As a full-time general dentist, CAD/CAM technology is a subject that has been of significant interest to me. I incorporated CAD/CAM into my practice more than 10 years ago and have been a proponent of the technology and its efficiency ever since.

I began with CEREC 3, and then graduated to CEREC 3D. After successfully incorporating 3-D technology into my practice, I was excited to see some new faces emerge in the CAD/CAM market-place. E4D, Itero and Lava COS were all options to consider for digital capture, but only the E4D Dentist System and CEREC offered both scan and mill capability in the office.

When the time was right for me to upgrade to the newest technology, the E4D Dentist System by D4D Technologies was just a better fit—literally and figuratively. The software, support, training and results were more in line with my practice goals and vision, and I felt more confident in the longevity of the hardware. While both systems can produce high-quality restorations, I felt that I would be better supported in achieving restorative success with the E4D Dentist System. I made my decision to switch late in 2010 and have never looked back. Since then, research and development in CAD/CAM restorative materials have exploded. We have a wide variety of material options to choose from to meet all of our restorative and aesthetic demands.

My peers routinely ask me about how to use technology most effectively to cope with rising costs and lower margins. I often answer by suggesting that they incorporate chairside CAD/CAM into their practices. I am confident that chairside CAD/CAM is the future of restorative dentistry, not only from a clinical perspective, but also in terms of profitability and marketing.

Simple economics

Over the last five years, my practice has doubled in revenue. In 2010 it grew 18 per cent while other practices were struggling to break even. It consistently produces more than $1 million on a four-day work week, with an average collection rate of 98 per cent. It maintains an overhead of about 55 per cent and normally attracts more than 30 new patients per month.
I am able to do all of this while participating with more than 15 preferred provider organizations (PPO), as well as several reduced-fee plans and two union plans. I attribute the success of the practice to five key factors (Table 1).

Although every factor plays a critical role in the growth and success of a practice, technology has the most significant impact on my practice’s ability to generate high-quality restorative dentistry in a more efficient and less stressful way. My practice utilizes networked office management software with computers in every operatory, office and support area.

In addition to digital radiography, we regularly use intraoral cameras, diode and erbium lasers and, most importantly, chairside CAD/CAM technology. Our ability to provide high-quality dentistry with ease and efficiency relies on the integration and utilization of all of these different technologies, with CAD/CAM being at the centre of our restorative treatment appointments.

The decision to purchase and implement new technology can be challenging. In a PPO practice, where fees can be as much as 30 per cent lower than in a fee-for-service office, the decision can be even more intimidating. With a lower potential profit margin, added capital expenditures can have more of an impact on your bottom line.

I considered several factors when choosing to add CAD/CAM to my technology armamentarium. Quality, fit and durability of the restorations were the primary focus of my clinical decision. The profitability, practical application and return on my investment were the primary focus of my business decision.

**Control and aesthetics**

Aesthetics was a significant concern as well. Would I be able to achieve optimal aesthetics with the available materials with same-day CAD/CAM dentistry?

Would the materials available offer enough variety to handle complicated aesthetic challenges?

After I completed some additional clinical training in CAD/CAM aesthetics, including staining and glazing IPS Empress and IPS e.max ceramic (Ivoclar Vivadent), and now the simplified polishing of LAVA Ultimate (3M ESPE), I was surprised by how easy it was to achieve great aesthetics. I now find myself tackling the more challenging cosmetic cases on my own because I have more control when characterization is done chairside.

The E4D Dentist System also offers the option to have your restorations designed and/or milled offsite using the E4D SKY network. For an additional fee, you can actually send your scans to D4D Technologies to expert designers to have your designs or milling completed if you choose. This is a great service for dentists who are new to the technology, are just getting into more advanced restorative/cosmetic cases or want to maximize utilization while still keeping a full schedule.

In addition, the E4D Dentist System (DentaLogic Version 4.5) can import and export open file formats to practice success.

**Table 1. Five key factors to practice success.**

<table>
<thead>
<tr>
<th>Five key factors to practice success</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical skill</td>
<td>Proficiency in clinical, diagnostic and communication skills for the practitioner and team</td>
</tr>
<tr>
<td>Team</td>
<td>Highly skilled, motivated, well-trained and easily adaptable individuals</td>
</tr>
<tr>
<td>Systems</td>
<td>Clear and effective protocol for clinical, administrative and financial practice management</td>
</tr>
<tr>
<td>Marketing</td>
<td>Effective marketing and advertising to generate awareness and new patients</td>
</tr>
<tr>
<td>Technology</td>
<td>Cutting-edge technology to increase efficiency and productivity</td>
</tr>
</tbody>
</table>
CE article: CAD/CAM standards

mats (.stl), providing additional options for utilizing a variety of digital services from laboratories and services through the E4D Sky network.

Not only can it match the esthetics, strength and durability of traditional indirect restorative methods, but CAD/CAM technology can also provide a significant and immediate financial advantage over traditional impression-based dentistry. It allows a dentist to produce and deliver restorations in one visit.

It reduces overhead by eliminating external fabrication fees and it reduces material costs associated with impressions and provisionalization as well reducing chairtime.

**Scheduling same-day dentistry**

Every patient visit costs a practice time and money. Each time a patient is seated we use perishable goods, expend valuable chairtime, utilize staff time and must track and manage scheduling. The average crown delivery visit requires 30 minutes of chairtime and costs a practice more than $50 in overhead expense.

It is critical to maximize the efficiency with which you provide dentistry in order to remain profitable, and one visit is more efficient than two. The economics of single-visit vs. multiple-visit indirect restorative dentistry is obvious and impactful.

In addition to an increase in total profit and hourly productivity, the dentist has 30–45 minutes of additional down time to produce more dentistry, provide hygiene exams and perform administrative duties.

Beyond the financial return on investment are the intangible and immeasurable benefits that same-day dentistry provides. If a patient does not need a temporary, he or she is certainly less likely to call you over the weekend to have the temporary re-cemented.

If a second visit is not necessary to insert a restoration, then the potential of cancelling, changing or not showing for the appointment is eliminated. This reduces stress and opens up valuable time in your schedule to produce more dentistry profitably.

**Marketing same-day dentistry**

Whenever I am speaking with dentists or team members about practice management and increasing production, marketing strategies invariably become a topic of discussion. I usually suggest that the best marketing techniques focus on addressing the concerns that our patients have regarding dentistry.

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**Table 2: The economics of single-visit vs. multiple-visit indirect restorative dentistry.**

<table>
<thead>
<tr>
<th></th>
<th>Crowns #13, #14</th>
<th>Traditional Restorative Treatment</th>
<th>CAD/CAM Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Visits (time)</strong></td>
<td>150 min</td>
<td>135 min</td>
<td></td>
</tr>
<tr>
<td><strong>Lab cost</strong></td>
<td>$ 250</td>
<td>$ 0</td>
<td></td>
</tr>
<tr>
<td><strong>Materials cost</strong></td>
<td>$ 100</td>
<td>$ 80</td>
<td></td>
</tr>
<tr>
<td><strong>Staff cost</strong></td>
<td>$ 40</td>
<td>$ 50</td>
<td></td>
</tr>
<tr>
<td><strong>Average PPO fee</strong></td>
<td>$ 1,722 ($861 each)</td>
<td>$ 1,722 ($861 each)</td>
<td></td>
</tr>
<tr>
<td><strong>Production per hour (fee/time)</strong></td>
<td>$ 688.80</td>
<td>$765</td>
<td></td>
</tr>
<tr>
<td><strong>Total profit (fee minus cost)</strong></td>
<td>$ 1,372</td>
<td>$1,592</td>
<td></td>
</tr>
<tr>
<td><strong>Down time</strong></td>
<td>15 min</td>
<td>45 min*</td>
<td></td>
</tr>
</tbody>
</table>

*During this procedure, Krieger delivered three IPS Empress CAD/CAM crowns and produced an additional $365 in direct restorative dentistry in his second chair. The total office production for the two-hour time span was $2,157.
Fear, money, time and discomfort are common barriers to dental treatment. CAD/CAM addresses the issue of time quite well, but for most patients every dental visit represents time away from work, family members or other important tasks. By providing same-day restorative treatment you are saving your patients precious time.

People don’t like going to the dentist. It’s not personal. It’s just not pleasant. Have you ever had a colonoscopy? Not a great memory. Now imagine the thought of a colonoscopy that took not one, but two visits and required you to “wear a temp between each visit that may fall out.”

It is much easier for patients to accept treatment if they can fit it into their budget, as well as into their schedule.

Show patients that you value their time and that you have made a significant time/money investment in your practice in order to facilitate the ease and efficiency with which you can provide treatment, and I will show you a great marketing strategy.

Not only is time a major deterrent to treatment acceptance, but so is fear. When patients are told that they need a crown, these are the thoughts and images that come to mind: An awful tasting impression materials or temps that fall out during an important meeting. Ugly gray lines near the gum lines around old crowns. Think about how powerful a marketing tool it is to be able to tell them that in your practice:

- they don’t need any impressions,
- they don’t have to wear a temp,
- there is no metal under the crown so they won’t have gray lines,
- and the entire procedure can be done in one visit, during which they will have 30–45 minutes to catch up on work, return e-mails or just relax and watch TV (I have TVs in all of my operatories).

When that patient leaves with a brand new crown and goes back to work or out with friends, he (or she) is going to talk about what a wonderful and convenient experience he just had in your office. “No, I don’t have to go back. My dentist can do crowns in one day.” That’s how to market your practice, and the results that you see will far outweigh the financial concerns that are preventing you from making a huge leap forward and a difference in your dentistry.

Although the decision to implement new technology into your practice can be stressful and challenging, reduced productivity due to outdated technology should be of greater concern.

Make an investment in your office, your team and your practice, and the results that you see will far outweigh the financial concerns that are preventing you from making a huge leap forward and a difference in your dentistry.

Matthew Krieger, DDS, is a 1998 graduate of New Jersey Dental School. He completed a GPR at Mt. Sinai Hospital in New York City. He started his practice in 2003 and built it into a full-time practice in just one year. He has consistently grossed more than $1 million since 2006.

In addition to running a full-time private practice, Krieger is the founder and CEO of Symposia C.E., and he serves as a practice efficiency consultant with High Performance Dental Consulting. Krieger maintains more than 500 hours of C.E. credits and continues to expand his knowledge in dental practice management.