design, the restorations were milled with lithium disilicate e.max blocks.

Another advantage of the Omnicam is that it can be used to verify intraoral fit of the milled restorations. Due to the high resolution of the camera, the visual verification of the fit of the restorations can be performed with ease. Figure 12 shows how the marginal fit of the restorations is verified visually using the Omnicam. The milled restorations were crystallized using the Ivoclar Fast Fire cycle and bonded in place using Multilink adhesive cement.

The Omnicam represents a major leap forward in CAD/CAM imaging. Its ease-of-use and clinical accuracy sets the bar for all other systems going forward. It is the authors' opinion that all current and future CEREC clinicians will benefit significantly from utilizing this technology in their practices.

VERIFYING BUCCAL BITE ACCURACY WITH THE CEREC OMNICAM

By Sameer Puri, D.D.S., and Armen Mirzayan, M.A., D.D.S.

Capturing occlusion with the CEREC technology has certainly come a long way. Initial versions of the CEREC had no method for the clinician to accurately determine the occlusion. In fact, the only way to properly gauge occlusion was to design the restoration with no opposing scan and manually grind in the occlusion in the patient's mouth. Subsequent versions of the CEREC allowed clinicians to have the patient bite on a bite registration. The indentations in the bite registration were used to record the anatomy and position of the opposing teeth.

While these methods certainly had their place, once the Buccal Bite feature was introduced, other techniques were rendered obsolete. The Buccal Bite allows the clinician to scan the prep and opposing teeth, and allow for the digital articulation of the arches.

Regardless of what technique is used to accurately record the occlusion, a practitioner can inadvertently introduce errors in the process, leading to a frustrating seat appointment. The advantage of digital dentistry is that it is very easy to verify that the correct process is occurring to minimize post-cementation adjustments.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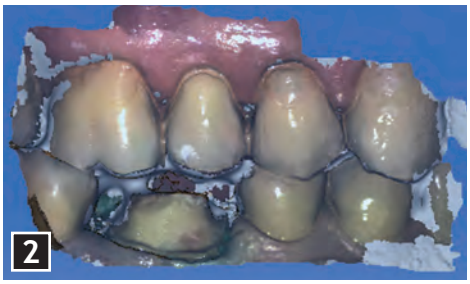
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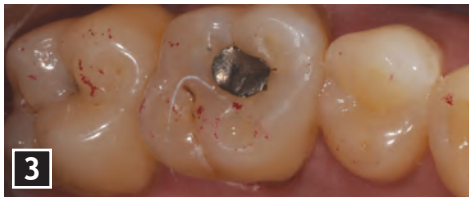
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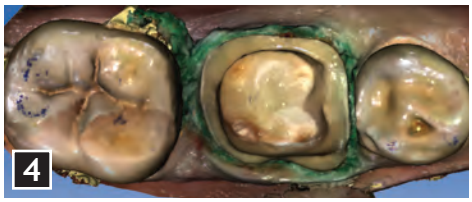
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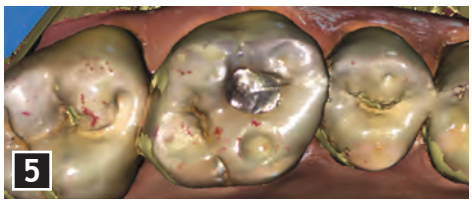
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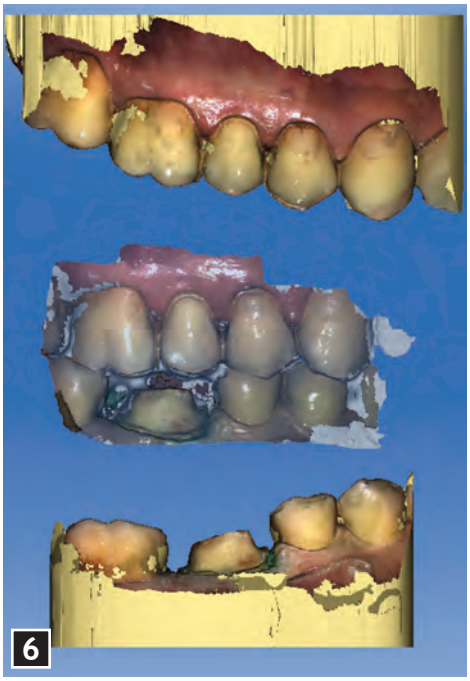
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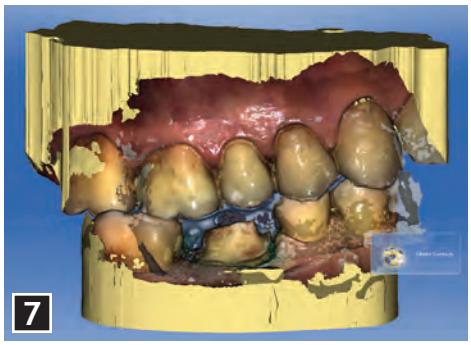
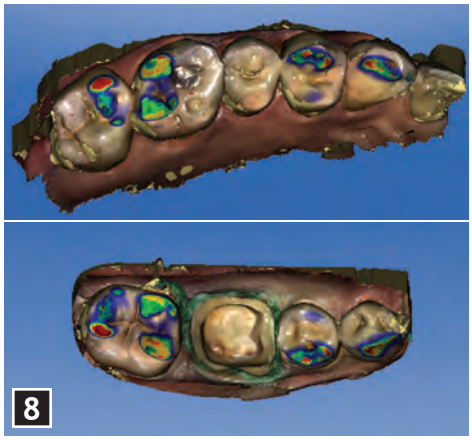
BUCCAL BITE ACCURACY

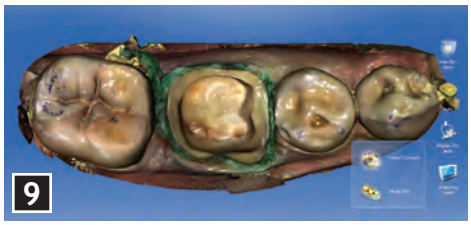
The buccal bite optical impression is taken when the patient is in maximum intercuspation (Fig. 1), either before or after the teeth have been prepared. The images are registered with the color streaming video capture of the Sirona Omnicam, the flexibility of which allows the clinician to take the images either before prepping the teeth or after (Fig. 2). The optical impression of the opposing arch, in this case the upper right maxilla, is also captured (Fig. 3), along with the prepared arch (Fig. 4).

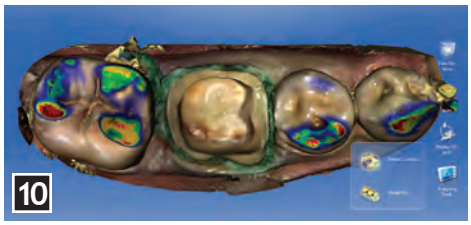
With the advent of the Omnicam, precise color representation of the dentition is recorded in the software. In the 3-D model

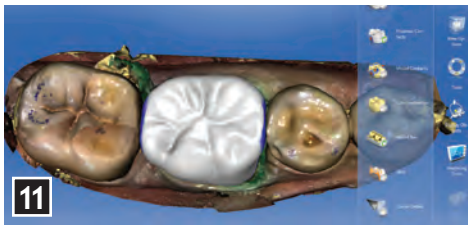
Due to print deadlines, the Omnicam images shown are with a beta version of the software. Please visit www.cerecdoctors.com/omni for the most up-to-date videos and information.

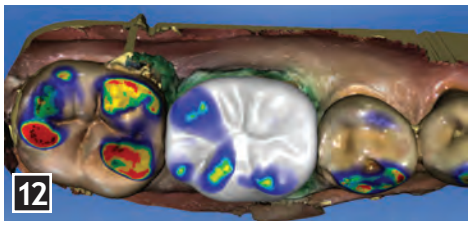












of the upper arch (Fig. 5), one can readily discern red occlusal markings that were captured after the patient articulated, with articulating paper clearly showing where the patient's occlusion is intraorally. The color camera can also highlight the amalgam restoration that appears in the upper first molar. The importance of being able to visualize where the markings are intraorally in the scan is that it allows the dentist to verify these markings intraorally at this step.

Once the lower arch, upper arch and the buccal bite are captured, the software proceeds to the model step, where the clinician has to articulate the arches together (Fig 6). In this clinical case, the buccal bite was transferred to the upper arch and then that complex was moved and articulated to the lower arch (Fig. 7).

At this step, one can activate the Model Contacts feature of the software (Fig. 8) and again verify that the digital occlusal markings correspond to the articulation marks that were recorded intraorally, thereby verifying the manual and digital recording of the occlusion.

Once satisfied with capture of the correct bite, the software proceeds to the margin placement step in the Phase menu (Fig 9). Once again, the black markings of the articulating paper are captured by the Omnicam, and when the digital color palette is activated, one can verify that the proper occlusal stops are demarcated (Fig. 10).

The Biogeneric software then renders an automatic proposal that positively creates a contact to the adjacent teeth and derives its morphology from the neighboring dentition (Fig. 11). The software has many features that allow a dentist to analyze the occlusal scheme and design the desired occlusal stops on the restoration, along with the proper force distributed in that area (Fig. 12). Once the restoration is designed to the clinician's desires, the restoration is milled in about nine minutes with the CEREC MC XL milling machine.

After trying in the restoration and verifying proper contacts (Fig. 13) and margins of the lithium disilicate restoration (e.max by Ivoclar) the restoration is placed in an oven and crystalized with proper accentuation with stains and glaze. Once that process is complete, the restoration is prepared for delivery. Since the buccal bite was captured in maximum intercuspation, generally there are some minor adjustments to make in excursive movements after the bonding agent has been cured and excess resin has been removed. Figure 14 reflects the immediate bite registration markings of articulating paper, which very accurately reflect the digital markings found previously in Figure 12. The inner incline of the distolingual cusp was adjusted and the patient was dismissed.

After years of CEREC use, it's still exciting to deliver care with such precision and to be in total control over the outcome. The excitement never subsides, even after years of repeated validation that the system works very accurately.

CAD/CAM Product News from Sirona

SUPERIOR ACCESS. POWDER-FREE. COLORSTREAMING: CEREC AC WITH OMNICAM DOES IT ALL

By Ingo Zimmer
Product Marketing Manager CAD/CAM Sirona Dental Systems, LLC

The CEREC Bluecam was groundbreaking when introduced in 2009. The precision, the speed

and the ease-of-use made the Bluecam the best-selling and highest-quality 3D-intraoral camera on the market. So we asked ourselves: How can we make something this powerful even better? What is the next technological leap? We challenged ourselves and decided to design a completely new 3D intraoral camera from the ground up.

Our engineers at the Sirona Center of Innovation in Bensheim, Germany, answered this challenge by developing a camera that is small and beautiful, yet improves upon our innovations of the past: The CEREC Omnicam. Its incredibly compact camera tip allows for the best intraoral access in even the tightest spaces. New ColorStreaming of the intraoral data makes the scanning process even faster and easier and, with it, Sirona introduces another industry first: full-color presentation of the captured data. Now dentist and patient can see the actual clinical situation in the mouth. And yes, the CEREC Omnicam is truly powder-free; yet, it retains CEREC's stringent precision requirements established by our industry-leading Bluecam.

DESIGNED FOR ACCESS

The biggest challenge during the design process was to create a camera tip even smaller than the CEREC Bluecam. Achieving this was only possible by building a completely new optical and electrical system and combining it with the latest manufacturing methods. The result is a camera with a shape and size that feels much more like a dental hand piece than a 3D intraoral camera. A rounded camera tube allows easy rotation of the camera and increases operator comfort level. The small camera tip features a scratch-resistant sapphire lens and guarantees the best intraoral access. Holding the camera in your hand feels very natural and the weight is perfectly balanced. The CEREC Omnicam is truly a breakthrough in design and engineering.

POWDER-FREE FOR CONVENIENCE

The CEREC Omnicam works completely powder-free. It does not need any reflective medium for capturing data. This simplifies the learning curve and makes the scanning process of, for example, half/full arches convenient and fast, yet retains the highest level of precision to meet Sirona's industry-leading standards.

COLORSTREAMING FOR CONFIDENCE

Scanning with CEREC Omnicam is very intuitive and easy to learn and now the result is in full color! ColorStreaming allows the user to perfectly visualize the captured data as the camera moves over the teeth. In addition, the position of the camera is visually highlighted in the software to give the best guidance and orientation possible. The scans can be paused any time and additional scans can be taken if necessary. Intraoral scanning has never been easier, nor more intuitive.

The CEREC Omnicam also captures and visualizes 3D intraoral data in full color. Another Sirona first, the user can see on the screen what s/he sees in the patient's mouth in real time. The color information allows differentiating between soft-tissue and tooth structure. Different filling materials like gold, amalgam, etc., are shown on the screen as they are in reality. Even pre-operative static and excursive markings from articulating paper can also be seen and considered during restoration design. CEREC takes the clinical evaluation, patient experience and their treatment to a new level of clinical excellence.

Superior access, powder-free and ColorStreaming — all features that directly benefit the user and make the CEREC Omnicam the most advanced 3D intraoral camera Sirona has ever built and the industry has ever seen. It is a break-through in design and engineering and elevates CAD/CAM to the highest level of clinical dentistry.

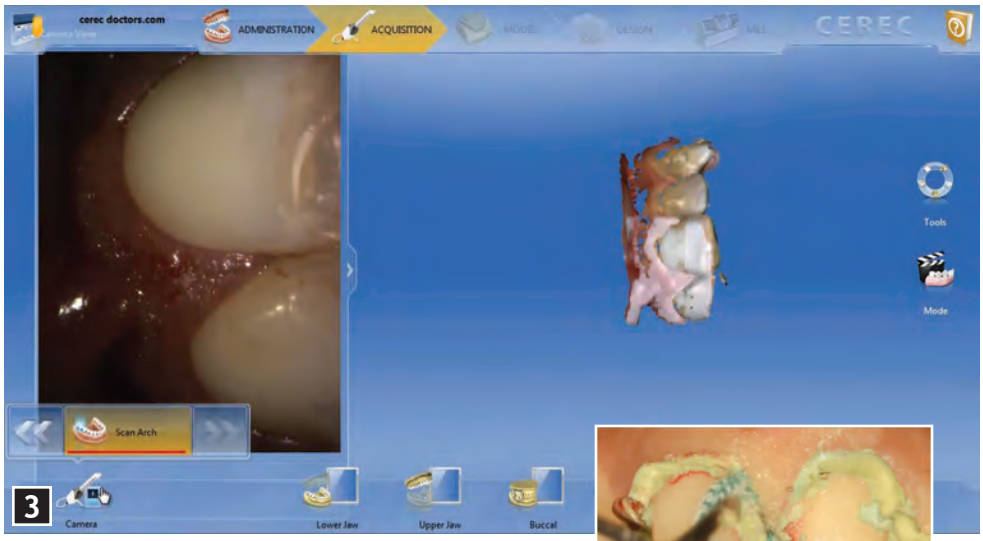
Please visit CEREConline.com or cerecdoctors.com/omni for more information.

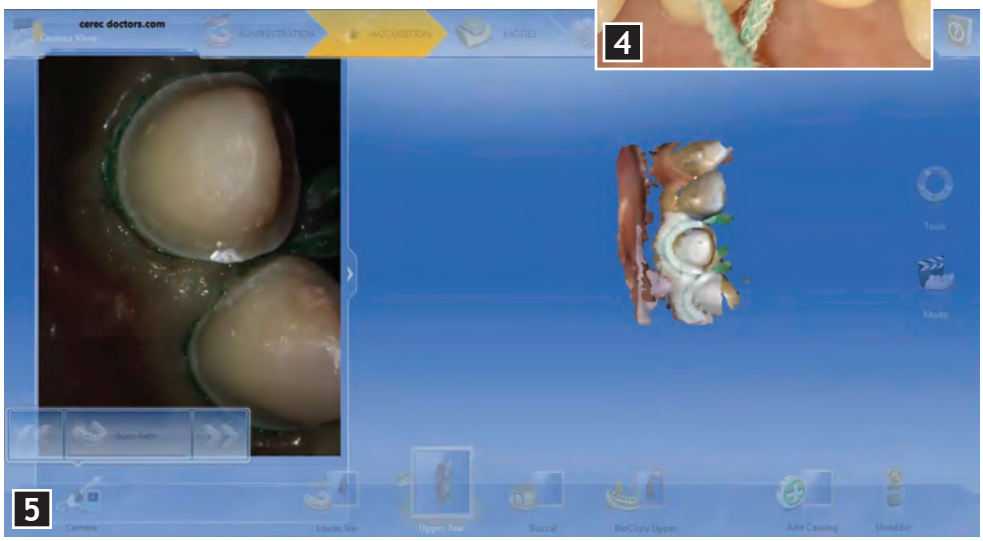
A PAIR OF CENTRALS RESTORED WITH OMNICAM

By Armen Mirzayan, M.A., D.D.S.

I have been beta testing CEREC for almost a decade now. I used to be the stereotypical dentist, isolated in my dental office with no contact with my peers—both on purpose and for the mere fact that I'd rather just be left alone to do my dentistry, one tooth at a time. Technology, let alone dentistry just didn't interest me enough to expand outside of my comfort zone, which included prepping a single tooth, taking an impression and sending it to the lab to have a crown fabricated. Unbeknownst to me, my life was about to change dramatically when I was asked to beta test the original CEREC 3D.

A chance occurrence landed me the opportunity to beta test CEREC 3D. I had reluctantly purchased the CEREC 3 as a possible escape from my isolation hoping that it would bring some excitement into the profession that I had been so diligently working in. But as I started to test the CEREC 3D, I knew that there was no way I was ever going to practice analog dentistry again for the rest of my career. I knew that the CEREC was going to be my escape from my isolation. Watching the models render in 3-D after taking intraoral





Due to print deadlines, the Omnicam images shown are with a beta version of the software. Please visit www.cerecdoctors.com/omni for the most up-to-date videos and information.

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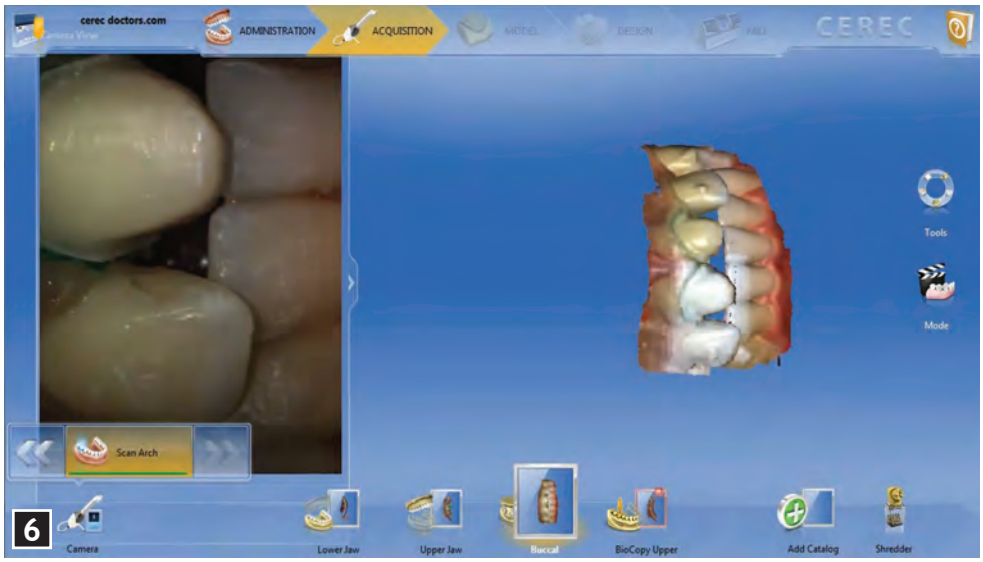

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images was something that I had never witnessed before in my life. For a year we tested the software — at that time it was very unstable but still visually dramatic as it allowed me to image in the mouth and design my restorations in 3-D. When it was launched in 2003, a mass influx of new users came aboard. The early adopters quickly integrated and the number of users doubled in a short period of time. There have been significant advancements made to CEREC over the years, but nothing has captivated a potential user like the original transition from CEREC 3 to CEREC 3D.

Until now. Until Omincam.

8

Recently, I had the opportunity to test the development of the Omnicam from Sirona. The image acquisition has dramatically evolved to live color video capturing, which I now believe will have a bigger impact on dentistry than the aforementioned development of 3-D rendering of the models. Although we were able to manage multiple units, both posterior and anterior, with the predecessor camera the Bluecam, the process of imaging with the Omnicam has now become infinitely easier. As a beta tester, I verify accuracy, have input on design and provide thoughts on workflow. When the opportunity came to test the workflow with the new Omnicam, I applied all of the beta testing principles to a pair of central incisors that needed restoration in the office.

CASE STUDY

The patient presented with large failing composite restorations interproximally on both distal and mesial post invisalign treatment to close diastema (Fig. 1). What an incredible opportunity to now try out the new Omnicam. Not only was I excited to image the case without powder, but also with the live streaming color camera.

After anesthesia was administered, the Odyssey soft tissue laser from Ivoclar was used to contour the gingival zenith of the left central incisor (Fig. 2). The goal was to create in essence a mock-up of the ideal preoperative situation to serve as a template for Biocopy. Even though we were using the new Omnicam, the great news for CEREC owners is that all the same software design techniques that are available for the Bluecam are available for the Omnicam.

One of the main advantages of Omnicam is that as it captures data and creates a virtual model, it inherently fills in the proper information into the voids and cavities during the model formation step. This means one can pick up very detailed information from areas in the interproximal and, more importantly, from cervical areas and the line angles of the pre-existing conditions. A virtual model with roll shots capturing data below the height

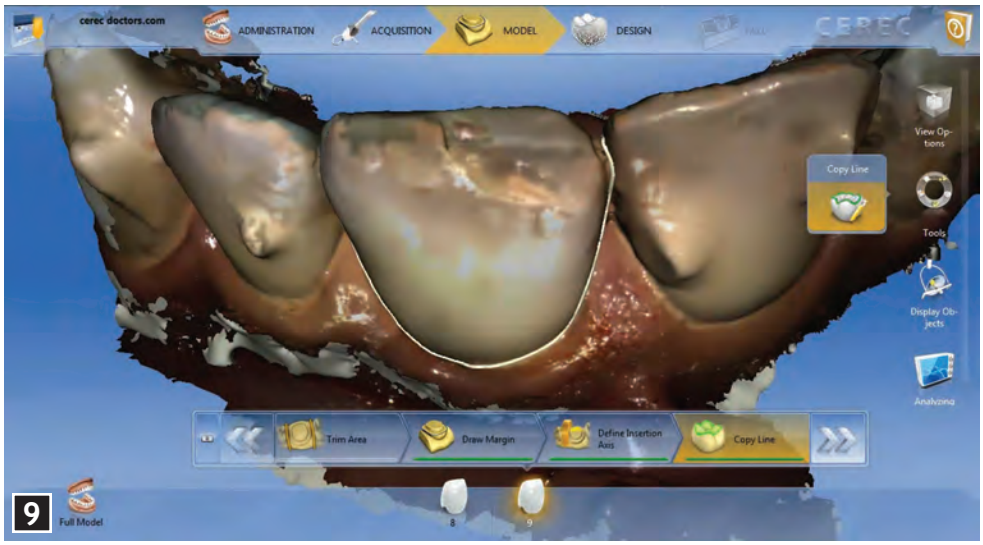
of contour was created with the Omnicam, as the desire in this design process was to mimic the exact dimension at the cervical of the pre-exsiting dentition to serve as a template for the final restorations (Fig. 3).

Once the pre-operative condition was captured and saved, the centrals were prepared for definitive single-visit, all-ceramic restorations. To obtain isolation and hemostasis, Expasyl (Kerr) was placed in the sulcus and cord was packed over. This achieved the goal of stopping any hemorrhaging as well as gaining the desired tissue retraction (Fig. 4).

Once the area was isolated, the prepared teeth were captured in color with the Omnicam being sure to capture sufficient adjacent teeth to allow for the fabrication of a virtual model (Fig. 5). After the preps were captured, the buccal bite was recorded (Fig. 6), along with the lower arch dentition. The camera is simply waved over the teeth and the streaming feed records the teeth in the virtual model. The color capture of the dentition allows for accurate imaging.

After capturing all the required data, the software inherently guides the clinicians to the buccal bite registration step (Fig. 7) which allows the clinician to digitally mount the models and create a virtual model that contains the preps and their opposing teeth. Following this step is the placement of margins on the prepared teeth (Fig. 8). The image shows how photorealistic and accurate the models are. They are not based on a virtual rendering of the dentition — causing them to appear "cartoony" — but are in fact composites of the video feed that was captured. This clarity is something that has never before been witnessed in dentistry.

After margination, the copy line (Fig. 9) was used to circumscribe the pre-op condition, so the proposals can mimic the original shape of the teeth precisely. The advantage of Biocopy is the ability to copy shapes exactly and with the accurate imaging of the Omnicam, the preoperative situation is an exact replica of the mouth. Figure 10 shows the initial proposals and figure 11 displays the preop condition



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on top of the restorations. The speckled look in Figure 11 verifies the desired copy effect with the turquoise indicating minimal thickness parameter warning the practitioner that the preparation may be under-reduced. This is one of the greatest benefits to CEREC dentistry, as one can pick up any short comings in preparation design in a clinical situation and address them appropriately prior to fabricating the final restoration. Please note that the screen captures included here are from a beta version of the software. Due to print deadlines, an early pre release version of the software is shown, which is why you see some bumps on the proposals and preoperative situtation. The incisal edges of the pre-existing condition were not ideal, but with the same tools that clinicians are currently using, the edges (Fig. 12) were addressed appropriately and designed to completion. Once one restoration is designed (Fig. 13) it can be sent to the milling chamber and while its being milled, the second restoration is finalized with the design.

After verifying fit and contacts (Fig. 14) the restorations are stained and glazed and then prepared for delivery with hydrofluoric acid etch , silane and then bonding agent. Using an adhesive cement, they are delivered onto the prepared teeth. The retraction cord was left in sulcus to avoid contamination of the bond and after the resin was cured, the cord was removed (Fig. 15).

One of the greatest attributes of the Omnicam that I have noticed is its ability to pick up detail that a traditional SLR camera may not, particularly because of the effect of the flash over-exposing the teeth. There are ways to address those issues, but Figure 16 shows the immediate post op picture of the two restorations which were subsequently scanned with the omicam to demonstrate the amount of detail and color that is registered (Fig. 17). It is easy to appreciate the subtle gradient change in value in the Trilux multi-layer block, shade 1M2C (which is 1M2C at cervical, 1M1C at body and 1m1CEL at incisal) along with the birch and blue stains at the incisal that were added during the glazing stage.

It will be compelling to watch mainstream dentistry take note of the advancement the Omincam will make in the CAD/CAM realm in the years to come, and hopefully will draw many other dentists, who have isolated themselves with the comfort of traditional dentistry onto the digital platform and excite them about our profession — like it has to so many of us current users. Let the fun begin!

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SELECTIVE EDITING OF MODELS WITH THE OMNICAM AND 4.0 SOFTWARE

By Armen Mirzayan, M.A., D.D.S.

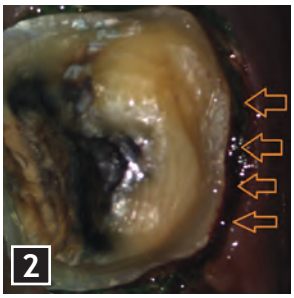
Despite significant advances in digital imaging, digital impressions are no different than traditional analog impressions with regards to tissue isolation

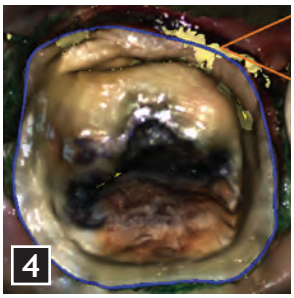
and retraction. Regardless of the impression technique, the clinician must take care to gain proper hemostasis and displacement to allow for the complete capture of the margins and the surrounding tooth structure. Hemorrhage and saliva on margins can distort the stone working models that the laboratory fabricates. The same distortion can occur on digitally designed models and restorations if care is not taken to properly isolate the dentition.

However, unlike physical impressions, the advantage of digital impressions is that a practitioner can instantly recognize a failed margin, and then capture and address the situation appropriately — as opposed to waiting four to five minutes to analyze the set PVS impressions for bubbles and tears. The recent introduction of the Sirona Omnicam allows this selective editing of the model to occur as soon as the preview of the model is rendered.

Introduced in August of 2012, the Omnicam represents the next generation of intraoral imaging. Completely powder-free, the system operates with a color streaming capture of the intraoral dentition. The operator simply waves the camera over the teeth to be captured, and a virtual model of the teeth is fabricated.

While testing the new Omnicam, a new digital solution to editing the virtual model was introduced that is sure to excite all CEREC users. Figure 1 shows a clinical case where inadequate hemostasis was achieved intraorally. This image, captured with the Omnicam, is magnified in Figure 2. It's important to note that Figures 1 and 2 are images that are actual screen captures of the Omnicam and show the clarity and color that is achieved with this new imaging camera. When the 3-D model is rendered (Fig. 3), and the margin area is magnified (Fig. 4), artifacts from lack of data prevent a clinician from adequately defining the margins and achieving an acceptable clinical fit with the final restoration.





Omnicam allows the users to recognize missing areas of data in the acquisition phase and then edit areas of deficiency before the case proceeds to the model phase — preventing the user from having to redo the work that they previously did and wasting valuable time.

When one is imaging with the Omnicam (Fig. 5) in the live streaming color capture mode, the goal is to fill in all voids in the 3-D model preview that is being formed at the right side of the screen (Fig. 6). Additional color streaming images fill in these voids

Due to print deadlines, the Omnicam images shown are with a beta version of the software. Please visit www.cerecdoctors.com/omni for the most up-to-date videos and information.

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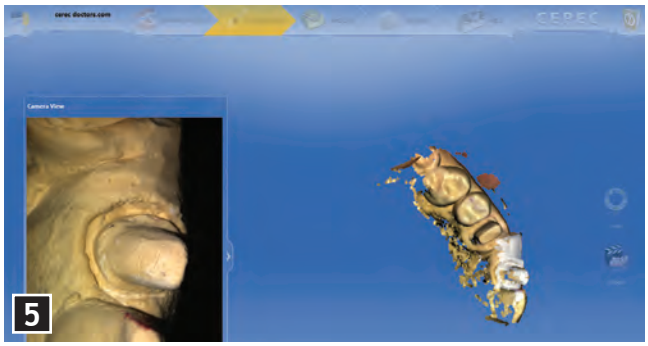

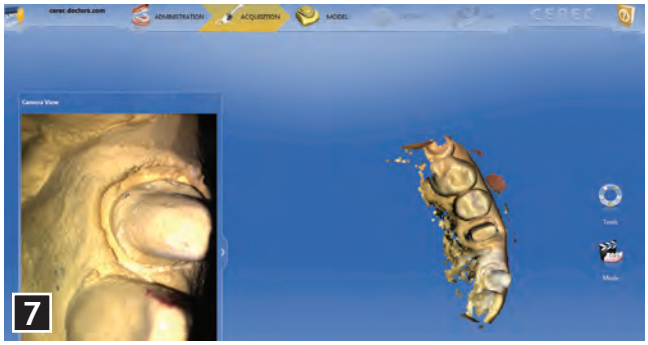

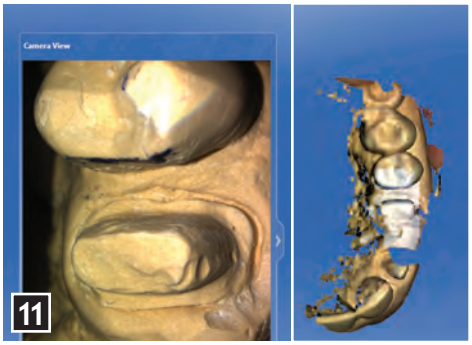

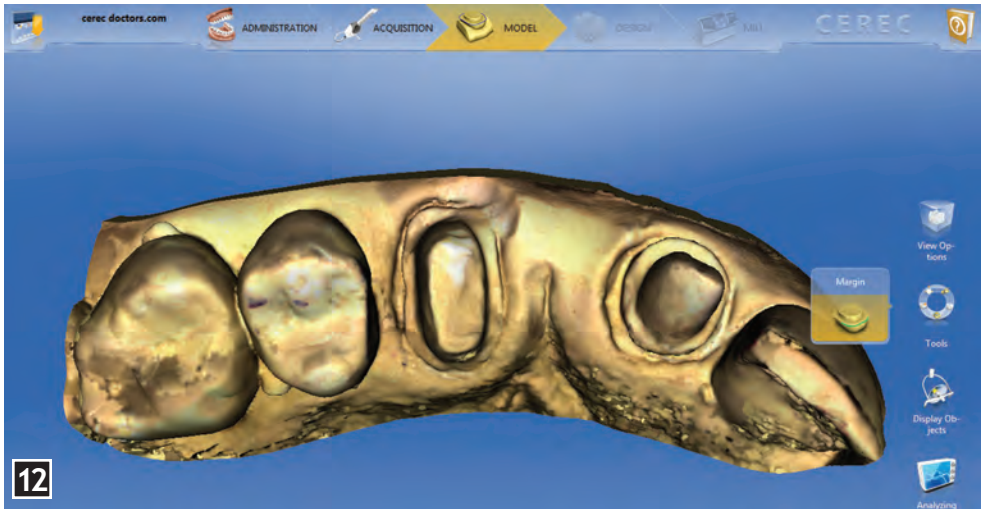

(tentatively called Freklenstruddlesafts) (Fig. 7). Once the color streaming capture is halted and the clinician recognizes that there are areas of deficiency in the model, the user can selectively crop out areas of the model that do not meet the dentist's satisfaction. In the image acquisition step of the phase menu, one can activate the edit tool and use the crop feature (Fig. 8) to selectively delineate the area that can be removed and reimaged (Fig. 9). Figure 10 shows the area that has been cropped out and Figure 11 shows subsequent live color streaming captures that fill in the desired area with new data to replace the cropped out portion of the model.

The incredible capabilities of the Omnicam allow a user to focus his or her efforts on select areas rather than taking an entire new set of images. This is similar to taking a PVS impression where one fails to capture the margins and decides to just reline the impression with wash material with the hope that the initial impressions serves as a custom tray. Only with the Omnicam, selective addition of data is more accurate and highly predictable. With this approach, one can leave prayers and luck out of the equation as the software and hardware accurately recapture the select areas with reliable and trustworthy data, meanwhile providing comfort and ease, and also rendering models that are easy to work with (Fig. 12).

The Omnicam is a major step forward in not only intraoral imaging but also CAD/CAM dentistry in general. Its ease-of-use is sure to introduce a new generation of users to chairside CAD/CAM, and software features such as selective editing will allow clinicians of all skill levels to maximize their use of this new technology.

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IMAGING WITH THE OMNICAM

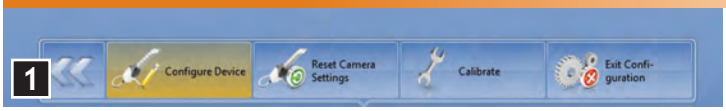
By Pete Gardell, D.D.S.

Growing up as a young boy, I remember the black-and-white TV that allowed me to travel to other places with my imagination. That TV entertained me and my family for hours as we watched the various shows that were available. An unforeseen benefit was that it kept us in shape since we had to get up to change the channel. It was six whole channels of pure bliss.

Then, one Christmas, my parents made an investment in the new technology of the day: color TV. We saw what the rest of the world really looked like in dynamic color, not a black-and-white representation. Was it better? Absolutely! It was more enjoyable and more exciting. But we still had to get up to change to one of the six channels, and the TV took up half of the room with its size. Cable expanded the options even more, then DLP, and plasma flat screens; now 3-D TV immerses you into the world of Hollywood's creations. While the original TV worked, today, it's easier and more enjoyable to watch a movie in 3-D HD instead of black-and-white.

We now have a parallel experience in dental CAD/CAM thanks to the vision and hard work of Sirona. We have moved from the Redcam system that did single units efficiently and predictably, to the high definition of the Bluecam. The Bluecam had the precision and accuracy to expand the services we could do digitally allowing us to image more teeth with ease, work with labs using Sirona's CEREC Connect and integrate with the Galileos cone beam to plan and place our implants. Bluecam gave programmers the hardware required to push the limits of what we knew, and push the development of CEREC 4.0 and its modular platform — simultaneous designs of adjacent and opposing restorations, and more powerful and intuitive tools for designing great-looking restorations that function with one another.

The latest development from Sirona: The Omnicam, full-color in a high-definition video package.



Today, we see the latest development to come from the research and development teams at Sirona, the Omnicam: full-color in a high-definition video package, simpler to use, accurate, fast and powder-free. Impressive for the seasoned CEREC user as well as the clinician who has only investigated the technology.

Omnicam is more than just a new tool for the CAD/CAM restorative part of our practices. It has the ability to cover the full spectrum of service we provide our patients from diagnosis, records, imaging and education, as well as the restorative needs that have to be addressed. Its accuracy expands the technology to where it truly can replace conventional impressioning. It is easy enough for your present staff or your hygienists to use during exams, or your assistants can take the images as they do your study models. Your staff doesn't have to worry about how to take images that will stitch, or how to adequately powder and then clean the powder off.

The way the video is displayed will capture the patient's attention right away, engaging them and opening the door for discussion on any condition that is present in their mouths. In other words, the full-color high-definition video feed from the Omnicam can be used similarly to an intraoral camera by using the camera in a 2-D mode to capture and save video exams of patients. This is ideal for archiving and storing the patient's dental condition prior to any restorative commencing. After the imaging, the workflow and options are the very familiar CEREC 4.0 chairside software.

Due to print deadlines, the Omnicam images shown are with a beta version of the software. Please visit www.cerecdoctors.com/omni for the most up-to-date videos and information.

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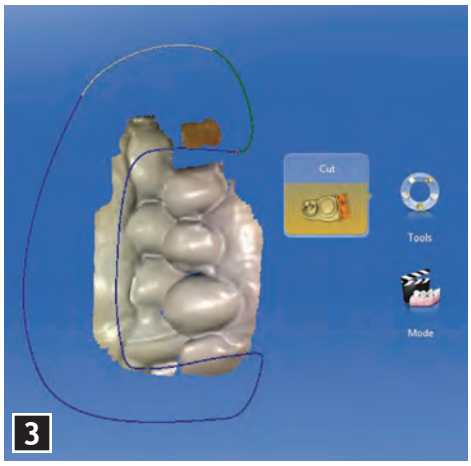

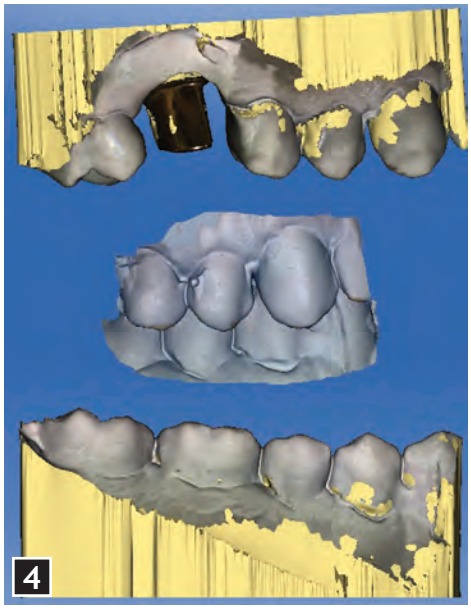

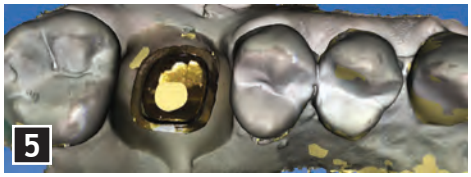

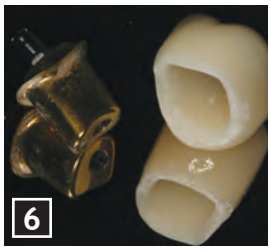

CASE STUDY

The Omnicam is designed as a fully functioning impressioning system, so it has an extraoral setting to allow you to scan models. The following is the design and fabrication of an implant-supported restoration that was imaged with the Omnicam and restored with the CEREC. This patient suffered a vertical root fracture on his maxillary right first molar which caused a catastrophic failure resulting in the tooth being extracted. A Biomet 3I Tapered implant was placed and allowed to integrate for 12 weeks. After uncovering, a Bella Tek Titanium abutment was fabricated using the Bella Tek digital impressioning workflow being tested presently by the author. The abutment was returned and placed on a model and then scanned utilizing the Omnicam. The camera's setting was switched to Extraoral Mode which adjusts the light output of the camera system to work with the ambient light of your workspace.

When imaging, the same imaging catalogs that are currently present for the Bluecam are also present for the Omnicam. In fact, other than a few minor software features that are specific for the Omnicam, the software is virtually identical to the 4.0 software used currently.

All the details of the model and the abutment are captured for the arch that is being restored as well as the opposing and the buccal bite. The image catalogs do have a different appearance than what we are familiar with, but with the new imaging module of the Omnicam there are simpler methods for removing bad images and data. In the acquisition stage, the user can use the Cut tool to remove the area of the virtual model that is deficient. We then can re-activate the camera and fill in the defective area that was removed. This technique is more intuitive than trying to cycle through the image folder to find the offending poor image.

After evaluating the models in the acquisition stage, we can then move forward to the model phase. A nice addition to this version of the software is the ability to edit your models prior to the completion of the buccal bite step. Many times, the buccal vestibule or a flange of the Isolite or cotton roll will be captured, occluding the view of the buccal surfaces of the teeth we want to use to stitch the models together. Instead of being forced to either edit our image catalogs or even re-image, we can now just cut out the offending portion. The Replace function is present, allowing one to virtually fill in the screw-access hole so it isn't milled out when restoring an implant abutment.

At the margination step you can see how the Omnicam delivers a virtual model that is highly visible. (Please note that due to print deadlines, all image captures are shown with a beta version of the software. The final version of the software is expected to be even more clear and detailed.)

The design and mill phases of the software are the same familiar steps, and all of our favorite tools are present to allow us to manipulate the proposal if needed to create the restoration we want.

Since this is an implant-supported restoration on an abutment, e.max was chosen as the restorative material for its esthetics and strength. The abutment received back from Biomet 3I is a very CEREC-friendly preparation with good reduction, adequate taper and a nicely formed shoulder with smooth transitions. It is designed with smooth emergence supporting the soft tissue and is easily cleansable. The milling chamber can create a restoration that intimately fits the abutment.

With implant dentistry, our goal is to recreate nature and seamlessly replace what was damaged. And in today's economic environment, we need to do it as efficiently and cost-effectively as possible. With Omnicam and our other technology and material partners, we are able to deliver restorations that are pleasing to our patients, making them raving fans who help us to expand our practices.

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PRODUCTS OF INTEREST: LAS VEGAS EDITION

By Martin R. Mendelson, D.D.S.

One of the reasons I love the CEREC community so much is your willingness to embrace change.

In thinking about recent product and software developments, I realized that a number of these developments could be seen as disruptive. Bulk fill composites, universal adhesives and (full-contour) zirconia restorations are used in ways today that are different from their original use, technique or even indication. Developments in Web-based education that marry communication with your patients and in-depth education for you and your staff can also be considered disruptive. Why? A tool like Spear Case Assistant has never been launched on a large scale before. All of the topics below are innovations and improvements to products or types of software that we use every day but their uses and or indications have changed.

VITA INCERAM® YZ MULTICOLOR BLOCKS TO DEBUT IN OCTOBER

With the meteoric rise in the use of full-contour zirconia restorations, VITA has entered the market with a multi-colored zirconia block (Fig 1). The gradation in color is similar in concept to the VITABLOCS Triluxe Forte. These blocks for full-contour zirconia restorations have three color-intensive layers, are available in MC-20/19 for crowns and MC-55 for bridges and come in lightness levels LL0 – LL3. These can be milled with InLab 3.8 or 4.0 software and require sintering after the milling process.

E.MAX GOES THINNER AND FASTER — BUT HOW FAST IS FAST?

Good news: Ivoclar-Vivadent will be releasing an official firing cycle of just under 15 minutes. Even though we have several studies that show success with the 12-minute cycle*, why is this 15-minute cycle different? What will you achieve with this new protocol according to Ivoclar is full maturity of the lithium disilicate crystals. You need to assure a conversion to complete lithium disilicate instead of partial metasilicate for maximum strength. Esthetics would be number two. Complete color change can be at risk with shorter firing cycles. Last but not least, e.max is going thinner — 1 mm reduction on the occlusal! That's amazing, BUT you must use the 15-minute cycle and adhesively bond the restoration in order to fabricate these restorations at 1 mm. When you have thicker porcelain, esthetics may not be as critical — other shorter cycles may suffice. But for maximum strength and minimum thickness, follow the Ivoclar approved 15-minute cycle.

SPEAR CASE ASSISTANT

CEREC is an amazing tool to accomplish your treatment-planned restorations. But using CEREC can only happen after the treatment plan is developed and the patient has said YES. If you desire assistance to communicate with your patient and staff, to show before-and-after pictures, and to help you with a deeper clinical understanding by viewing videos, slideshows and literature references, you should check out Case Assistant. A ground-breaking new application that helps you treatment plan, it enables your staff to communicate more effectively with patients to help patients recognize the value of your proposed course of treatment and say YES.

3M ESPE UNIVERSAL ADHESIVE

One adhesive for both total-etch and self-etch? One adhesive for both direct and indirect restorations with consistent bond strengths? One adhesive that can be used without sensitivity or the need a separate primer? And it works? How can this be possible? The answer according to research by the University of Alabama is yes ... this is promising. With all of the variables in bonding procedures, it is very helpful to be able to standardize our protocols to include a single adhesive. Lastly, Universal Adhesive (Fig. 2) also contains silane and is stable at room temperature. This eliminates the storage and volatility issues of a separate bottle of silane that requires storage in the refrigerator.

*J. Burgess, S. Shah, D. Cakir, P. Beck and L. Ramp, University of Alabama. Shear Bond Strength to Restorative Materials and Tooth Structure.

CASE STUDY

BRIDGE MODE IN CHAIRSIDE 3-D FOR LONG-TERM PROVISIONALIZATION

By Bob Conte, D.M.D.

One-visit chairside bridges are still on most CEREC users' wish lists. Soon the day will come when material science will catch up to the technology of the CEREC AC and the latest software, and one-visit bridgework throughout the arch will be a reality. In the meantime, an underutilized feature of the current 3-D software offers the ability to design and mill high-strength, esthetic provisional bridgework.

Quite often there is a need to provisionalize a patient for several months prior to creating a final restoration. Waiting for implant integration, soft-tissue contouring and healing, and creating esthetic pontic sites are just a few of the indications. Such indications call for a material that is very durable and esthetically pleasing. Prior to digital models and CAD fabrication, we were often left with the very tedious task of creating and adjusting acrylic bridgework by hand, or taking impressions and having a lab-fabricated provisional bridge made for the patient.

The ability to design bridges and mill out of a solid block of a product such as VITA CAD-Temp is a much easier task that will yield an excellent restoration more efficiently and with less aggravation to the soft tissues. VITA CAD-Temp is a composite block consisting of fiber-free, homogeneous, high-molecular and cross-linked acrylate polymer with microfillers. The material also features a considerably higher strength than conventional composite materials.

In this case study, tooth #10 presented with failing endodontic therapy and subsequent abscess (Fig. 1). The patient was not willing to have a single implant placed, so the decision was made to extract the tooth and use a traditional PFZ bridge.


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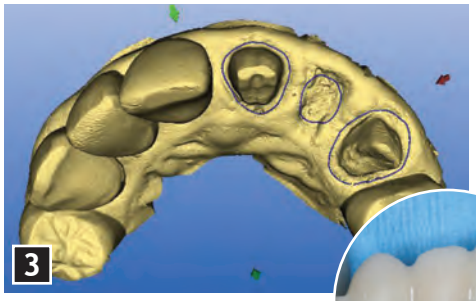
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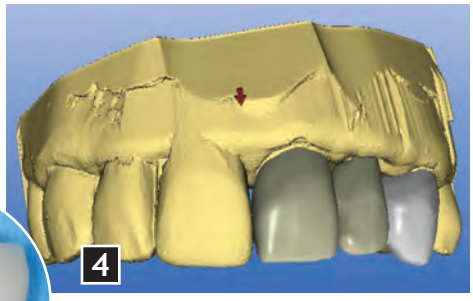
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The patient was anesthetized. Single PFM crowns #9 and #11 were removed and the preparations were refined. Tooth #10 was gently removed and Gelfoam was placed in the site (Fig. 2).

At this point, Bridge Mode was selected in the 3-D software. The area was powdered and images were captured to create a digital model (Fig. 3). The Biogeneric software will yield a very nice three-unit bridge proposal (Fig. 4). After minor editing, the bridge was milled out of VITA CAD-Temp multicolor in a size 40 (Fig. 5).

The contacts and occlusion were verified and minor adjustments were made. The bridge was cemented with TempBond, and the patient was dismissed with post-op instructions (Fig. 6).

After four weeks of healing, the soft tissue has healed to the pre-op condition (Fig. 7).

The provisional bridge was removed, and the preparations were refined. Note the

formation of an ovoid pontic space (Fig. 8).

At this time, a final digital scan was taken and uploaded to our lab via CEREC Connect. The provisional was relined and re-cemented.

Two weeks later, the final three-unit PFZ bridge was delivered to a very satisfied patient (Figs. 9 and 10).

This case illustrates one of the features of the current 3-D software that we can implement into our day-to-day practices. To have a provisional bridge milled out of a solid composite block has many advantages: i.e., strength, convenience and esthetics, just to name a few. Happy CEREC-ing.

For questions and additional information, Dr. Conte can be reached at dr_conte@yahoo.com.

CASE STUDY

SIMPLIFYING THE SINGLE-UNIT ANTERIOR CROWN

By David Juliani, D.D.S.

The single-unit anterior crown is possibly the most esthetically challenging chairside procedure we face as beginning or experienced CEREC users.

Phonetics, function and esthetics must all be taken into consideration for a successful restoration. CEREC 4.0 has given us the ability to routinely complete these single units predictably, while at the same time reducing the design stress normally associated with anterior procedures. In this article, we will discuss five easy steps to simplify the anterior procedure for efficiency and clinical success.

STEP 1: PRE-OPERATIVE CONSIDERATION AND RECORDS

The pre-operative photo is perhaps the most important non-clinical step in any anterior case, whether single or multiple units (Figs. 1 and 2). This can be taken during the hygiene examination portion of a patient's routine maintenance visit. One simple photo is usually all that is needed. Multiple photos or a presentation set can be taken at a later date if desired. This photo allows the clinician the ability to determine the material to be used, any esthetic challenges that may arise during the finishing process, any shape concerns regarding contours and incisal corners and, finally, any occlusal complications that may arise. It also serves as a reminder to our patients of their pre-op condition. If shape or shade questions arise in the future, you have the pre-op photo to fall back on for reference.


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STEP 2: DESIGN OPTIONS

CEREC 4.0 allows multiple successful design options for anterior restorations. Biogeneric Individual and Biogeneric Copy are the two most commonly selected modalities. Biogeneric Copy (Correlation in past software versions) allows the user to copy the shape and occlusion of the pre-operative tooth. Biogeneric Individual (compared to Dental Database in past software versions) allows the software to design an anterior restoration by first using the mesial adjacent tooth, then the distal adjacent tooth, as a guide for shape and contour. This is the opposite of posterior (distal to the canines) Biogeneric Individual where the distal adjacent tooth is first referenced, then the mesial. In most cases, selecting the design option Biogeneric Individual delivers a proposal that can be easily and quickly customized and sent to the milling chamber for milling.

STEP 3: MATERIAL SELECTION AND PREPARATION

With CEREC 4.0, we now have multiple material choices available. From the traditional Empress (pressable ceramics) and VITA (feldspathic) blocks, to the lithium disilicates (e.max or the new Impulse blocks from Ivoclar), material selections cover any clinical situation we may face. Traditional ceramic preparations will be required for the conventional materials such as VITA and Empress, while more conservative preparations may be used with e.max

or Impulse blocks (Fig. 3), which can be milled as thin as 0.3 mm. The traditional blocks (Empress/ VITA) are available in Universal or Standard shades. Impulse blocks are available in Opal (Fig. 4) or Value (Fig. 5) shades which represent the A1, B1, BL3, and BL4 shades. The VITA Real Life Block (Fig. 6) is the first CAD/CAM machinable ceramic block to offer 3-D esthetics. Embedded with a "dentin core" shaded internal


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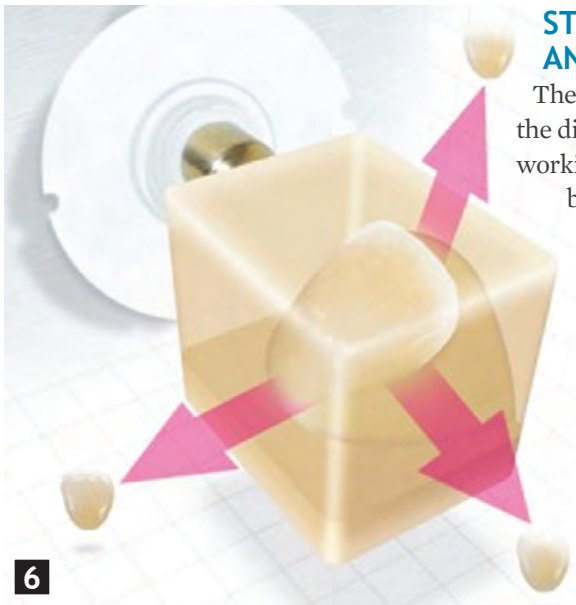
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porcelain, the Real Life block offers superior esthetics in the anterior maxilla. In cases of decalcification or natural staining, I find it best to match the block shade with the most difficult area of the tooth to reproduce esthetically. The remaining surfaces can be stained to match the adjacent teeth. Proper reduction is needed for esthetics and occlusal strength. The incisal edge of the preparation needs to be at least 1 mm wide and without any sharp line angles. This will prevent over-milling of the restoration and a consistent thickness of porcelain to maximize the esthetics. Margins should be either a shoulder or well-defined chamfer.

STEP 4: DIGITAL IMPRESSION AND DESIGN TOOLS

The question of how large to make the digital model always arises. When working in the anterior, I find it best to build a model from first bicuspid to first bicuspid, rolling the camera to the facial to capture the facial contours and embrasures. Crossing the midline is simple and easy with the CEREC AC (Bluecam), so this model will take less than a minute to build. A model this size also allows the clinician the ability to use the bicuspid and canine for an accurate buccal bite registration. Once the model is fabricated, the restoration proposal should require very few design changes. With CEREC 4.0, the user has the ability to manipulate the restoration by customizing specific areas with the circular shape tool, or full sections of the proposal with the anatomic shape tool. Both allow the user better control than the grid lines and points of previous software versions. Movement of the restoration can be achieved in all three dimensions with the Move and Rotation tools. The smooth tool is available, but is slightly different than previous versions of the software. The smooth tool is placed over the desired area, held in position and then activated with a left mouse click. This process is repeated until the area is smooth.

STEP 5: MILLING AND FINISHING

Once the restoration is milled and adjusted for proper fit, it is ready for stain and glaze. The pre-op photo can be used to accurately stain the restoration to match the adjacent teeth. Brush the necessary stain and glaze on smoothly and in one direction only. Feather the stains to allow for natural-looking, subtle transitions. Be very careful to not let the glaze pool in areas of the restoration that may interfere with occlusion.

The final restoration can be bonded using any of the approved light- or dual-cure cements. In the case of e.max or any of the lithium disilicates, traditional glass ionomer cements may be used. Remember to take a post-op photograph for the patient record (Figs. 7 and 8).

CONCLUSION

Though extremely challenging, the single-unit anterior restoration can be a rewarding procedure for every CEREC practice. CEREC 4.0 software allows the user full control of all contours and occlusion. Proper pre-operative consideration, preparation and imaging will generate a restoration requiring very little adjustment or design time.

For questions or additional information, Dr. Juliani can be reached at djuliani@live.com.

CASE STUDY

SEQUENCING MULTIPLE RESTORATIONS

By Gregory Mark, D.D.S.

Dentistry can be difficult. It's stressful, challenging and can take a toll on a clinician's back and mind.

Hunched over, trying to prepare that perfect margin on a patient who would much rather be anywhere other than your dental chair is not the most enjoyable way to spend a career. Even if you overcome the clinical challenges, then you have to deal with the patient challenges of scheduling, collecting the payment and all the other things that come with running a typical dental office.

What makes dentistry worthwhile however, is when you get that mix of a patient who not only needs dental treatment, but knows that they need dental treatment and, most importantly, appreciates the clinician who is treating them and the care they will be providing.

Single-tooth dentistry is simple for patients needing care; prep the tooth, image and design using either regular Biogeneric or Biogeneric Copy. When you have a case where a patient needs multiple restorations however, the challenge becomes how best to sequence the case. While there are many approaches we can use, some work better in certain situations. The key for the CEREC clinician is to decide which technique to use at which time. The following are some options for a CEREC user:

- "SArmen" Technique: You prep one tooth and then send the proposal to mill; while it is being milled, you start prepping another tooth.
- Prepare all the teeth, scan them and fabricate crowns at the same time.
- Break a case up into three separate visits by doing individual restorations.
- Restore the lower arch in one window and the upper in another.

While all of these options have a valid use, it's up to the clinician to decide what's the best way to treat the case for maximum efficiency. In the clinical example presented below, we highlight a technique where all the teeth are designed simultaneously with the CEREC 4.0 software due to the lack of interocclusal clearance.

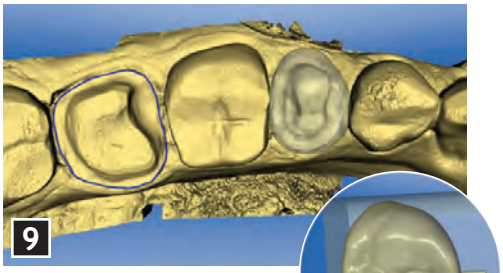
CASE STUDY

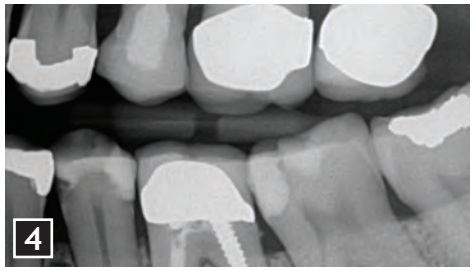
A patient in his 40s presented to the office with rampant caries. Clinical and radiographic examination revealed secondary decay under tooth #15, an existing PFM restoration. Teeth #18 and #20 had failing composite restorations. Tooth #18 also had a fractured MB cusp in addition to the decay (Figs. 1-4).

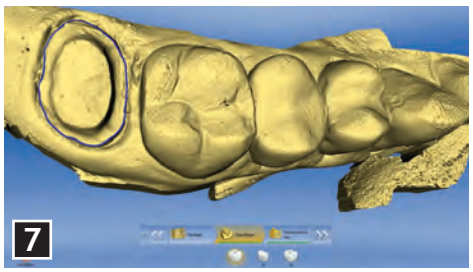
After presenting the clinical findings to the patient, the treatment plan was finalized to place full-coverage restorations on the affected teeth utilizing the CEREC system. Because of the limited interocclusal space as described earlier, the decision was made to treat all the teeth in the same file.

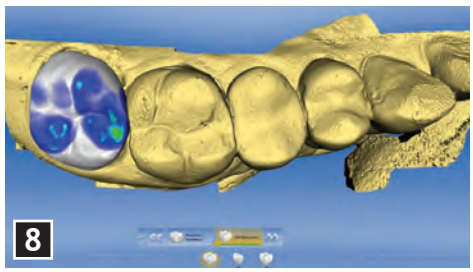
The patient was anesthetized and buccal bite images were taken while he was getting numb. After giving anesthesia, an Isolite was placed in the mouth and the preparation on tooth #15 was started. Tooth #15 was previously treated endodontically, so it was clear to start with this tooth which saved time while the patient was getting numb on the lower arch. Tooth #15 was prepared for a full-coverage crown. A cord of #00 was placed and the tissue retracted and prepared for the optical impression (Fig. 5).

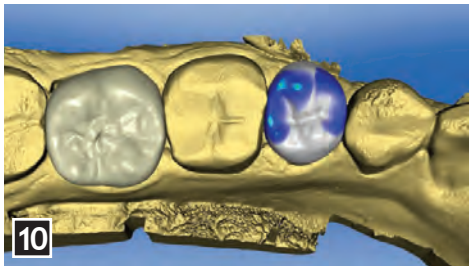
By the time tooth #15 was prepared, the patient was numb on the lower jaw. Teeth #18 and #20 were prepared for full-coverage restorations. Again, #00 cord by Ultradent was placed to retract the soft tissue and to obtain hemostasis (Fig. 6). By preparing both the upper and lower arches together, this allows the clinician to work on both arches simultaneously in the CEREC 4.0 software, giving the operator complete control of the occlusion and design of the case.

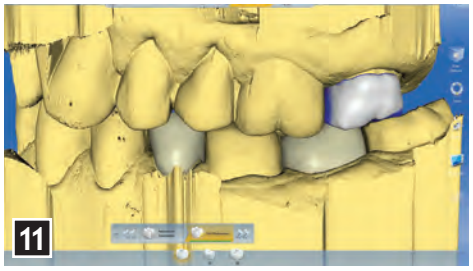


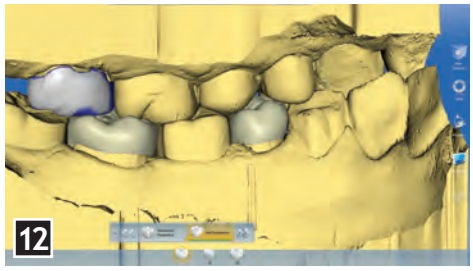


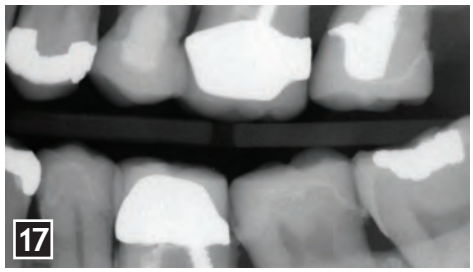












Both arches were scanned utilizing the CEREC Bluecam and the CEREC 4.0 software. By scanning arches simultaneously, the clinician has the ability to work on multiple teeth at the same time. After getting the initial proposal, the operator can start fine-tuning each proposal individually to make sure that the restorations fit in the arch form with proper occlusion, form and function (Figs. 7-12).

When the first restoration is designed, it can be sent to the milling chamber where the appropriate block size and milling mode is selected (Fig. 13). As the first restoration is milling, the operator can complete the design on the remaining restorations. This gives the operator maximum flexibility as well as efficiency to make sure the case design can be completed quickly.

Once all restorations were milled, the crowns were tried in and occlusion, contacts and margins were verified. After verifying, the restorations can be stained, glazed and crystallized by an auxiliary while the doctor moves on to other productive procedures.

For the final cementation, a microabrasion unit by Danville was used to remove all contaminants from inside of the restoration. Microabrasion also serves as a reversible agent if you used any hemostatic solution to avoid any sensitivity. When using microabrasion, it's important to keep the pressure low, because using an air-abrasion unit may cause internal cracks in the porcelain.

With the Isolite and the cords still in place, NX3 Nexus dual-cure cement was used with OptiBond Solo Plus bonding agent to cement in this case. The excess cement was removed, the restorations polished and a final radiograph was taken to verify the fit and to make sure no excess cement remained (Figs. 14-17; excess cement removed after X-ray was taken).

The CEREC system is a capable CAD/CAM system that allows for the fabrication of multiple restorations at the same time. Because of its use in our office, the CEREC system has helped to make an otherwise stressful profession enjoyable.

Learning various techniques such as SArmen, simultaneous design and more allows the clinician to be not only productive, but also treat the patient in the most efficient manner.

For questions or additional information, Dr. Mark can be reached at bestdental10@gmail.com.

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LAVA ULTIMATE RESTORATIVE

A new material for age-old problems

By Daniel J. Poticny, D.D.S.

As chairside CAD/CAM dentists know, the monolithic block concept has served us well—not only at the chair, but now in the laboratory. The argument can now be made that there is little need to consider hand-layered restorations in the posterior unless it is your personal choice. Materials like lithium disilicate and zirconia are increasing in popularity due to very good clinical performance and stable price points for dentists using laboratories. The addition of lithium disilicate to the gold standard feldspathic and leucite-reinforced materials broadens the range of applications for chairside manufacturing, particularly where the highest possible strength is needed.

As many of you are aware, we have had a resin block available since 2000 called Paradigm MZ100 (3M ESPE), which, despite some rather impressive credentials, has suffered from a lack of clinical use in the United States. Like all resins in general, it suffers from the perceptions that it is inferior to the glass ceramics currently available for chairside milling. This opinion is derived from our clinical observations of composite resins in general—in that they are generally hand-formed, suffer from polymerization shrinkage, and either wear excessively or are incapable of maintaining a lustrous surface finish over time.

As chairside CAD/CAM dentists, one thing we learned when contemplating this treatment option was the value of monoblock construction, which produces a homogeneous, defect-free material. With reference to the aforementioned Paradigm MZ100 block, Fasbinder found that it performed comparably to the VITA MK II materials for inlay applications.[1] This is an important finding, as inlay restorations are subject to high loading with margins subjected to wear. Fasbinder found that when compared over a 10-year period, there was no significant difference between inlay restorations made from the Paradigm MZ100 block and the VITA MK II material with respect to margin and surface finish and overall anatomic form. Furthermore, the same study showed a difference in fracture rates for the materials; six of the ceramic restorations fractured versus just one resin inlay. Lastly, shade matching was judged to be better for the composite inlays as compared with the ceramics.

This study is significant in terms of what the real takeaway might be. Performance issues aside, the underlying thought is that resin materials have a place in restorative dentistry, with performance seemingly more related to technique, as the majority of this material class is fabricated by hand (or laboratory processed in a similar fashion albeit with better control). Resin materials, owing to a lower elastic modulus, have a better ability to deform under loading in comparison with the glasses, both esthetic and structural. The future for dental materials may not always be in the direction of harder materials, but perhaps in the direction of "engineered ceramics" that possess the desirable attributes of both glass and resin.

A PROMISING NEW MATERIAL

One such material worthy of consideration is now available for use by chairside CAD/CAM dentists— marketed as Lava Ultimate CAD/CAM Restorative by 3M ESPE. It has also been made available to dental laboratories and it is termed as a nano-ceramic incorporated into a block form. Uniquely, it contains a blend of nanoparticles agglomerated to clusters with individually bonded nanoparticles embedded in a highly cross-linked

polymer matrix. Conversion is reported at 90 percent with a ceramic fill load of 80 percent. These exceptional numbers are achieved by a proprietary process that is a patented 3M technology. Particle size is in the 4-11 nm range for the zirconia filler and 20 nm for the silica component.

As for the mechanical properties, the new material exhibits a flexural strength of 200 MPa, which is significantly higher than the feldspathic, leucite-reinforced, or conventional veneering glass ceramics, with a higher fracture toughness – making it less brittle and more resistant to fracture. To be sure, you can imagine applications for this functionally, including bruxers, implant-supported crowns, and perhaps even routine use. I realize that for most of us the idea of a "resin" crown may be less than appealing, but I am also of the opinion that harder materials are not always the answer either — rather, it is the limitation imposed in our attempt to satisfy form, function and esthetics.

The previously discussed Paradigm MZ100 material was not very good at maintaining gloss (no relationship to performance), and Lava Ultimate restorative may have solved this issue as well. While no long-term clinical studies have been completed, I will attest to the fact that this material polishes to a brilliant shine easily and quickly using stock, off-the-shelf materials. In 3M ESPE's own internal testing, it was determined to be the equivalent of the glass ceramics with respect to gloss retention after repeated cycling, which is promising indeed.

Furthermore, this material offers some advantages you cannot get with a pure glass. It can be added to and subtracted from easily in the mouth, and fills niches where the use of a pure glass can be a challenge.

CONSIDERATIONS FOR BONDING

Lava Ultimate restorative is a bonded restoration, and all of us use various systems for various reasons. I am interested in performance, even if it is at the expense of convenience, which is why I have remained with total-etch to this day. I am also a believer in using one system from one manufacturer. Due to the variety of materials all of us deal with on an everyday basis, most offices must inventory multiple adhesive systems and different chemical products to handle metals, structural ceramics, glass ceramics, composites, glass ionomers and the like, and this doesn't even include other applications such as desensitization, sealants and porcelain repairs. Everything seems to be a trade-off in terms of performance, sensitivity concerns, convenience and technique issues. Add to that the failures that appear on the blogs and it's clear that bonding is not a straightforward issue.

In conjunction with Lava Ultimate restorative, we have been using Scotchbond Universal Adhesive with RelyX Ultimate Adhesive Resin Cement (both from 3M ESPE). Most of us are familiar with the generational categorization of adhesives—one through seven or eight, with the all-in-one bottle systems being termed the "fifth generation" and incorporating the total-etch concept. This fifth generation and the one before it produced the "best performing" adhesives, all other issues aside. With Scotchbond Universal adhesive we have an entirely new approach to adhesion dentistry that does not neatly fit into this categorization, as it incorporates all of the elements of each generation while still maintaining performance, including lack of sensitivity, ease of use, and choice of total-etch, self-etch or selective-etch methods. Additionally, it incorporates silane and MDP metal primer to literally let you bond to any dental material or surface without additional chemicals or complicated protocols.

Most of us use dual-cure cements as insurance for areas where light cannot reach sufficiently to polymerize the resin cement. RelyX Ultimate cement contains a self-cure initiator that catalyzes the auto-cure component when it comes into contact with Scotchbond Universal adhesive, eliminating the need for a separate dual-cure activator. In cases where you prefer a different resin cement, a dual-cure activator is available. Performance-wise, Burgess[2] and others have shown consistent bond strengths in the 30 MPa range for dentin, enamel and cementum, reflective of what we would typically see in the fourth- and self-etch, fifth-generation adhesives[3] products.


1


2

CASE STUDY

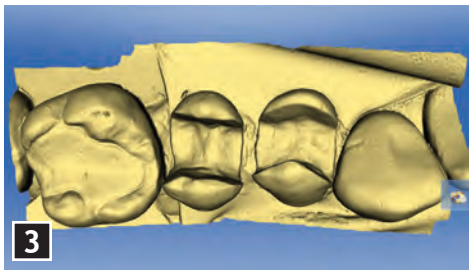
A patient reported with three failing amalgam restorations. Her previous dentist had recommended crowns for each (Fig. 1). After discussing treatment options, benefits and risks, it was determined we would treat teeth #12 and #13, postponing #14, using inlays instead of crowns if possible, and using the CEREC system for same-day fabrication and delivery.

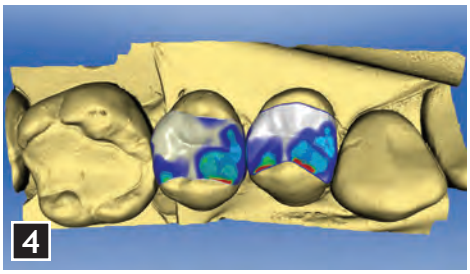
The opposing arch and buccal bite were scanned and anesthesia was delivered to the maxillary arch. A rubber dam was applied using the split-dam technique and the existing restorations were removed along with residual caries (Fig. 2). It was determined there was sufficient axial wall/cusp thickness in the buccal lingual

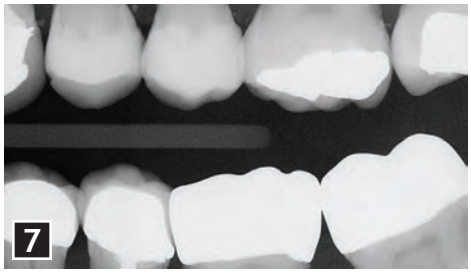
dimension, with no evidence of horizontal fracturing, to proceed with inlay restorations. The arch was powdered and scanned. CEREC 4.01 software was used to design the subsequent restorations (Figs. 3-4). Lava Ultimate restorative was chosen in the administration phase as the material of choice. Of note is that Lava Ultimate restorative is available in two translucencies (HT and LT) and eight of the most common shades. In this case shade A2 HT was chosen. Occlusion was designed with prematurities left intact for adjustment and removal post-insertion. After recovery from the milling chamber, a trial fit was performed to ascertain margin quality and anatomic form.

A key feature of this material is the precision of mill along margins, which are thin by nature and prone to chipping during the mill and placement. As seen, adaptation was excellent. The proximals were pre-polished with a 5 m paste (Diashine Intraoral) and a soft bristle brush with intaglios air abraded lightly with 50 m aluminum oxide at 30 psi, then cleaned with denatured alcohol. Scotchbond Universal adhesive was dispensed from the single bottle dispenser and applied to the intaglio by the assistant for 20 seconds and air dried for five seconds. The tooth was selectively etched for 15 seconds (Fig. 5), and then rinsed for the same amount of time. Scotchbond Universal adhesive was applied to the two teeth over a period of 20 seconds in two applications, rubbing it into the dentin. The solvent was dispersed with moisture and oil-free air for approximately five seconds or until the adhesive no longer moved on the tooth surface.

The adhesive was cured and RelyX Ultimate cement was syringed into each preparation, after which both restorations were seated. (As an alternative, dentists may seat one at a time.) A cotton-tipped applicator was used to remove gross excess and then each was gel-cured for two seconds. An explorer was used to remove excess, then each was cured in 10-second intervals with three applications per restoration. A sharp scalpel was used to remove cured flash, and a 20 m diamond was used to remove luting excess at the cavosurface and to refine occlusion. Centric stops and working side interferences were removed. Lastly, the same 5 m paste was used on a prophy brush to attain the final desired result (Figs. 6-7). Crowns can also be polished to an exceptional finish intra- or extra-orally as shown for the molar (Fig. 8).







CONCLUSION

This case demonstrates an application that Lava Ultimate restorative can address with significantly less effort in comparison with glass ceramics, particularly when incorporating state-of-the-art adhesives that streamline protocols for consistently predictable outcomes. It is quite clear the future resides in these innovative approaches to ceramic chemistry, leveraging the favorable properties of both ceramic and resins while mitigating the negatives.

For questions and additional information, Dr. Poticny can be reached at djpoticny@earthlink.net.

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5 Perdigão J, Geraldeli S. Source Division of Operative Dentistry, Department of Restorative Sciences, University of Minnesota, Minneapolis. perdi001@umn.ed

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CASE STUDY

CEREC CONNECT UTILIZATION WITH DENTAL LABS

By Charles Rodgers, D.D.S.

Pacific Dental Services (PDS) is the largest single provider of CEREC restorations in the world with more than 120,000 units delivered to patients

in 2011. Our intentional focus is still milling in house whenever possible but with the large number of incoming doctors unfamiliar with CEREC, which includes a significant number of new graduates as well as a number of existing doctors hesitant to change behaviors, we had to look at other opportunities to utilize our technologies and minimize costs while providing the best in patient care. In 2009, the organization decided to implement a plan to capture these missed opportunities.

With the CEREC Connect process, we can image the patient directly or image a model of the patient and send this image straight to a lab. Our protocol suggests that the clinician mark the margins before submitting the data to the lab. The image is then uploaded to the CEREC Connect website with a digital lab slip attached. A CEREC Connect-approved lab downloads the image and lab slip and decides which method to use to fabricate the crown.

If we choose a millable type crown, a lab-based model will not be required to finish the processing of our requested crown. If we choose any type of traditional crown, such as a PFM or a full-cast gold crown, the lab will typically need a model milled to complete the requested crown and make the crown using traditional methods. In most cases, the lab will charge an additional fee for the cost of manufacturing the milled model to make the requested crown, as there is a fee of approximately $22 per model fabricated for the creation of the restoration

We needed to identify which dental labs were ready for our expected volume of CEREC Connect cases, or, more realistically, we needed to see how many labs were ready for this process at all. In 2009, a "wish list" for the ideal lab was created:

CEREC CONNECT LAB REQUIREMENTS

- The ability to make any type of crown requested (PFM, PFG and all the way to Lava).
- Make these crowns with or without a milled model, depending on the office/doctor needs.
- Beat their current pricing for these same types of crowns, especially when we don't request a milled model (no courier, no plaster and only one-way shipping of product, etc.).
- Up to three-unit bridges, of any type of units (PFM, PFG and all the way to Lava).
- Faster turnaround, preferably one week or less on traditional units, and down to one day for milled type crowns/bridges.
- Most likely done through CEREC Connect, since this is the only dependable route available so far.

Due to its close proximity to the Pacific Dental Services headquarters in Southern California, Glidewell Labs was chosen as the laboratory that would handle the CEREC Connect cases. As this was a rather large project, several preliminary meetings were required in 2009 to see where we both were as far as timing the first case to be sent to them. After Glidewell, several other labs chose to pursue this idea as well, which meant more interviews, checking price lists, evaluating preparedness start dates and making arrangements to allow them on the CEREC Connect drop down menu.

As the lab arrangements were set up, we also evaluated which PDS offices were ready to test the new technology. Three locations were identified, all within Southern California to keep the logistics of any travel to a minimum. They needed to be using CEREC in their officers a great deal already, as well as sending a large number of cases to the labs with traditional impressions. The pre-existing

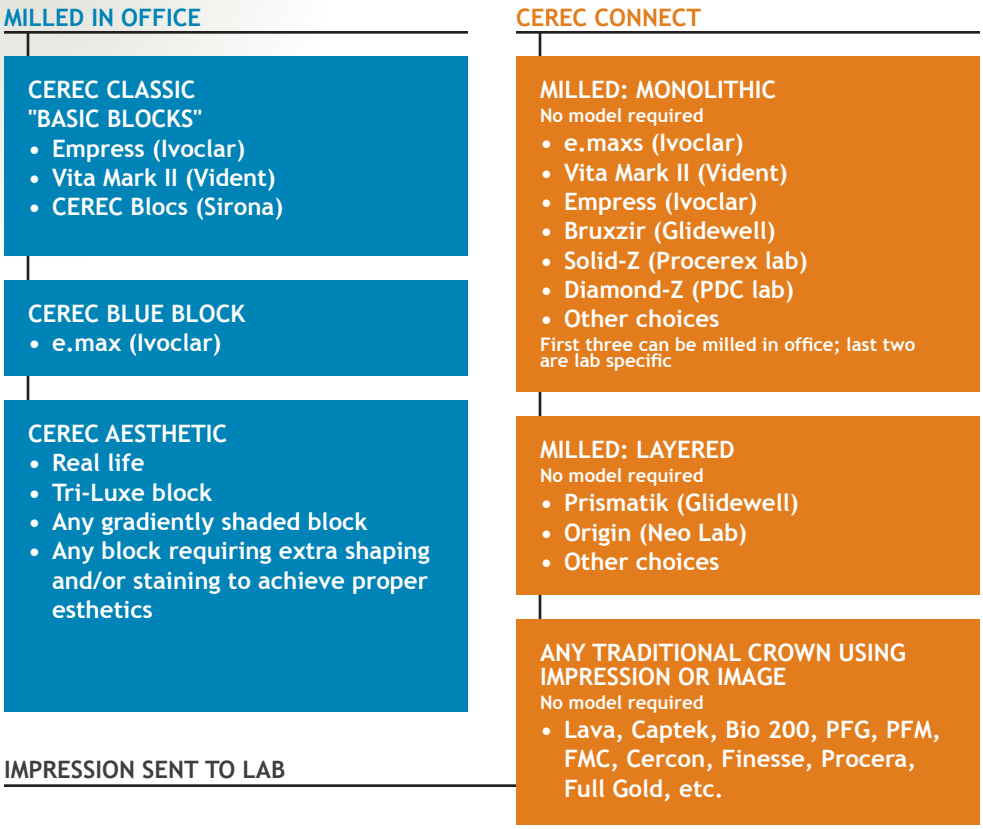
FIG. 1
CEREC CONNECT "IMPRESSION-LESS" 2009 BETA TEST OFFICE CANDIDATES

Office	Owner/ Doctor	Manager	In*	Lab**
#34	Dimitri	N.H.	24	63
#85	Iskaq	L. Ali	34	20
#118	Gebhardt	R.Gomez	36	23

* Crown made in-house
** Impressions sent to lab

FIG. 2

CROWN CHOICES



data related to the three offices that best fit our monthly utilization criteria in mid-2009 is shown (Fig. 1).

A basic flowchart was structured in 2010 to help clarify the choices a doctor might select when providing a patient with a crown (Fig. 2). The original intention of the whole project was to decrease the use of impression material while increasing CAD/CAM-based dentistry. The three categories of choices a doctor faced when determining what type of crown to place is described as follows:

The hard route: Polyvinyl Siloxane (PVS) impressions, or any other type of impression, for crowns. This would be considered an analog route, with the exception of Lava, which utilizes some digital imaging for the coping. This route requires a gooey mess for the patient, an extra visit to deliver and the patient wears a temporary with additional cost to office.

The medium route: This route is CEREC Connect, and this process allows us to "connect" straight to an approved dental lab of our choosing. It is a portal to send an image to a lab, and then any crown can be requested. The catch here is that if a hand-held model is needed to finish the requested crown, there will be extra cost. This route also requires that the patients wear a temporary and more patient visits, with the possible additional costs if a model is needed. This means it can actually be a more expensive route if a traditional type crown is requested from the lab.

The easy route: Every inlay, onlay and crown is done in-house. This route is the fastest for the patient, cheapest for the office, involves the least patient visits and does not require models or impressions. It is the exclusively digital route. To master and consistently deliver the most efficient product, make this your commuter route. It is the easiest and best long-term solution.

We assumed that a majority of our offices would be mostly requesting anterior cases and the occasional bridge with this Connect process. Their utilization was observed over a couple months while also beginning the announcements and promotions for use company-wide. The problem with a multifaceted push also turned out to be beneficial, since there were several other offices that caught wind of the test and decided to jump on board ahead of the official roll-out date, and helped the project gain momentum.

The decision was soon made to open the process company-wide, but a strategy was needed to promote the use of CEREC Connect. Announcements with weekly notifications as well as verbal announcements at the appropriate meetings were used to convey the strategy behind the new promotion. Articles for the internal PDS magazine, PDS Life (PacDen.com/PDSLife), were written and the software was made available at all office locations. Job aids were made available for reference and training, and troubleshooting resources were built within our business support systems. Offices wanted to see pricing and lab information, so this was made available within our PDS intranet. With the expansion across regions and states, it became necessary to identify alternative labs for doctors to choose from that were closer to where they practiced.

Our use of CEREC Connect started in 2009. The majority of the roll out did not begin until December, with a total of 28 units for that year, including the few that were done in our beta test. We quickly realized that we were going to have trouble tracking the volume of units sent to labs because there was no easy way to tie the process to existing internal software systems. The easiest,

and sometime tedious, solution was direct communication with labs regarding the number of units sent to them each week. This took the form of a summary spreadsheet of crown choice requested from lab, patient name and tooth number. In 2010, our total units with CEREC Connect were 4,705 (Fig. 3). In 2011, our total number of units through CEREC Connect was 8,080 (Fig. 4). Based on the first quarter of 2012, there are more than 15,000 units projected for the year 2012 (see Fig. 5).

By early 2011, we could see that many offices in our system had reasonable utilization of the process, but there also existed offices with limited or nonexistent utilization. Further investigation showed that generally, the higher use for CEREC and CEREC Connect was at the newer facilities in the recently expanded regions. The core base of our long-standing offices was having a difficult time adjusting to high utilization with CEREC. They showed sporadic or no use of CEREC Connect. It became necessary to have a secondary push around the use of this process for these offices. This was completed by reusing already produced internal information detailing the process, PowerPoint presentations, job aids, etc., combined with a regional focus driven by the Owner Doctors of that region.

One of the best examples of increased CEREC Connect utilization in 2011 was our Hemet office (Fig. 6). At the start of the year, they were still sending impressions to labs while sending zero units through CEREC Connect. With the help of Dr. John Nosti, Dr. Fred Lee and the associate at the time, Dr. David Lee, they were able to average more than 60 units per month with this process from May until year end 2011, becoming our highest utilization office for 2011.

As for those initial three offices we identified in 2009, we wanted to know how they fared in February 2012

FIG. 3
2010 CEREC CONNECT TOTALS

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	YTD
Glidewell	24	90	145	166	257	306	334	420	316	373	375	316	3122
IDOC		2	9	57	37	56	95	64	56	41	37	65	519
Polaris				65	66	74	69	64	30	33	25	11	437
Neo		1	32	28	35	44	49	23	44	27	30	18	331
PDC						2	15	5	5	13	23	3	66
ProCerex										3	39	43	85
A & A		1	11	33	43	18	7	4	9	5	9	5	145
Totals	24	94	197	349	438	500	569	580	460	495	538	461	4705

FIG. 4
2011 CEREC CONNECT TOTALS

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	YTD
Glidewell	400	326	353	323	295	363	296	429	414	331	395	435	4360
IDOC	32	33	37	28	16	29	19	50	58	58	68	50	478
Polaris	10	10	27	39	8	23	10	166	156	126	103	108	786
Neo	27	23	10	6	4	19	10	44	27	52	61	79	362
PDC	7	7	9	9	12	4	10	1	0	4	4	0	67
Sundance	17	17	36	17	12	8	12	13	1	2	15	0	150
A & A	12	21	89	89	153	110	223	348	177	148	196	211	1777
Iverson										9	19	35	63
Van Hook								18	7	1	8	3	37
Totals	505	437	561	511	500	556	580	1069	840	731	869	921	8080

FIG. 5
2012 CEREC CONNECTR TO DATE

	Jan	Feb	Mar	YTD
Glidewell	510	536	474	1520
IDOC	95	137	73	305
Polaris	168	218	127	513
Neo	154	177	148	479
PDC	0	7	0	7

	Jan	Feb	Mar	YTD
Sundance	2	4	20	26
A & A	258	286	281	825
Iverson	16	38	14	68
Van Hook	11	0	0	11
Totals	1214	1403	1137	3754

FIG. 6
HEMET OFFICE 2011 CEREC CONNECT TOTALS

RM: Jack Knudsen; RP/RVP Joanna Rodgers

Office	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	YTD
28	0	13	12	6	59	58	53	51	61	68	58	46	485

FIG. 7
ORIGINAL CEREC CONNECT BETA TEST OFFICES AS OF FEB. 2009

	CEREC In-house Crowns | Inlay/Onlay		CEREC Connect	Impressions sent to lab
#34 GATEWAY DENTAL GROUP, EASTVALE RM: Melanie Smith; RP/RVP: Joanna Rodgers	54	34	30	0
#85: LA VERNE DENTAL GROUP RM: Stephanie Lasher; RP/RVP: Paula Larson	25	30	35	0
#118: PAVILION DENTAL GROUP, PEORIA RM: Michael Roelandts; RP/RVP: Kevin Lawton	88	13	0	0

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(Fig. 6). In the case of the Peoria, Ariz., office (#118), they are doing all cases in-house so there is no need to send to the lab through CEREC Connect. However, there is still the occasional difficult anterior bridge or unique case requiring more careful esthetics that is sent out via impression or image and may require a milled model.

The most challenging aspect for implementation was getting doctors to change their daily behavior and routines so it could be fully integrated. Imagine no more costly impressions and re-impressions. Imagine the best zirconia-based permanent restorations. Imagine every single case of three units or less size being either milled in the office or sent straight to the lab as an image. The unexpected bonus from the CEREC Connect push was the increase in ceramic-based crowns. Why would a doctor image, and then send the image to the lab to request a traditional crown and then suffer the additional cost of a milled model to go with that traditional crown choice?

The overall shift in permanent full and partial restorations was, and continues to be, from metal-based to metal-free. The prior shift was to in-house milled crowns as opposed to lab processed. The current shift is to impression-free, all-imaged cases. Some will be milled in-house, some will be milled by labs and bridges will be included. The obvious trend is for doctors to request less metal-based lab restorations to all metal-free, including cases from the labs as well. The homerun for missing teeth will be a monolithic block that can be milled in-house and is strong enough for long-span bridges, and has minimal sintering time. Currently we are using CEREC Connect for approximately 8 percent of our total cases, which is a dramatic increase over the 5 percent use of 2011. Ultimately, we expect that roughly 20 percent of our overall cases will be done through the CEREC Connect pipeline. What had started in 2009 as an alternative to capture those traditional crown impression cases, has turned into a valuable choice with increased ceramic usage while being more efficient and providing superior patient care.

For questions or more information, Dr. Rodgers can be reached at Rodgers@pacden.com.

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LAVA IS OFFICIALLY CONSIDERED A CERAMIC!

Compiled from www.cerecdoctors.com/discussion-boards/view/id/10817

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

It's official — the ADA's Council on Dental Benefit Programs has broadened the definition of porcelain/ceramics in the CDT Code. But until the change goes into effect in January, how do CEREC doctors need to report the work in the meantime?

Sameer Puri (cerecdoctors.com co-founder)

For Immediate Release

ada's council on dental benefit programs broadens the definition of porcelain/ ceramics in the cdt code; new nomenclature applies to all porcelain/ceramic cdt codes including d2740 for crowns and codes for inlays/onlays

ST. PAUL, Minn. – (June 12, 2012) – In response to requests from 3M ESPE and the dental community, the ADA will broaden its definition of porcelain/ceramic materials in its CDT Code for insurance reimbursement, allowing 3M™ ESPE™ Lava™ Ultimate Restorative to be classified as a porcelain/ceramic. The change will be effective January 1, 2013, making it possible for dentists who use the material to easily file for insurance reimbursement, including using CDT code D2740 for crowns.

Lava Ultimate restorative is an innovative new material formulated from a blend of approximately 80 percent nanoceramic particles embedded in a highly-cured resin matrix using a proprietary 3M manufacturing process. The material is available for chairside milling using CEREC or E4D systems, or can be ordered as a finished restoration from Authorized Lava Milling Centers, Jensen Milling Centers and Straumann CARES Digital Solutions.

At the time the material was launched, the ADA's CDT Code nomenclature did not yet reflect the advances in material science that Lava Ultimate restorative represents, resulting in challenges with selecting the proper CDT code for insurance reimbursement. However, following a formal request from 3M ESPE, the ADA has now broadened the material definition of indirect porcelain/ceramic restorations. With this change, Lava Ultimate restorative will fall under any CDT code defined for ceramics, allowing for the same rate of reimbursement as other ceramic materials. The new CDT Code definition reads:

Porcelain/ceramic Refers to the pressed, fired, polished or milled materials containing predominantly inorganic refractory compounds — including porcelains, glasses, ceramics and glass-ceramics.

"By broadening the definition of porcelain/ceramics in the CDT Code, the ADA's Council on Dental Benefits is making the benefits of advanced material science accessible to more patients," said John Stefanick, director of industry and professional relations, 3M ESPE. "This CDT Code change will be welcomed by many dentists."

The streamlined insurance reimbursement enabled by the revised definition of glass ceramics in the nomenclature of the CDT Code will make it even easier for dentists to take advantage of Lava Ultimate restorative's unique functionality, providing restorations that are strong as well as kind to opposing dentition. The restorations can be repaired intraorally if necessary, and are backed by a 10-year warranty from 3M ESPE. With the ability to code Lava Ultimate restorative like other porcelain/ ceramic materials for insurance reimbursement, now even more dentists and patients can experience the outstanding qualities of this material.

For more information about Lava Ultimate Restorative and how it will fit under the porcelain/ceramic codes in the CDT code, visit www.3mespe.com/LavaUltimate.

Baron Grutter | Gladstone, Miss.

Sitting in Level 3 right now, as is the chair of the committee reviewing the case. He just confirmed that we can now begin billing as ceramic. He said that for now, just note in your charts that you used Lava.

January 2013, the CDT book will be updated with appropriate definitions of ceramic/porcelain.

Lindell Kemmet | Golden Valley, Minn.

Lava Ultimate Block, that is. Lava itself is known to most people as a zirconia-based coping with porcelain stacked. Lava Ultimate is a block for CEREC made roughly of 80 percent zirconia particles and 20 percent filler resin. Just to make sure everyone writes the same thing down: "Fabricated with Lava Ultimate"

Steve Nielsen | Shelley, Idaho

As the committee chairman, will they be making an official statement about this or just slide it into the code revision without announcing anything?

Scott Welch | Lakewood, Colo.

WOW! A lot earlier than I had anticipated! At the CMG field trip to 3M, some of the "white hats" were hoping for a January 2013 date for approval as a ceramic; or, more to the truth, a redefinition of a "ceramic." Probably just being cautiously optimistic.

I've milled several dozen Lava Ultimate restorations, most of them Cl II inlays and/or smaller onlays. The material is easy to work with, obviously — no firing needed and easy to adjust and polish after placing. I'd only tried a couple of full-coverage restorations with the Ultimate, but wasn't too impressed with the aesthetics after polishing. The finish lacked the 'lustre' that you can achieve with a properly polished e.max or Empress restoration.

Found out at a very recent Denver CEREC Study Club meeting that you can't use the same polishing technique or materials to get Lava Ultimate to shine. Dr. Fasbinder was the guest speaker at the meeting, which was sponsored by 3M, so, consequently, he spent quite a while going over the properties of the material. He's been using LU in a clinical study for close to two years with excellent, if only short-term, results. He had the same issue, but came up with a technique to produce a very high-quality finish that equals that of other polished and/or glazed ceramics. I don't have the info at hand to post, but would be worthwhile to look up or post. It will be interesting to see the effect this has on the sales and use of the LU block.

Ray Kessler | Charlotte, N.C.

I have placed about 80 Lava Ultimate restorations and cemented with Scotchbond Universal and RelyX Ultimate cement. After milling and cleaning with soap and water to get the oil off, or [using a] steam cleaner you must microetch (sandblast) the bonding surface, clean again, and when ready apply Scotchbond Ultimate. Note, all of these are the same family — 3M ESPE. I have had no debonds. Polish outside the mouth with Diashine on a Robinson Bristle Brush. Don't let it fly away.

The material was said to be approved as a ceramic. You need to include in your narrative when filling insurance code 26 that you used Lava Ultimate CAD/CAM block. This is important at first until it is in the CDT in January 2013 or even after.

Stephen Ura | Nashua, N.H.

Hi all — I am the guy who was sitting in Level 3 when this topic arose. I chair the ADA Subcommittee on the Code so please allow me to clarify early on before confusion develops.

At the February meeting of the Code Advisory Committee, we reviewed a request to edit the description of porcelain to address this material that performs like a ceramic but did not meet the current definition in the CDT. At that time, the payer

community commented that they were currently paying for Lava Ultimate as a ceramic under codes D2740, D2643, D2644, etc. Given much of the favorable testimony, as a committee and council, we did move forward to edit the description of porcelain for CDT 2013 that will become effective January 1, 2013. However, in the meantime, given that the payers said they were paying for Lava Ultimate under the porcelain codes, we are instructing dentists to make a note on the comment section of the claim form that Lava Ultimate was used. By doing this over the next 7-½ months, you will be protected that you are not presenting false information while obtaining a benefit for your patient that most carriers are paying.

To summarize, the codes will not be official until January 1, 2013. However, you can currently bill with porcelain codes in the interim provided that you make notation on the claim form in the comment section.

Mark Fleming (Faculty & Magazine Editor) | Scottsdale, Ariz.

In response to Ray Kessler: Let's keep things straight. 3M is notorious for confusing people with their brand names. Bonding agent is SCOTCHBOND UNIVERSAL and the resin cement is RELY X ULTIMATE.

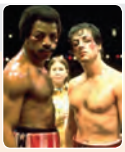
Carry on.

Ray Kessler

Damn Flem, I even proofread my reply. I missed it. 3M needs to come up with a specific name for this family of restorative applications. The "U" is tripping up everyone.

A fault of the pen is not a fault of the brain.

Thanks for the complete clarification and we can call our milled Lava Ultimates, ceramics and maybe get a fair fee.



Peter Gardell (Faculty) | Stamford, Conn.

In response to Stephen Ura: Thank you for the information. Was there discussion on the addition of other materials from other manufacturers being covered by these changes? Will all manufacturers be covered or will they have to go through the code advisory committee on a case-by-case manner?

Just thinking out loud about VITA in particular, and a ceramic hybrid matrix block that was discussed last year at the owners' symposium.

Thanks.

Scott Barrix | Columbus, Ind.

So, if you do need to HFL acid etch the internal surface of this crown previous to bonding and apply a silane coupler if you do not micro-etch?

Baron Grutter

I'm sorry, I don't understand your question. The manufacturer does not recommend etching at all. Users are split. I do not (have gone back and forth on using Interface though), and have had great success with the product.

Sameer Puri (cerecdoctors.com co-founder)

Absolutely no HF acid on Lava Ultimate. Only micro etch and silane.

Scott Barrix

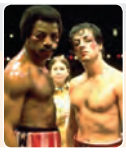
Clearly, I should never start typing before I finish my first cup of coffee. Just wanted to know if HFL acid etching is indicated if you do not have a micro-etcher. Thank you.

Sameer Puri (cerecdoctors.com co-founder)

Nope. Not on Lava Ultimate. No need to HF, it does nothing.

Greg Keene | Lafayette, Colo.

In response to Stephen: Thanks, Stephen, for listening to us! The material is great in so many ways. I'm thankful and appreciate that the code advisory committee recognized this material and modified the code for ceramic. It shows that the committee is forward-thinking and is willing to accommodate new advances in technology.



Peter Gardell (Faculty)

In response to Scott Barrix: If you don't micro etch you need to abrade the intaglio with a diamond.

Stephen Ura

We never get into proprietary products, per say, when developing codes. When we develop codes or make changes, we are looking to fill gaps within the code or provide clarity. Lava Ultimate was the center of discussion since 3M submitted the change request and provided the most testimony and documentation. The committee recognized two things: first, there was lack of clarity since the material did not really fit within the composite definition, yet it did not fit under the current description of the porcelain; we also recognized that Lava Ultimate is not likely to be the only product of this type. Therefore, we worked the definition of porcelain in the CDT with the Division of Science at the ADA to address the gap in the code while being factually correct and not product-specific.

So the short answer to your question is no, we will not develop codes for each new product.

Peter Eliopoulos | Chelmsford, Mass.

Sam, I thought the silane was in the Scotchbond Universal, so it was not necessary to apply silane separately, just micro etch.

Peter Gardell (Faculty)

If you use Scotchbond Universal, silane is NOT needed. Silane is in Scotchbond Universal and has a two-year shelf life.

Sameer Puri (cerecdoctors.com co-founder)

Peter, you are correct; no silane necessary if using Scotchbond Universal or XTR from Kerr.

Eric Ballou | Boise, Idaho

Great news. Thanks for the effort of putting this together, getting the correct code and for getting the word out. I've only done about 10 LU restorations and only two full-coverage crowns. All with XTR and NX3. No debonds yet, but I haven't seen the patients back to see how the polish held up. I thought it polished very easily and well, though almost too easily inter-proximally where the sprue was on an inlay. I wiped through one and had to remill.

Question: has anyone had a debond or any negative results with XTR and NX3? I feel like I just get used to a bonding system and then cerecdoctors.com makes me think I'm not keeping current. Multilink, then NX3 and now RelyX Ultimate. It's hard to know what to do. I feel like the weakest link is by far the bond, so I want to get that right.

Sameer Puri (cerecdoctors.com co-founder)

Eric, all three of those are fine bonding agents. They work great. We want to keep you guys up to speed with the latest developments, but that doesn't mean you have to change every single time.

Lindell Kemmet

Eric, some of us here are Multilink users, some XTR/NX3, some Scotchbond Universal/RelyX Ultimate, some Anchor, some ... you get the point. Lots of us test products for companies and have three or four bonding agents on-hand in our office. We typically have our "go-to" material, but we are here to make sure everyone has information for each material and what is working or not working in another practitioner's hands. All of these bonding agents have their advantages and disadvantages. All will work. Use what you feel comfortable with. Happy Bonding! ;-)

Michael Scoles

Pete, you posted that you need to "rough up the intaglio with a diamond" if you don't have a micro etcher. Does that mean the margin is not going to bond properly? If one part of the intaglio needs to be "roughened" for bonding, seems like the entire surface should have that same tx. Am I missing something here?

John Pappas | Phoenix, Ariz.

Isn't the silane in bottle 2? Bottle 1 is for enamel and dentin priming, only 2 is placed in the restoration.

Baron Grutter

In response to Michael Scoles: Agreed. I suggest just buying a micro-etcher. I think it's like $250. We use it on pretty much every restoration anyway. Well worth the investment.

Michael Scoles

In response to John Pappas: Yes John, brain fart.

This is from Kerr: The adhesive (silver bottle) #2 works as a silane.

Think of the step 1 green bottle as an etch/primer for the tooth only. It's not acidic enough for etching porcelain, so we replace the green step 1 with HF acid and use the adhesive silver bottle #2 to bond to the crown.

Darin O'Bryan | Coos Bay, Ore.

Great news. I thought I was going to have to wait until January. So all we need to do is make a note on the claim that we used Lava Ultimate, and that is just so the insurance company knows we are being forthcoming in what material we are placing.

Yvon Belliveau

If this is going to be classified as a ceramic, and they do away with Paradigm, what are we going to use as a composite? Can this be considered as some sort of hybrid where insurance would cover both?

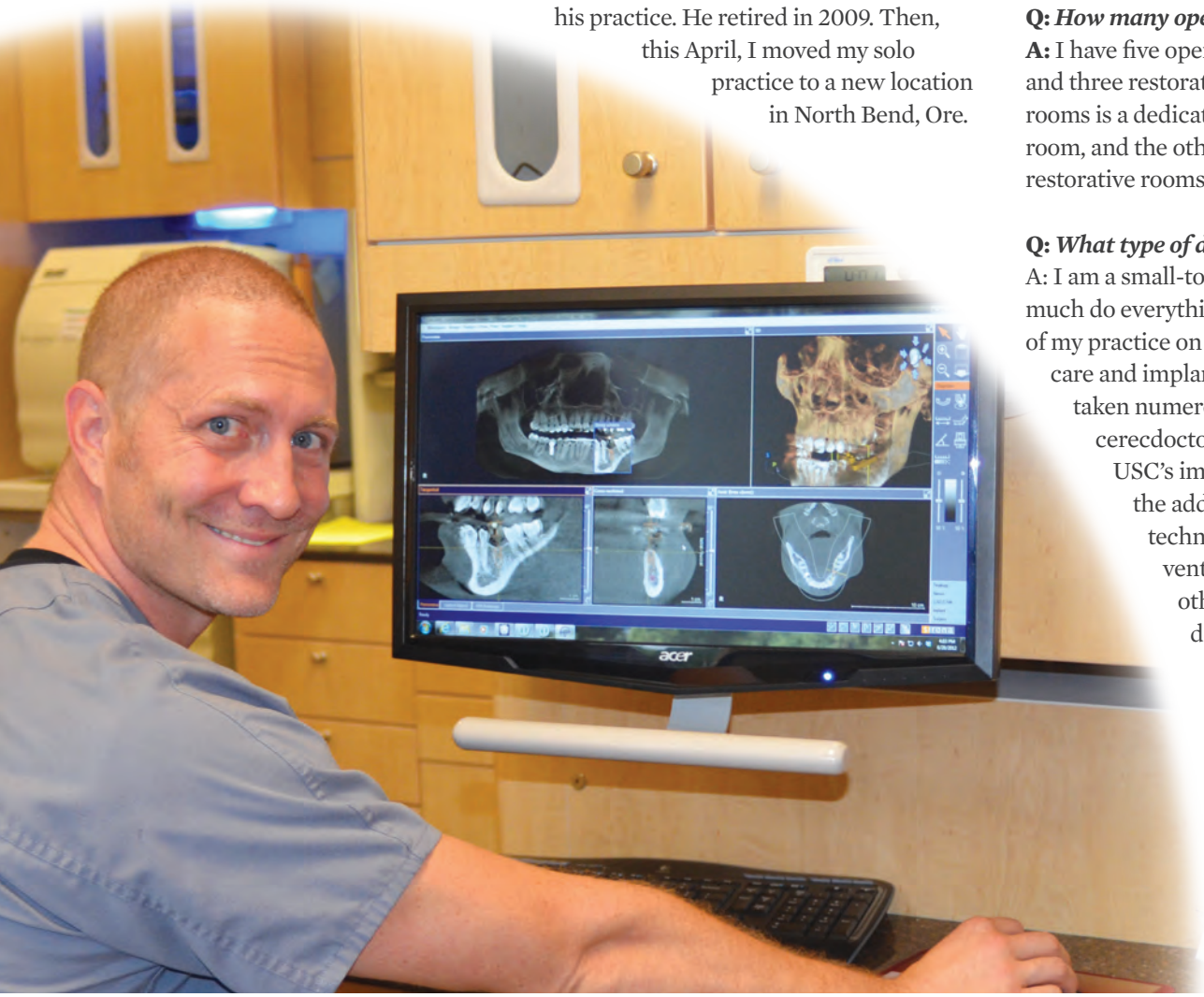
Jeffrey Caso (Faculty)

I think Paradigm will still have a place. I bet they keep it.

DARIN O'BRYAN: A (CEREC) FRIEND INDEED

By Mark Fleming, D.D.S.

After acquiring his practice in 2009, Dr. Darin O'Bryan turned to his Patterson rep for a recommendation on a good lab. Instead, the rep suggested CEREC, and one demo later Dr. O'Bryan was on board. Today, he says CEREC changed his life, giving him the opportunity improve his practice and impress his patients, train others on this technology, lecture, travel and even make some great new friends.



Q: ***How long have you been in practice?***
A: I graduated from the University of Minnesota in 1997. I practiced in a large group in Minneapolis for about seven years before I moved out to the coast of Oregon in 2004. I went into a partnership with a dentist who wanted to transition his practice. He retired in 2009. Then, this April, I moved my solo practice to a new location in North Bend, Ore.

Q: ***What is the size of your practice?***
A: We have about 1,500 patients on record, and we do get some referrals for implants and third-molar removal. We have two assistants, two hygiene and two office staff round out the team.

Q: ***How many operatories does it have?***
A: I have five operatories, two hygiene and three restorative/surgical. One of the rooms is a dedicated surgical/implant room, and the other two are general restorative rooms.

Q: ***What type of dentistry do you do?***
A: I am a small-town dentist so I pretty much do everything, but I focus most of my practice on esthetic restorative care and implant dentistry. I have taken numerous courses through cerecdoctors.com, Spear and USC's implant continuum. With the addition of cone beam technology, I am starting to venture into sleep apnea and other expanded fields of dentistry.

Q: ***Why is CEREC your CAD/CAM choice?***
A: I bought my CEREC in early 2006. I was looking for a good lab and asked my Patterson rep who to use. He mentioned CEREC.

So we had an in-office demo done by Vic Cao, and when I saw the type of restoration that could be generated with the CEREC, I bought it. It was kind of a no-brainer. I could produce a quality crown or an onlay in under an hour and fix my lab costs — why wouldn't I do it? Not to mention the total geek factor of having such a cool piece of technology. I love the wow factor that CEREC brings to my practice.

Q: ***How does this technology fit into your office philosophy?***
A: I am a geek at heart. I love technology and the CEREC merges great with our philosophy of changing people's perspective on dentistry through education and superior customer service. Being able to offer a quality restoration in a single visit helps change our patients' view of dentistry. I can't count the number of times a patient gets a crown or onlay done and says, "Wow, that was the easiest dental appointment I've had."

Q: ***How does CEREC impact your practice?***
A: CEREC has impacted my practice on almost every level. Almost all of my restorative procedures are done with my CEREC machine. Having the CEREC machine then led me to purchase a Galilleos CBCT which I now use for diagnosis and treatment planning of numerous procedures. Coupled with the CEREC, it makes my implant surgeries stress-free and efficient. Just the other day I took a tooth out and did a guided implant surgery in under an hour with a surgical stent that I milled on my CEREC machine. Talk about changing your practice.

Then there is how CEREC has impacted the rest of my life. In 2010, I was asked to be the basic trainer for Oregon, Southern Washington and parts of Northern California. That started me down the path of teaching and lecturing, which has really added a nice change of pace to clinical dentistry. Also, I have met some of my best friends through working with CEREC. Now my "work" vacations are as fun as my regular vacations.

Q: ***What is your favorite CEREC procedure?***
A: It is hard to pick just one. I love doing esthetics and restorative care, but I would have to say full integration of CEREC and the Galilleos is my favorite. Nothing is more techno-geeky than that. The ability to design my final restoration before the implant is even placed makes the whole procedure so smooth. It combines everything I like: CT imaging for implant treatment planning, surgical guides for easy surgery, custom abutments on the inLab software and an esthetic final restoration, all kept in-house and with complete control of the process. I get all excited every time I get to do one.

Q: ***What is your most unique CEREC procedure?***
A: I made an overlay out of e.max that I bonded onto the occlusal surface of an existing PFM bridge that had a horrible plane of occlusion. I designed the onlays to straighten out the plane of occlusion and bonded them into place. The onlays have been in for a little more than two years now.

Q: ***If someone was to take your CEREC away today, you would ...?***
A: Besides retire? I am not really sure, CEREC has become so much a part of how I practice. I would not want to go back to taking impressions, making temporaries and waiting two weeks for my crown to come back.

CEREC OMNICAM POWDER FREE IN LIVING COLOR

By Sameer Puri, D.D.S.

This pictorial will showcase the imaging power of the new powder–free camera from Sirona. The Omnicam works similar to an intraoral camera. Simply wave the camera over the teeth to capture the data and create a working model.

FIGURE 1
The camera is used intraorally–no powder is needed. Simply move the camera over the teeth and a virtual model is created.

FIGURE 2
Any areas of missing data are filled in with the ColorStreaming technology.

FIGURE 3
Opposing images are a breeze–Just wave the camera over the areas that you want to capture and the software does the rest. Preop (Biocopy) images or opposing and Buccal Bite images can be taken with no effort.

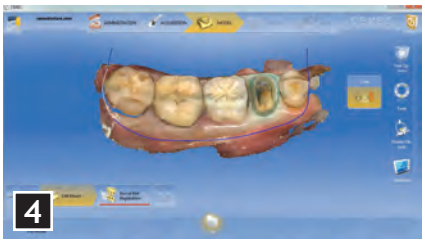


FIGURE 4
A photorealistic virtual model is created in full color. You can even see the cord packed in the sulcus.

FIGURE 5
High–quality opposing scan results in a photorealistic virtual model.

FIGURE 6
The preparation – captured in full color with discolored dentition and all–has been marginated and is ready for margin refinement

FIGURE 7
A fully articulated virtual model of the prep and the opposing can be evaluated by the doctor. Did we mention that this is in full color!

FIGURE 8
Final restoration ready to send to the milling unit.

FIGURE 9
A quadrant case–initial scan started. As you scan, the virtual model is built on the right side

FIGURE 10
More data means a bigger model

FIGURE 11
Upper arch scan is almost complete with a high resolution full color model

FIGURE 12
The opposing scan and buccal bite comes next- again with no powder and in full color

FIGURE 13
The color virtual model is ready for margination. One teeth or four- the process is the same as in the current version 4.0

FIGURE 14
The preparations are marginated and are ready for initial proposal.

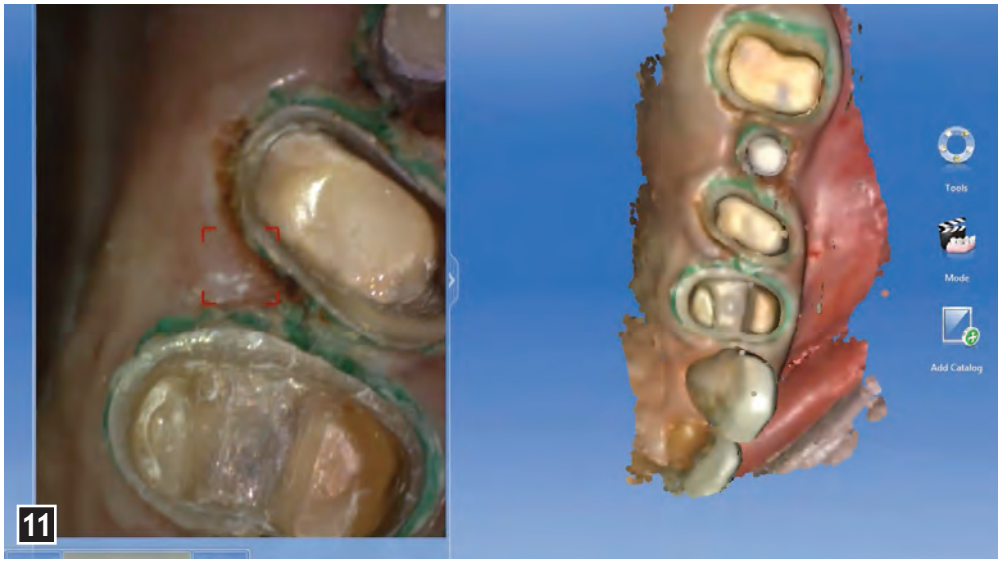


FIGURE 15
Initial proposals for all four restorations are ready for refinement

FIGURE 16
Buccal view of proposals as we tweak the initial proposals by the software.

The Omnicam–powder free, ColorStream and just plain easy to use.

For videos on these procedures, visit:

www.cerecdoctors.com/omni

DID YOU HEAR THAT?

By Sameer Puri, D.D.S.

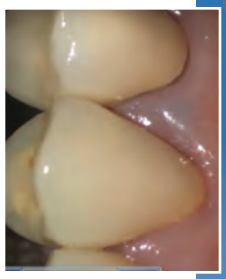
It's the sound Sirona throwing down the gauntlet at its competitors. With the release of the new powder-free, live streaming capture, color intraoral

scanner called Omnicam, Sirona has now made it very clear that it is the big bad boy in the world of CAD/CAM, and all other competitors need to step up their game if they wish to compete.

The Omnicam made its worldwide debut at the CEREC 27 and a half event in Las Vegas. Not only did your humble author have the opportunity to perform one of the first clinical presentations to any audience in the world, my colleague Dr. Armen Mirzayan was one of the beta testers of the camera.

Forget for a second that the Omnicam is powder-free; given the fact that the Bluecam already works incredibly well, this feature was to be expected if Sirona was going to go to the trouble of releasing a new camera. The big news here is that the main criticism of intraoral imaging – powdering – is now a thing of the past. The Omnicam is completely powder-free. Zip, zilch, *nada*. *No necessita el powder-o* (in my best Spanish accent)!

The virtual models created by the Omnicam are photo-realistic and a true representation of the oral condition of the patient — not just cartoons or graphical representations of the teeth and the surrounding tissue. The models actually look like the real deal: representing the tissue, the enamel as well as the dentin in photo-realistic quality.

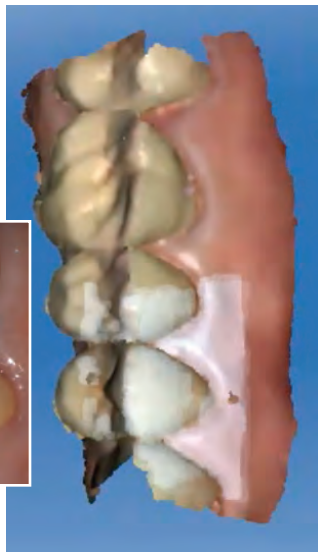


Imaging has never been easier. Simply grab the camera and take it to the mouth to capture your data. You can even use the camera to give the patient a preview of their dentition, thereby replacing the intraoral camera that sits unused in your operatory. Simply put, the technology is something never witnessed before in dentistry. It's the only 2-D and 3-D intraoral camera in the world.

The introduction of the Omnicam represents a true lesson for all would-be CAD/CAM users from whom I've heard every excuse as to why they have waited to integrate in-office CAD/CAM:

- You wanted to wait until the system could do crowns — The CEREC can easily do crowns.
- You wanted to wait until the system could do bridges — The CEREC can easily do bridges, both temporary and permanent.
- You wanted to wait until the system could do implants — The CEREC can not only help in your implant planning, but you can also fabricate your surgical stents and abutments as well as your final restoration.
- You don't like to powder — Well, unlike other systems that claim that they are powder-free but actually sell a powder to help with their imaging (you guys know who you are!) the Omnicam is truly powder-free and full of color.

I always say, stick with the leader. Why would I want to invest $100K+ in a system that is not at the cutting edge? For this I bring the example of the iPad. Yes, there are lots of copycat tablets out there, but for my money, I want to buy not only the best and most innovative tablet, I want to buy it from a company that doesn't follow the trends, but instead sets them (i.e., Apple).



Sirona didn't just copy another company and create just another camera. Their engineers actually invented the technology 27-and-a-half years ago. Sirona didn't just look at the market and create another "me too" system; they took everything we knew and thought we knew about intraoral imaging and blew it out of the water.

The Omnicam represents a milestone achievement in intraoral imaging. To experience it for yourself and watch dozens upon dozens of videos, visit www.cerecdoctors.com/omni. You will see the camera in action and experience multiple clinical cases performed with the system.

As always, cerecdoctors.com continues to be your leader for all things CEREC, and CEREC continues to remain the king of all CAD/CAM systems.

1 Patient Scan

2 Diagnosis

3 Treatment Plan

4 Surgical Guide

5 CEREC® Integration

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† M. Kern et al. "Ten-year results of three-unit bridges made of monolithic lithium disilicate ceramic"; Journal of the American Dental Association; March 2012; 143(3):234-240.

††Mean observation period 4 years IPS e.max Press, 2.5 years IPS e.max CAD. See The IPS e.max Scientific Report Vol. 1 (2001-2011).

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