

CAD/CAM

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Looking to the future

Throughout the history of modern dentistry, clinicians have learned certain methodologies in dental school, which they have then applied during the course of their careers. Most times, the focus would be on perfecting how they performed these techniques, concentrating on what they already knew. But dentistry is not a stable field; it is always evolving and expanding, and what once was considered cutting-edge is not any longer.

Today we are experiencing a shift in how dental procedures are delivered. The use of CAD/CAM, new materials and a range of new technologies are enabling better solutions for patients and greater efficiencies in the practice. Transformations in dentistry are being spearheaded by advanced digital technologies, and demographic changes are creating new opportunities to enhance the patient experience and evolve and grow your practice.

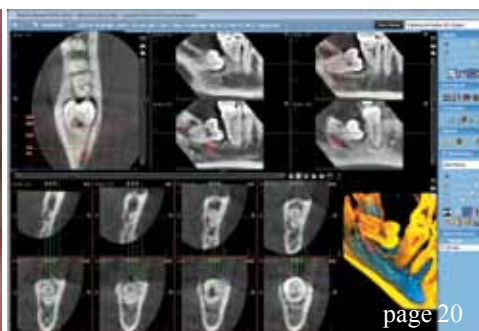
In this issue, we have put together a compilation of articles that will show you just how CAD/CAM and imaging technology is changing the modern-day dental practice by giving clinicians more flexibility, saving time and costs, and providing more convenience and comfort to patients.

We start with Dr. Curtis Jansen's "Understanding the potential of digital scanning workflows," which explores the various workflow models. We then examine the importance of CAD/CAM preparation in achieving a beautiful restorative outcome, with Dr. William Davidson's "Preparing for success with digital impressions."

We also explore ways that CAD/CAM can be used as a tool for your practice to get patients in the door. In Dr. Rhonda R. Savage's "Click with your patients," she shows you the way she and her team utilize technology to her marketing advantage while Cody Baird of Milkmen examines the "Anatomy of a successful practice," providing strategies every office should use to grow its practice with real-life case studies, tips and advice.

There is no question that digital technology is changing dentistry as we know it, but understanding just how to use it to its fullest advantage can take time. That's why we hope you enjoy this issue of **CAD/CAM**. The advances in technology are ever evolving. For the field of dentistry, the future is here, and it is time to explore all it has to offer.

Carrie Nelson
Director of Marketing
PLANMECA – CAD/CAM



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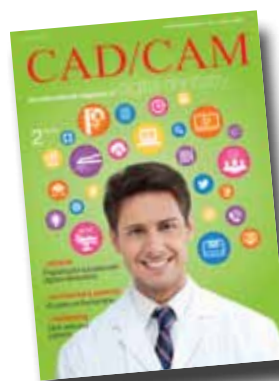
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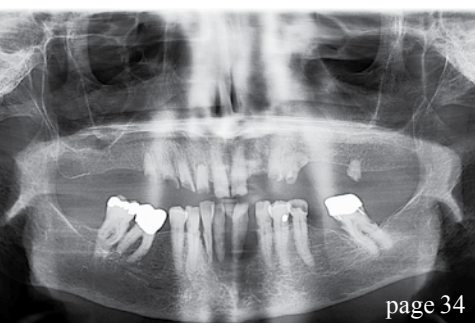
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on the cover

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Understanding the potential of digital scanning workflows

A guide to Planmeca Integrated Solutions

Author _Curtis E. Jansen, DDS

Although the overwhelming majority of dental offices now use digital radiography and patient records, relatively few yet use either standalone intraoral scanning systems or complete systems that combine intraoral scanning with computer-aided design and computer-aided manufacturing. This should change as dentists become more aware of the numerous advantages scanning systems offer in terms of patient care and communication of patient information, particularly with the dental laboratory. This article reviews the various types of scanner architecture as well as potential workflow models.

Many dental offices have implemented digital processes, such as digital patient records. For many restorative and surgical practices, the transfer and sharing of some parts of patients' digital records — including health history, financial/insurance information and digital radiographs — are well understood and routine. In fact, according to the Millennium Group, an estimated 90 percent of dental offices use some type of digital software for patient records, with 71 percent using digital radiographs.

The often-overlooked component of the patient record — laboratory information (e.g., impressions, models, restoration fabrication data) — is also becoming digital; however, incorporation of digital methods for creating and transferring this intraoral data is far less prevalent than for the aforementioned data. Despite the benefits offered by digital impression scanners, such as greater accuracy, enhanced

patient comfort, and savings of time and materials, standalone intraoral scanners are used in just 6 percent of dental offices. Complete in-office chairside restoration systems, such as the Planmeca FIT, are found in an estimated 15 percent of dental offices.

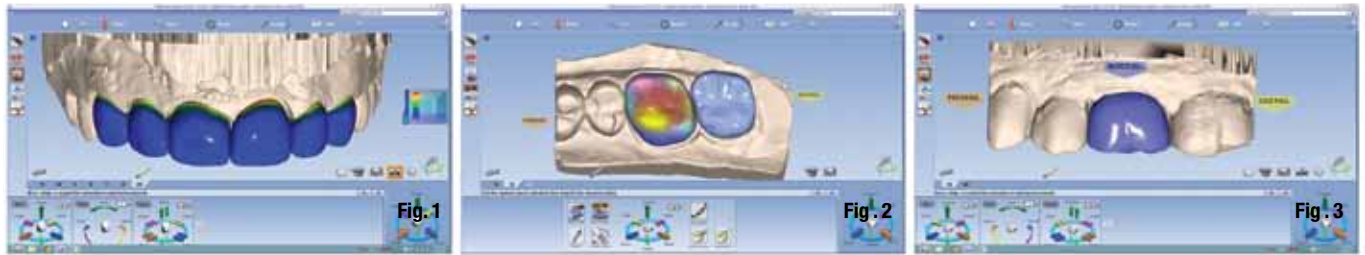
Intraoral scanners capture data regarding tooth and soft-tissue morphology, topography and preparations or, in some cases, analog impressions or models. The tip of the scanner emits light as the scanner camera collects the data that is ultimately manipulated to create a 3-dimensional (3-D) image data file.

Once in a digital format, these records can potentially be electronically transferred between restorative, surgical and laboratory teams, presenting opportunities to change current dental workflow models. However, this capability is dependent upon whether the scanner's architecture is open, closed or semi-open (as described below).

This article reviews various digital workflows that could be incorporated into restorative, surgical, and laboratory offices when the laboratory portion of patient records is acquired using the Planmeca PlanScan digital scanner, PlanCAD design software and PlanMill 40 mill.

_Scanner architecture

Not all digital data are the same, and some cannot be shared easily. Like different speech dialects, there are different types of system architectures. Because



their architectures — i.e., the ability to send and receive digital data in a usable format — may differ, not all of the various scanning systems or manufacturers' scanned data are interchangeable. As a result, data collected from one system from one manufacturer may not be able to be exported to fabricate a milled restoration from another manufacturer.

There are two types of architectures: open and closed. Fully open architecture enables a scanner such as the Planmeca Planscan, to send and receive data from various other manufacturers. In such a case, digital data files can be exported and used to mill a restoration on the PlanMill 40 or to another system.

These scanners typically produce stereo lithography files (STLs) that can be used with multiple design software systems, thereby enabling dentists to work with a variety of referring specialists and laboratories. The ideal situation is to have a digital scanning system with an open architecture and, therefore, the ability to use all manufacturer data interchangeably and among a variety of partners (dental colleagues, specialists, and laboratories).

With closed-architecture systems, such as CEREC, only data from a given manufacturer's system can be used. Typically, the manufacturer combines the scanning, and milling units for CAD/CAM systems. In this scenario, scan data from the CEREC system can be used to mill a restoration on the system mill, but scan data from other systems cannot be exported to that system mill for milling a restoration. The individual manufacturers determine how their images and data can be transmitted.

Planmeca's open architecture accepts third-party data to enhance its own data or add value to its data. For example, cone-beam computed tomography (CBCT) data will accept third-party software to enhance viewing of scan data.

Therefore, when dental practitioners are contemplating different workflows based on digital data transfer, it is important to remember that architecture is an important consideration. Just as there are language barriers that impede communication among individuals, scanning system architecture barriers among different equipment and software companies can limit the use of data by dental professionals with different scanning and/or CAD/CAM

systems. The type of workflow model desired by dental professionals — such as restorative dentists, specialists, laboratories and production centers — should be considered when purchasing any type of digital system. Just because a dental practice has and uses a certain digital scanner does not mean its collaborative or referral partners will be able to use the acquired data.

Potential workflow models

Any dental practitioner today could benefit from using a digital impression system. Depending on whether the system is a stand-alone unit or part of a complete CAD/CAM milling system, different workflows could be implemented to capture tooth and soft-tissue morphology, topography, and preparation data to ultimately produce restorations (e.g., inlays, onlays, crowns, veneers and bridges.) Workflows that are possible by incorporating digital impressing systems are described below.

Full chairside restorative workflow

CAD/CAM systems such as the Planmeca FIT restorative system allow dentists to take digital impressions, design and then mill the restorations, and stain and glaze or simply polish the finished product, all in a single visit. Same-day restorations offer patients significant convenience and practitioners more control over the restorative process yet with the same accuracy demonstrated by restorations fabricated by a professional dental laboratory. Scanning the intraoral anatomy, designing restorations chairside and milling them in the dental practice have reduced the time required to deliver restorations from several weeks to just a few hours in the same day.

In this workflow model, intraoral images are captured using the digital scanner, after which computer software evaluates and manipulates the images into 3-D renderings, such as digital images of the impression and digital models. The dentist then uses this information to design the proposed restoration—a computer-aided design process (Figs. 1–3). Once the restoration is designed, the information is transferred to the in-office milling unit for fabrication.

While there is a learning curve, advances in intuitive software for both capturing intraoral data

Fig. 1 Multiple restorations can be completed. Whether chairside or laboratory, CAD enables efficient design of proposed restorations based on scan data.

Fig. 2 Contacts can be manipulated and individual cusps put into occlusion.

Fig. 3 Final design proposal.

(Photos/Provided by
Dr. Curtis Jansen)

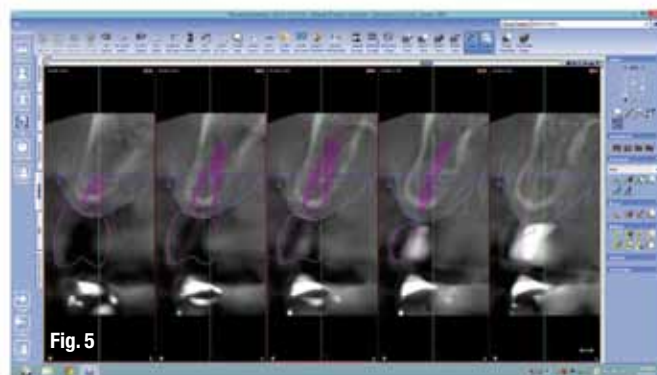


Fig. 4 When surgical referring specialists use an open-architecture IOS following implant healing with corresponding scan bodies, intraoral impression scans of the patient's postoperative condition can be acquired and shared with the restorative dentist and laboratory.

Fig. 5 Scan and CBCT data can be overlaid to allow for ideal implant planning from a restorative perspective.

and Planmeca's Romexis and PlanCAD designing and PlanMill 40 are making this workflow increasingly popular in restorative dental practices. Overall, complete in-office CAD/CAM systems enable dental practices to perform all aspects of the restorative process digitally: impression making, model making, and restoration design and fabrication.

What clinicians must understand is that a complete system can offer different workflows in their practice, including same-day and/or next-day dentistry, which many patients are now desiring. Additionally, complete systems offer more control of the restoration. Scan data can be used to mill multiple restorations or anterior restorations, which the clinician may not feel comfortable completing without the help of a laboratory professional. In such cases, restorations can be milled in the dental office and then sent to a dental laboratory for completion. This can reduce the clinician's laboratory bill and save the laboratory time.

Collaborative partner restorative workflow

Not all dentists have the confidence, desire and time availability to design, mill, and characterize restorations for the digital impression scans they obtain on their patients. There may also be cases for which the dentist's in-office capabilities cannot accommodate. For example, those requiring cutback techniques for esthetic layering. Digitally scanned and the data files can be sent to the laboratory for fabrication. The dentist may switch from a chairside workflow to this collaborative model by sending the digital impressions to the laboratory when treatment challenges arise.

In this workflow model, dentists may acquire data about the patient's preoperative condition and tooth preparations using the PlanScan digital scanner and then transfer the digital files to their laboratory, regardless of geographic location. In such a scenario, the digital file transfers represent an advancement over sending impressions and/or models via tradi-

tional methods of mailing or shipping. Having a compatible open architecture is imperative for enabling this type of workflow model.

Orthodontists, particularly those who prescribe removable clear aligners for their patients' treatment, use this type of workflow model frequently. Furthermore, when a digital file is used to send patient intraoral data to the dental laboratory, cases can be completed and returned in as few as two days.

Planmeca integrated virtual diagnosis and treatment planning

The availability of digital scanners is enabling patient referrals among multidisciplinary dental practices (e.g., oral surgeons, periodontitis, restorative dentists), as well as collaboration with dental laboratories. In this workflow model, for example, an oral surgeon may consult with a patient, acquire scanned images and CBCTs (see section below) both pre- and postoperatively, and transfer them to the restorative dentist and/or laboratory as a means to generate and maintain referrals, as well as facilitate treatment planning (Figs. 4–5). This type of virtual treatment diagnosis and planning evaluative service using stand-alone scanner and CBCT systems fits naturally into the routine flow of treatments.

Alternatively, when the restorative dentist uses PlanScan, preoperative data can be acquired and transferred to the oral surgeon as part of the collaborative process to better plan surgical procedures (e.g., implant placement). This saves the patient time and offers convenience, because referral consultations are generally performed virtually, without the need for a separate patient appointment with the surgeon or specialist.

Furthermore, consider that after placing an implants, oral surgeons and/or periodontists perform a surgical release to verify the healing of the implants — usually three to four months post-treatment — to ensure the patient can proceed with restorative therapy. During this appointment, the specialist can use PlanScan to scan the now integrated implant with a

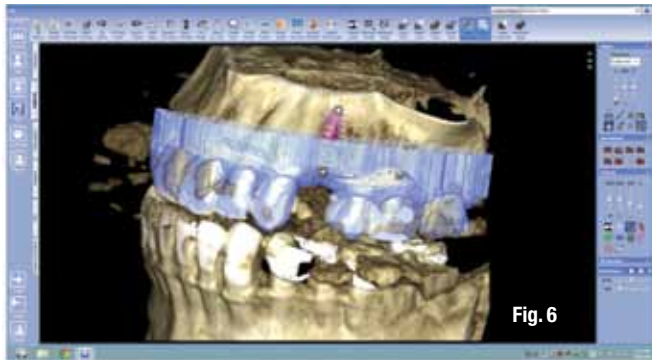


Fig. 6

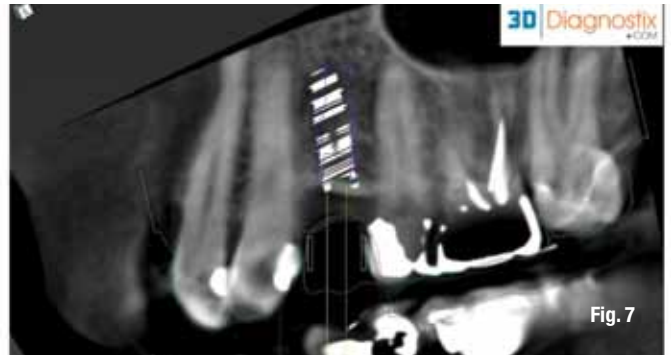


Fig. 7

corresponding scan body in place to and provide relevant impression and opposing-arch/occlusion data to the restorative dentist and laboratory, thereby relieving the patient of the need for an impression appointment with the restorative dentist.

This workflow would involve the surgeon using a scan-ready healing abutment or removing the healing abutment, placing a scan body on the implant, and scan it. This significantly streamlines the process for all parties involved. Previously, impressing for dental implant restorations required the use of conventional impression materials and impression copings, a time-consuming effort fraught with the potential for errors.

Restorative-driven implant planning

With a fully open digital patient record system and Planmeca's Romexis software can be used to incorporate CBCT images and data Planmeca's or others to facilitate implant and other dental surgical treatment planning. If a restorative dentist has both a digital scanner and a CBCT, the two data files can be merged and forwarded to the dental laboratory and oral surgeon/periodontist for treatment planning (Fig. 5) to determine ideal implant placement based on proposed restorative needs and for fabrication of an implant surgical guide.

In this type of 3-D workflow model, a CBCT scan is made showing the area of concern, along with the digital scan of a model or impression. This enables thorough evaluation of the patient's condition, as well as planning of ideal restorations from esthetic and functional perspectives.

The intraoral information can be merged with the CBCT scan to further evaluate whether the proposed treatment is appropriate or whether additional procedures (e.g., bone grafting) should be considered (Figs. 6–7). These images can then be used for collaboration with the laboratory and referral specialists, either via Romexis cloud-based file sharing or electronic transmission, to ensure that a restoratively driven approach is undertaken for ideal implant placement.

Conclusion

Acquiring and processing information digitally — with IOS, milling units in the dental office, or transferring digital files of analog impressions and models to the laboratory — offers tremendous advantages to dental professionals and completes the patient's digital record. These advantages are maximized when digital impressions are incorporated into new digital workflows, any one of which can enhance communication of patient information among restorative, laboratory, and surgical/specialist partners.

Fig. 6 When CBCTs are combined with scan data files, a more precise evaluation of the patient's oral structures can be performed for implant placement and treatment planning.

Fig. 7 By merging CBCT files with scan files and using implant-planning software, dental professionals can plan all components of the implant/restoration procedure in advance for a restoratively driven approach. The image shows the implant placement and implant guide CAD.

about the author

CAD/CAM



Dr. Curtis Jansen completed his DDS and his prosthodontic education at the University of Southern California (USC) School of Dentistry. He taught full time at USC and was director of implant dentistry in the Department of Restorative Dentistry. Currently, he has a full-time practice limited to prosthodontics and a dental laboratory in Monterey, Calif.

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Preparing for success with digital impressions

Author_William Davidson, DMD

During the last decade, dentistry has seen a dramatic shift from full-cast gold (FCG) and porcelain-fused-to-metal (PFM) restorations to metal-free, all-ceramic restorations. This shift has been caused by an explosion of dental ceramic technologies, which now allows dentists to provide both strength and esthetics.

As with all new technologies, there is a slight learning curve that, if approached correctly, can actually permit dentists to conserve more tooth structure while creating better preparations.

I have been working with digital dentistry and doing same day all ceramic crowns since 1997. I have been teaching the use of CAD/CAM systems and preparing teeth for all ceramic restorations since 2000. I have personally taught more than 800 dentists these techniques.

I have been in practice since 1981 as a general dentist and my practice is located in Northfield, Ohio. I currently own three different digital scanners and three different milling units. The Planmeca FIT™ Open CAD/CAM System is my daily choice for digital dentistry whether restoring teeth chairside or sending files and impressions to a lab.

Although I have placed countless FCG and PFM restorations over the years, my practice now focuses primarily on providing metal-free all-ceramic restorations. I utilize my PlanScan to capture optical impressions and then fabricate my restorations in-house using my PlanMill 40. The one thing I've learned throughout my career regardless of which restorative material I use, is that success always starts with the preparation.

During my transition to fabricating mainly all-ceramic restorations, I have encountered three main bumps along the road, which causes many of us to stumble: underprepping, leaving sharp internal angles and not obtaining proper tissue management before my impressions or digital scans. If you are considering placing your first all ceramic restoration or you have already made the transition, it is my hope that this article can provide you with the tips and tricks that I have learned the hard way to help reduce your learning curve.

Case information

I want to present this case to show that, with the correct diamonds, retraction materials and adjusting tools used in a step-by-step manner, predictable, excellent results are easily achievable. Long-term success and immediate ease of design are both enhanced through teeth prepared to meet the requirements of the systems producing the crowns and the material used. I wanted to show how a simple bur kit could pave the way to success. Using quality diamonds, not just their shape, make achieving these results much easier.

The patient presented with a leaking, large MO composite, palatal and buccal, vertical craze lines, and a buccal abfraction lesion on tooth #14 as can be seen in Figs. 1 and 2. IPS e.max® CAD is the material of choice for restoring this tooth for its unmatched combination of proven strength and esthetics. The material preparation guidelines call for 1.5 mm of occlusal reduction and 1 mm of axial reduction.



(Photos/Provided
by William Davidson, DMD)

The preparation

How much should a traditional PFM preparation be reduced? The metal needs to be .5-.7 mm thick. The porcelain should be 1 mm thick. There also needs to be a cement gap. So a PFM needs at least 1.55 to 1.8 mm of reduction to be successful! When we give a lab less reduction, they have to correct our errors by adjusting the thickness of porcelain, not the metal thickness. Sometimes there is even a metal island or we are forced to reduce an opposing cusp to allow for fabrication of the restoration. Under prepping for PFM crowns can lead to metal show through and to porcelain fractures.

With all-ceramic dentistry, under preparation leads to thin construction of the monolithic ceramic, which can lead to failure by fracture. The good news is, however, that all ceramic restorations require anywhere from 0.5 mm (BruxZir®) to 1.5 mm (IPS e.max® CAD) of reduction depending on the type of ceramic, which allows the dentist to conserve more tooth structure while also helping to reduce fractures.

Lab vs. in-office milling

There are advantages and disadvantages to sending impressions to the lab and milling restorations in-house. If you send impressions to a lab, the lab technician can review your impression and prep and make accommodations for any discrepancies (which is a nice way of saying deficiencies) in our preparations. They can correct undercuts, sharp angles, ditches, etc. The problem is, we may not be informed of our deficiencies so we continue to make them over and over. While the corrections the laboratory technicians need to make may provide a nicely fitting restoration for delivery, they may also have compromised the strength and integrity of the restoration.

If you are milling in-house, you do not have the lab technician as a middleman correcting any of your "discrepancies." Therefore, the first few restorations may not fit due to insufficient occlusal reduction, sharp internal line angles, ill-defined margins, or inadequate degree of taper which may cause substantial frustration. The key is to prepare the tooth in a way which is both predictable and reproducible.

In an effort to help me help you, Premier Dental Products Company has just introduced a digital dentistry optimization kit (see below) for metal free restorations which makes it easy to produce ideal preparations and obtain proper hemostasis and retraction. The following steps will demonstrate how, with the correct burs used in the proper sequence, ideal preps can be easily achieved.

Preparation

1. Occlusal/incisal depth cuts

I have been a CAD/CAM trainer for more than 16 years. In that time, I have trained more than 800 dentists on how to properly prepare teeth for all-ceramic and digitally fabricated restoration. The main problem I see is under-prepping.

I realize many of us have been practicing dentistry for quite some time and the last thing any of us want to hear is to be told how to do a crown prep. The things we were trained to do in dental school are distant memories in our rearview mirrors. If I may, I implore you to go back to the basics when prepping for all-ceramic restorations and start with depth cuts.

Premier Dental Products not only distributes the famous Two Striper® diamond bur, it also supplies the milling diamonds for the PlanMill40®. Premier Dental's Director of Clinical Affairs, Dr. Jim DiMarino, also a long-time CAD/CAM dentist, in collaboration with other KOLs, has carefully chosen the diamonds required to achieve the desired optimal tooth prepa-

Below, the Digital Dentistry
Optimization Kit.





Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8



Fig. 9

ration and included them in the new Digital Dentistry Optimization Kit.

They have taken all the guesswork out of researching which diamonds to use and presented them in an autoclavable bur block with all the diamonds laid out according to the order of use as can be seen in Fig. 3.

The kit includes a Two Striper round diamond (L120c), which has a cutting depth length of 1.5 mm. It is absolutely critical that your first step includes proper reduction of the occlusal central fossa. By sinking the L120c to the edge of the cutting surface as shown in Fig. 4, you will guarantee that you are achieving the 1.5 mm of occlusal reduction. Fig. 5 shows the three occlusal depth cuts. I highly suggest you follow this step for your next five crown preps so that you may recalibrate your technique. You can also find alternative depth-guide burs, but I like the simplicity of the round diamond. I can also use it for many other procedures for which the specialized depth-guides are unsuitable.

Fig. 6 shows the Two Striper 770.8C diamond being used to complete the occlusal depth cuts. This diamond has a tip diameter of 1.2 mm and the major diameter of 1.8 mm. Therefore, the center of the diamond length is 1.5 mm. Fig. 7 shows how, by holding

the 770.8C at the proper angle, we will easily achieve the desired 1.5 mm occlusal reduction.

2. Occlusal/incisal reduction

I then take the same diamond (770.8C) and complete the occlusal reduction by connecting the depth cuts as shown in Fig. 8. Fig. 9 shows the completion of the palatal occlusal reduction as compared to the buccal which still shows the occlusal depth cuts.

Note: Team Premier has tried to think of everything to allow us to recalibrate our prep technique while staying in our comfort zone. The kit provides identical diamond shapes in multi-use (Two Striper) and single-patient use SOLO diamond burs. You choose your go-to bur for margin design. The kit contains a round-end taper for a chamfer margin and a KR modified shoulder bur (KR indicates a "rounded" tip radius) for a shoulder margin with round internal line angles. Whether it's the Two Striper multi-use or Solo pre-sterile single use, your transition to digital/all-ceramic restorations is a win-win using the Digital Dentistry Optimization Kit. An illustrated brochure delineates the bur dimensions and item numbers. These multiple offerings allow dentists to focus on prep design using the cutting tools with which they are most familiar.



Fig. 10



Fig. 11



Fig. 12



Fig. 13



Fig. 14



Fig. 15

3. Axial depth cuts

Similarly, I use the dimensions of the 770.8C to achieve three objectives:

- the axial depth cuts of 1 to 1.2 mm of reduction
- obtain the proper degree of taper
- establish the proper elevation of my margins

As mentioned, both the 770.8C chamfer diamond and the 703.8C KR modified shoulder diamond provide a minimum diameter 1.2 mm at the tip and a maximum dimension of 1.8 mm at the base. Translation: If you simply focus on holding this diamond parallel to the long axis of the tooth at the desired margin height and sink the diamond into the tooth to create your depth cuts (Fig. 10), you will have achieved the three objectives.

Furthermore, by using either of these diamonds, you will also be eliminating any sharp internal line angles which are the second most common cause of all ceramic failures. Simply let the diamond do the work for you. Figure 11 shows the results. You can easily see the six axial depth cuts.

4. Axial reduction

I then take the 770.8C chamfer diamond (you can

also use the 703.8C KR or either of the two corresponding SOLO diamonds if you prefer) and connect the axial depth cuts (Fig. 12). The key to completing the axial reduction is to make sure you're holding the diamond parallel to the long axis of the tooth and the tip is at the desired height of the margin as you connect the depth cuts. By following this technique, you are guaranteeing then you will have the proper degree of taper, create rounded internal line angles, and eliminate any undercuts. Again, let the proper diamond dimensions do the work for you. Fig. 13 shows the final result of your axial reduction.

5. Break contact

Next, either the Two Stripper 777.8 M or the SOLO 862012C can be used to break your mesial and distal contacts. Both of these diamonds provide a flame shape to help you break contact without compromising the adjacent teeth as can be seen in Fig. 14.

6. Define margin

Fig. 15 shows the preparation after breaking contact and utilizing the 770.8C chamfer diamond to define the margins. When possible supra gingival



Fig. 16



Fig. 17



Fig. 18



Fig. 19

margins are preferred. It is very important to utilize the 770.8C, the 703.8C KR or the SOLO diamond equivalent to define your margins. Again, by holding these diamonds parallel to the long axis of the tooth your proper degree of taper and internal line angles are maintained.

One way to confirm this is to look at the prep from a true occlusal plane. If you are able to see the margins 360 degrees around your prep as you can see in Fig. 15, you will confirm that you do not have undercuts.

7. Refine the preparation

The last thing you want to do before preparing the tooth for an impression or optical scan is to make sure you round all line angles. This step is critically important for all ceramic restorations, especially for those milled in house because there is no lab technician to make any accommodations. The in-house milling units cannot mill sharp angles, therefore the restorations will not seat completely leading to longer visits and frustration.

Truthfully, this is an easy step. Simply use your preferred diamond to round any sharp line angles and establish the proper secondary planes as can be seen in Fig. 16. Re-evaluate the prep to make sure you can see your margins and you do not have any sharp edges (Fig. 17).

Using the diamond shapes that Premier has already identified as optimal for all-ceramic preparations in the aforementioned steps will all but ensure that your restorations will be successful if you provide an impression or optical scan with proper tissue management.

Retract

As with any crown and bridge impression, proper hemostasis and retraction is imperative. With digital impressioning there is no physical impression material to push tissue out of the way. We have to move tissue out of the way prior to scanning.

That's where Traxodent™, used by itself or in conjunction with cord placement, becomes essential. Traxodent is 15 percent aluminum chloride in a proprietary clay matrix that absorbs crevicular fluid, saliva, and blood while also providing sulcular retraction.

Premier provides Traxodent, the market-leading retraction paste, in the kit along with a knitted retraction cord called Knit-Pak. Traxodent can be used by itself, with a cord, or with a retraction cap.

Personally, I am a fan of the double cord technique but admit that packing the second cord is often difficult and time consuming. Who likes packing retraction cord? Not me. Anything that makes the task easier and more efficient helps. Knitted cord that packs easily and holds hemostatic agents efficiently do that. Knit-Pak does this better than any other cords I have used.

When gingival retraction pastes first came out, I tried several. I just didn't like the material handling or delivery systems. Traxodent works! I like the small 0.7 g syringes of material with the bendable tips which allow for easy access to all areas of the mouth. The optional retraction caps really help me to insure the Traxodent is pressed into the sulcus and helps to keep my patient from displacing the material. Better retraction, done easier equals better impressions.



1. Apply Traxodent

One tip I can offer is that I easily pack the first cord as shown in Fig. 17 before I eliminate sharp angles. You'll notice however in Figs. 16 and 17 that hemostasis has now become a concern. In order to control the bleeding and obtain retraction, I then syringe Traxodent over the cord as shown in Fig. 18, place a retraction cap on the Traxodent, and ask the patient to close gently as shown in Fig. 19.

2. Wait two minutes and rinse

After two minutes, I removed the retraction cap and rinsed away the Traxodent with the light air water spray to reveal a dry, retracted, well-defined margin as seen in Fig. 20. Fig. 21 shows the margin and prep design in my PlanScan software.

3. Review margin

Digital scanning allows you to see how precise these technologies are. As you take a molar prep and review it on your 30-inch monitor, you will be able to analyze your prep design unlike anytime before. Any "discrepancies" are hard to hide at this magnitude, but you learn to be grateful for this opportunity to evaluate your preps because it encourages you to become the best dentist you can be.

At this point, you want to make sure you can see your margin clearly so either your lab or milling unit can fabricate a matching restoration. If you are unable to see your margins, you have the ability to re-prep or retract again and take another scan in order to ensure you will have a perfectly fitting restoration.

Adjust/polish ceramics

So far we have seen how easy the all ceramic preparation is if the proper products are utilized to

their fullest potential. Similarly, special care must be taken to use the right tools when adjusting and polishing these ceramics. I recommend that the only diamonds we should use to adjust the ceramics are the same diamonds which were used to mill the ceramic restorations.

Premier Dental Products not only supplies the milling diamonds used in the PlanMill40 but it also provides similarly made diamonds for dentists to use in adjusting ceramics. Premier calls these diamonds the Two Striper TSZtech.™ Given the popularity of e.max, in hindsight the company should have called them TSEtech! Suffice to say they work on both lithium disilicate and zirconia. The TSZtech football is included in the Premier kit to provide a safe, smooth cutting tool that does not gouge or crack the ceramic unlike other diamonds on the market. They are marked with two orange stripes as the proprietary diamond grit is in a range between fine and very fine, and the processes used to make them are identical to those used in manufacturing the Two Striper PlanMill 40 milling burs.

1. Adjust high spots – Tsztech diamonds

When using TSZtech diamonds it is important to use copious amounts of water and a light touch so that the diamond is always spinning at its highest speed. Fig. 22 shows the TSZtech 285.5 Z diamond lightly removing high spots from the occlusal surface of the finished ceramic restoration with high volumes of water spray.

2. Polish – Diamond Twist SCO

When finishing ceramic restorations the more highly polished the surface, the longer lasting more beautiful the restoration will be. Additionally if a ceramic is adjusted intra-orally and not polished

about the author CAD/CAM



Dr. William Davidson has been in private practice since 1981. He received his doctor of medicine in dentistry degree from Case Western Reserve University. Davidson is well-known for practicing state-of-the-art dentistry and using 3-D technology to create natural and durable ceramic teeth restorations. He is sought after by both national and international groups to train dentists in the art and science of using these technologies. He is frequently called upon as a technical advisor for various dental manufacturers and assists in evaluating new precision instruments. In his private practice, Davidson owns four different digital impression systems and has been a digital dentist since acquiring his first system in 1997. He is a member of the Cleveland Dental Society, the Chicago Dental Society, the Ohio Dental Society, the American Dental Society and the Academy of General Dentistry.



well it can wear the opposing dentition. Polishing traditionally takes time and many steps to achieve. Superior results in less time, what a concept! Premier's Diamond Twist SCL (L as in LAB) and SCO (O as in intra-ORAL) kits do just that. If you would like to polish the restoration before firing, I would suggest using the Diamond Twist SCL.

The SCL kit starts with the unique Fibra Points to achieve a rapid initial polish without generating excess heat. They do this better than any other product I have used. The polishing is finished with the excellent diamond paste and a felt disk/point. If the ceramic is adjusted in the mouth with a Premier TSZtech diamond (special zirconia adjusting grit) and needs a final polish, the Diamond Twist SCO kit does that in one step. Just use the paste with a brush or micro-cloth disk. I use the SCL/SCO kits for better, faster results.

I have had long experience with the SCL/SCO kits and have always found them easy to use. What I especially like is the lack of heat build-up with the Fibra Points. When polishing ceramics in the lab and we are in a rush, they ensure my staff doesn't stress the ceramic with a localized build up of excess heat. Additionally, the SCO kit can be used with composite and helps to cut down on stocking multiple finishing products for different materials.

The last step is to polish any areas that were adjusted intra orally using the Diamond Twist supercharged Polishing Paste with Micro Cloth Disk or brush as shown in Fig. 23. Premier also includes this unique paste and applicators, which has been proven to be quite effective at restoring ceramics to a high shine in one easy step, as can be seen in Figs. 24 and 25. In fact, the April 2016 issue of The Dental Advisor confirmed what I knew all along, Diamond Twist achieved a maximum gloss score of 99 for SCO and 98 for SCL when polishing lithium disilicate like eMax. The patient was pleased with this result.

Conclusion

This case was the first time I used many of the Premier products provided in the Digital Dentistry Optimization Kit. I was shocked! Premier Two Stripper

diamonds cut tooth structure like butter when compared to other diamonds I have previously used (which I'm sure many of you are currently using) and perform well longer. Longer lasting, better diamonds give a better result with lower net cost per use.

Premier Two Stripper Diamonds are the best I have used. My assistant, without tactile feedback, just from watching me work, noticed how much superior their cutting ability was. The cut from Premier diamond was smoother, faster and more consistent than my previous diamonds. Less pressure was needed to cut tooth structure and less heat buildup was evident. I could tell there was less heat as no tan debris built up on the diamond or in the mouth. I will only use Premier diamonds on my patients in the future as they allow me to deliver a higher quality of care.

My take-home message advice to you, as a dentist with more than 19 years experience placing all-ceramic restorations and teaching more than 800 dentists to do the same, is to depth cut all of your preparations as a first step and follow the products and steps outlined in Premier's Digital Dentistry Optimization Kit to the letter.

Remember, for consistent results, we are not asking for more reduction than a lab crown, but it is far more critical for success that we don't under-prepare (under-preparation may lead to long-term fracturing of all-ceramic restorations) or leave any sharp internal line angles.

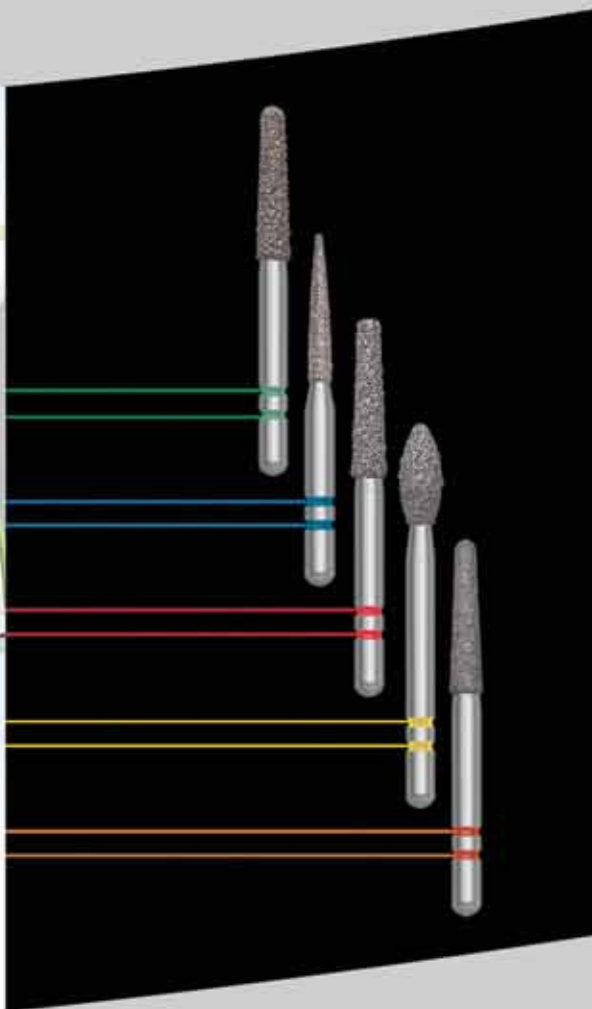
Premier's Digital Dentistry Optimization Kit has all the diamonds, retraction/hemostasis, and adjust/polish products I needed to create predictable, metal free all ceramic restorations, set up to be used in sequence, to achieve an excellent result. These products are now being used in my practice daily. Why search around for different things from different sources that may or may not be effective.

All of these products are part of a well thought out system for preparing, impressing and finishing all ceramic restorations. The sum of these products used together is truly greater than the parts used individually. Make your life easier and your patients' restorations better by producing consistent results with the use of the Premier's Digital Dentistry Optimization preparation kit and retraction system.

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Digital restorative veneers: Functional and esthetic outcome achieved

Author_Walter Renne, DMD

It is a common misconception that single-visit chairside milled veneers will never look as good as expensive laboratory fabricated veneers. I have in fact found the opposite to be true. Veneers from the mill can exceed that of many laboratory veneers, even those fabricated at very expensive high-end labs. Here is a patient that came to me for veneers.

Case presentation

This 30-year-old patient presented with composite resin veneers on her peg shaped lateral incisors. The composite veneers are only 2 years old, and she indicates she has had them replaced several times because of esthetics deteriorating with aging (Fig. 1).

Step 1

Close-up photographs of the central incisors were made to capture the natural appearance before desiccation occurs (Fig. 2). I always do this and use

the digital photos when I am doing the staining and glazing because, upon desiccation, things can change dramatically.

Step 2

In the anterior, I almost always use the clone or copy feature rather than use a library tooth. When you use the preoperative tooth or a wax up to start, I always feel better because not only do you have reference points like width, length and midline, but you also have a copy of the occlusal surface that has been in proper function and guidance for many years and can serve as a good initial proposal.

If the patient has pathological occlusion or is in need of major alterations of the contours, I always get a wax up made to copy. I concluded that for this case, I do not need a diagnostic wax up to copy because her lateral incisors are good enough to use as a template. Therefore, I scanned the existing laterals before I started.

(Photos/Provided
by Walter Renne, DMD)



Fig. 1

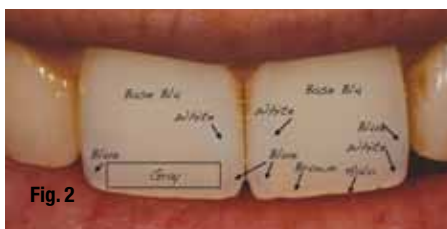


Fig. 2



Fig. 3

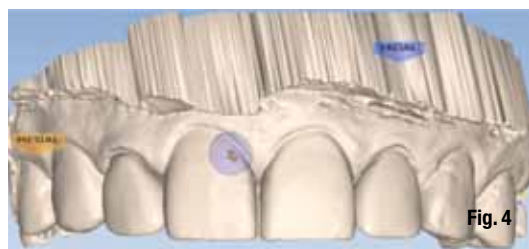


Fig. 4



Fig. 5

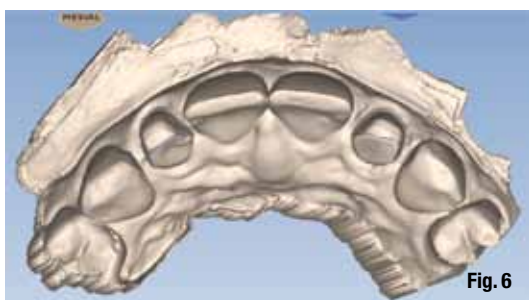


Fig. 6

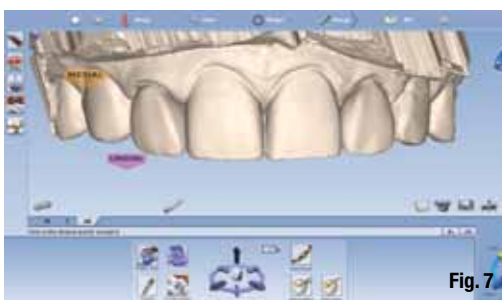


Fig. 7



Fig. 8



Fig. 9

Step 3

The teeth were prepped for conservative ceramic veneers and scanned with the Planmeca PlanScan scanner. The opposing and the bite were also scanned. The software automatically aligns the preoperative model with the preparation model. The preoperative tooth is outlined so the software (Fig. 3) knows what you want to copy as the initial proposal, and then I marked the preparation margins (Fig. 4–6).

Step 4

The initial proposals, which are an exact copy of the preoperative condition, were slightly altered. Using the powerful tools in Planmeca PlanCAD design software, the anatomy of the tooth is enhanced. You can see in Fig. 6 that the initial proposals are an exact replication of the preoperative resin veneers. There are several quick and easy digital modifications that I made; most importantly I accentuated the mesial lobe of the laterals (Fig. 7).

Step 5

The veneers were sent to the Planmeca PlanMill 40 milling unit. The material I selected was e.max MT B14 (Ivoclar Vivadent). After milling, each veneer was tried in for proper fit, and proximal contacts were verified. The restorations were then placed in the oven for the appropriate crystallization time. Once out of the oven and cooled, they were checked again

for fit to make sure nothing changed in the oven.

Step 6

The restorations are etched with 5 percent hydrofluoric acid for 20 seconds and then salinated for 60 seconds. The teeth were pumiced with plain pumice, rinsed and isolated. Optibond XTR was used on the teeth and cured. Variolink Veneer Value +1 (Ivoclar Vivadent) was loaded into the veneers and seated. The veneer cement was completely cleaned prior to cure using microbrushes (Fig. 8). Each veneer was light cured for 20 seconds on each surface.

Step 7

The patient returned two weeks later to see how the veneers were doing and to check the tissue health (Fig. 9).

Conclusion

You'd be amazed at how well chairside restorations turn out. The quality is amazing, the restoration does not lose any strength, and the esthetics will always win out – everything can be done with the patient right there in the chair. There is absolutely no compromise to the restoration's fit, form or function when it comes to using the Planmeca FIT System. The capabilities for in-office abilities are high when it comes to using a chairside restorative system.

The five most commonly asked questions about imaging equipment

Dr. Louis Kaufman shares his thoughts on CBCT

Reprinted with permission from Dental Products Report

Dr. Louis Kaufman is a Chicago dentist who lectures nationally on CBCT and implantology for imaging equipment from Planmeca USA. Like all lecturers, he gets dozens of questions from other dentists who attend his lecture. Dental Products Report decided to explore some of the most common questions he receives about CBCT.

What is the return on investment or how do I justify this amount of capital?

When you purchase a cone beam, I suggest that you look at the ability of the machine to generate images in different formats. You need to ask yourself, besides taking a three dimensional image, can this machine create panoramic images? If it can take panoramic images, ask yourself, "How many panoramic images do I take in a year?" Then ask yourself, "What do I charge for those images?"

For example, if I charge \$100 and I take 400 panoramic images a year, then I just billed out \$40,000. If this machine cost you \$120,000, dollar for dollar, you

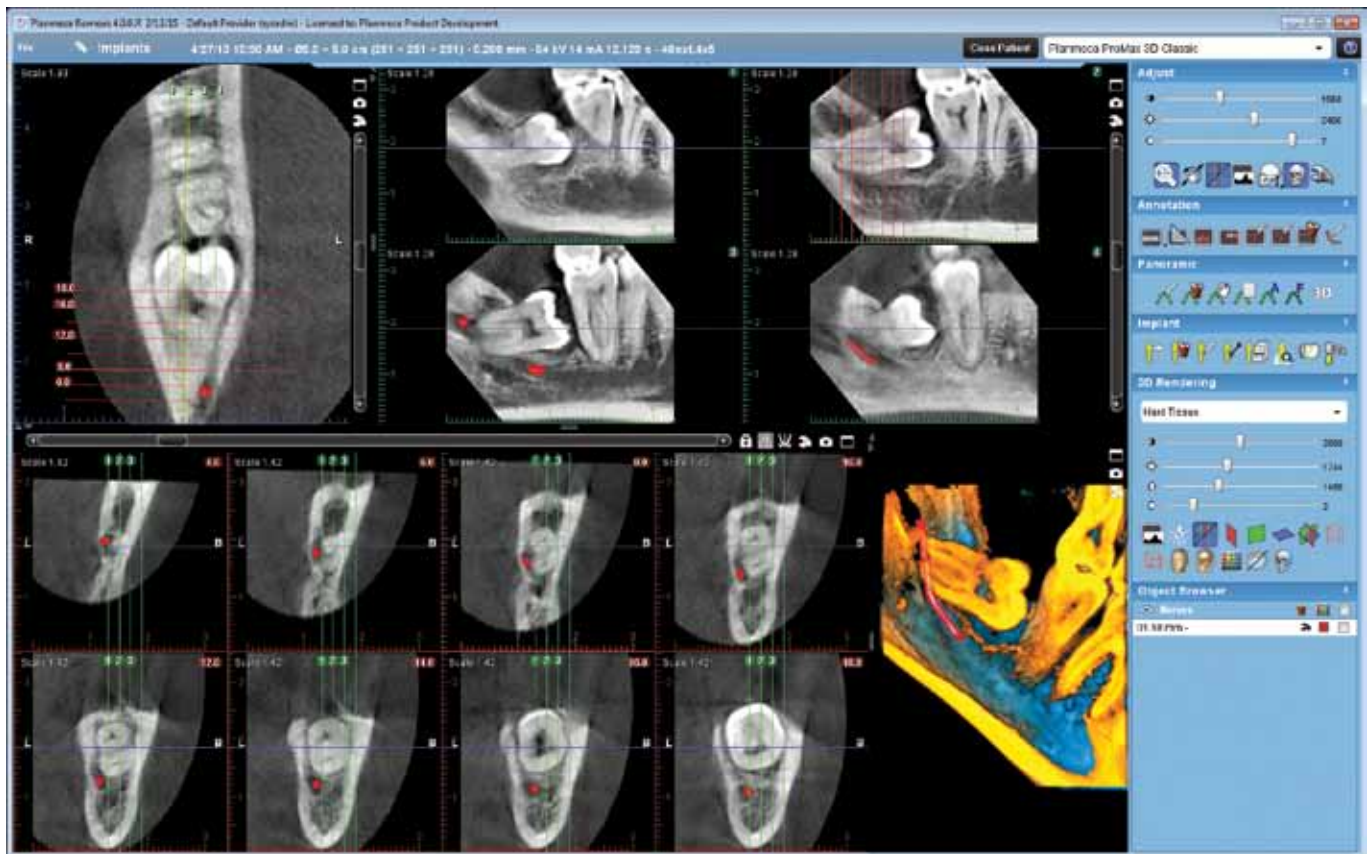
recoup the expenditure in three years. Realistically, you pay for it over four years.

Remember, it's just not about the X-rays. It's about the amount of undiagnosed dentistry and implant planning we can do with this technology. It generates better comprehensive treatment planning and ultimately better dentistry for the patient.

How has communication improved with your patients using CBCT?

Where I can place an implant in their jaw using their own anatomy and a chairside model, patients can visualize and comprehend the procedure more clearly. I would encourage the use of videos that all the major dental implant companies produce. Check with their marketing department and incorporate a video into your website.

While the patient is in the chair, you or your team can pull it up on your website for the patient to view. This serves two purposes. First, patients can visualize it more clearly. Second, when they go home to their



Above, Planmeca ProMax 3D Classic.
(Photo/Provided by Planmeca)

significant other, they can pull up your website and explain the procedure to them.

Do you need a dental radiologist to review all your scans?

It's extremely important to have a working relationship with a dental radiologist. Of course, then the question becomes, "Do I need to send every scan to the radiologist?" In my opinion, when a large field of view is taken, I recommend sending the scan to the radiologist. The beauty of this technology is that it allows us to take small fields of view or limited fields view. Therefore, it is not necessary to send every scan to a dental radiologist.

I can't stress enough the importance of reviewing all your scans even after the patient has left the office. The more we review and educate ourselves on the normal anatomy, the better we become at identifying the obscure. I also encourage taking classes that are continually being offered throughout the country on how to review a cone beam.

Do I need an intraoral scanner and CBCT?

Having an intraoral scanner and a cone beam is the perfect marriage. Both are completely independent of each other. The scanner focuses on teeth and tissue and the cone beam addresses the bony architecture.

When the STL files are joined in the lab, there is complete harmony. Like a great marriage, they make each other better.

From my understanding and speaking with different vendors, one can take a DICOM file obtained from the CBCT, convert it, make a virtual model, 3D printed model and fabricate a crown. So, in theory, you could prep a tooth and have an edentulous area. Plan the implant and make the crown or partial all at the same time. And then there are times we just need to take an intraoral scan and make a crown inlay or onlay.

What's your opinion on the obsolescence of a machine you purchase today?

The most important question to ask the equipment sale rep is, "Is the hardware upgradeable?" Also, is there a fee for upgrading to a newer version of the software? Many companies have software updates so you should ask what is included with your purchase. Like any other technology, there are advances in how it's delivered. Going with a company that's one and done is not the way to go. I want to do business with a company (and there are many out there) that wants a long-term relationship with the buyer.

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CBCT and computer-guided surgery

Author _Eric Seitlin, DDS

_Introduction

Implant-supported oral restorations are among the most validated treatment options for restoring edentulous and partially edentulous patients. Despite the many benefits, implant surgery has been perceived as a procedure that requires a fair amount of guesswork because of challenges in evaluating alveolar bone contours and implant angulations accurately. More recently, this situation has been greatly mitigated by the use of cone-beam CT (CBCT) combined with computer-guided treatment planning technology.

In recent years, there has been increasing interest in computer-guided surgery because of advantages that include less bleeding, less discomfort, shorter surgery time, reduced healing time and minimal swelling as well as an increase in drilling accuracy and a restoratively driven work flow that allows for immediate CAD/CAM provisional restorations.

The following is a case example that demonstrates the CBCT-based implant guided surgery workflow and how these technologies come together to provide dentists with the insight and tools they need to give their patients the ultimate restorative outcome.

_Step-by-step procedure

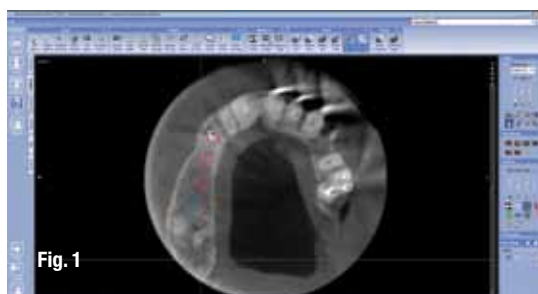
The patient is a 78-year-old male referred to Dr. Eric Seitlin (in Charlotte, N.C.) for implant rehabilitation for teeth #3, 4, 5 and 6 in the right side of his maxilla. The patient initially had a failing bridge (teeth #2–6) and single-unit crowns on #7 and #8, which all had to be removed and replaced by a chairside temporary bridge.

Examination includes a Planmeca ProMax 3D CBCT scan and digital impression acquisition by an intraoral scanner (e.g. PlanScan) to be uploaded to 3D Diagnostix (3DDX) for surgical guide design since this case required a tooth-supported surgical guide.

Fig. 1 _Axial view of implant plan in Planmeca Romexis.

Fig. 2 _3-D view of implant plan in Planmeca Romexis.

(Photos/Provided by
Eric Seitlin, DDS)



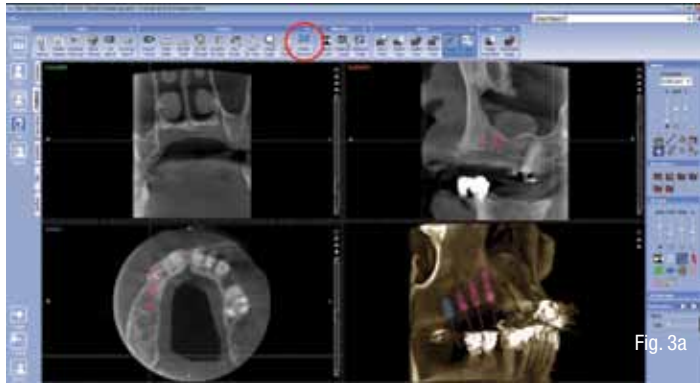


Fig. 3a



Fig. 3b

Fig. 3a_The 3DDX Order Services button is right in the Planmeca Romexis toolbar.

Fig. 3b_3DDX electronic prescription form.



Fig. 4

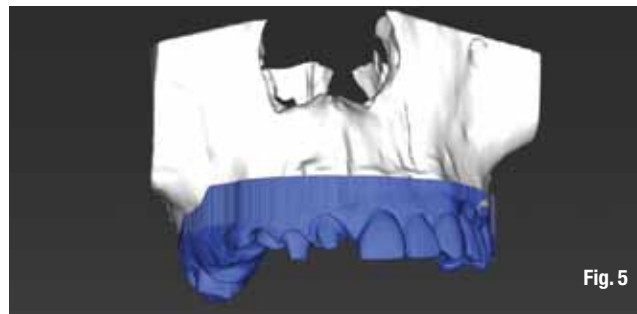


Fig. 5

Fig. 4_STL registration of digital impression (blue) on CBCT.

Fig. 5_STL registration of digital model (blue) in 3-D.



Fig. 6

Fig. 6_Modified implant plan after 3DDX online review session.

The imaging revealed adequate bone to proceed with implant placement.

Using the implant planning tools available in Planmeca Romexis® imaging software, Dr. Seitlin initially planned the case by placing four Camlog implants, one in each of the edentulous sites (Figs. 1 and 2). A remaining root in site #6 would be immediately extracted, and a sinus lift was to be performed.

Next, by pressing the 3DDX Order Services button (Fig. 3a) in the Planmeca Romexis software toolbar, Dr. Seitlin was able to fill out an electronic prescription for his case (Fig. 3b), including information about the patient's relevant history, the implant plan, date of surgery, the surgical kit he will be using and whether he required a radiological interpretation by a board certified OMR.

Once the form was submitted, all this information, along with the Planmeca ProMax 3-D scan, were automatically and securely transferred to the 3DDX servers. The digital impression was also acquired and uploaded separately through the 3DDX Connect secure online portal. Upon receiving the case, the scans were reviewed and prepared for STL registration (Figs. 4 and 5), where the digital impression was superim-

posed onto the Planmeca Promax 3-D CBCT data. Dr. Seitlin was later contacted on the date he scheduled for the online review session with a 3DDX dentist to go over the treatment plan one more time before the surgical guide is designed.

During the session with one of 3DDX's on-staff dentists, it was determined there was not enough space for all four implants that would allow for the 3.0 mm safe distance between them. Dr. Seitlin made the decision to remove the implant planned for site #4 and proceed with only three implants instead of the initially planned four (Fig. 6). Implant diameters were also changed to a uniform 4.3 mm for all three Camlog implants and lengths were adjusted to 7 mm, 13 mm and 16 mm for sites #3, #5 and #6 respectively to better accommodate the patient's bone.

Implant angulations were slightly altered from the original Planmeca Romexis plan for better positioning in relation to the bone and sinus and also for an optimal restorative outcome. Upon re-evaluating the scan, the sinus appeared to be inflamed, and therefore, the sinus lift procedure had to be ruled out.

The session concluded with Dr. Seitlin's confirmation of the modified implant plan, and the 3DDX

Fig. 7_ Surgical guide design by 3DDX for the CAMLOG Guide surgical kit.

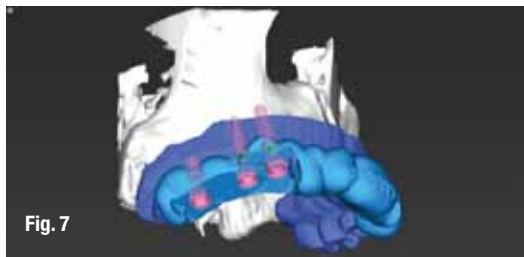


Fig. 7

Fig. 8_ Surgical guide with CAMLOG sleeves (left) and fitting surface (right).



Fig. 8

Figs. 9a-9b_ Remaining root extraction for site #6.



Fig. 9a



Fig. 9b

Figs. 10a-10b_ Guided surgery.



Fig. 10a



Fig. 10b



Fig. 11a



Fig. 11b

_about the author CAD/CAM



Dr. Eric Seitlin is a general dentist in Charlotte, N.C. He graduated from the University of Maryland School of Dentistry in 2004. He is a general dentist in private practice and works on all aspects of general dentistry, including surgery, endodontics, and restorative dentistry.

dentist proceeded with surgical guide design for the case. The superimposed digital impression allowed for better visualization of the crown tips and soft-tissue contours than is possible with just a CBCT scan and is essential for designing a perfectly fitting surgical guide.

In our previously mentioned Planmeca Romexis electronic prescription, Dr. Seitlin chose to use the CAMLOG Guide System surgical kit for this case. The sleeves for the surgical guide were designed accordingly, and a CAMLOG-compatible surgical guide was designed (Fig. 7), manufactured and delivered to the doctor along with a detailed drilling instruction sheet (Fig. 8) within five business days.

The patient was prepared for surgery, and the temporary bridge was removed. The surgical guide was then fitted on both teeth and mucosa firmly.

The detailed process of the surgery and restoration is covered in Figs. 9 through 11.

Finally, Dr. Seitlin proceeded with the restoration process. For this patient, a transitional bridge (teeth #2-8) with an intermediate abutment on #7 was used. After implants are integrated, teeth #3, #7 and #8 will be restored with individual crowns.

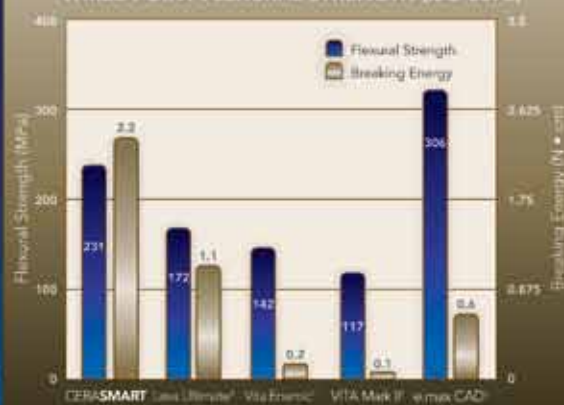
CAD/CAM custom abutments and restorations are also available from 3DDX for single- and multi-unit guided surgery cases.

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Restorations courtesy of Dr. Rich Rosenblatt

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GC

45 YEARS ON THE FRONTLINE OF HEALTH TECHNOLOGY

Shiny white design and devices with colors from metallic silver to lime green, 3D printed skulls of humans and pets in illuminated glass display cabinets, touch screens surrounding the devices, which look like they're parts of a spaceship. This futuristic yet inviting pastel-colored scene is not part of a science fiction novel but reality in a showroom in Helsinki, Finland. This showroom belongs to the Planmeca Group, a company which develops and manufactures cutting-edge Finnish health care technology.

This year marks the 45th anniversary of the founding of Planmeca. CAD/CAM magazine had the pleasure of interviewing Heikki Kyöstiä, the President and founder of Planmeca Group.





Planmeca X-ray showroom, Helsinki, Finland

A GLOBAL PLAYER

Planmeca Group's product range covers high-technology dental care equipment, world-class 2D and 3D imaging devices, comprehensive CAD/CAM and software solutions, mammography systems as well as dental instruments, supplies and services.

President and founder of Planmeca, Heikki Kyöstilä, has seen his company and the industry evolve hand-in-hand. 45 years ago, in 1971, Kyöstilä saw a market opportunity for manufacturing dental equipment after doing business for German companies in the same field and decided to start a company of his own. Today, the parent company of the group, Planmeca Oy, is the third largest dental equipment manufacturer in the world and also the largest privately owned company in the field.

"It was all about hard work and an urge to put Finland on the map. And today, Planmeca is a global leader in health care technology," said Kyöstilä.

Planmeca's aim is to create functional, durable and beautifully designed products that stand the test of time. Planmeca's dental care units, X-rays and software solutions are all designed

and manufactured in Finland. Using the latest technology and the best materials, products are tailored to meet the needs of dental professionals in different markets. Planmeca Group's advanced mammography and orthopedic imaging products are manufactured by the group's subsidiary Planmed Oy.

Plandent Division of the group is the biggest dental supply and service chain in Northern Europe. The division consists of comprehensive dental supply houses which offer innovative digital solutions and supply high-tech equipment manufactured by Planmeca. The division also offers a comprehensive selection of high-quality materials and instruments from the world's leading manufacturers.

Over 98% of products manufactured by Planmeca are exported around the world. Planmeca Group operates in over 120 countries, employing nearly 2,700 people worldwide.

"Our strong commitment to building customer relationships around the world and a passion for innovation guide everything we do. They give us the focus to consistently develop revolutionary





Planmeca headquarters, Helsinki, Finland

technology and gain a deep understanding of the needs of dental and health care professionals. I believe these values have led us to where we are today – at the forefront of our industry”, Kyöstillä explained.

STRONG COMMITMENT TO R&D

The secret behind the success and never ending innovation decade after decade is, according to Kyöstillä, a strong and unwavering commitment to R&D.

“As a privately owned company, we are in control of our own destiny and able to make the long-term R&D commitments that are the driving force behind our innovations. We also collaborate closely with health care professionals and leading universities. I firmly believe that this dedication to continuous development will enable us to make the work of dental professionals easier and more efficient for many years to come”.

Up to 10% of the company's annual revenues are invested in R&D. Planmeca's in house R&D department employs 140 people; a mixed



Planmeca Production Lines

group of experts including software, mechanics, and electronics engineers together with usability and industrial designers. Unrivalled scientific knowledge and in-depth understanding of clinical workflows are vital parts of the product development.

The enthusiasm toward innovation and the industry shines through when the President of Planmeca Group talks about his company.

"One needs to have a strong will to see further into the future than others and also the determination to act accordingly. You have to really listen to what the industry and the customers are saying and hear the silent signals. You also need to believe in what you're doing", Kyöstilä summarized the factors underlying the success of the company.

A DIGITAL PIONEER

Already in the late 1990s, Planmeca realized that a shared software platform would be the logical next step, bringing diagnostics and treatment planning into a single workflow. Planmeca's solution for this was, and still is, the ever evolving Planmeca Romexis®, an all-in-one software connecting all of the equipment in a dental clinic.

In 2011, Planmeca launched the concept of Digital perfection. The company took digital imaging to the next level by enabling the combination of three different 3D datasets (photo, X-ray data and digital impression) into one complete 3D model.

Planmeca was also among

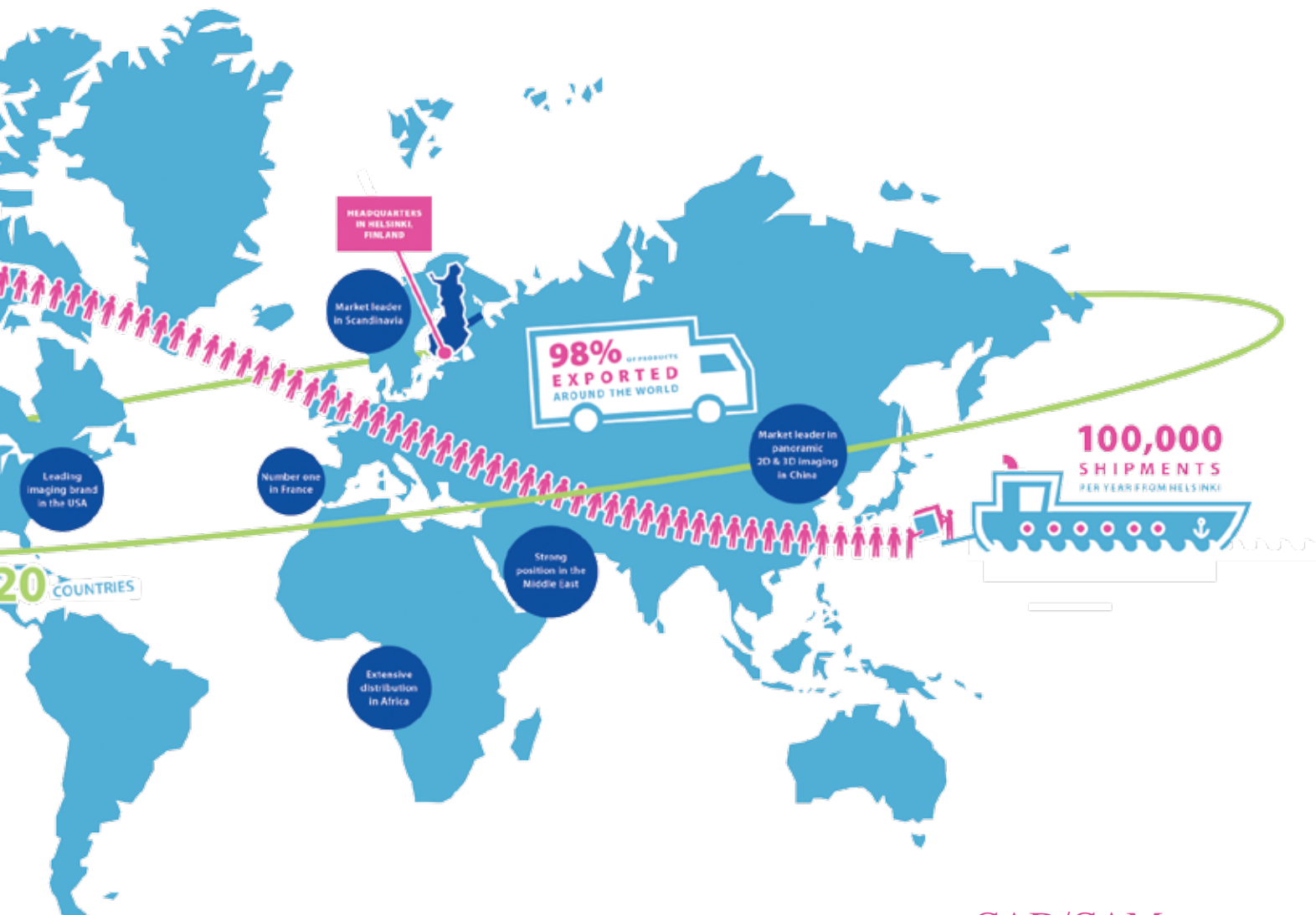


the forerunners to market the integration of CAD/CAM to dental treatment units. Due to the open source STL file format of Planmeca's CAD/CAM solutions, it is easy for dentists to connect with the rapidly growing computer aided dental manufacturing community. The Planmeca FIT™ solution offers dentists a completely integrated and digital workflow with three simple steps – ultra-fast intraoral scanning, sophisticated design and high-precision chairside milling. All of this is seamlessly integrated into Planmeca Romexis software.

"CAD/CAM dentistry is an integral part of Planmeca today – our wide range of open architecture CAD/CAM solutions lets the dental professionals choose their preferred way to treat patients, improve workflow and opens new horizons in growing the business scope. Openness is an important value to us – we don't want to set limits or boundaries. Our open solutions give us a considerable advantage over other



CAD/CAM Production Lines



Planmeca USA, Inc.

Planmeca USA, the North American Subsidiary of Planmeca, was launched in 1987 and the first to introduce the software driven dental care unit concept in America. For the past 29 years, Planmeca USA has lead North American dental industry with advanced dental imaging systems starting with film based, then 2D, and now 3D imaging equipment with patented SCARA (Selectively Compliant Articulated Robotic Arm) technology. Today, it is one of the most admired dental imaging companies in North America.

Planmeca offers one of the most robust product lines in the world, which include: dental care units, dental lights, dental stools, dental cabinets, intraoral X-rays, intraoral sensors, 2D extra oral imaging, and 3D imaging products, which are distributed through selected NDC members, Patterson Dental, and Henry Schein Dental. Planmeca USA, Inc. also distributes the Planmeca FIT CAD/CAM system, which is manufactured in the United States and sold exclusively through Henry Schein Dental in the United States and Canada

All of Planmeca's imaging, dental care units, and CAD/CAM products are powered by all-in-one Planmeca Romexis software, which is built on open-architecture platform. Designed with clinicians in mind, Planmeca's upgradable, modular platform allows doctors to keep up with new technology by easily integrating the newest advances in hardware and software.

Planmeca USA, has distribution in the United States and Canada servicing over 160 dealer locations throughout North America. Currently Planmeca USA, maintains 42 sales representatives in the field, one of the best management teams in the industry, and 40 technical support professionals with a total of over 135 employees supporting our North American distributors and doctors.



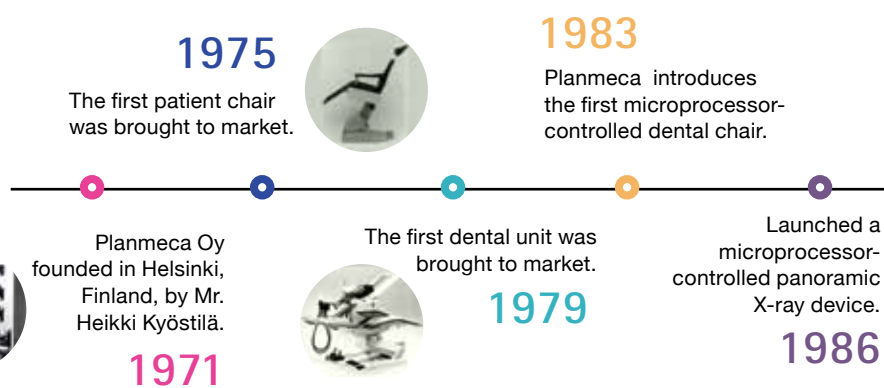
solutions in the market", Kyöstilä described.

ELEMENTS OF FUTURE GROWTH

Planmeca has stayed on the cutting-edge of dental products now for almost half a century. The plan is to stay on the cutting-edge in the future too. But what does the future of dentistry and health care technology look like? Kyöstilä sees a digital future ahead.

"We are living in an exciting era. Dentistry is at a crossroads, the digital revolution has already begun. In the future, dentistry will be completely digital and 3D technology is going to transform the entire field. Software-driven innovations are now the heart of progress and cloud services are reality. This presents unforeseen opportunities, but also new challenges."

"The industry is moving from products to services. In a completely digital dental workflow, it will be of paramount





Planmeca showroom Finland

importance that all devices and software work together completely seamlessly. The future will not only be digital, but also increasingly mobile. This reality is at the core of all Planmeca product development", Kyöstilä explained.

When Kyöstilä describes his visions of the industry's future, phrases like software, industrial internet, 3D printing, CAD/CAM, 3D and even 4D keep coming up.

"It is our goal to design and manufacture high-end digital products that work together as smoothly as possible. To achieve this, we have been forerunners in building a rich ecosystem of devices, software and services. Our unrivaled product portfolio covers everything needed in a high tech

dental clinic: all 2D and 3D imaging modalities together with digital treatment centers, CAD/CAM systems and software."

"Software used to be something people received with the device they purchased, but now software is often the most important product. Software is the brains behind the products. We keep developing our software solutions and improving them constantly. This is all part of our goal to create the most powerful dental ecosystem in the market."

"At Planmeca, we always operate with the future in mind. The possibilities with CAD/CAM, 3D and even 4D are endless. I strongly believe that Planmeca will guide dentistry into the future like no one else can."



2005

A Cone Beam Volumetric Tomography (CBTV) system for 3D dental imaging was introduced.

2007

Introduced dental unit with symmetrical motorized movements enabling fully adaptable unit.

2013



Introduced a full range of open CAD/CAM solutions for dentists and dental labs

2015

Planmeca Romexis 4.0 is the first dental software in the world to combine 2D and 3D imaging and the CAD/CAM workflow.

Launched the all-in-one software, Planmeca Romexis.

2006

Planmeca Romexis Clinic Management module was introduced allowing Planmeca digital dental equipment to be easily connected to a network.

2008

Planmeca Digital Academy, an umbrella concept covering all education and training was launched.



2014

CAD/CAM
2_2016

Making implant dentistry more predictable with digital technology

Author _Michael Corson, DDS

_Cone-beam technology has significantly advanced and enhanced implant dentistry to create much more predictable results. When my initial implant journey started more than 10 years ago, it was quite common to be more aggressive with our surgical approach to be able to visualize the bone at the time of surgery. This meant larger flap designs and the inability for the patient to know ahead of time exactly what would need to be performed at the time of surgery.

Often flaps to gain visualization of vital structures (mental foramen, submandibular concavities) were necessary. The ability to pre-plan surgeries on the Planmeca design software helps doctors know what length and diameter implants will be ideal for their patients, as well as visualize vital structures without surgical intervention. This also ensures that the practitioner has enough inventory of implants prior to surgery.

_Clinical case

A 71-year-old female patient was referred by her physician for consultation. This patient was undergoing renal dialysis and trying to get approval for the recipient list to receive a kidney. All oral disease/infection or potential for thereof needed to be eradicated prior to approval.

Treatment discussed was full-mouth extractions and conventional dentures, locators 4x4 for solid retention but removable and lastly screw-retained hybrid restoration non-removable was discussed. Pros and cons were thoroughly reviewed and the decision was made for a 4 locator overdenture on both arches.

An immediate denture was made as well as a duplicate surgical guide. The decision was made that due to the presence of so much infection we would extract all remaining teeth and then place eight implants two weeks later.

All implants were first digitally placed prior to the surgery using our Planmeca Pro Max 3D CBCT and digital software. This allowed us to ensure there was enough bone present in the planned areas of implant placement as well as evaluate AP spread. A total of eight 3.3 diameter Camlog implants were placed ranging in length from 11 mm–16 mm.

Cover screws were placed and 3.0 silk suture was placed continuously. Three and a half months of healing occurred and patient was seen again for uncovering. A full thickness flap was laid to gain access to cover screws. Locator attachments were placed, and apical repositioning of the buccal and lingual flaps were maintained to gain more keratinized gingiva around the locators.

Processing caps were then picked up directly in the intaglio surface of her existing upper and lower

Fig. 1 _Pre-op panorex (Planmeca) of 71-year-old patient with severe decay and advanced periodontal disease.

Fig. 2 _Intra-oral retracted photo of pre-existing dentition.

(Photos/Provided by Michael Corson, DDS)





Fig. 3



Fig. 4



Fig. 5



Fig. 6



Fig. 7



Fig. 8



Fig. 9



Fig. 10



Fig. 11



Fig. 12

Fig. 3_Intaglio view of mandibular denture and female Locator housings.

Fig. 4_Anterior view of maxillary denture.

Fig. 5_Intaglio view of mandibular denture with locator housings.

Fig. 6_Anterior view of mandibular denture.

Fig. 7_Maxillary arch with male Locator abutments.

Fig. 8_Mandibular arch with male Locator abutments.

Fig. 9_Retracted photo of overdentures in centric occlusion.

Fig. 10_Smiling view of patient after treatment.

Fig. 11_Pre-op cone-beam CT with Romexis software. Preplanned surgical sites and proposed implant lengths and diameters for patient.

Fig. 12_Post-op cone-beam CT with Planmeca Romexis software.

denture with Sterngold Era pick up material. The palate was also removed out of her upper complete denture.

Conclusion

This patient through the use of 3-D imaging and implants was given the ability to have a better smile along with the ability to chew her food much more efficiently. More importantly she eradicated all infection from her mouth and was given approval by her doctors to be on the kidney recipient list.

_about the author

CAD/CAM



Dr. Michael Corson, DDS, is a second-generation dentist who was born and raised in Parker, Colo. He did his undergraduate studies at Colorado State University and then attended Indiana University School of Dentistry, graduating in 2001. Upon graduation, he had the privilege and honor of serving his country in the post-9/11 era. While stationed at Fort Hood, he gained advanced training in the areas of oral surgery and endodontics. He is a fellow of the Misch International Implant Institute, an associate fellow of the American Academy of Implant Dentistry, a fellow of the International Congress of Oral Implantologists and a fellow of the Academy of General Dentistry.

Experience inspires new career in CAD/CAM

Author_ Winnie Guan

After a nightmarish experience following a routine dental check-up, Misty Garr, now dental assistant, turned a horrible incident into one that would change her life forever. As dental practitioners, it can be hard to see that dental care is not just about dental health. As patients put more care into their health, dentists need to understand it's not only patients' mouths that are being taken care of — a healthy mouth encompasses a patient's whole health and well-being. Digital dentistry has come a long way for not only the patient and the practices, but also for the dental assistant.

For Misty, it has opened up many opportunities and has allowed her to become an incredible dental assistant, friend, mom and an inspiring individual.

_A not-so-typical dental check-up

Not having gone to the dentist for at least five years, Misty went in for a routine dental check-up and had a few dental fillings done. Two weeks later, she started experiencing migraines. "I started having these uncontrollable mind-numbing migraines and I didn't know where they were from nor could I attribute them to anything," she recounts.

Thinking this was a medical condition, Misty went to the emergency room several times for relief, only to get dismissed with vague diagnoses — she was prone to migraines or that she had a sinus infection. "They had me on multiple pills and migraine medicine to alleviate the pain. I lost a good month and a half of my life that I don't remember because I was so doped up. The minute I would start to feel the migraine come on, I would take the medicine and lay down for the rest of the day because I was in so much pain."

That went on for a month and a half before her girlfriend, a dental assistant, asked her about her dental visit. "I told her it's kind of crazy that she mentioned that because I went in for a regular check-up over a month ago, but everything was fine." But after more questions and finding out Misty had gotten some actual work done on her teeth, that's when she realized the dental work could've been the source of her pain all along. Her friend put two and two to-

gether and recommended she see a different dentist.

_An unforgettable dental experience

Going in for the dental visit, everything was just completely normal. Once they took the endo ice to Misty's tooth, she shot through the roof instantly and started crying. "It was so painful and I was so scared that I just wanted to run out of there kicking and screaming. I was absolutely petrified that I was in that much pain and I didn't know what to expect."

Casey, the head dental assistant, sat there with Misty and held her hand. She gave her a tissue, told her it was normal and it wasn't a big deal. "She made me feel a lot more comfortable, but then they told me I needed a root canal and that scared the pants right off of me, but she told me, 'Don't worry, I'll be here and you don't have to do this by yourself.'"

When Misty returned for the root canal, Casey sat beside her until the whole procedure was completed. "She never once left the room and calmed my nerves; she made me feel like I wasn't alone. Short of my boyfriend (now husband) sitting there next to me and holding my hand, this was the next step. I felt completely comfortable, got through the root canal, and came back for the follow-up, just to make sure everything was good."

Little did she know, Casey changed Misty's life forever because after that visit, she kept reflecting back on how comfortable Casey made her feel and how she took her fears away. "That girl changed everything for me because all I could think about was WOW! How awesome would it be for me to do the same for other people? She made a difference for people on a daily basis." This experience really resonated with her and fueled Misty to care for others. "She really changed my world from a career's perspective to being somebody that could make a difference for someone else and so that is when I decided to get into dental."

_Education is critical

During the follow-up visit, Misty spoke with Casey on a personal level to find out how she could get into

dental assisting. Misty took the information, did some research on local schools and found a program. She started taking classes and graduated at the top of the class. She knew the market was heavily saturated with potential assistants coming out of school from many programs, so she took the time to specifically find one where a practicing dentist was teaching. There, she learned about the importance and true meaning of the role while he explained dentistry to her from all angles. She took every opportunity for extra credit and had perfect attendance because it wasn't just school; she was interested in every little detail and knew she had found her place in the world.

Upon working, her first goal was to gain experience so she could eventually work in a private practice. She started in a public aid office, moved to a corporate practice, and by then, she knew she was getting great experience but wanted to move into a private practice. This was when she first learned about CAD/CAM through CEREC. She worked for an amazing doctor who stayed on the forefront of technology and was constantly looking into continuing education. Misty worked there until she got to a limit on how far up she could get within the practice. So she jumped at the next opportunity when she found an ad for a private practice looking for a full-time dental assistant, and lucky enough, this new practice was in the process of purchasing the Planmeca FIT System.

Upon the purchase of this new CAD/CAM system, every practice has to go through in-office Elements (basic training) and in-office integration through a visit from a Planmeca Clinical CAD/CAM Specialist. Basically, the specialist goes out to offices and trains the staff, showing them ways to successfully integrate the technology. When Angie (specialist) came out to her office, Misty got very excited and realized this was her calling. "It was one of those experiences all over again, I didn't know how Angie was doing what she was doing, but I had to find out."

Misty quickly adapted to the Planmeca FIT system because of her previous experience with CAD/CAM, "I asked a lot of questions and probably annoyed Angie to death but she guided me through becoming Certified in Digital Dentistry (CDD)." She took the online course and met all the requirements, including creating 30 restorations. There were many questions along the way but someone was always there to reach out a helping hand.

Eventually, Misty became a Clinical CAD/CAM Specialist and shadowed Angie, "I would drive and meet her anywhere I could get to within a three hour drive. I would observe her, and the more I observed, the more I knew this was what I wanted to do." CDD is a fairly new certification and having that allows assistants to stand out and show doctors they've taken extra steps to becoming more efficient and proficient at not only digital dentistry but also understanding



the importance behind having the best fit and function of a tooth. It adds another level of capability, dependability and importance to the dental assistant position while opening up doors for Misty's future.

Misty uses the Planmeca FIT system to scan a patient.

(Photos/Provided by Misty Garr)

—Moving up in the world

All of Misty's digital dentistry knowledge has been chairside but being CDD certified means that she's not just guessing. "You can always be trained and have things explained to you, but with Planmeca University's education program, it is far less complicated. The education department has done a great job of putting everything together to literally walk you through step-by-step instructions to make sure you understand every reason as to why you're doing what you're doing." Misty is very excited to take advanced classes at Planmeca University, and while she does learn on the job, "The extra guidance of having an instructor walk-through each step has been extremely beneficial."

While Misty has not been officially trained on advanced cases such as multiples and implant crowns, she continues to fall back on the CDD workbook. "I pull out my book or paperwork to make sure I don't skip any steps. Although I'm not following a specific format, I continue to use the book from training for reference to make sure I am doing it as well as possible." When Misty is really stuck on a case, she can easily pick up her phone and call one of the program's mentors to help her. "It's nice to have some amazing women that are completely supportive and are there for me, guiding me through the dental world."

Not wanting to fall behind on technological advances, Misty ventured out of her comfort zone to find an office with a fully digital restorative dental system. She eventually found an office an hour away



Misty, with the PlanMill 40.

that had what she was looking for. To her luck, they needed someone right away since they had just hired a new doctor, so she joined an office that had the full Planmeca FIT system. "I really respect the doctor there because she is all about doing procedures in the easiest, fastest and safest way. She is really on point when it comes to doing everything the way it should go as far as being a digital provider."

More than just a dental assistant

Misty does quite a bit of the digital workflow, from tissue management to scanning, designing and characterizing, while the doctor typically comes in for prepping and seating. The doctor will check the restoration and occasionally make adjustments, but it is never something that slows them down. The team gets patients in and out within two hours, depending on what materials are used. With Misty's proficiency, the doctor sees more capabilities of the system. In fact, she is their go-to person when it comes to chairside restorations, allowing them to do all restorations in-house; this means they rarely ever see a lab bill.

Misty also builds relationships with her patients and makes it a point to create the best experience for them because, let's face it, nobody likes to visit the dentist. She laughs and jokes with them and reassures them she will be there with them the whole time. She loves making them feel comfortable by keeping them informed and showing them exactly what she's doing to help them, getting rid of any anxiety they may have as Casey did for her. "I like keeping patients as involved as possible. Once you impress the patient by showing them how the technology works, their fears subside because they get so excited to see their teeth on the computer."

As for being a top-notch dental assistant, "I made a great choice learning from a doctor because I un-

derstand dentistry from every level. I learned entire procedures from start to finish, which has helped me stay three steps ahead of the doctor at all times. This makes a huge difference for me because it has been the highest compliment I've received from doctors that I've worked for." Misty tries to troubleshoot issues before they arise to give doctors options before they have time to even think about them, which has affected her career in many positive ways.

One of the biggest challenges she faces as a dental assistant is wanting to do more. "I can't imagine any assistant not wanting to do, help or provide more like you can with CAD/CAM. It really has opened up doors that never existed."

Before working with the Planmeca FIT system, Misty had no idea that further education was available. "You're always aware that you can move up or do more around the practice to give yourself more value, but when it comes to being able to create your own designs and being a producer for the practice, that's huge." There are endless opportunities with this system, and she has definitely reached out to grab every single one of them. "Get involved with chairside CAD/CAM because the possibilities are endless. You become more valuable in the office as a dental assistant. I wholeheartedly feel if you have that drive and desire to want to do more, then you can do as much as you are willing to do." No other system has allowed her to be so much more than just a dental assistant.

Girl power

Misty has grown up with many strong women in her life. "It really makes a big difference to be surrounded by strong and supportive women. This is where our profession is so amazing because they are not intimidated by helping someone or seeing someone else progress." Misty works with amazing women, including her doctor, who depends on her and owes it all to the Planmeca FIT System. "Working with people who are supportive and want to see you grow is a true testament to the people we work with and what dentistry is all about."

While she doesn't have any daughters, her three boys look up to her. Seeing their mother help others has influenced one of her sons to be a surgeon one day. "I think strong people set that precedent for everyone else to take on. I was empowered by Casey, who showed me what dental assisting was really about and guided me to get to where I am. I have three girlfriends who are interested in doing what I do and they're starting to take classes. They told me I've inspired them, and knowing I've turned around now to empower other women in my life fills my heart. To know one woman made a difference in my life and now I'm making a difference in other women's lives, that right there in itself is the biggest reward."



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Click with your patients! The new era of marketing and PR in dentistry

Author_Rhonda R. Savage, DDS

Providing patient value

We all know that times have changed, and the context that our patients live in has also changed. Old-fashioned dentistry is still good, but we have more options now for our patients that can benefit them in many ways.

(Photos/Provided by Rhonda R. Savage, DDS)

This old-fashioned 1932 Diamond T truck still runs (Fig. 1). (It's our "yard art." We decorate it up every

season). It was well built. Our old-fashioned amalgams still "run." They work, to a fashion. I recently saw an amalgam that lasted 52 years! But technology has advanced. Are amalgams or composites the best?

Most patients want more than standard, old-fashioned dentistry. What impresses patients tremendously, and gets them in your door, is your technology. But technology isn't all they expect. They still want old fashioned warmth, compassion, and friendliness. Patients today are more time sensitive, making same day dentistry ideal for many people. They also want to be included in the decision making process: They want options.

When patients hear that the best restoration is porcelain, created by a computer, with a more exact fit, smoother, easier to keep clean: Many patients will shop up if they feel the value exists.

A new standard of care

Let's talk for a moment about gold restorations. Gold was the standard of care for many years. It's a beautiful material. But now, with precision computer work, the marginal fit of porcelain can be better than the lost wax and casting techniques of previous times that were used to make gold restorations.



Fig. 1



My dog, Blitz, was a highly trained protection dog. He sheared off his canine during a training session, running into a wall. I worked with a veterinarian, and performed an endodontic procedure. I used my old scrap gold from dental school and made him a maxillary right canine. It was old gold, so it was full of porosity. Did it work? Absolutely.

You could say, "Blitz! En garde!" He'd snarl and show that canine. It was quite impressive! Your Plameca equipment is even more impressive to your patients. The "Wow" factor of the technology is huge; it can definitely increase referrals to your practice. Marketing is one of my favorite topics. Branding means that you stand out differently from other dentists. The technology is especially effective if all of your team is talking about it and can demonstrate the software for you. From a marketing perspective, we know that women think differently and can be time pressured. They love same-day dentistry for that reason. What does she do if there's something she likes (or dislikes)? She talks about it.

Case No. 1: A case for same day

Sarah hated her diastema between her centrals and wanted same-day dentistry. She didn't want orthodontics, and understood the value of porcelain over composite (Fig. 2). Sarah's feeling of self-esteem increased significantly when she had her veneers delivered (Figs. 3-4). The discussion began because my team introduced the idea to her. My assistant asked, "Have you ever whitened or been interested in whitening?"

That led to the discussion of her diastema, led by the patient. The more the team is responsible for setting the stage for case acceptance, your world will change. Patients listen to the staff, but want to hear it from the doctor. Would you like your team to do more for you?

Career growth and opportunity

I think that dentistry is a very exciting career. But, have you ever been bored? Or, you feel tired of doing it

all? Have you ever thought, "Is this all there is?" I felt like that once, years ago, in my first dental practice. I explored specializing in prosthodontics, but when I realized the sheer number of hours I'd have to be away from my daughter, Kaitlyn, I said, "No. I can do my job even better than before" and set out to change my practice.

I sold the first office and simultaneously opened a second practice from scratch in our new professional building. With selective, effective marketing, my second practice was as productive as my first, within the first six months.

After four years, however, in my dream practice, I had to have three rotator cuff surgeries on my right shoulder. I called Linda Miles and said, "Linda, I can buy your company or I can go to law school." She said, "How soon can you be here?" For seven years, I then said to my audiences: "If I was in practice, I'd do this!" Advanced technology such as Planmeca was one of those "things."

I recently had the opportunity to reacquire my second dental office space, and have been practicing now at a different level of dentistry. (Check out the dental practice at UptownDentalGigHarbor.com) This is my third dental practice. My shoulder is still bad. With team delegation, Planmeca reduces my need to extend my shoulders. It improves my profit margin and my patients love the technology! And, in addition, I have sleep apnea systems in place, as well as a program for TMJ/headache sufferers. We can get patients off headache medication and sleep well at night! I love the shift to health; and patients love it also. Plus, these sleep and TMJ patients often need restorations.

There are some marketing paradigm shifts that have occurred in dentistry. Have you noticed a shift in patients requesting more natural products for their care? Have you noticed a change in patient's reception to all porcelain versus 'mercury' restorations? This isn't the case in all practices, but it is in many.

(A marketing tip: Do search engine marketing (SEM) for "mercury and/or metal-free restorations." It's one of the number one SEM searched items, yet few dental offices market toward that topic.)



Fig. 5



Fig. 6



Fig. 7



Fig. 8



Fig. 9

— Case No. 2: Anterior beautification

Kim came to me because of the metal showing at the gum line (Fig. 5). She had a high visibility job, and people would tell her, constantly, that she had something stuck in her tooth. It was the metal base under the old porcelain fused to metal crown. It took several tries, but we came close with our in office porcelain work and she was very pleased (Figs. 6–7).

To achieve this level of success, we took photos of the dentin shade. I prefer the term 'dentin' shade versus 'stump' shade. Thinking like a patient, how would you like to hear the doctor say, "Did you get the stump shade?" We also had pre-op models, pre-op photos, a cosmetic consultation regarding her expectations, and clarified the process. We didn't want her disappointed and crying because the first round didn't turn out as we expected.

She whitened her teeth with Zoom (the new advanced Philips Whitespeed) sensitive setting and loved the results. I smoothed the uneven, rough incisal edges. During treatment, I blocked out the darkness of the root #9 with vitrebond and composite, and used HT e-max. Is it perfect? No, but it's close: She was thrilled with the results! (She has a gingival margin discrepancy, but her low lip line helped cover the area). In addition to metal-free restorations, what I find patients are looking for is 'whiter teeth and fresher breath.'

— Patient of a different kind

Here was another patient who presented with

this concern: ET, the Walrus. I had the privilege of being a volunteer zoo dentist in Tacoma, WA for 12 years (Fig. 8).

Have you ever worked on a 3700 pound periodontal patient? He didn't need porcelain restorations, but he certainly needed his teeth cleaned (Fig. 9). He also had an ulcer on the roof of his mouth that I checked.

After his cleaning, guess what ET got? No, not a fish! He got two girlfriends!

— Team sets the stage for case acceptance

My question to you is this: "How often does your staff talk about cosmetic whitening?" The more the team talks, the higher acceptance for replacement of old, tired, worn out amalgams.

Beginning a cosmetic discussion with the phrase, "Have you ever been interested in whitening, or have you whitened before?" is a non-threatening way for a team member to open the door for possibilities. They can increase your case acceptance of inlays, onlays, veneers, crowns, implant supported dentistry and fixed bridgework.

I firmly believe that a computer generated porcelain inlay or onlay is far superior to a hand-made composite resin. Did you know that women are twice as likely to shop up, if they feel the value exists?

If your team is practicing and training their verbal skills, your case acceptance can increase. As you and your team are trained in systems, techniques and verbal skills, you'll find that what you practice, you'll do.



Fig. 10



Fig. 11



Fig. 12



Fig. 13



Fig. 14

My daughter, Kaitlyn, is a professional soccer player. She's the goalie, and has played internationally for 6 years since playing Division 1 soccer for FIU in Miami. This is during practice (Fig. 10), and then in a game (Fig. 11). Look at the intensity of her focus both in practice, and in the game. I believe every practice has growth and the ability to improve teamwork and communication. Could your practice benefit from increased focus?

Times have changed and our patients can benefit. Periodontal health is much better around smooth porcelain restorations, moving away from metal based allergic type reactions of the gingivae surrounding the crown. Rugged, old composites can have the same effect on tissues.

Calming concerns for a positive patient experience

Let me introduce you to Tim. He's a shy, quiet Alaska native, who had so many composites in his anterior teeth, that it was difficult to create the necessary insurance narratives. We followed the same process previously noted previously for Kim.

Many patients think: "I want this." But then they leave your office, thinking, "Can I afford it?" Or their brain spins: "Are there better alternatives? Do I really need this? Am I acting too impulsively?"

You can head off these concerns during the presentation by saying, "Are you concerned that there are better alternatives?" Or, you could ask, "Is there any concern that would cause you to put off treatment when you go home?"

Get the objections up front. Listen well and be

honest. Be confident! Confidence comes from practice, knowledge and passion.

Here's Tim's final results (Figs. 12–13). He had to go back to work in Alaska quickly, hence same-day dentistry.

Much has changed in dentistry and letting the public know about your services is part of your success. Nineteen years ago, this patient (Fig. 14) came to me because his wife had passed, and he wanted a nicer looking smile.

This case is 19 years old and still is successful. It was done by an outside lab. However, he hated the retraction cord, the impression process and the temporaries. So while we might admire these results, consider the patient experience.

Times have changed. Can you market more effectively and most importantly, dial up the level of energy, training of your team, and subsequently, the education of current and future patients?_

_about the author

CAD/CAM



Rhonda Savage, DDS, CSP, is an internationally known author and lecturer. She is owner of Uptown Dental, a principle owner of Savage Dental Marketing and CEO of Miles Global, an international dental training and consulting firm. She lectures and publishes on women's health issues, leadership and business management. Savage is a past president of the Washington State Dental Association and an affiliate faculty member of the University of Washington School of Dentistry. She is also a member of the Pierre Fauchard Academy, American College of Dentists and the International College of Dentists. A former dental assistant and front office staff member for 14 years, she understands the dynamics of success in a dental team. A dentist in private practice for more than 18 years, she knows the demands of quality patient care, leading a winning team and the running a successful business.

Anatomy of a successful practice: Strategies for marketing your practice

Author_Cody Baird, Milkmen

The simple question is: How do dental patients find a new dentist? There are basically two ways. First is a referral. Your existing, happy patients are a great source of new ones. But what about everybody else? People who haven't been to a dentist in years and now have to find someone? Families who moved and are looking for a family dental practice? Someone who needs a dental specialist?

Dental marketing goes digital

Marketing where the lead finds the business when they have an active need is called inbound marketing. Studies show that 90 percent of people looking for a new service such as a dental practice will begin their search online. People once used the print Yellow Pages, but when you've got a mini-computer in your back-pocket, why bother?

Two challenges face your dental practice with digital inbound marketing:

1. **Visibility.** When someone does a search, you have to show-up on page one or you will lose business to practices that are there. Pay-Per-Click (PPC) gets you in the very top positions based on a bidding platform. This is essential as an early traffic driver and to garner more traffic from mobile searches. Organic SEO gets you free clicks and ties into location, but takes longer to rank on page one.

2. **Convertibility.** Your online ads and website are far more than just online listings. They are your most important marketing collateral and your first-tier salesperson.

Prospective patients will literally compare your website side-by-side with your competitors. You have to persuade them you are the best choice. Value, trust, convenience, price, experience, reputation... all of these are part of a strong web presence that converts.

5 strategies for success

Strategy No.1: Have an optimized website

Eighty-eight percent of consumers who search for a type of local business on a mobile device call or go to that business within 24 hours. Eighty-one percent of consumers research a product online before buying. Yet in the United States, more than half (52 percent) of small business owners do not have a website. Google recommends the following to get better rankings in your search engine:

1. Make pages primarily for users, not for search engines.
2. Make a site with a clear hierarchy and text links. Every page should be reachable from at least one static text link.
3. Create a useful, information-rich site, and write pages that clearly and accurately describe your content.
4. Use keywords to create descriptive, human-friendly URLs.
5. Make it mobile.

Having a website isn't enough. Search engine optimization, Google AdWords campaign, or social media marketing are needed to drive traffic to your website.

Strategy No. 2: Search engine optimization

Google's research into local search behavior reveals that local searchers are poised to take action. According to its findings, "50 percent of consumers who conducted a local search on their smartphone visited a store within a day, and 34 percent who searched on computer/tablet did the same." This means ranking in local search has a direct impact on in-store traffic. Mobile-friendly websites have seen a 10.8 percent increase in traffic since Google's Mobile-Friendly algorithm update. SEO provided the



highest return on spending over all other channels for both dental practice case studies, offering over a 10-to-1 return on marketing spending. Things to consider about SEO:

1. Complete your Google My Business profile & make sure that all information is accurate
2. Submit your business to local directories such as Yelp, Google+, HealthGrades and Yellow Pages
3. Encourage online reviews of your business
4. Integrate local keywords in your website, including: URLs, headings, titles, descriptions & page content
5. Ensure your NAP (Name Address, Phone Number) is consistent across your website, ads & all social channels
6. Include valuable local information on your website such as: opening hours, directions to your store, testimonials
7. Make sure your website passes Google's mobile friendly test, if not invest in responsive web design.
8. Speed your website up (Mobile users expect fast-loading websites, especially when on the go).

Strategy No. 3: Reviews

Why does my practice need reviews? Because 88 percent of your customers read reviews to determine the quality of your practice. For nearly nine in 10 consumers, an online review is equally as important as a personal recommendation. What patients say about you — both to friends and in online postings — is now a major component in marketing. People today have

more lines of communication and more platforms to share their opinions. Those opinions are, literally, marketing material for your dental practice. Every aspect of your service and medical results affect word of mouth/mouse. Exceptional work pays off here, but the core of this is your reputation, and that's in your hands. Things to consider about reviews:

1. Integrate into business processes. For a business, saying you will do something versus actually doing it, is a matter of the process being easy for employees and a required part of the internal procedures. This may require employee training and perhaps new procedures to be sure that they ask for reviews.
2. Regularity. Reviews are like traditional testimonials. If they all occurred last year or the year before both potential clients and the search engines are going to wonder what's up.
3. Diversity of review sites. Putting your eggs in one basket is never a good strategy. Being in a range of places protects against both eventualities.
4. Plan for the bad review. Even if you run the best business in the world, you will sooner or later get a bad review. Decide ahead of time how it will be handled and who will handle it. Ending up in argument on the front of the customer is a no-win situation and some thought put in how you are going to respond will avoid the worst outcomes.

Strategy No. 4: Pay per click

There are several places to purchase online ad-



vertising: Facebook, Twitter, display ads and Google Adwords. Adwords offers results at a lower cost and the best place to start. With paid reach, you can get your practice in front of potential patients without them looking for you; instead you go to them. Adwords can help speed up your SEO, increase your geographic reach and track patient leads. Things to consider about pay-per-click

1. Setting up your PPC Accounts. Consider hiring a company to help you to set-up and manage your campaigns. Their help is invaluable in helping to track sources of business and developing campaigns that work.

Strategy 5: Social media/Facebook

Your customers are social and so are your competitors. Your customers meet in these online channels like Facebook, Twitter, LinkedIn, Yelp, Google, YouTube, blogging and others to share content and spread the word. They also spread their influence, discussing and sharing what interests them. Things to consider about social media

1. Listen. Immerse yourself into the conversations. Read consumer commentary on dental services listed on Yelp or Angies list. Join the forums like LinkedIn.

2. Build your brand, create your personality and

presence online. Create a voice that others will be interested in following.

3. Be intentional. What you post and how often you post is crucial.

4. Be relevant. Social media is all about what will resonate now. Start with topics that relate to dentistry, your business or your customers. Consider posting things like developments in dental technology that your practice is adopting or a new service.

5. Be consistent. Much like having a website, having at the very least an active Facebook page is essential in presenting yourself as being in business and trustworthy

A word about reporting

This is one where you work with your marketing group so you know what the marketing data is really saying. Many dentists or office managers shy away from understanding analytics and digital marketing data. This is a mistake. You don't have to know all of the intricacies of Google Analytics (your marketing group should do that for you), but you do need to have an idea of what the data signifies. If you don't, you can't have a constructive dialogue with your marketer about modifications and improvements.

about the author CAD/CAM



Cody Baird started developing online campaigns in 2004, launching Milkmen with Shawn Baird in 2011. In his work, he tries to reflect his passions and values: attraction to originality, affinity for simple design, appreciation for well-made things and a belief that companies should try to make their communities a better place.

Case study No. 2: South Park Family Dental, San Antonio, Texas

Challenges

South Park is a multi-office practice owned by Dr. Shiva Izaddoust. Izaddoust needed to find more patients. And she needed to do it with a smaller budget. Izaddoust wanted a mobile website that better represented her practice. A website that would rank in the search results. At the time, she only ranked for searches with her practice name. Or in other words, the practice didn't rank for non-branded searches like dentist or dental implants.

Each practice operated under a different name. Having three different businesses operate on the same website is a big SEO problem and part of reason she wasn't ranking. She had to decide between a re-brand to consolidate names — staying with one website or splitting sites and keeping the names of each office.

The decision was made to keep each office name as is because patients were familiar with those brands. Izaddoust was opening a fourth office.

Solutions

Customized responsive websites: launched (4) new custom, mobile-friendly websites for each office. Optimized digital profiles: Claiming and verifying the Google+ Local, Bing Local, Yahoo Local, Yelp, Health Grades and 30 other digital profiles. Implemented review strategy and training how to ask for reviews and surveys were implemented.

Results

South Park has seen steady growth in patient revenues every year through budget reallocation from Yellow Page ads and AdWords to optimized website and SEO. At the same time, South Park has reduced its spending by almost \$20,000 in two years. It has increased unique website visits from 50 per month to 700 per month, a 1,300 percent increase. South Park ranks for 705 keywords. South Park's search engine traffic was worth \$4,181. Meaning, Izaddoust would have to spend \$4,100 dollars on AdWords to get the same traffic that her website is now generating for the cost of optimization.

Increased office call volume by 82 percent. Average calls in 2015 were 187. Average calls in 2016 were 340 a month. Total calls in 2013 were 329 for all three offices. South Park office received that many calls alone in March 2016.

South Park's monthly budget has gone up from \$650 per month for hosting and SEO campaign to \$2,650 month for hosting, SEO, PPC and retargeting ads. Cost per call is \$7.79. Average annual value per patient is \$1,860. _

Customer perspective: Dr. Shiva Izaddoust, five locations in San Antonio



Dr. Shiva Izaddoust,
South Park Family Dental,
San Antonio, Texas

Website: In order to be accepted, recognized and be known, there is a need for a website. The lack of a website can actually be detrimental to a small business. Society is geared toward social media so a website serves a connecting medium between a business and its customers. Without a website, there is no interface and any marketing is dead in the water before it takes off. With that being said, though, too much information can also be the kiss of death.

SEO: You need an SEO group to help determine what and how much info is necessary and to keep up with search changes on a weekly and monthly basis. Each SEO group has a different approach. Interviewing different SEO companies is imperative.

Reviews: I do not go to any trip, hotel, hair salon etc. without checking online reviews. I'm sure all my patients are doing the same about my office. If I want my small business to be competitive, then I need to make sure my future patients know why they should come to my office instead of the guy next door and that will be with reviews from my existing patients.

Retargeting: This allows you to spend money on ads that will target people who have visited your site. It allows you to narrow your marketing campaign to people who are interested in the services you provide. I haven't done long-term retargeting to see the benefits yet.

Adwords: As much as websites and reviews are important, there is a need for a way to inform new patients that you exist. Your practice name and website are already linked to certain words that allow a patient to find you when they are searching for a dentist. With AdWords, you can increase the number of words that can be linked to your name and make you more visible to more protective patients. Picking which words and how many is important.

Social media: Many articles praise Facebook, blogging etc. I have a Facebook but I can't say I've received extra phone calls or patients because of it. It's good for keeping in touch and informing existing patients. Much like brochures and newsletters that we used to do. All forms of getting your name out is advantageous, and social media is the best way to do that. But you have to make sure you keep up with changing material on a day-to-day basis and keep it interesting and upbeat.

Reporting/call tracking: Reporting is an important tool to keep track of how beneficial your marketing campaign is to your business. Call tracking has allowed me to determine how well my staff handle phone calls and the amount of time it takes for them to make an appointment and, therefore, train them to become better listeners and be efficient in handling prospective patients.

Can you afford not to have a chairside CAD/CAM system?

Author _Rick Willeford, MBA, CPA, CFP

_I'm not a dentist, dental assistant or dental technician, but I am a dental professional: a dental CPA; and I'm also a patient. While I can't vouch for your analysis of the fit, form and function of the restorations that you can now fabricate in your own offices with systems such as the Planmeca FIT System (Planmeca) and CEREC (Sirona), I can vouch for the financial "margins" they'll produce. Once you are confident in the clinical results, the rest is elementary.

Here's a scenario I experience far too often. I was at a large client's office recently when a CAD/CAM representative stopped by. After the representative explained the various clinical advantages as well as the financial benefits of chairside CAD/CAM technology, such as buying blocks and sundry supplies for about \$30 per unit versus paying an outside fabrication fee, etc., my client was visibly excited. He has three dentists in the practice, and they do a lot of bread-and-butter dentistry; in fact, if you are a general practitioner who's reading this, it is most likely that 70 percent of your crown and bridge work is single-unit posterior units — the prime target for chairside solutions.

The representative then went on to explain that the cost to finance the machine was about \$2,500 per month for five years. I was flabbergasted when my client said, "Oh, I can't afford that!" I almost jumped across the clinician's desk and asked, "Tom, how much is your monthly lab bill?" "About \$12,000," he replied. "Well," I said, "in the next five years, you will be writing checks out to someone else to make your restorations, totaling nearly three-quarters of a million dollars! Surely, you can't afford not to take advantage of the benefits of doing your single units

yourself. Think about it: a chairside system would most likely save you \$6,000 to \$8,000 a month — or nearly half a million dollars in five years time!"

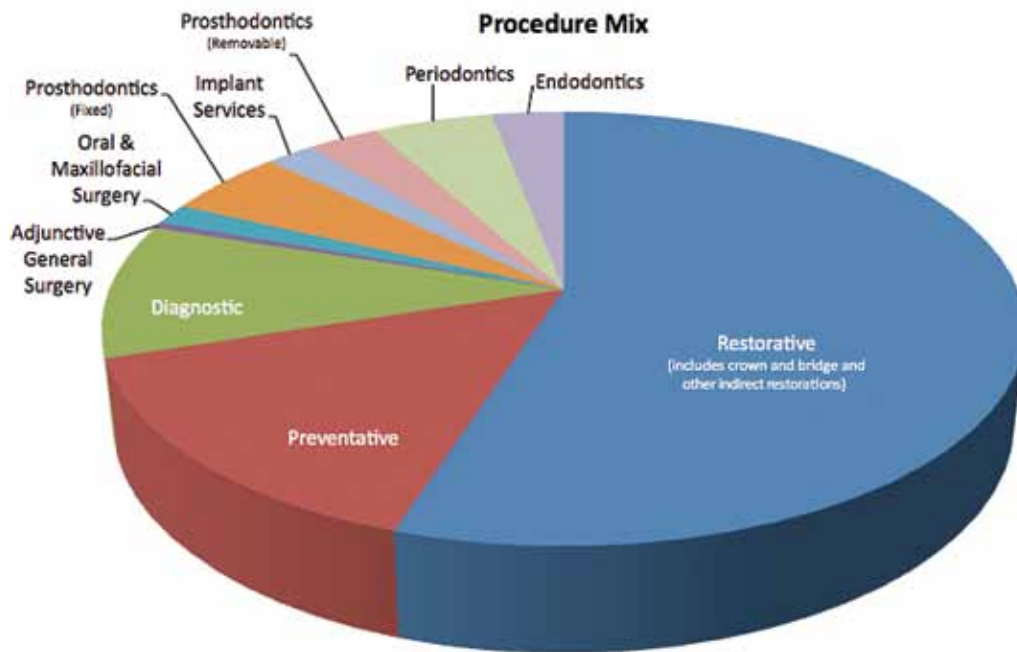
There is no other piece of capital equipment that can return immediately on the ROI (return on investment) like a chairside CAD/CAM system. You need to look at the payoff, not the price.

I can give you a few facts to consider to help you make an informed decision, but I obviously can't make you pull the trigger, even if it seems like a perfect solution.

The math comparing the cost of blocks to lab fees is fairly straightforward. There are online calculators to evaluate your specific situation (www.planmeca-cadcam.com), but very generally, most folks would break even if they produce about 15 units per month based upon fabrication fees. One of the greatest analytical tools for your practice is available from your Henry Schein representative. It's called a Digital Practice Analysis Tool, and it can show you the many ways you can run your practice more effectively and efficiently while still delivering a higher standard of care and excellence in dentistry without compromise.

Have you considered the marketing advantage of being able to offer quality, same-visit service? Think of the time off work, gas and travel time a patient saves if you can eliminate a second appointment. Not to mention having to hassle with temporaries. I have clients who have lost patients to nearby offices that offer same-day crowns. I want other practices losing patients to you!

From a purely financial standpoint, there are some exciting tax depreciation changes that almost cut the effective cost in half!



Depreciation and Section 179: What's the big deal?

Unless you have been living under a rock, you have probably heard about a huge tax savings feature called Section 179. Yet, you may have wondered what the excitement is all about and whether it might help you.

First, here is some background information. When you write a check for day-to-day operating expense items, such as wages, supplies, lab fees, etc., those expenses reduce your taxable profit and are tax deductible. The assumption is that such items are consumed in the current tax year. However, not all purchases are immediately deductible. For instance, if you buy items that are expected to last at least a few years (dental equipment, vehicles, computers, etc.), the IRS requires that you spread the tax deduction over five to seven years (or up to 39 years in the case of a building). This is done in the form of an annual depreciation expense deduction.

Well, would you rather have an expense deduction all in the current year rather than spreading the tax benefits over five to seven years? Enter Section 179, named after the IRS code section, as well as another benefit called "bonus depreciation." These two options give you the right to treat a large purchase as though it were "supplies" and take some or all of the deduction immediately.

More specifically, Section 179 allows you to immediately deduct ('write-off') up to \$500,000 per year in equipment purchases. (If you spend more than \$2 million, then the limit is phased out.) In addition, the '50 percent bonus depreciation' allows you to

write off up to 50 percent of any remaining equipment, if it is new.

After going back and forth with expiration issues over the years, in 2015 Congress finally made the Section 179 deduction permanent, and it made the Bonus Depreciation available through 2017.

So how does this all affect you? Well, if you are in the 40 percent marginal tax bracket (federal, plus state, plus Social Security taxes) and you purchase and expense a \$120,000 chairside CAD/CAM system, then you would get a 40 percent tax refund of \$48,000. This means your after-tax cost is essentially only \$72,000!

A word of caution: Incorporating a chairside CAD/CAM system represents a very large potential deduction, and its actual impact will affect each clinician differently. This is because of your actual tax situation as well as whether you are a sole proprietor or incorporated, so it is imperative that you have a good CPA to analyze your circumstances. I would suggest you use a good dental CPA who can help analyze the clinical impact on the operations of your practice as well as the tax impact. The Academy of Dental CPAs (www.ADCPA.org) is a great place to start. It's an association of 25 dental CPA firms that represent about 8,000 dentists throughout the country.

While dentistry is a great profession, it is also a business, and to make your livelihood more productive and profitable, you can either work harder or work smarter. Investing in technology that will improve your bottom line and your financial and clinical margins is a good idea. Check out the latest technology and offer yourself, your team, your patients and your family all of the benefits. _

Are you taking advantage of 2016 tax-saving benefits?

Author _Keith Drayer, Vice President, Henry Schein Financial Services

_Last December, when most people were winding down for year-end, our government passed legislation that increased Section 179. Along with other things, it allowed health-care practitioners to deduct purchases of equipment, technology, and off-the-shelf software, up to \$500,000, off their taxes.

This year, practitioners can purchase new equipment and get a tax deduction. To help practitioners take advantage of new purchases in 2016, Keith Drayer, Vice President, Henry Schein Financial Services provides his advice with respect to frequently asked questions.

Q: Should I hold off purchasing new technology or equipment until my equipment breaks?

A: That type of thinking could cost you money. There are many advantages to acquiring the equipment now.

Q: What are some of the benefits of acquiring new equipment sooner rather than later?

A: There are several key benefits, including increased revenue and efficiency. New technology and equipment can directly impact a patient's experience (e.g., more comfortable chair) and result in referrals to new patients. New equipment and technology can also help improve efficiencies, which helps reduce errors and ultimately improves dental team and patient satisfaction.

Q: Should I be concerned about other practices' purchasing decisions?

A: Yes, it is important to stay competitive, especially as more and more practices embrace new equipment and technology, such as comprehensive scanning, designing and milling CAD/CAM systems, and cone beam technology. Keeping up-to-date on technology can grow your practice so your patient

base will not age along with your equipment. The investments you make in your practice can make it more efficient and profitable.

Q. Why is waiting until something breaks risky?

A: When equipment goes out of service, you may have to wait an undetermined amount of time until it gets repaired. If you need to replace equipment, the length of time can be even longer, especially if you don't know exactly what you want. You'll need time to do research, decide which features, and to arrange financing. Once you order equipment, there is a period of time until it is delivered and installed.

Q: Will there be a rise in interest rates for new equipment?

A: You can take advantage of low-interest rates by buying and financing equipment now. You may pay more if you wait.

For more, contact Henry Schein Financial Services at (800) 853-9493 or hsfs@henryschein.com.

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done in a day?
That's music
to my schedule."



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