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Dr. Werner Mörmann photographed by Roddy MacLeod

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FROM THE EDITORS

Time – and Technology – **Marches On**

MARK FLEMING, D.D.S. AND DARREN GREENHALGH, D.D.S.

his issue of *cerecdoctors.com* magazine highlights the upcoming anniversary celebration of the CEREC technology in dentistry. In some ways, it seems like just the other day we were in Las Vegas to celebrate the 20th anniversary. Time, along with technology, marches on.

At that meeting, we had the opportunity to hear from Professor Werner H. Mörmann how the CEREC concept was born. From the initial idea, to enlisting Dr. Marco Brandestini to help, the first CEREC machine came into being. In this issue, we have the distinct pleasure and honor to bring you an interview with



Professor Mörmann. We know it will be fascinating to hear Time and technology marches on! How does one keep up from the inventor of CEREC Technology.

years. It's like Dr. Tarun Agarwal says in his article – this is behind as this exciting technology moves into the future. not your father's CEREC. Explore with him the many ways this exciting technology can be used.

He shares with us how he first saw the melding of different go to www.CEREC25.com. technologies to restore edentulous mouth. He offers a view of the integration of GALILEOS cone beam CT data with happening with the progressing CEREC technology. Here at CEREC digital impressions. Yes, time marches on. And, these cerecdoctors.com magazine, our goal is to provide you with are exciting times.

We also bring you articles from Dr. Mark Hyman, discussing We hope you enjoy this issue. ❖ how important one's team is in the patient experience,

and Dr. Rich Rosenblatt discusses ways he utilizes the CEREC technology in different clinical situations.

As always, we have another doctor's profile and Dr. Sameer Puri's "What's Happening in the CAD/CAM World." You can feel his excitement concerning the upcoming 25th anniversary celebration.

with the changes in CEREC technology? We invite you to A lot has changed since Professor Mörmann had his check cerecdoctors.com for the latest advances. We also invite initial idea for fabricating chairside restorations. Both you to increase your skills by attending one of the CEREC software and hardware innovations have occurred over 25 workshops at Scottsdale Center for Dentistry. Don't be left

Come join thousands of CEREC owners from all over the world Aug. 26-28 at Caesars Palace in Las Vegas for the 25th Dr. Jay Reznick continues with the theme in his article. Anniversary Celebration. To find out more about this event,

> We hope we have helped you keep the pace with what is the latest information concerning this exciting technology.



WE'LL SEE YOU AT CEASARS PALACE FOR C25!

Come by and visit us at the cerecdoctors.com and Spear Education booths, and be on the lookout for our orange CEREC t-shirts. You'll also find us at the opening cocktail parties at Caesars, and don't miss us at the Vita party at PURE Nightclub on Saturday night!

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HOW-TO

Insufficient Block Size

Overcoming situations where the restoration is too big for your largest block

BY TOM NIETING, C.D.T.

hen designing restorations, it is occasionally possible to have a restoration that will not fit into the largest block available. By dividing the restoration into two segments, it is then possible to mill them out in a size that fits within the block.

This case study shows a design problem where the doctor has designed an endo crown on tooth #23, and it



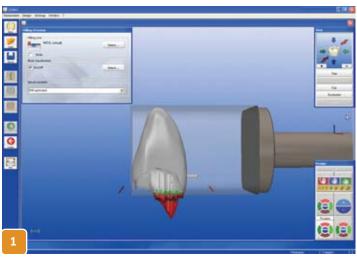
» Tom Nieting.

the final crown (Figure 2).

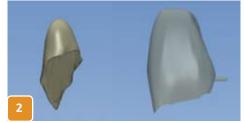
will not fit into the largest CEREC block (Figure 1). The part of the restoration that will not fit into the block is shown in red. In this case, it makes sense to split the restoration into a post and core and

The initial restoration was designed using Correlation. However, Dental Database was used for the prep extension, and the original correlate model was used to design the crown.

In order to take the first step, we start from the milling preview and go to Design>Change. Then we select the patient, the restoration type and design we section the model and trim away technique. For the post and core, the the mesial and distal neighbors. Next, bottom of the prep area (Figure 4). restoration type is set to Inlay/Onlay/ we enter the preparation margin for Partial Crown, and the design technique the post. In order to do that, we're is Dental Database. After setting up the going to have to create a margin inside patient information, we click OK and of the actual prep margin. There are then click the green arrow to move times where we will use the spacebar to forward to the digital model.



- Fig. 1: Endo post crown designed with too much material for the largest block available
- Fig. 2: Illustration of post and core and final crown



Once the digital model is proposed,

automatic margin finder mode to draw the margin for the post (Figure 3).

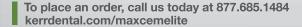
After drawing the margin, we adjust the insertion axis. When setting the insertion axis, we want to make sure that we get the best view possible looking down the canal to get the best post possible. It is important to make sure that we see all the way down to the

Once the insertion axis is lined up, the software generates an initial proposal. Changes need to be made to the initial proposal when designing the final restoration for the prepextension (Figure toggle between the manual margin and 5). Various tools will be implemented Maximum Strength, Maximum Power, Maxcem Elite.



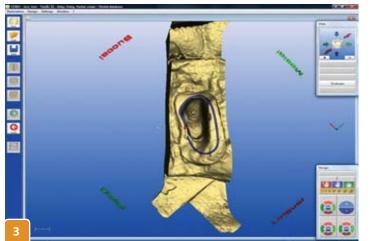
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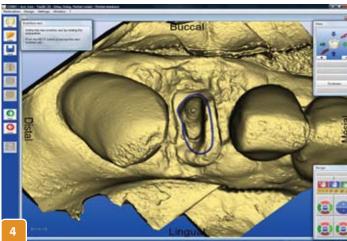
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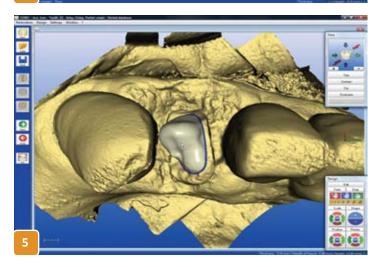


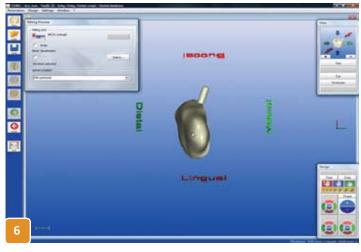


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and Smooth) and the Shape tool in an continue to add material as necessary attempt to make a very strong prep to add strength to the restoration. extension. It is critical throughout the design process to constantly monitor we click the green arrow to go to the how the draw of the post will be placed milling preview (Figure 6). Once in clicking on the center of the virtually for the final crown.

to the restoration by drawing a circle the restoration type, Correlation for the around the top portion of the restoration design technique and tooth #23 from enter the preparation margin (Figure and clicking the plus button in the tool the model. to extend the height of the restoration. Doing this adds a base that material can seats the prep extension (Figure 7) and between the automatic and manual be easily applied to in order to increase in another window of the software, the margin finder in order to draw the the strength of the post. Again, we prep extension is ready to be milled. best margin. want to continue to check the draw to Now it is time to design the crown,

using the Form tool (Add, Subtract the final restoration is going well. We

When we finish designing the post, the mill preview, we click on Design> The Shape tool is used to add height Quadrant and then select Crown for

- » Fig. 3: Margin for post
- » Fig. 4: Setting insertion axis for the post
- » Fig. 5: The initial proposal for the post
- » Fig. 6: Post is ready to be milled

seated prep extension.

We then trim the mesial and distal neighbors of the prep, click Next and 8). There are times where we will want At this point, the software virtually to again press the spacebar to toggle

We green-arrow forward and set the make sure that the path of insertion for and first we redefine the pivot point by insertion axis for the crown. One of the

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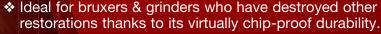
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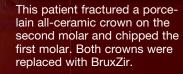
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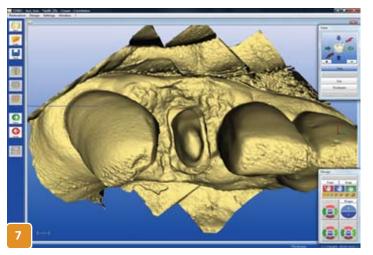
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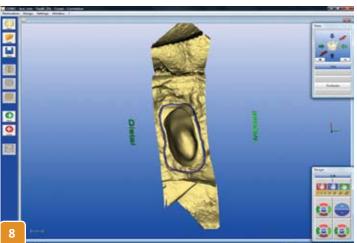
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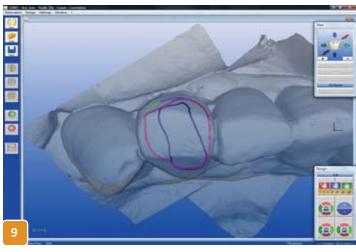
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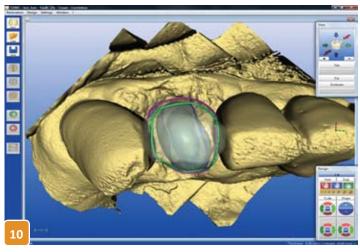
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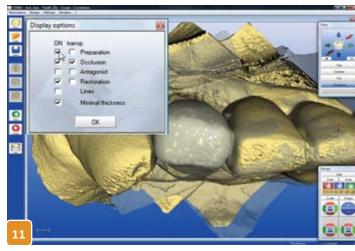
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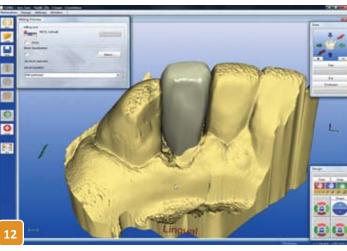












- » Fig. 7: Post is virtually seated and ready for the crown to be designed
- » Fig. 8: Margin for crown
- » Fig. 9: Editing the contour line
- » Fig. 10: Changing the contour lines in relation to the proximal contacts
- » Fig. 11: Using the display options to make the correlate model transparent
- » Fig. 12: Final restoration

things that we have to keep in mind Next, we take a look at the occlusion to The first step in adjusting this with this case, is that we have to take see how the proposed restoration lines restoration is to use the Plus Form a look at how the correlate model lines up with the correlate model. We also tool to smooth the restoration out and up. So we need to try and match a good want to be able to see the restoration add material where needed. On areas insertion axis for both the prep and the and the correlate model at the same where the material is thin, we can add correlate model. Next, edit the contour time. In order to achieve this we click on material with the Plus Form tool and line (Figure 9), arrow forward and check Window>Display Options and turn on then the Smooth function to smooth the copy line.

initial proposal. The first thing we want see through the correlate model and see and correlate model together to make to do is click on edit and check where where the restoration is placed. In this sure that we are satisfied with the result areas (Figure 10).

the transparency for the correlate model away excess material. Once we are satisfied with the copy and also turn the preparation model on When we finish adjusting, we repeat line and arrow forward, we receive the solid (Figure 11). This will allow us to the process of looking at the restoration the contour lines are and edit them case, the proposed restoration is a little (Figure 12). When satisfied, we arrow appropriately to lighten the contact shy of contact so we will have to adjust forward to the milling preview and we the restoration manually.

are ready to mill. *

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FEATURE

Building Blocks for Successful CEREC Restorations

EDWARD R. SCHLISSEL, D.D.S., M.S.

hen choosing a ceramic block for a CEREC restoration, the dentist must consider the factors that determine long-term success. Understanding the evidence of clinical studies and the limitations of laboratory tests will guide the dentist in making decisions that will offer the patient the

best chance for many years of troublefree function.

When selecting from the materials available to use for CEREC restorations, it will be helpful for the dentist to ask the following questions and carefully consider the answers.

- How may materials and restorations be evaluated?
- What are the most significant criteria for evaluating clinical performance?
- What has been the experience in the profession with CEREC restorations?
- What can be done to improve the likelihood of success?

The performance of a material that is used for a restoration may be evaluated in the laboratory and in patients. While tests of mechanical and physical properties are helpful, particularly for quality control, they are not always of predictive value, especially when comparing materials. The assumption should not always be made that higher values in the lab correlate with better clinical performance.

For example, the lab tests most often used to evaluate the strength of ceramic not the case. Neither of these laboratory materials are those of diametral tensile (actually a test of compressive



'While tests of mechanical and physical properties are helpful, particularly for quality control, they are not always of predictive value, especially when comparing materials," says Edward R. Schlissel, D.D.S., M.S.

and flexural strength. strength) involve measuring applied to a specimen until it ruptures. Statistically, significant differences in values obtained during strength testing of different materials may or may not be significant indicators of clinical outcomes.

While it would seem to be obvious that higher values always indicate superior clinical performance, such is tests takes into account the adhesive bonding process, including acid etching

and silanation. These steps greatly improve the strength of a restoration by reducing the potential for cracks to be initiated at the inner surface of the porcelain.

Bindl, Lüthy and Mörmann investigated the relationship of bonding on the in vitro strength of CAD/CAM crowns.1 Their study compared the fracture strength of posterior crowns made of three different ceramic materials: lithium disilicate glass, leucite glass and feldspathic porcelain, when secured to dies with zinc phosphate cement or

resin bonding. Fifteen crowns were restoration. Thickness, especially in percent of the Mark II, 71 percent of the luted with zinc phosphate cement, but after bonding. that when adhesive bonding was used,









was very similar after bonding.

units of force per unit area. While the studies involve many patients, many control of the dentists, the dimensions of significant length of observation time. the restoration, particularly thickness, Vitablock is 1.5 mm at all places on the have been found to be very successful. occlusal surface and 2.0 mm under areas of occlusal contact. The recommended a seven-year clinical trial.² Restorations

to measure the thickness of a milled Paradigm MZ100. At seven years, 94

materials are shown in Figure 1.

made of each material, with a uniform the central groove and areas of occlusal ProCAD and 55 percent of the Paradigm occlusal and lateral wall thickness of contact, should be checked during MZ100 restorations were without flaws. 1.5 mm. After cementation or bonding, design and reviewed critically in the The failed restorations were replaced. the crowns were loaded in compression milling preview. Dimensions should until they fractured. The authors observed be kept in mind during any reductions the results of clinical reports from that the lithium disilicate crowns (which in thickness of the milled restoration, 1986 to 1997 that described the clinical has the highest flexural strength), were especially if occlusal adjustment in the performance of nearly 3,000 restorations. stronger than the other crowns when mouth is necessary during try-in or In their review, the authors considered

In the absence of laboratory tests that that determined success or failure of that difference was not evident. The will be absolutely predictive of clinical fracture strength of all three materials performance, clinicians can be more

secure in making decisions based

There have been many clinical reports performance. An example is ensuring sensitivity. Restorations made from that the minimum thickness of a Mark I and Mark II Vitablocs have been feldspathic porcelain restoration such as assessed in all of these standards, and

In 2006, CRA reported the results of dimensions for crowns milled from these included in the study were inlays, onlays and full crowns. Materials used Using the CEREC software, it is easy were Mark II Vitablocs, ProCAD and

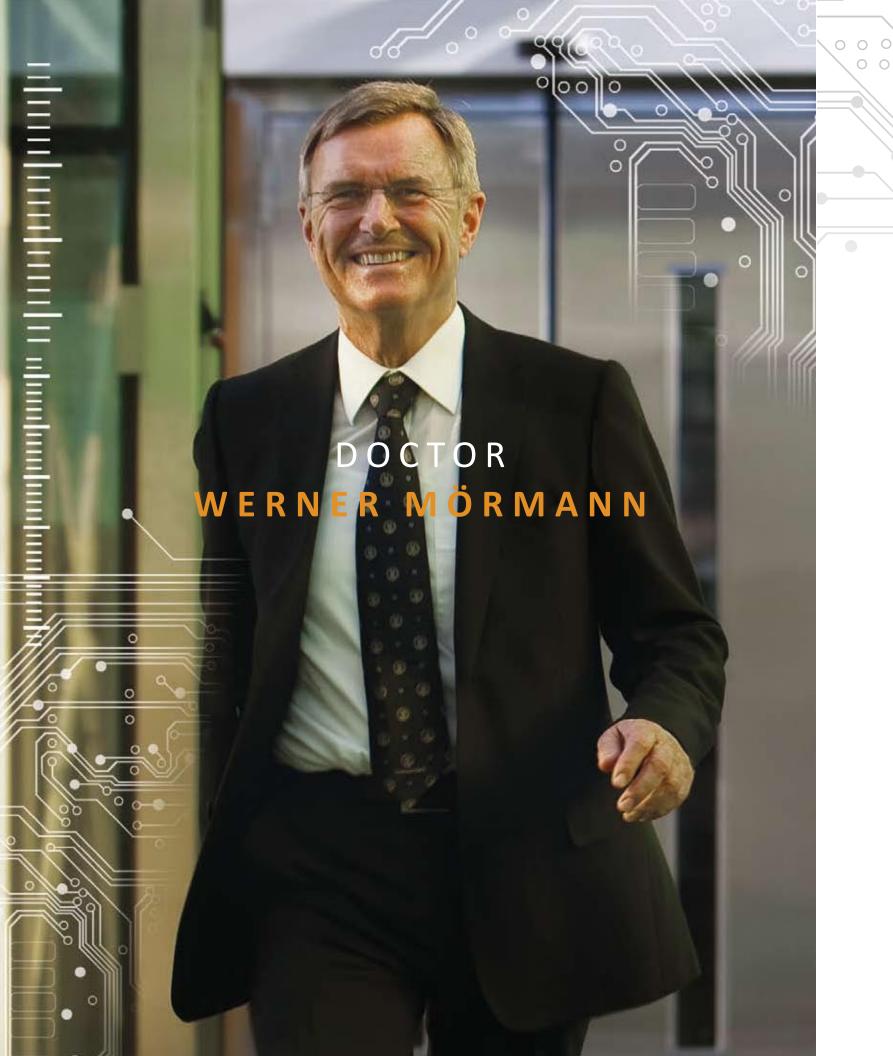
Martin and Jedynakiewicz³ evaluated the aspects of the individual studies the restorations as they were related to long-term survival. In their calculation, the mean survival rate over four years was 97.4 percent. The majority of the restorations were made with Vitablocs.

Fasbinder⁴ reviewed and summarized 22 clinical studies from 1985 to 2006. The majority of the reports included restorations made with Vitablocs, Mark I and II. The author's The results of fracture tests do provide on review of the evidence collected summary conclusion was, "... The useful information. They are given in during clinical trials. The best clinical survival probability of CERECgenerated restorations was reported to strength of the ceramic is not under the restorations, many dentists and be approximately 97 percent for five years and 90 percent for 10 years."

Based on the evidence reported in are easily managed. For CEREC on the performance of CEREC clinical studies conducted by many restorations, proper tooth reduction restorations since their introduction 25 dentists including many restorations, and restoration design will ensure years ago. The criteria for evaluating the a dentist may feel very comfortable adequate strength. By staying within the success of restorations have included selecting Vitablocs as the restorative performance envelope of the ceramic, fracture, marginal integrity, surface material for CEREC techniques. Proper the dentist may be comfortable that the wear of the restoration and the opposing restoration dimensions and bonding restoration will have successful clinical dentition, color stability and patient procedures will ensure predictable clinical outcomes. �

> Bindl A, Lüthy H and Mörmann WH. Strength and fracture pattern of monolithic CAD/CAMgenerated posterior crowns. Dent Mater 2006 RA 2006, April; 30 (4), 1-4 artin N and Jedynakiewicz NM. Clinical performance of CEREC ceramic inlays: a systematic review. Dent Mater 1999;54-61.

Fasbinder, D. J. Clinical performance of chairside CAD/CAM restorations. J Am Dent Assoc, 2006, Sep;137 Suppl:22S-31S



The Man Who Created CEREC

BY SAMEER PURI, D.D.S.
PHOTOS BY RODDY MacLEOD

It was my privilege to interview the man who is arguably the 'Father of CAD/CAM Dentistry,' Dr. Werner Mörmann. As the inventor of the CEREC some 25 years ago, it's fitting that he not only graces this issue's cover, but also shares his story in conjunction with the CEREC 25th Anniversary Celebration in August. I hope you enjoy this insight into the mind of the man who created CEREC.

Q: Dr. Mörmann, will you share with our readers your history in dentistry, and your current duties and responsibilities at the University of Zurich?

A: I graduated as a dentist at the University of Heidelberg Dental School in 1967, and completed a doctoral thesis on the condensation of spherical particle amalgam in 1968. I liked designing and doing experimental work. In my first year as a resident dentist in a private downtown practice, I became accustomed to treating 10 to 14 patients during a working day. And later, in a busy practice

in the countryside, I would see between 30 and 40 patients a day.

In October, 1970, I started as a clinical associate at the University of Zurich Dental School's Department for Preventive Dentistry, Periodontology and Cariology, at the time a leading place in the field of periodontology.

Professor Mühlemann's scientific approach to dentistry immediately got me hooked. Learning and researching perio was a pleasure, and teaching undergraduate students operative dentistry was a

THE MAN WHO CREATED CEREC

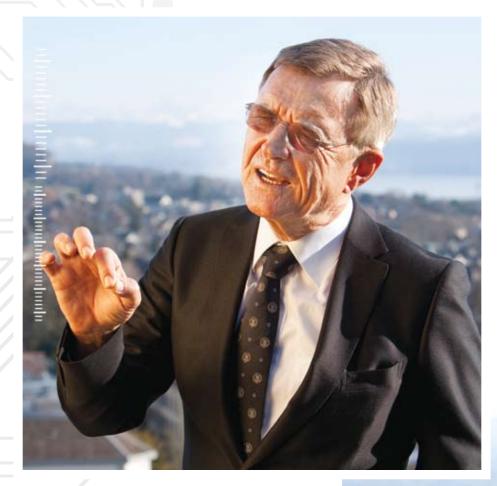
duty. I did another doctoral thesis, titled, "Gingival Reaction to Well-fitted Subgingival Proximal Gold Inlays," to qualify as a periodontist, and published more than 50 articles in the fields of periodontology, preventive and operative dentistry. I qualified as a professor in 1979 with an extended postdoctoral thesis work on "Fluorescein Angiography of Human Gingiva." To study revascularization of gingival grafts, I designed a motor-driven cutting device for taking graft tissue of even thickness from the palate.

Early in 1980, I started laboratory and clinical experimentation on bonded posterior composite inlays, prompting me to develop CEREC. I am now professor emeritus, but still use my office part-time, tracking the current developments of CAD/CAM and related materials science.

Q: What led you to create the initial CEREC technology 25 years ago?

A: I had always liked to restore form and function of posterior teeth with placing amalgams or seating gold restorations. However, the physical and esthetic mismatch between the natural dental hard tissues and metal had always irritated me. In 1979-80, when I observed a downtown Zurich dentist starting a large-scale business with placing extended Class II posterior resin-based composite fillings that all failed after a short time, I knew that state-of-the-art, tooth-colored posterior restorations would be a future need.

My first approaches to solving the problem were experiments with heat and pressure processing of composite inlays. The inlays showed porefree density and improved resistance to occlusal abrasion, but advancements, however, were not really satisfactory. But above all, the indirect fabrication of the inlays was tedious, comprising the lost-wax process, plus pressing and heating. On the basis of established conventional technology, I could not find any practicable shortcut method to make composite-inlays available as a fast, higherquality alternative to direct filling, and saw myself



faced with two problems: first, find a tooth-colored material superior to composite, and second, make it useable as a fast, direct restorative technique.

Q: What do you feel was the biggest challenge that you had to overcome at the time?

A: Dental porcelain (esthetic ceramic) inlays have been known for more than 100 years, and have been manufactured by dental technicians using slurry of powder to layer and fire the restoration. However, for material testing, manufacturers were using monolithic, fired ceramic ingots. The question was, can we shape inlays within a short time from esthetic ceramic blocks using diamond tools, without weakening the material? My tests said, yes we can!

My research showed that within the industry,

quick-point grinding was used to fashion alumina ceramic hip-joint heads. While this kind of fabrication produces big numbers of the same product, the dental work piece has the essential need to custom-shape each restoration individually with every new application. First and foremost, this implies measuring any and every preparation with micron accuracy in three dimensions.

In my vision, to enable fast ceramic inlay fabrication at chairside, the 3-D-data capture of a tooth preparation had to be a split-second process performed directly in the oral cavity. This was, without any doubt, the biggest challenge.

Q: In the early years of CEREC development, what was the most significant advance that

made you think that you had a viable product?

A: Developing the 3-D opto-electronic mouth camera was the gist of the matter. It could not have been done without a brilliant partner, electrical engineer Dr. Marco Brandestini, and not without the help of a small optics company, Kern Inc., in Aarau, Switzerland.

Marco and I had to travel to the Silicon Valley to meet the R&D director of Fairchild, Inc., and convince him to supply us with their CCD video chip, which we dearly needed. It measured 14 mm by 14 mm, with a resolution of 50 microns – just the size necessary to scan a molar tooth preparation, including the proximal surfaces of the mesial and distal neighboring teeth one-to-one. In the early 1980s, CCD technology was withheld from general circulation for reasons of national security because of the ongoing Cold War, and we had to present in-depth information about our project to finally be accepted as a receiver.

Though we had been able to do 3-D scans from plaster casts on the bench as early as 1983, it was an overwhelming, great experience. The entire system was then ready for doing the first chairside CEREC inlay on Sept. 19, 1985, which marks the birthday of CEREC CAD/CAM as a dental restorative method. This gave me the definite feeling that we had a viable method and product.

Q: How was the early version of the CEREC received by the dental profession? What was their reaction to the technology?

A: Among private practitioners and dental schools, the original CEREC was received with enthusiasm and skepticism simultaneously. The comments on the presentation in 1985 ranged from, "electronically garnished stone-age restoration," to "revolutionary high-tech system." At dental schools, the reason for a more negative attitude toward CEREC was, "sorry, not invented here," or "you must know our school is very, very conservative." But then CEREC was honored with the Götz



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Award from the medical faculty of the University of Zurich, and the Engel Award from the Academy for Continuing Education in Karlsruhe, Germany.

Dental technicians heavily criticized the obvious imperfections that the system had at the beginning, such as limited marginal fit and lack of occlusal shaping. Additionally, they didn't like the idea of a ceramic-restoration-producing device in the hands of the dentist. However, several clever dental technicians started working with second-hand units, and offered occlusally adjusted, finished and polished, indirect CEREC restorations to private practitioners.

Enthusiastic dental practitioners stepped in at once. They usually reached the peak of the learning curve after about 50 to 70 inlays. For various reasons, some failed: They couldn't align and steady the camera properly; some were unable to interpret the grey scale optical impression image and brightness-coded depth profile. Another big sticking point was the 2-D design software made up of just 400 kbytes, offering simply 2-D profile lines, margin finder, boundary lines and marking points. However, smart CEREC 1 freaks loved it, and were proud to belong to an exclusive breed of

clinical experience documenting the reliability and durability of CEREC 1 inlays. Those stepping in today enjoy the mature top technology right from start, including the 25-year technical experience of the manufacturer.

Q: At what point did you realize that you needed a larger entity involved to grow the dental CAD/CAM concept, and how did you end up at the steps of Sirona (Siemens)?

A: I had serious money invested in the private Brains, Inc. company we founded in November, 1985 to manufacture the first 25 CEREC 1 units. Seeing that our own considerable capital diminished rather rapidly, I realized that we needed a larger entity involved to further develop and market the dental CAD/CAM concept.

Since 1983, Marco Brandestini and I had developed the user interface and the design software for inlays in close cooperation with Dr. Alain Ferru, a young software engineer who programmed the CEREC operation software Version COS 1.0. In December, 1985, I congratulated him for his contribution so far, but told him that we had to completely revise the software to make it more user-friendly. He was shocked, because

For me personally, developing CEREC and accompanying its further growth has been a multi-faceted adventure. Visions are born out of professional practical experience, knowledge, creative power, perseverance, opportunity and luck.

dentists who were able to master the system. They never would have wanted to have the CEREC be easy to use. They enjoyed mastering the technology and their success by its use.

Conservative dentists said, "I will buy such a system in 20 years when it is mature." In my personal opinion, both attitudes were right. Without the colleagues stepping in early, we would have missed the now-precious 20 year

he was totally convinced that everything was up to absolute perfection, and could not be improved. That was tragic, and we had to end our collaboration with him. But this also confirmed our need to look for a strong industrial partner to keep CEREC going.

Major dental companies such as 3M, Dentsply and Siemens were interested in the system. For us, the electrical engineering R&D power and proximity of the partner played the major role, since a close cooperation between the initial developers and new partners was essential for the success of the project. In 1986, our contacts with the R&D team of Siemens Dental in Bensheim, Germany grew closer, and in August of that year, Brains, Inc. and Siemens arrived at a cooperation and licensing agreement. When Siemens sold its dental branch in 1997, its grounds and manpower – including the CEREC team – became Sirona. Today, Sirona is a NASDAQ-registered enterprise. Through all that time to this day, I work closely with the CEREC team.

Q: What do you believe has been the most significant advancement from CEREC 1 to the current CEREC AC powered by Bluecam?

A: Recent users may not be aware of this because it is commonplace today, but the introduction of the 3-D software was the biggest step ahead in the practicability and ease-of-use of the CEREC system, compared to the former 2-D user interface. This is true for both chairside restorations by the dentist and for the work of the dental technician in the laboratory as well.

The 3-D software also formed the basis for the implementation of the mathematical Biogeneric

Virtual articulation will be used for adjusting the functional pathways of new restorations. This system paves the way for individual, fully automatic design of any part of the dentition.

Q: What have you been most disappointed by in the evolution of the CEREC technology?

A: I had always hoped that the acquisition costs for CEREC hardware and software could come down, so that CEREC would become a more easily affordable standard equipment for every young dentist. So far, this has not happened, much to my disappointment. However, the continuing rapid pace of research and development of hardand software permanently causes high costs which have to be paid for. Increasing demands on the precision of 3-D scanning (Bluecam) and milling (MCXL), quadrant and full-arch scanning, biogeneric occlusion and continued automation of restoration design - all are improvements which ease and speed up the restorative process, saving time and money for everybody involved. This is completely in line with my original CEREC concept, using high-technology to enable durable, highly esthetic restorations by a fast chairside process.

With CEREC 1, we started with an "inlay/onlay/

... I had the luck to have Marco Brandestini as a partner; other lucky circumstances also helped. The time must be right for a basic innovation. Here amalgam-phobia, increasing economic wealth and rising esthetic demands were driving factors.

tooth morphology, as developed by Albert Mehl and V. Blanz. The Biogeneric system is now a unique, integral part of the CEREC software. Based on a large sample of 3-D scans of all natural teeth of the human dentition, the natural anatomy of any tooth can be retrieved if the system gets 3-D scanning information from neighboring or antagonistic teeth. This is automatic, individual, digital "waxing-up" at its best! Occlusion is registered by buccal scans.

veneer machine." CEREC 2 added anterior and posterior full crowns; CEREC 3 and inLab introduced unrestricted, fully anatomic machining and use in the dental laboratory. Finally, CEREC AC and MCXL comprise highly efficient chairside as well as laboratory restorative work pieces of any kind, including zirconia crown and bridge framework, and provisional polymer bridges. The CEREC CONNECT concept optimizes collaboration

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between dentist and technician. What a great development! Current users are successful by the added value CEREC provides economically, and by the fun it is to operate and to experience as a patient. Hence my disappointment concerning this matter is put into perspective.

Q: What is your level of involvement with CEREC today?

A: It is reduced, and will be further reduced. I have stopped treating patients, and I have handed over my CEREC training courses to Professor Albert Mehl and Dr. Andreas Bindl. I still have my direct contacts to the Sirona CEREC R&D people in Bensheim, some of whom I've known since the start of our collaboration 25 years ago. I continue working with my long-term clinical associates at the dental school, especially Dr. Bindl, who is now evaluating long-term clinical studies (e.g. on three-unit CEREC zirconia framework fixed partial dentures), and I help with publishing the respective articles.

My greatest concern during the last three years was to find an able successor for the position of head of the division for computer restorations at the dental school. I am very happy that we have found the ideal candidate in the person of Professor Mehl. I was able to attract him to the Zurich Dental School as a guest professor, and he has the best chances to be officially appointed as my successor in short. He has already significantly contributed with developing and integrating biogeneric occlusion into the CEREC software. With Andi and Albert in position, I think I have secured the Zurich Dental School as a lasting hot-spot of CAD/CAM in general, and CEREC technology in particular, in the future.

Q: Compared to 25 years ago, have you been pleased with the acceptance of the CEREC concept within the dental community?

A: In the beginning, the acceptance of the CEREC concept was always good enough to just keep it going. I have presented lectures on computer restorations around the globe. Competing activities

of Drs. François Duret (French system) and Dianne Rekow (Minnesota system) have kept dental and even public interest in dental CAD/CAM boiling. Enthusiastic support among dentists and in-house Siemens clinicians was met by committed opponents. CEREC 1 was not really profitable for Siemens Dental, and I had several serious discussions with the management and controllers. The company had to experience its own learning curve with this particular product, with its technology and its philosophy.

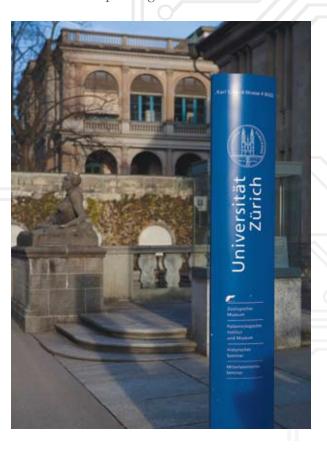
In 1991, I organized the International Symposium on Computer Restorations, which assembled first-rate international dental researchers and demonstrated the strong impact the CEREC concept had on the dental, clinical, scientific and industrial worlds. However, the good times of acceptance did not start until 1994 with the advent of CEREC 2. Today, in the city and Kanton of Zurich, at least every third private practitioner works with CEREC, and acceptance is globally excellent and on the rise. I am very much satisfied with this growth, but I think it can still be improved.

Q: There is a tremendous amount of research validating the CEREC concept. Is there any specific study that hasn't been done that you feel needs to be done with regard to CEREC restorations?

A: I would like to see a direct clinical comparison of bonded CEREC molar crowns with similar occlusal thickness made of feldspathic ceramic (ProCAD/EmpressCAD, Vita Mark II) on the one hand, versus lithium disilicate ceramic (IPS e.max CAD) on the other. What is the point of that? Remember, a single CEREC crown can be machined in approximately 10 minutes, and is then manually finished and polished before bonding.

Using lithium disilicate ceramic after machining adds a minimum of 30 minutes for crystallization and glazing, yielding a ceramic which nominally has a two to three times higher strength than feldspathic ceramic. No matter which material you prefer, it would be of scientific interest to know

whether these two types of esthetic ceramics makes a clinically relevant difference with regard to reliability and durability. It would be good for the patient and for the dentist to know whether the time added is wasted or worthwhile. To my experience, bonded Vita Mark II posterior crowns stand the test of time. Depending on the results of a direct



clinical comparison, specific indications could be established for the investigated ceramics. The same studies could be conducted using self-adhesive luting agents and non-adhesive cements.

Furthermore, I would be happy if somebody knowledgeable in the field could provide an easy-to-use device which would enable the practitioner to quantitatively measure the posterior bite force of a patient quickly and easily. Even a close estimate may suffice. Current methods are complex and

time-consuming.

Q: If you look back on the early CEREC restorations that you've placed, how have they held up? Have you been satisfied with the results? What would you like to see improved?

A: One of my patients came in after 14 years and complained that his CEREC had just broken. I had to redo it without charging him.

When I started doing CEREC 1 inlays in 1985, I experimented a lot and went through quite a number of questions and tasks, including which cavity design to choose, which taper to use for occlusal and proximal-lateral walls, the occlusal minimum depth of preparation, how to handle undercuts when replacing amalgams, and how to avoid unnecessary cut-back. Can marginal beveling be used? How should the gingival margin be prepared, butt-joint or chamfer? How do I handle subgingival margins? Which base material is best, or can it be set aside at all?

Other things I had to consider: developing scan powder and propellant system, optimizing scan powder; adhesive bonding of the inlay: enamel etch technique (at the beginning I had to use 37 percent clear phosphoric acid solution; gel was not on the market), bonding to enamel, and later, bonding to dentin; etching the ceramic and developing the hydrofluoric acid gel; using resin-based composite for adhesive cementation: decide between light or chemical curing. Manual contouring of the occlusal morphology: avoiding excessive deepening of fissures; finishing and polishing.

Every step had to be defined anew. Mistakes and errors happened.

The Vita Mark I ceramic was made from standard ceramic powder, featuring a broad range between 5 micron and 150 micron, and larger particles which did not result in a completely flawless structure of the ceramic at that time. Cracks could happen if the material was weakened by a deep main fissure as a result of exaggerated occlusal contouring

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using blunt carbide burs. At that time, we had uncontrolled wall thickness. I had to replace some of the early CEREC 1 restorations. But nevertheless, success was achieved to a high extent.

Today, the CEREC process has been fine-tuned to perfection. A selection of high-quality esthetic block-ceramic is available. Self-adhesive cements improve adhesive bonding. Nevertheless, I would like to see ceramics developed which do not need further processing after machining by additional time-killing heat treatment, such as sintering or crystallization to secure immediate chairside application of full molar crowns, even if non-adhesive cementation is demanded.

Q: In terms of materials, what material evolvement would you like to see occur?

A: It is an old dream of ceramists and ceramic engineers to furnish esthetic ceramic with some degree of elasticity to reduce its brittleness and its tendency to crack and fracture. Such a material could be ideally suited for restorative purposes. Current literature describing freeze casting techniques indicates that hybrid ceramics can be generated with directional enamel-like structures. This may be a way to further improve machinable esthetic ceramics. I will watch this fascinating, basic scientific field with utmost interest.

Q: What do you feel needs to be improved with the current CEREC AC Technology?

A: The Bluecam is a wonderful, much-advanced piece of technology based on our original optical concept of the CEREC 1 camera. Although we have to powder the teeth, the convenience of the system far outweighs other systems on the market. When I started using scan powder in the mouth of the patient for the very first time, the dental assistant was shocked. But she quickly learned to use the suction to eliminate excess clouds of powder so that it could not settle everywhere. Today the application of scan powder is routine, and more sophisticated

devices than the first ones are available.

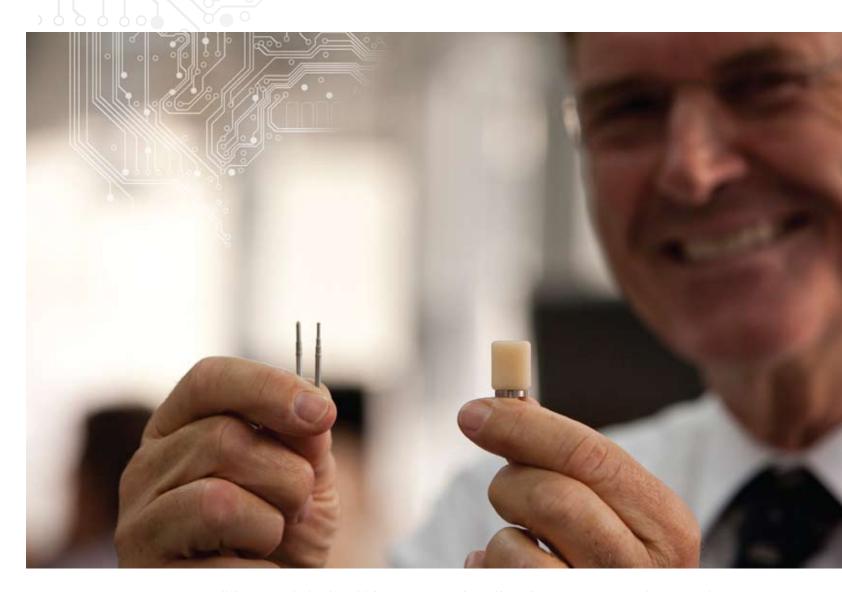
Nevertheless, it would be a benefit for every CEREC user if we could get rid of the powder. The question is, at what cost? There is a confocal laser scanning system on the market that works without scan powder. Apart from powder, the same requirements are met, such as complete dryness and absence of bleeding during the scanning sequence, best provided by placing the rubber dam. The problem is that the confocal laser scanning system needs a lot of space, expanding the camera to the size of a muscular male forearm.

I cherish our classical dental instruments, their handy size and weight, designed for the space available in the mouth. If the price of no-powder scanning has to be a bulky camera, I want to stay with powder and wait a couple of years until technology allows us to have a no-powder mouth camera no bigger than the Bluecam – or even better, the same size as the small CEREC 1 camera. But again, that is my personal preference.

Q: Where do you see CAD/CAM, specifically CEREC, in five years? Ten years?

A: The existing competition in this field will keep research and development at a fast pace. We will see even more automation and ease-of-use, and I expect potential for miniaturization of the chairside hardware. The odds for CEREC are excellent; the fact that CEREC was the first successfully marketed CAD/CAM system means ample experience of the Sirona R&D team, and ensures an enormous research and development power.

My own idea has been to create a small, integrated mobile unit especially for chairside use, like the original CEREC 1 and 2. If newly engineered with today's machining and camera technology, it could fulfill the needs of many chairside users. More than a few CEREC users have told me, "I mainly use CEREC for inlays and overlays; every once in a while I do veneers, and maybe single full crowns. If I get to do fixed partial dentures or a multi-unit highly esthetic



anterior case, I collaborate with the dental lab."

For collaboration with a lab or center, CEREC Connect Internet platform and software is now available. Practices focusing on crown and bridge work and full-mouth rehabilitation – as well as busy dental labs or centers – would rather use heavyduty, industrial-type machining hardware mainly suited for the machining of framework ceramic, such as transformation-toughened zirconia.

Even though the MCXL represents a multipurpose, high-grade piece of technology, it may technically make sense to separate the wet machining with diamond tools of glassy esthetic ceramics (Vita Mark II, ProCAD/EmpressCAD) and glass ceramics (IPS e.max CAD) from dry or wet milling with milling cutters. The latter milling technique is used mainly for shaping porous infiltration ceramics (In-Ceram zirconia, -alumina, -spinell) and polycrystalline alumina ceramics (Vita AL-Cubes; Procera,) as well as for milling polycrystalline zirconia ceramics (Vita YZ-Cubes; e.max ZirCAD; InCoris ZI and AL and others). Systems best fulfilling

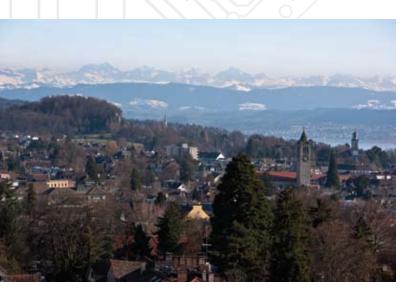
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the needs of users will prevail in the future.

Q: The CEREC 25th Anniversary Celebration in August will be your last public lecture on the CEREC technology. What can attendees expect to hear from you?

A: I will share my personal CEREC story with them. Some may experience a "déja vu" effect, or "I



have heard this before." But for CEREC newcomers, it may be interesting to learn how it all developed.

I consider the knowledge of the history of technologies and the associated persons as precious. It tells you that, "Effecting change is so very difficult. You get beaten down by all the outside forces you can't control." $^{\rm 1}$

For me personally, developing CEREC and accompanying its further growth has been a multifaceted adventure. Visions are born out of professional practical experience, knowledge, creative power, perseverance, opportunity and luck. I had the luck to have Marco Brandestini over as a partner; other lucky circumstances also helped. The time must be right for a basic innovation. Here amalgam-phobia, increasing economic wealth and rising esthetic demands were driving factors.

In spite of many difficulties and set-backs during the early years, CEREC presents – other than most competing systems – a lucky story. The clinical as well as the technical concepts stood the test of time. But the most important benefit CEREC has for patients and doctors is: CEREC is fun and fascinating. It is fun for the dentist to command high technology in front of the patient, and it is fascinating for the patient to experience "it feels like my own tooth," when closing after a CEREC restoration has been seated.

Q: What does the future hold for Dr. Werner Mörmann?

A: Hopefully it will hold fun and fascination for me. My heart is in research. I will continue to study the literature concerning the developments in dental CAD/CAM and related technologies, as well as dental materials. I am also interested in physics and astronomy. I still have my desk and computer at the dental school, with access to technical e-journals, including science and nature. This is not for me to come up with new bright ideas, but I need to know what's going on.

In addition to the technical literature, I read newspapers, fiction and bibliographies. Apart from German, I enjoy reading books in English. As I get older, I want to stay mentally and physically fit. Every morning at 5:45, I do a 30-minute workout. During the winter, I frequently ski downhill and cross-country. In summer, we hike in the Alps – Switzerland has a perfect system of alpine hiking trails. I also love windsurfing and swimming on Lake Davos, on the Red Sea in Egypt, or other nice spots when possible.

We have a house and a garden to tend to in Zurich. Our daughter is an artist and our son went into finances. They are close to us, and keep us busy. By watching me, my children got the impression that dentistry is a hard-working profession that they didn't want to copy.

I am interested in fine art, and regularly visit exhibitions in Switzerland and abroad. I hate long-distance flights, but I love traveling by car through the United States. So far, I am not afraid of getting bored. �

¹ E. Van Lustbader 2009: 'The Bourne Deception'





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August 26-28, 2010, Caesars Palace, Las Vegas, NV

A general schedule outline is provided below...

Wednesday, August 25, 2010

9am – 7pm – Registration/Hospitality Desk Open

10am - 5pm - Exhibitor Setup, Octavius Ballroom

6pm - 8pm - Wine & Cheese Reception, Neopolitan Ballroom

Thursday, August 26, 2010

7am – 1:30pm – Registration/Hospitality Desk Open

11am – 2pm – Tradeshow Open, Octavius Ballroom

8:30am - 12pm - General Session, Forum Ballroom

12pm - 1:30pm - Lunch in Exhibit Hall, Octavius Ballroom

2pm – 7pm – Hospitality Desk Open

1:30pm – 4:20pm – General Session, Forum Ballroom

4:30pm - 5:30pm - Special Guest Rulon Gardner, Forum Ballroom

6pm - 8pm - Welcome Reception in Exhibit Hall, Octavius Ballroom

Friday, August 27, 2010

7am – 7pm – Hospitality Desk Open

7:30am - 9am - Breakfast in Exhibit Hall

7:30am – 6pm – Tradeshow Open, Octavius Ballroom

8:30am - 12pm - Breakout Sessions

12pm - 1:30pm - Lunch in Exhibit Hall, Octavius Ballroom

1:30pm – 6pm – General Session, Forum Ballroom

6pm - 7:30pm - Special Guest Dennis Miller, Forum Ballroom

Saturday, August 28, 2010

7am - 6pm - Hospitality Desk Open

7:30am – 9am – Breakfast in Exhibit Hall

7:30am - 2pm - Tradeshow Open, Octavius Ballroom

8:30am - 12pm - Breakout Sessions

12pm – 1:30pm – Lunch in Exhibit Hall, Octavius Ballroom

1:30pm – 4:30pm – General Session, Forum Ballroom

4:30pm – 5:30pm – Special Guest The Second City, Forum Ballroom

6:30pm - 10:30pm - Celebration at PURE

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CAD/CAM FOR EVERYONE



CASE STUDY

Defying Perceived Limitations — A Tale of "Dueling" CERECs

BY MARK E. HYMAN, D.D.S., M.A.G.D.

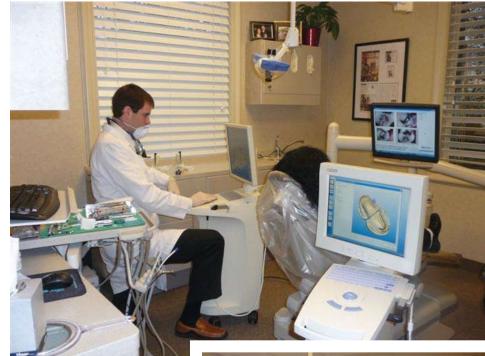
hen an extraordinarily intricate case presents itself, it may seem wise to place reasonable limits on the technical skills of your dental team. Given the challenges and potential risks that abound when stepping out of your comfort zone, you may choose to play it safe and not place yourself in

asituation that seems to offer improbable our longtime patients, had encouraged consultation with the dentist, generally odds of success. On the other hand, her to schedule a dental appointment lasting 20 to 30 minutes. We utilize this an extreme situation can produce during her visit to Greensboro. We valuable time to find out as much as incalculable rewards that elevate had recently placed a quadrant of we can about our patients as unique even the most highly functioning crowns for the local sister utilizing our individuals with specific needs, wants team to new levels of expertise. It was newly purchased CEREC AC Bluecam and perceptions of what they believe to be recently demonstrated to our practice equipment. She had been amazed by the the optimal patient-dentist relationship. that by changing our perceptions of procedure - particularly pleased with We ask many probing questions and the limitations of our performance the fact that she only needed to schedule watch and listen carefully, attenuating capabilities, we were able to exceed one visit during which the work would to their verbal and nonverbal responses all expectations for superior team be completed. She was thrilled with as we build an understanding of the work and realize an excellent the beautiful results that she saw in impact of their past dental experiences. outcome. This unique situation her mirror every day. When Dr. L. saw This communication session also helps that we now refer to as the "Day of the her older sister's new bright smile for us to identify their expectations for our Dueling CERECs," taught us many the first time, she was very impressed practice, gauge their priorities for their lessons about the value of having and, as she later admitted, quite envious dental care, and document important confidence in our team dynamic, and of her older sister. She also found it details regarding their overall health utilizing advanced technology to its very difficult to believe how quickly the history. Our time with Dr. L. was full capacity. We also found that while procedure had been completed, and extremely limited - we only had the it might have been tempting to turn in how easy it had been for her sister to afternoon to implement our diagnostic our 3-D CEREC unit for credit towards have the work done. In fact, she was routines, develop a comprehensive the latest model, keeping it as an intrigued to the point that she devoted auxiliary to our shiny new AC Bluecam her last 24 hours in town to seeking a financial agreement. The procedure had was a very canny decision.

similar dental experience for herself.

From the beginning, this unique While this intimidating time constraint paradigm-shifting case presented an - one afternoon and one morning array of special circumstances. The presented a formidable challenge, we daunting, we made our preparations patient involved was a psychiatrist followed our usual protocol for a new with optimism and excitement. from the northeast (Dr. L.), who came patient encounter. At our practice, each to our office because her sister, one of new patient first visit includes a private to attain critical information during the

treatment plan and finalize a comfortable to be completed the next morning, as she was leaving on a plane for Boston that evening. While these stipulations were



» Above: Dr. Farless and the dueling CERECs.

» Right: Dr. Hyman with intraoral.

patient consultation that afternoon, which enhanced the effectiveness of our pre-planning. Although, as a busy psychiatrist Dr. L. was deeply involved in healthcare, like

she was apprehensive about having any chew properly.

professionals who work Monday she claimed that she flossed regularly, the necessity for the extensive through Friday for many more than she believed she was suffering from procedure. Her interest in having the 40 hours a week, she had not been to a gingivitis. In this candid discussion, dental work was to attain the aesthetics dentist's office in a relatively long time. she told us she was unhappy with the of "white fillings" and a brighter We weren't particularly surprised to color, size and shape of her teeth and smile. Dr. L. was extremely impressed learn that her last dental appointment would like to have her old mercury by the technological tools we would had been five years earlier. While her fillings from her childhood in Central use to achieve the esthetic outcome work schedule was the main reason for America replaced. She also complained she was seeking. And the evidence this neglect, Dr. L. also admitted that that it was becoming difficult for her to we provided was also influential in

questions and determine our patient's preferences before we developed the treatment plan helped us stay on our tight schedule. And equally as important in this situation, it saved us from making any incorrect assumptions before moving ahead. Dr. L. told us before she left that afternoon, like so many of our other new patients, that she had never before had a dentist take the time to talk with her at such length and in such depth about herself or her dental and medical history.

As a physician, Dr. L. was naturally highly inquisitive about the equipment we used to make our diagnosis while determining the condition of her teeth. The intraoral camera allowed us to show her clear evidence of the problem areas located throughout her mouth. We took digital X-rays, and performed a cleaning that included our routine oral cancer exam. We also took impressions for trays for a home teeth-whitening program. We gave Dr. L. a demonstration of how the CEREC would allow us to design, manufacture and place the partial crowns during her visit the next morning. The opportunity to view her entire mouth in real time video was a step that convinced her of finalizing the financial arrangements, dental work done, stating a particular Having the opportunity to ask which, like the treatment plan, needed

As is always the case, we were able

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our stringent schedule.

as comfortable and relaxed as possible been completely unaware. she needed to visit the restroom, check economy. especially the patient!

and the comfort of the intense dental as the opportunity was presented and the corner. ❖ experience. Although she had thought ensuring that my team was properly

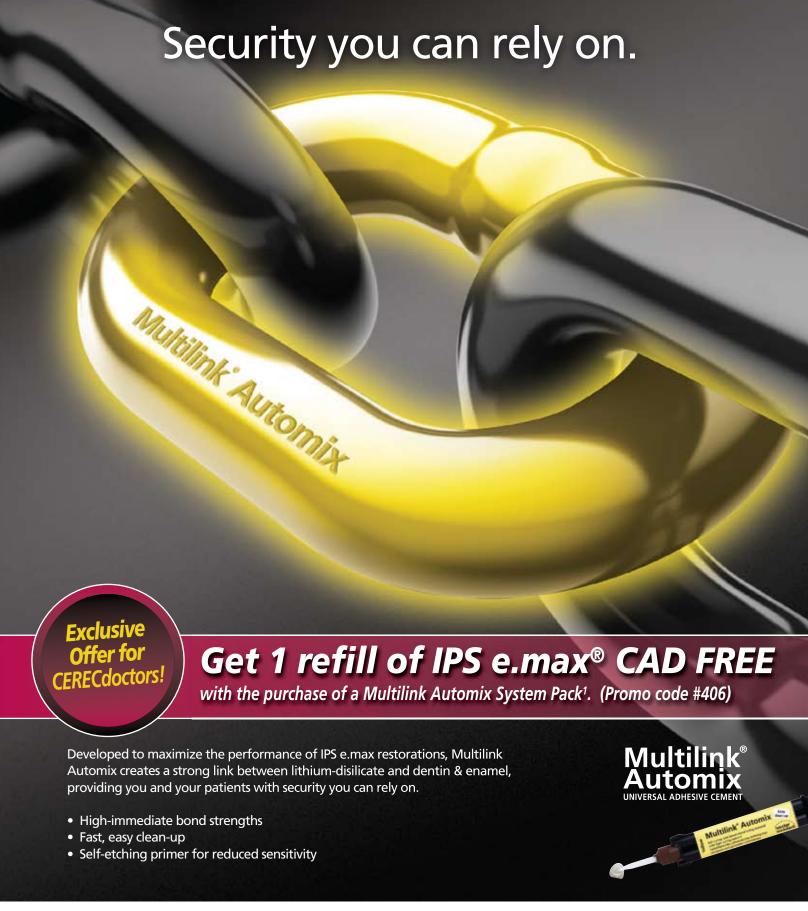
northeast urban area would be more we have watched our profits rise along At this point, I think it's important to sophisticated than our much smaller with our patient satisfaction levels. stress that this was a very complicated southern city, she told us she was case involving eight partial crowns in four doubtful that she would have been that the percentage of the dental quadrants. While the initial consultation offered a similar treatment program practices that have invested in CEREC included the dentist performing the by her own dentist. As a new patient, equipment do not utilize it regularly, work, moving forward, each member a highly educated medical professional, I am puzzled. Not only does the latest of our team was apprised of the details and the sister of a satisfied patient, her equipment produce crowns that are of the case and collaborated at every perception of the value and the success accurate to a tolerance heretofore step, from assisting in the initial exam to of the procedure could not have been unachievable, they require even making sure the operatory was properly more positive. Dr. L. landed at home less time to complete the procedure. equipped. From the moment she entered that evening with a smile beyond With comfort and convenience the waiting room that morning, our shared her dreams, developed through a overwhelmingly cited as top patient objective was to make sure Dr. L. was procedure of which she had previously concerns, there is no other tool we can

throughout the procedure. The team The reaction of our team was truly a advantage in providing these values. In was highly engaged, and enthusiastic joy to share. Each member felt a sense such a competitive healthcare market, about the challenge. We started of pride and accomplishment when how can we justify not benefiting from the procedure promptly at 8 a.m. we reviewed the case and critiqued the use of this advanced technology? We offered her an iPod and sound- the procedure. Overwhelmingly, our From a hospital-based case involving resistant headphones – a very effective conclusion was that the CEREC, a patient requiring sedation dentistry to audio analgesic. We gave her dark whether 3-D, Bluecam AC or "dueling," manage acute dental phobia, to creating glasses to minimize glare, and we placed presents one of the highest returns a full-mouth coverage crown for a a warmed blanked over her to increase on investment of any technological 78-year-old grandmother wanting her feelings of serenity from the start. We advancement available to a dental to improve her appearance, our list encouraged her to take breaks whenever office, especially in today's difficult of satisfied patients, enjoying the

to be accepted that afternoon to meet that the dental care available in her trained in the use of the equipment,

When I read statistics that indicate rely upon that will place us at a higher

opportunity to watch their crowns being her messages, or simply stretch her legs.
I was among one of the first dentists designed, milled and placed is extensive Dr. Farless, the lead dentist on the case, in North Carolina, and the very first in and growing daily. As a dentist with a switched his attention from CEREC to my city, to invest in the CEREC 2 in 1998. career spanning more than two decades, CEREC – designing, milling and placing I was impressed by the relatively short it is always gratifying to watch the the partial crowns, one after the other amount of time required to take the younger members of our team quickly in a synchronized procedure that was quadrant impression, the clarity of the grasp this technology. I enjoy listening flawlessly smooth for everyone, screen, and the accuracy of the milling to them carefully explain the CEREC work. In 2004 we traded up to the 3-D procedure so comprehensively and At 1 p.m. when the eight partial model. Not surprisingly, we were also enthusiastically to our patients of all crowns had been placed, we surprised early adopters of the Bluecam AC when ages. And when they tell the story about Dr. L. with a soothing fruit smoothie it was introduced last year. Each of the "Day of the Dueling CERECs," and showed her the results of the these three CEREC machines paid for I always hear the excitement of that procedure. She was ecstatic and truly itself within six months of purchase. By moment in their voices and I know surprised by the scope of the work, investing in this technology, upgrading the next big challenge is just around



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HOW-TO

Take the Bite First

BY ARMEN MIRZAYAN, M.A., D.D.S.

s we have had the opportunity to teach thousands of clinicians at Scottsdale Center for Dentistry, one of the common problems that doctors have is inconsistent occlusion with

erratic behavior of the tongue. Once discomfort for the patient. working field.

to take the bite registration out of the they can start at more than \$100/tube. reseat the material, there is very little to eliminate the flash, so that the camera the camera might dislodge or display the antagonist bite registration images the bite registration in a fashion that are acquired. By this time, the patient is reduces the whole appointment to an anesthetized, and the dentist can prep exercise in futility.

A different approach can solve many it as a depth gauge.

their CEREC machines. To alleviate to preparing the teeth. As soon as the frustration when returning to practice, anesthetic needle is removed from the one of the most compelling learning patient's mouth, we advocate placing exercises is the sequence with which a slot with an inverted cone in the prethe dentist captures bite registrations. operative condition (Figure 1). This Traditionally, most dentists capture trough should be deep enough to retain the bite after the preparation images the bite registration material (Figure have been acquired. This can introduce 2). Since you are not penetrating many errors, the first of which is the into dentin, there is minimal to little

the patient bites down, we have no Once an adequate channel has been idea what the tongue is doing to distort placed, load the bite registration into the bite registrations. Furthermore, by the working field. We recommend a bisdesign, a crown preparation does not acryl material (Figure 3, Luxabite), but a trap any of the bite registration in the polyvinylsiloxane material can suffice. The rigidity of the bis-acryl material Once the registration material sets, it provides the stability we need to lock becomes the dentist's turn to introduce the material intracoronaly. One must possible errors. The very first step is consider the cost of these materials, as

mouth to trim the excess. As soon as we A flat disc bur (Figure 4) can be used reassurance that it has been indexed path is not impeded when capturing the properly. Furthermore, if there is any images (Figure 5). The pre-op images flash material protruding occlusally, are quickly opaqued (Figure 6), and

of the aforementioned issues. The Once the tissue is retracted and the rest assured that the bite registration is cerecdoctors.com faculty recommends preparation is finalized, the optical accurately related to the preparation







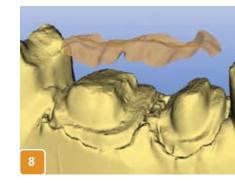


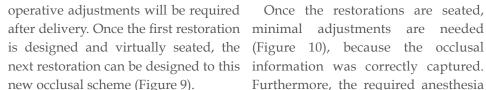
right through the material and even use (Figure 7) and the design process can begin. For this particular case, one can that you take the bite registration prior impression can be quickly acquired model (Figure 8), and that minimal post-

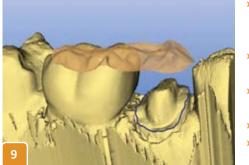


















Furthermore, the required anesthesia

Fig. 1: Preoperative images of a fractured molar and failing amalgam on a premolar that has recurrent decay

Fig. 2: Channel troughing through the working field

Fig. 3: Loading of bis-acryl bite registration

Fig. 4: Flat disc to reduce flash

Fig. 5: Excess removed from intracoronally retained bite registration

Fig. 6: Opaquing of bite registration

Fig. 7: Opaquing of prepared teeth

Fig. 8: Accurate transfer of bite registration to prep model

» Fig. 9: Fabrication of the premolar restoration with neighboring virtually seated restoration

Fig. 10: Immediate seat of premolar and molar Vita TriLux crowns

Fig. 11: Five-year post-op images of seated premolar and molar crowns

Fig. 12: Five-year post-op x-rays of vital crown on premolar and molar crowns

time was leveraged against the time it takes to capture the antagonist. Between these two principles, we can confidently guarantee that you can reduce your clinical time by 15 percent to 25 percent.

The five-year follow-up images (Figure 11, 12) show how little of the anatomy or stain and glaze were affected after the delivery date! ❖

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CLINICAL POSSIBILITIES

Not Your Father's CEREC

BY TARUN AGARWAL, D.D.S.

f you haven't looked at CEREC in recent months, you are missing out on technology that can have a tremendous impact on your practice. What are you waiting for? The world around us is literally changing daily. Whether it's the 24-hour news cycle or simply the way the world has changed, it's a fact that we must simply accept.

CEREC technology is no different than anything else - change is rapid and inevitable (kind of like death and taxes)! What's important is that you keep abreast, adapt, and adopt these changes.

There are three types of dentists reading this article: A CEREC owner who continually learns about new developments and regularly invests in training; the CEREC owner who is simply happy with status quo and hasn't kept up with the phenomenal changes with CEREC in the last 18 months; and finally, the non-owner sitting on the fence, who looked at CEREC some time ago, but shut the door.

To the first person, I say CONGRATULATIONS and keep up the great work. You are reaping all the benefits that CEREC can bring.

To the status quo CEREC owner, I boldly ask, "ARE YOU NUTS?" You've already made the investment in one of the most powerful technologies in dentistry.

For the non-owner, I humbly ask, "WHAT ARE YOU WAITING FOR?" Either way, what CEREC can offer today is simply unbelievable! For the next few minutes, I ask that you put any biases or misconceptions aside, as I share with you CEREC 2010 (Figure 1)!





ABOUT THE AUTHOR

Dr. Tarun Agarwal, a 1999 graduate of UMKC, maintains a fulltime private practice emphasizing esthetic restorative and implant dentistry in Raleigh, N.C. His work and practice have been featured in numerous consumer and dental publications. He has completed extensive continuing education with many dental leaders and most importantly, the school of hard knocks. Dr. Agarwal regularly presents entertaining and informative programs to study clubs and dental organizations nationally

and internationally. Through his refreshing and real-world approach to dentistry, practice enhancement, and balancing life, Dr. Agarwal has motivated dentists and energized team members to increase productivity, profitability, and start enjoying dentistry again. He can be reached at dra@raleighdentalarts.com or through his dental Web site, www.tbonespeaks.com.







- » Fig. 2: Preoperative photo showing clinical condition upper right quadrant
- » Fig. 3: Intraoperative view showing pulpal exposure due to decay #3
- » Fig. 4: Postoperative view showing completed restorations in single visit utilizing CEREC

CEREC CHAIRSIDE -SINGLE-VISIT RESTORATIONS

in-office chairside restorations. One of

a barrier to treatment acceptance.

In this case, a patient comes to my office with the upper right quadrant system, snap a few optical images of the Let's start with the most common needing treatment (Figure 2). Tooth teeth and utilize the Internet to securely use of CEREC technology - immediate numbers 2 and 4 need direct restorations, send this data to your laboratory. A and tooth No. 3 requires endodontic major advantage is that your laboratory the biggest compliments I continuously therapy due to extensive decay into receives the case literally within seconds, receive from patients is regarding the the pulp (Figure 3) and a full-coverage and can begin restoration fabrication ability to save them multiple visits—by restoration. Instead of needing multiple immediately. The laboratory can choose either completing more work at each visitstocomplete the necessary treatment, to make the restoration without models visit and/or being able to deliver quality utilizing CEREC technology I am able or with digitally printed models, and final restorations in a single appointment. to provide the patient with the entire without material limitations – including Let's not fool ourselves – saving patients treatment in a single visit, including gold restorations (Figure 5). time is saving them money, and removing delivery of a final crown for tooth No. 3. Wouldn't it be nice to have your

By combining multiple appointments, you make treatment easier for the patient and more profitable for the practice. The final result is a beautiful, durable quadrant of restorations (Figure 4).

CEREC CONNECT -DIGITAL IMPRESSIONS

One of the hottest topics in dentistry today is digital impressions. Imagine – instead of taking traditional impressions you simply use your CEREC







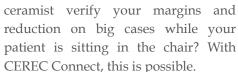




- » Fig. 5: Gold onlay restoration fabricated with CEREC Connect
- » Fig. 6: Preoperative view of patient presenting for smile enhancement
- » Fig. 7: Digital impression captured using
- » Fig. 8: Digitally printed models with anterior porcelain restorations made by laboratory, using CEREC Connect
- Fig. 9: Postoperative view of patient with eight porcelain restorations, teeth Nos. 5-13

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- » Fig. 10: Preoperative view of tooth #30, requiring full coverage restoration after endodontic treatment
- » Fig. 11: CEREC Connect digital model arrives to laboratory mounted, sectioned, and ditched, ready for restoration fabrication
- » Fig. 12: Restoration fabricated on digital **CEREC Connect model**
- » Fig. 13: Postoperative view showing wellfitting, highly aesthetic #30



Your patient is getting a new smile (Figure 6), you take digital impressions and pictures, and literally within than a traditional impression, and CEREC & IMPLANTS -









minutes your ceramist is looking at giving you immediate feedback. This your digital impressions (Figure 7). patient needs a crown on tooth #30 He/she can give immediate feedback (Figure 10). You prep the case, send it impressive use of CEREC is the utilization (while the patient is in the chair) on to the lab through the Connect portal, the preparation margins and reduction the lab receives a digitally printed be utilized in every step of the implant without actually being in the office! model already sectioned and trimmed To complete the case, your ceramist (Figure 11), the ceramist fabricates CEREC general dentist, complete control

That's a lot of uses and clinical possibilities from a single piece of technology.

Today's CEREC technology gives you the ability to complete simple and complex restorative cases, enhances your communication with laboratories, aids in implant planning and restoration, and so much more.

truly digital masterpiece (Figure 9).

cases, but typical crown and bridge aesthetic digital restoration. work as well, usually taking less time

verifies on the digitally printed model and a few days later (or even the same (Figure 8) and delivers your patient a day in certain cases) you cement the crown (Figure 13). The end result is a 15). From this planning, we order a CEREC Connect is not just for big truly durable, well-fitting, and highly surgical guide and place the implant

GAME CHANGER

The latest and possibly the most in implant dentistry. CEREC can literally treatment process, and gives you, the fabricates the restorations digitally, your restoration of choice (Figure 12), of the final outcome - surgically and prosthetically. Let's walk through a case.

> This patient comes to our office on routine hygiene recall with a missing tooth #12 (Figure 14). My hygienist discusses implant dentistry with the patient. Specifically, she talks about our innovative 3-D approach to implant dentistry. By utilizing 'CEREC meets GALILEOS,' we are able to visualize the final restoration and plan the surgical phase based on this information (Figure with minimally invasive surgery in literally 10 minutes (Figure 16).

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Imtiaz Manji, CEO Practice Growth Expert



Sameer Puri, DDS

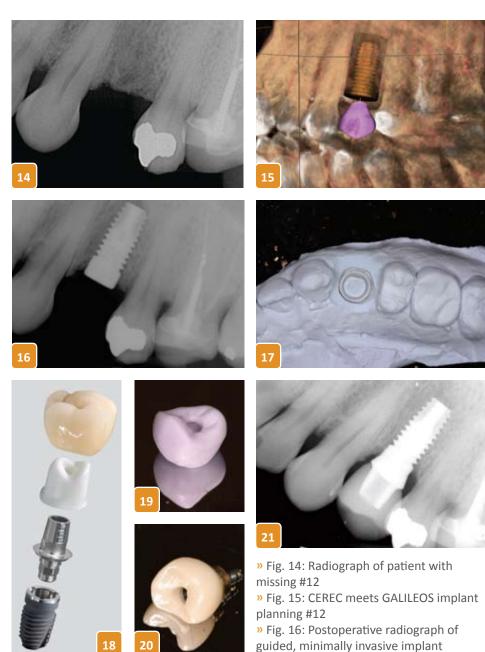
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After adequate integration time, the patient returns for implant restoration. Instead of sending the case to the laboratory and incurring a very large fee, I am able to utilize CEREC to fabricate the restoration. Since I have planned ideal placement, I am able to utilize a prefabricated abutment and make minor modifications (Figure 17). In cases where a prefabricated abutment is not possible, CEREC can be utilized to construct a custom Zirconia abutment (Figure 18). Using CEREC chairside, I fabricate the final screw-retained restoration with e.MAX CAD (Figure 19). The restoration is bonded to the abutment extra-orally (Figure 20) and delivered to the patient (Figure 21).

PUTTING IT ALL TOGETHER

Wow! That's a lot of uses and clinical possibilities from a single piece of technology. Today's CEREC technology gives you the ability to complete simple and complex restorative cases, enhances your communication with laboratories, aids in implant planning and restoration, and so much more. For those who already own the CEREC, this is all available to you right now! Which is why I boldly said, "ARE YOU NUTS?!"

For the non-users, the great news is that CEREC technology can be purchased in pieces that are appropriate for your practice style and budget level, then built upon to achieve full integration. If you haven't looked at CEREC in recent months, you are missing out on technology that can have a tremendous » Fig. 21: Postoperative radiograph of complete implant restoration, showing impact on your practice. So again I humbly ask, "WHAT ARE YOU WAITING FOR?!" ❖



surgery, #12

» Fig. 17: Model with slighly modified, prefabricated abutment showing excellent

» Fig. 18: Custom-fabricated Zirconia abutments from CEREC

excellent marginal integrity and implant integration

» Fig. 20: Final restoration bonded to abutment

» Fig. 19: Final eMAX CAD restoration #12 with screw-hole access

position for final restorative

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PROFILE

Practicing Smarter, Not Harder: Ryan Love, D.D.S.

MARK FLEMING, D.D.S.

etter patient service, camaraderie with other CEREC doctors, and an unrivaled ROI - CEREC has been the ultimate game-changer for Spokane general dentist Ryan Love.

Wash. in 1998. After I graduated from and a patient reception area. the University of Minnesota, I had an opportunity to move west and return to specialize? my family roots. I was able to practice mentor. It also gave me time to decide what my business card says!). how I wanted to practice. In 2001 after Sept. 11, I bought the practice and have CAD/CAM choice? with a wonderful team.

Q: *What is the size of your practice?*

CEREC has given me the opportunity

to practice smarter, not harder.

It has empowered me to be a better clinician and

given me opportunities to serve my patients better.

We have become more efficient with the clean sweep (a reference to Who Moved

new space, and feel the office is more My Cheese, by Spencer Johnson, M.D.).

Q: How long have you been in practice? consult room, sterilization, lab, team A: I started practicing in Spokane, area/conference room, business office

Q: In what type of dentistry do you

A: We provide general dentistry as an associate my first three years. This with emphasis in comprehensive care, gave me the needed experience to run a ranging from family, reconstructive, business, for which I am grateful to my and implant dentistry (at least that's

Q: Why did you choose CEREC as your

Although we did not incorporate

one of the best decisions, and worth the been blessed and fortunate to develop it A: Let me set this up. In 2005, we as investment. CEREC was the natural a team had an opportunity to embrace next step. At the recommendation technology with a new office. To this day, of my Patterson rep, I took a look into A: In 2005, I moved to a new location the team accuses me of not only moving CEREC. This decision alone has become that afforded the luxury of more space. their cheese, but also melting it in one a game-changer in how I practice. Hands down, the CEREC unit has been the best ROI I have purchased. CEREC has the track record. The years of investment, service, and product made it an easier decision. It was an important

Q: How does this technology fit into your office philosophy?

A: As I stated earlier, our office is



- » Above: Ryan Love, D.D.S.
- » Right: Dr. Love and CEREC assistant, Jayne Anderson

addition to our comprehensive care.

Q: How many operatories do you have? CEREC until the summer of 2006, we focused on comprehensive care. This A: We have eight treatment rooms, went to electronic records, digital X-rays, technology has improved our delivery seven operatories and one CEREC digital pans, and new delivery systems of care to our patients. In my opinion, lab. The office space was built with a in the fall of 2005. Looking back, it was CEREC and CAD/CAM dentistry



go hand-in-hand with conservative, comprehensive care. In reality, it is the new standard of care in dentistry.

Q: How has CEREC impacted your

A: CEREC has given me the opportunity to practice smarter, not harder. It has empowered me to be a better clinician and given me opportunities to serve my patients better. Patients appreciate the single-visit dentistry. In addition, I have been able to facilitate communication with other CEREC owners in Spokane, with the Spokane CEREC Study Club. This forum allows users in this area an opportunity to learn, share, and use their CEREC to its fullest potential.

Q: What is your favorite CEREC procedure?

A: Conservative CEREC preparations and multiple units in the posterior and anterior. In reality, anytime I am using the machine.

Q: What is your most unique CEREC procedure?

A: They are all unique. I like to start with a clean slate, and prepare teeth without a pre-determined end in mind. The lost art of gold inlay/onlay restorations has been rediscovered in CEREC/CAD/CAM dentistry. It does not replace conservative gold restorations; it is a good adjunct to dentistry.

Q: *If someone was to take your CEREC* away today, you would ...?

A: I would be pretty upset, and life would go on. Practicing dentistry would not be the same.

Q: Anything else you would like to add?

A: It was great to see another team besides USC win the PAC-10. In fact, congrats to "THE" in winning the Rose Bowl. �

comfortable for patients and the team.

WHAT CAD/CAM CAN DO

Using CEREC Outside the Box

RICH ROSENBLATT, D.D.S.

any know the everyday uses for CEREC. Inlays, onlays, crowns, veneers and multiple units of each are done by thousands of dentists every day. Also, with the application of CEREC-Connect, we now have the ability to do any laboratory-based restorative method. I'd like to talk about a

way that CEREC can be used, "outside the box."

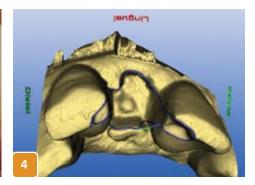
Our office received a call from an existing patient. He stated that he was out riding his bike and felt something in his mouth. Thinking it was a bug, he spit it out and kept riding. Turns out it was his lower central incisor (#25). It was a long-standing crown and now presented completely fractured at the gum-line (Figure 1). When the patient presented for an emergency exam, a PA of the tooth was taken. It was determined that an extraction and implant would be ideal. The patient was hesitant about doing the implant immediately, so it was decided to extract the tooth and place a conservative Maryland-type bridge. This gave the patient the added benefit of minimally preparing the adjacent teeth, and allowing him time to consider any future date to place the implant.

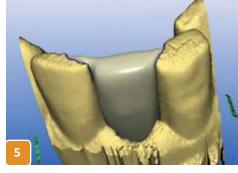
A composite mock-up of the tooth was crafted and bonded to the adjacent teeth. This mock-up is used not only to give the patient something to have temporarily, but will serve as the pre-operative template when utilizing Correlation in the CEREC software (Figure 2). Correlation allows the restoration.

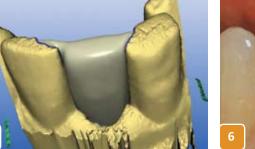












The following week, the patient was adjacent teeth to allow for more bulk CEREC user to copy exactly what is in anesthetized and the mock-up was of material and a positive seat of the the mouth and creates an identical final removed. Maryland bridge rest seats restoration. The root tip was removed



were prepared into the lingual of the a-traumatically and colla plug was

placed to stop the bleeding (Figure not indicated for Maryland-type bridges, 3). The lower incisors were powdered but it is the strongest material available purpose of being a fixed transitional type bridge using CEREC, the pontic that is supported by Ivoclar, but one that this case, it was tooth No. 25. When when using proper case selection. of breaking the connector (Figure 5).

from Ivoclar Vivadent. This material is Anchor from Apex dental materials.

placing the margin lines, one needs to An e.max block was chosen. It was Surpass was placed on the tooth and thinking. * The material that was chosen: e.max cured. The restoration was bonded with

This restoration will serve the and imaged. When doing a Maryland- with CEREC 3-D. This is not a technique restoration for the patient, and will also aid in forming an ovate pontic space tooth will be used as the correlate. In has been used successfully, especially with papilla support if an implant is placed in the future.

The applications for CEREC are incorporate the wings of the adjacent milled, stained and glazed, and tried in abundant. Many times we are limited teeth and the pontic area in the margin for fit (Figure 6). The bite was adjusted only by our imagination as to what line (Figure 4). When you have a to make sure of light contact to protect the machine can do. It is an exciting proposal, it is advised to bulk out the the connectors. Interface, from Apex time to use CAD/CAM, and this case connectors to help with strength. Also, Dental Materials, Inc. was placed on demonstrates just a small glimpse making the virtual contact on the pontic the restoration along with the bonding of what CAD/CAM can do in your (#25) very light to decrease the chance agent Surpass from the same company. practice with a little "outside-the-box"

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3-D CT IMAGING

"Once You've Tried It, You Can Never Go Back"

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

ay back in 2005, I was listening to a speaker talk about a new way of placing dental implants that would revolutionize the process. He showed a video of an elderly Swedish man strolling in to a dental clinic with a bag full of ill-fitting dentures, and walking out later that same day with fully

The process used 3-D CT imaging to post-op ibuprofens and were back at with minimal, if any, adjustment plan the implant placement, and then work the very next day. Soon thereafter, needed. a custom surgical guide was made I acquired Simplant software and began of a dozen or so implants so precisely planning and placing implants. for the majority of patients.

me, as I saw the potential in this technique. As soon as it was available in the United States and the cost became more reasonable, I vowed to bring this technology into my practice, where my

innovation.

took the NobelGuide training course, plan to the patient at surgery using a placed implants in ideal bone, that are and within a short time I had half custom surgical guide which controls straightforward to restore and in proper a dozen cases under my belt. I was the position, angle, and depth of each function, nearly 100 percent of the amazed by how quickly and accurately drill and implant fixture. It is so accurate time. I could place multiple implants, and that a custom provisional or even final

implant-supported final prostheses. how most patients needed only a few prosthesis can be made that is delivered

It is a panacea for the restorative that facilitated the flapless placement using both methods for treatment dentist, because implant placement is completely prosthetically driven, not that only minimal adjustments would These two pioneering systems dictated by the surgeon's whim if there be necessary to the prefabricated fixed opened the door for the current tidal are anatomical surprises when the tissue bridges. The cost of this treatment was wave of CT-guided implant surgeries. is flapped open. The anatomy is known about \$100,000, making it out of reach For those of you not familiar with the with 3-D accuracy before surgery, and concept, CT-guided implant surgery if bone or tissue augmentation will be This was a light-bulb moment for uses 3-D CT imaging to evaluate the necessary to properly position the



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

After years of planning and placing dental implants the "old-fashioned" way I learned in residency, I got a taste of a new way to do this. It was a radical change at first. But once I knew the recipe, I realized that it was a faster, better and more accurate way to treat my patients.

Early in 2006, I flew to Chicago and then accurately transfers the treatment planned up front. The result is perfectly

patients could benefit from this amazing bony anatomy of the edentulous jaw, implants, that is known ahead of uses this for implant planning, and time and additional procedures are

Even though I did not use CT-guided





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- Faster Cutting
- Superior Control
- Improved Precision
- Durable High Performance

process. I had to have the lab make a custom surgical guide. radiographic template, arrange for the Once I brought GALILEOS in to my integration of workflow that makes patient to get a CT scan, have them re-do office, life became easier. Now, as soon the implant planning phase rapid and it if the technician did not follow the as my patient was scanned, using a effortless. protocol exactly, import the DICOM files radiographic template, the images We have traditionally relied on in to the software, clean up the scatter, could be brought up on the monitor, panoramic radiographs and study treatment plan the implants, and then and implant planning could begin models to plan our implant placement. get the patient in for a second consult to immediately. What previously took Surgical stents have been used since the review the treatment plan.

critical. Most cases were done "the old-candidates. fashioned way" during this period.

practice. The beauty of it was not the scanner itself, as most CBCT scanners on the market will give you a good image. It was the software. Galaxis and GALILEOSImplantwere developed with the dentist in mind, as opposed to most other CT viewing and implant-planning programs, which were modified from existing medical CT software. With very little instruction, I was able to navigate through the images and start planning get the surgical guide manufactured. leaving this up to the discretion of the implant surgery like an expert.

facturer of GALILEOS, hit a home run when they considered the entire minimally-invasive incision. workflow in designing the software the same software program used for patients and more procedures in the implant placements vary from their

surgery for every implant case, I probably viewing the scan diagnostically could day. Of course, this is of little benefit if did 100 cases or more in those first two quickly and easily be used for treatment treatment planning becomes very timeyears. It was a very time-consuming planning implants, and then ordering a intensive. The beauty of the GALILEOS

at least 30 minutes of my time and beginning of implantology to aid in this Because of the significant time and two patient visits was now possible process. effort required to complete a in less than five minutes in a single

Implant/siCAT system is in the

The traditional surgical guide is made treatment plan, I appointment. As a result, cases that from a wax-up on a stone model that generally reserved this process for I previously considered to be "too does not allow representation of the the more complicated cases, or where simple" to treat using CT-guided true bony anatomy of the underlying accurate implant placement was surgery techniques were now suitable edentulous ridge nor the position of adjacent tooth roots. There are various Before I knew it, I was utilizing styles of surgical guides that have been My next revelation came in 2007, this technology for practically every in use, ranging from thermoplastic when I first saw the GALILEOS cone implant case. The only exception was sheets to solid acrylic replicas of the beam CT scanner, and started thinking when a patient could not wait the seven final prosthesis. These guides only about incorporating this into my working days that it currently takes to estimate the position for the initial drill,

> Sirona hit a home run when they considered the entire workflow in designing the software suite that was included with their machine. With the simple click of a tab, the same software program used for viewing the scan diagnostically could quickly and easily be used for treatment planning implants, and then ordering a custom surgical guide.

CT guided implant surgery has the surgeon, and do not control the depth In my opinion, Sirona, the manu- benefits of increased accuracy of of drilling. Sequential osteotomies are implant placement through a smaller, then generally drilled "free hand." This introduces many opportunities for Another major benefit to the implant aberrant implant positioning. Even suite that was included with their surgeon is decreased surgical time, in the hands of the most experienced machine. With the simple click of a tab, which allows you to schedule more implant surgeons, up to 20 percent of lab bill and impact the profitability of surgery. the case. However, in some cases, the In September of 2009, I was honored practice real "digital implantology." only solution is to not restore the fixture, to be the surgeon for the introduction. The restoration of a patient's missing or to remove it and start over.

implant fixture. We do not like to have to deal with these complications, but even the best of us have faced them more than we like to admit.

Many of my surgical colleagues are of the opinion that CT-guided surgery is unnecessary, because they

better? I don't think so.

of care for implantology within the seen on a computer screen.

intended position. One only needs to next 10 years, or sooner. Those who Merging these two sets of numbers look in their favorite implant textbook are CEREC doctors reading this article together seems like it should be a simple or journal to find examples of "textbook have already shown an understanding process. However, I am not a software cases" that are less than perfect. And I of what new technologies can do for engineer; I am just a dentist. Luckily have never met a restorative dentist the practice of dentistry. I'm sure for us, there are some smart people at who has not had their share of similar few of you could imagine practicing siCAT, Sirona's software subsidiary experiences. Often, these restorative without CEREC, and the benefits that in Germany, whose mission was to do challenges can be managed with custom this technology gives to your patients just that. Their efforts have changed abutments and other prosthetic tricks, and your practice. The same holds true implant dentistry forever. With the which significantly increase the dentist's for cone beam CT and guided implant integration of CEREC and GALILEOS,

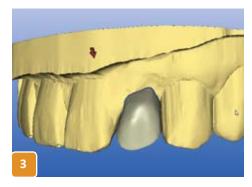
and first live demonstration of the dentition can be treatment planned in We also can get in trouble with integration of GALILEOS cone beam virtual reality, without the need to get anatomical variations such as a high CT data with that from a CEREC digital physical impressions, pour up study lingual mylohyoid concavity, a surprise impression and prosthetic proposal. models, and wax-up a prosthesis. The pneumatized sinus, or a divergent The CEREC uses surface-scanning ability to visualize the patient's bony root that came a little too close to the technology to capture a digital and soft tissue anatomy in relationship



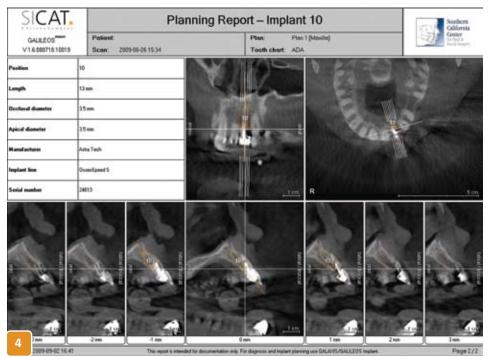


have been placing implants for many impression of the hard and soft tissues to the proposed prosthesis is a years and are doing "just fine" using around an area where a dental implant tremendous advantage when trying to the technique they learned 15 years is being considered. The GALILEOS follow the principles of prosthetically ago or more. I completed my surgical uses a radiographic source and sensor driven implant dentistry. This facilitates training in 1990, and have done more to image the bony anatomy in the area restoration, optimizes functional forces implants than I can count since then. of interest. The multiple views are then on the implant fixture, and improves And for the most part, I have a very high processed by a computer to create a long-term implant success. success rate, with minimal "problem" three-dimensional image of the teeth cases to speak of. But am I perfect? and bone, which can be viewed in surgery is the ability to perform the Of course not. Are my colleagues any an infinite number of cross-sectional procedure through a minimal incision. cuts. Both types of images are nothing This is possible because the underlying I strongly believe that CT-guided more than a set of digital data that is three-dimensional bony anatomy is techniques will become the standard translated into an image that can be known preoperatively. Also, since the

we now have the opportunity to

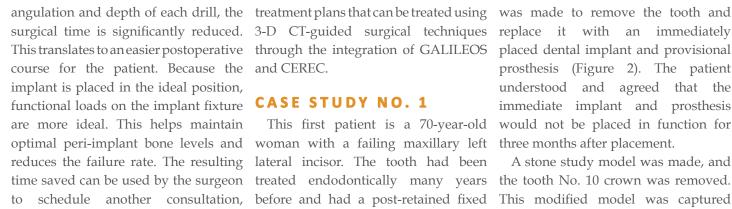


Another benefit of CT-guided implant surgical guide directs the position,



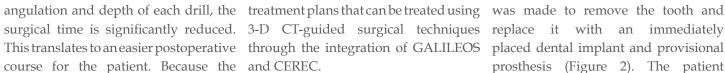






examples of the types of implant was not restorable and a decision extraction. The opposing dentition was

surgery, or recreational activity.



prosthesis that was subject to by CEREC to create a digital model The following cases show some repeated failures (Figure 1). The tooth representing the site after tooth



prosthesis (Figure 2). The patient understood and agreed that the immediate implant and prosthesis are more ideal. This helps maintain This first patient is a 70-year-old would not be placed in function for

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in CEREC (Figure 3).

GALILEOS Implant software program. (Figure 7). The procedure to remove The ideal implant size and position were the tooth and place the implant took determined within the GALILEOS scan, less than 10 minutes. Postoperative based on the bony anatomy data, as well GALILEOS scan images showed very as the mucosal surface and prosthetic accurate implant placement (Figures 8 data from CEREC (Figure 4). The and 9). At three-month follow-up, the undergone bilateral sinus lift surgery treatment planning data, along with provisional restoration was stable. The the stone model and a special scanning gingival architecture and tissue health template were sent to siCAT, and a were excellent (Figure 10). custom surgical template was returned.

This template was used in surgery, **CASE STUDY NO. 2** once the tooth had been atraumatically extracted, to direct the placement of tremendous power of the integration of site. The position, angulation, and partially edentulous patient.

captured in a Futar D bite registration software (Figure 5). A provisional and the prosthetic proposal was created abutment was placed (Figure 6), and the patient was sent to her dentist for The digital model and prosthetic a digital impression and fabrication of proposal were then imported into the a CEREC-produced provisional crown

This second case illustrates the

had been planned in the 3-D imaging teeth numbers 2-5 and 15, and had 13). The position of the implants was

to augment the bony deficiency in the posterior maxilla (Figure 11).

In preparation for implant placement, a GALILEOS CBCT scan was performed, with a siCAT scanning template. A full-arch digital impression was acquired with the CEREC AC unit, the implant fixture in to the No. 10 GALILEOS and CEREC for treating the and then prosthetic proposals were designed for teeth numbers 2, 3, 4, 5, depth of implant placement were all This patient is a 62-year-old man with and 15. This data was then imported controlled by the guide, so that the moderate bone loss due to smoking. He in to the GALILEOS Implant software implant was placed exactly where it was otherwise healthy. He was missing for implant planning (Figures 12,



















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Heraeus

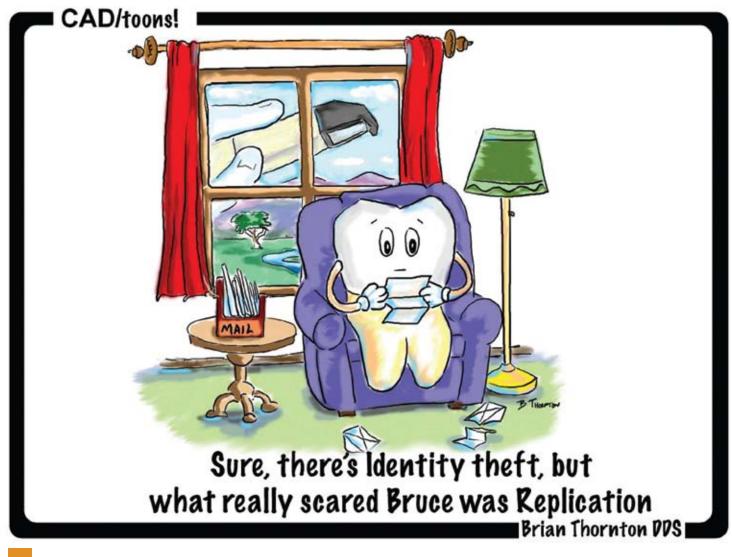
all four implants were accurately placed he could not drink anything else. and in accordance with the treatment For me, CT-guided implant surgery plan (Figures 16 and 17). The patient is no different. After years of planning had a very uneventful postoperative and placing dental implants the "old-

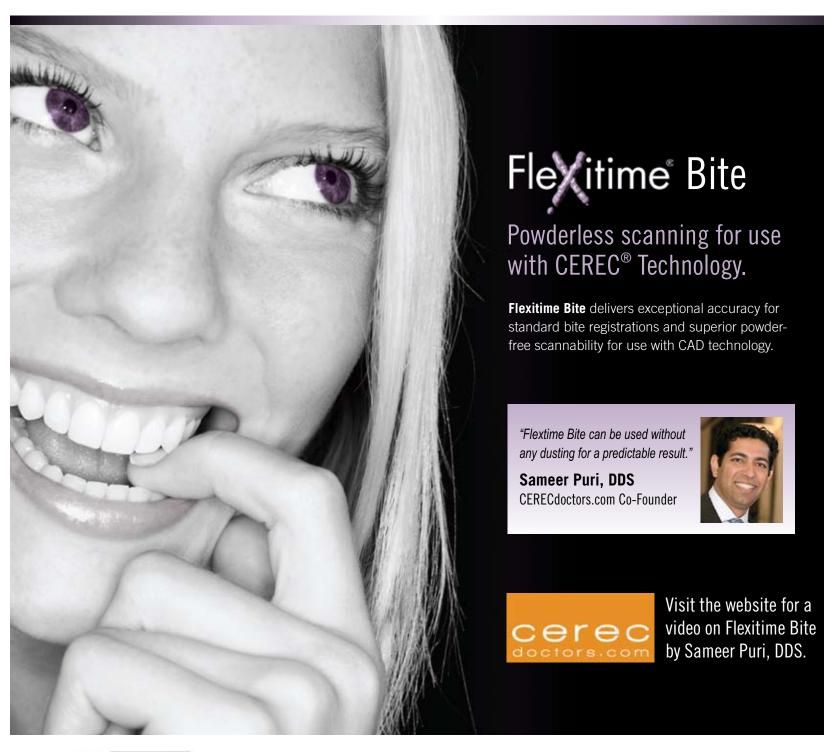
Vesper martini, which was introduced was a radical change at first. But once I

verified (Figure 14) and the surgical to the world in the novel, Casino Royale, knew the recipe, I realized that it was a guide was ordered from siCAT (Figure when James Bond asked the bartender faster, better and more accurate way to 15). This was used to accurately to mix him this variation on his standard treat my patients. place four Astra dental implants using drink. Mr. Bond named the drink after the Facilitate-guided surgical kit. Vesper Lynd, his love interest in the Hopefully, you will give it a taste too, Postoperative radiographs showed that story because, as with her, one taste and and agree. *

fashioned" way I learned in residency, One of my favorite cocktails is the I got a taste of a new way to do this. It

Now, I can't drink anything else.









HAPPENINGS IN THE CAD/CAM WORLD

CEREC Celebrates 25 Years

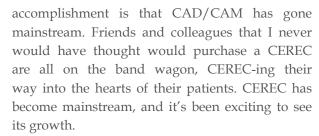
BY SAMEER PURI, D.D.S.

he passing of winter and promise of summer open the world up to great times outdoors with family and friends. Summer is a special time in the Puri house, as we routinely have outdoor barbecues and get together with family and friends. And as much as summertime holds a special place in my heart, this particular

summer, something special is happening in the world of CAD/CAM.

August 26-28, thousands of CEREC clinicians from all over the world will converge on Caesars Palace in Las Vegas for the largest CAD/CAM meeting ever held. It is the 25th anniversary celebration of the introduction of the CEREC technology to dentistry. It's amazing if you look back and think of all the progress that has been made with CEREC in the past years.

Cone beam integration, implant abutment milling, advancements that come to mind - and all of these just happened within the last 12 months. As big as these achievements have been, I think an even greater



With great humility, I'm proud, privileged and honored to have been selected to give the keynote presentation at the anniversary celebration. As much as I customized crowns, and Bluecam are just a few of the am looking forward to presenting in front of thousands of clinicians, I'd be lying if I didn't express my nervousness at sharing the stage with some of dentistry's greats.

Dr. Gordon Christensen, Dr. Ed McLaren, Dr. Frank Spear

and a whole host of other world-class clinicians will present their thoughts, their views and cases on all things CEREC. While all the lectures will be different and unique, one common thread will be the use of CAD/CAM as a tool in the dental practice to better serve our patients.

Now, if you were at the 20-year celebration, you know what a fantastic time CEREC meetings can be. The fun, the camaraderie and education all converge into a three-day orgy of education and entertainment.

cerecdoctors.com - the magazine and Web site will be a sponsor of the meeting. We are proud to be associated with the technology, and to be part of the CEREC process. Please visit our booth, stop by and say hello.

The meeting is right around the corner. Visit www.Cerec25.com for more information, and register early.

See you all in Vegas. ❖









