In Practice

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Digital Scanning in the Everyday General Practice

Intraoral scanners are a key component of today’s digital workflow
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The digitization of the dental office is in full swing in 2014. This transformative process in the practice of dentistry began with the onset and implementation of the original CEREC® system (Sirona, www.sirona.com) in 1984. The ability to scan a preparation in the mouth, take that data and convert it to a software algorithm, and then turn that algorithm into useful information that can be sent directly to a milling unit to fabricate a ceramic restorative product has forever changed the workflow of the traditional dental office.

Although not every new development has succeeded, the evolution of the digital workflow to where it is today and where it is going next has occurred at a brisk pace. In fact, few who started this process years ago could have predicted the trajectory the dental profession is now on to digitize the entire workflow. The ability to think and dream of what we would like to accomplish and then to take that vision to fruition is the dynamic force that creates the passion for innovation in a rapidly transformative environment.

How Chairside Scanning Has Changed

Digital chairside scanning itself is not a new phenomenon; what is new is the changing role of the chairside scanners. In the past, these devices were connected to a chairside milling unit, which allows a dentist to fabricate a restorative solution that can be placed the same day the tooth is prepared.

There are many advantages to this approach. The major advantage is same-day dentistry for both the patient and the dentist. While the same-day benefit is obvious for the patient, it also benefits the dentist because once the return on investment is realized, which is usually once a dozen or so units have been manufactured and placed, per month, it decreases the dentist’s laboratory bill. It also gives the dentist

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more control over the restorative procedure and the material used in that procedure. When the practice does not have its own milling unit, a popular alternative in digital chairside scanning is to send the digital workflow to the clinician’s laboratory of choice. For the general practice that sends multiple indirect units to a laboratory, the digital workflow gives the dentist the ability to choose the laboratory, material, and turnaround time, thereby allowing him or her to retain control of the entire process. A tremendous advantage to this method is that the data is never lost. Unlike a traditional impression that needs to be taken and sent out to a dental laboratory, the digital impression is sent via e-mail over a network and thus can be traced and filed in the system or on a hard drive back-up. If an unforeseen occurrence does happen, the file can easily be resent to the laboratory without inconveniencing the patient for a re-scan.

Digital chairside scanning can be used for both traditional crown-and-bridge restorations and implant-supported restorations. Implant companies have learned that by digitizing the workflow they can make custom abutments milled out of titanium, zirconia, or lithium disilicate that are superior to stock abutments. The choice of abutment material can be dictated by where in the mouth the implant is being placed, as well as the patient’s aesthetic desires. For example, in the anterior, a zirconia or lithium disilicate abutment might be a better option because of the higher demand for premium aesthetics. In the posterior, centers have started to focus on manufacturing these restorative parts as their use continues to increase and, as a result, the demands of the software increase as well. However, much more development needs to occur to push the system into becoming a more convenient and efficient end product for the patient, the dentist, and the laboratory ceramist.

**Digital Chairside Scanning Systems**

The digital workflow now enables laboratories and computer design centers to “rip” a scan and design the final prosthesis using different software systems. The laboratory ceramist can design a crown, veneer, onlay, or bridge out of either full-contour zirconia (e.g., Lava™ Plus, 3M ESPE, www.3mespe.com; BruxZir®, Glidewell Laboratories, www.glidewelldental.com) or lithium disilicate (e.g., IPS e.max®, Ivoclar Vivadent, www.ivoclarvivadent.us). These restorations are milled, stained, and polished in the laboratory, then returned to the dentist on a model prescribed from a chairside system.

Currently, there are quite a few chairside scanning units available, including the 3M™ True Definition Scanner (3M ESPE, iTero® (Align Technology, Inc., www.itero.com), Planmeca PlanScan™ (E4D Technologies, www.}

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where aesthetics is usually not as important, an implant replacing a lower molar might require a more robust abutment able to withstand the dynamic forces that need to be spread over the entire surface area of the crown.

The use of dedicated scan bodies for different implant systems is now a major growth area. Both implant companies and digital milling
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For example, the iTero takes images and stitches them together to create a complete image. The True Definition Scanner captures 20 3-dimensional images per second, in movie form, to create an image. With both of these systems, the data packets can then be sent, wirelessly, back to the companies to manufacture models or to laboratories that can unzip the files, import them into laboratory software, design a restoration, and mill the final prosthesis without the use of a model. This newest approach streamlines the process. By eliminating the need for a model, a restoration can be manufactured and sent back to the dentist in as little as 3 days; in the future, there exists the possibility of a restoration being completed in as little as the next day or the same day if regional milling centers open closer to the sending dentists’ offices.

For some clinicians, the second objection might be the size of the image-capture wands. The wands that house the chips are getting smaller with each generation, just as smartphones, tablets, and computers do in the rest of the technology world.

The final area of objection concerns a lack of education and understanding. Once a digital scanning workflow is incorporated into the practice, it is difficult to go back to past processes because the quality of the digital image is so superior to the average analog impression. Relevant clinical team members will need to be trained on any technology implemented in the practice until they feel comfortable and competent.

Conclusion
While no digital scanner is perfect, the continued evolution of these systems refines them and makes them easier to use in a general practice. The day is coming where digital scanners will be a standard piece of equipment in a dental operatory, just like the handpiece or curing light.

Chairside digital scanning is one of the most exciting applications to happen to dentistry. The offshoots of these processes are allowing other fields entry into the digital workflow, giving dentists the ability to provide an even higher level of service and quality to their patients.

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