Today's dental professional has more technology available at his or her disposal than ever before. It is truly an exciting time to be in dentistry. Advances in every facet of patient care enable the practitioner to provide not only a superior level of care, but usually in a more expedited fashion. This is especially important because of today's current economic situation where it is not easy for most people to take time off work for multiple dental appointments.

Though I love to embrace new technologies brought into dentistry, I was very hesitant to explore CAD/CAM technology, or more specifically, in-office CAD/CAM. The thought that a machine could fabricate a dental restoration as well as a human being was inconceivable to me. Add to this the fact that these in-office CAD/CAM companies were touting that you could deliver a restoration in one visit and it made me even more skeptical.

The truth is, these things are indeed possible. They are not only possible but also predictable and very rewarding for the dental practitioner. Though many misconceptions about in-office CAD/CAM systems are floating around the dental profession, if clinicians were to actually take a very detailed look into the technology, as I did, they would not only be pleasantly surprised but motivated to adopt it.

My first realization that CAD/CAM was going to be a serious contender in the dental profession was the fact that many dental laboratories were embracing the technology. As I visited numerous laboratories, I started to see more and more CAD/CAM machines and the restructuring of the laboratories to incorporate this technology. It was then I thought I should take a more serious look at CAD/CAM restorations. I started to become more educated about the process, the software and the various porcelain blocks available.

After watching many dental restorations being fabricated in the laboratory with CAD/CAM, I grew to appreciate the technology and the beautiful restorations that these labs were producing. I then thought that if the laboratories can incorporate this technology and make these restorations, why couldn’t a dentist?

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Fig. 1. Maxillary posterior quadrant exhibiting multiple failing restorations.
Laboratory CAD/CAM can increase productivity because these machines are estimated to have the capabilities equivalent of up to seven lab technicians.1 Another reason that dental laboratories are embracing CAD/CAM systems is the exceptional fit and contours created by these machines. The fit of CAD/CAM restorations is well documented to be as good or better than restorations fabricated by hand. Research has shown that in-office CAD/CAM systems can produce restorations that are equal to or superior to laboratory-made restorations.2 According to the Millennium Research Group (MRG), the global authority on medical technology market intelligence, CAD/CAM restorations/technology will grow from 40 percent to almost 70 percent in 2015, with the introduction of newer ceramic materials, such as lithium disilicate (IPS Emax), with increased strength and durability.1 CAD/CAM machines automate the process of fabricating dental restorations and are sure to dominate the dental laboratory environment in the future.

_Taking the plunge_

My first in-office CAD/CAM system was a good system, an adequate system, but left me wanting more. When fabricating a restoration, I wanted to create the most ideal restoration possible. I needed more options, more tools and a system with greater expandability. I wanted a system that was built for the future, a system that was being developed by people who truly want to make their system better and, therefore, listened to their clients. These desires led me to discontinue the use of my initial in-office CAD/CAM system and purchase the E4D Dentist by D4D Technologies.

The E4D Dentist system allows me to fabricate single tooth, multiple tooth or full-mouth rehabilitations. Combine this with the superior toolset to change, manipulate and verify my restorations and my dreams for the ideal in-office CAD/CAM system had come to fruition.

The toolset of the E4D Dentist system is truly unique. Besides being able to scan intra-orally without the need to powder or apply some other type of anti-reflection medium (the vast majority of the time), the E4D Dentist system can scan impressions. This saves the dentist the time and expense of pouring up the impression in order to scan the model. For quadrant dentistry (Fig. 1), there are many ways to view and evaluate your proposals before milling. The ability to view and manipulate all the teeth at once is not only timesaving but provides a smooth workflow in using the software (Fig. 2). Being able to “slice” all the restorations in the quadrant enables the clinician to evaluate all the thicknesses at once (Fig. 3).

Additionally, to evaluate the material thickness
of restorations, the E4D Dentist system has a unique color-coding system that gives visual confirmation immediately (Fig. 4). After milling the restorations, they can quickly be stained and glazed with a one-step process (Fig 5), thus producing naturally beautiful restorations (Fig. 6). These kinds of quick visual verifying tools make fabricating larger anterior restorations much more straightforward and predictable (Figs. 7–9).

In all my years of using an in-office CAD/CAM system, I have realized that there are certain keys to using it successfully. The first is to understand how and when to use the system. The operator must get comprehensive and thorough training on the E4D system; luckily, this as well as many other things, is included with your purchase. With the proper time dedicated to learning the software, the practitioner will feel empowered and confident.

The second key is to understand all the ways the system can be used: the single-visit scenario, the traditional two-visit scenario or as a modality to send data to a laboratory.

The third key to success is tissue management. One quickly learns that in using an intraoral digitizer to take virtual impressions, you cannot cut corners managing the tissue around the prepared teeth. There are many modalities to control tissue, including conventional cord, electro-surgery units, lasers and putty retraction systems, though the most overlooked tissue management protocol is to keep your margins supragingival.

A fourth key is to understand that this is only computer software. If you input bad data, you will get bad data (restorations) out. A common misconception is that these in-office CAD/CAM systems produce inferior restorations. Saying that is akin to saying your dental handpiece only cuts poor preparations. The quality of the restorations produced by in-office CAD/CAM systems, and subsequently inserted into the patient’s mouth, is directly related to the standards of the dental practitioner.

So what are the advantages of having an in-office CAD/CAM system? The obvious advantages are the lowering of your (monthly) laboratory invoice, not having to use impression material, not having to fabricate a provisional restoration and being able to eliminate the second (insertion) appointment. Another advantage, which is equally important yet often overlooked, is the ability to customize every single restoration and provide superior customer service.

Yet, it is this author’s opinion that the most overlooked advantage of an in-office CAD/CAM system, such as the E4D Dentist, is the personal satisfaction that the dental professional will get from having one of these systems.

In-office CAD/CAM is in the heart of every dental practitioner who truly loves and enjoys what he or she does. Dentists are creative people. We love to prepare, design and fabricate. In-office CAD/CAM can do so much for a practitioner’s own enjoyment of his or her craft, as well as his or her practice.
I would have never thought years ago that I would not only embrace but also highly recommend that dental practitioners investigate and evaluate their needs regarding in-office CAD/CAM systems. For me, it is my in-office CAD/CAM system, E4D Dentist, which has not only rejuvenated my excitement for the profession but has provided me with greater empowerment in performing my work.

To know that I prepared the tooth, managed the tissue properly, scanned, designed, stained and glazed and then adhesively inserted the restoration brings me great satisfaction and pride. It is a satisfaction that I wish all of my fellow practitioners would experience.

References

1. Dental CAD/CAM Ceramic Technology to Skyrocket to Nearly 70% of All-Ceramic Unit Share in 2015, Millennium Research Group, Toronto, CAN, Jan 12, 2011.