The ‘digital age’ comes to restorative dentistry

By Aurum Ceramic

Computer-based digital technologies are becoming more prevalent, not only in the dental laboratory but also in the operatory. Now with a proven, 20-year track record in dentistry, these technologies are simplifying workflow from initial impressions right through to the final restorative result.

Employing the latest in CAD/CAM (computer-aided design/computer-aided manufacturing) technology and space age materials through your dental lab, you can now offer your patients unsurpassed strength, precision, fit and esthetics anywhere in the mouth.

Let’s look at how these technologies are being applied in the restorative process.

Digital impressions

Predictable, accurate impressions have always been one of the more difficult procedures to perform consistently. Digital impression systems such as Cadent iTero™ are revolutionizing the practice of dentistry by allowing clinicians to replace conventional impressions with 3-D, computer-rendered optical scans. This ensures a more accurate impression right from the start, which results in a better fitting restoration.

While there are many different oral scanning technologies available on the market today, iTero has proven to be the best in reducing remakes (remake rates of less than 0.5 percent, based on Cadent’s data). The advantage lies in the accuracy of both the scanner and the milling technology used to make the models — where other model-making technologies use stereo lithography (SLA) to produce models at a higher throughput, so far they do not produce the same level of accuracy and, hence, the same proven ability to reduce remakes.

The iTero system develops a customized scanning sequence for each specific case, based on the parameters you enter. After preparation, and guided by iTero’s visual and audible prompts, the dentist — or assistant — proceeds through this sequence. Unlike all other oral scanner systems, iTero does not require the teeth to be coated with a powder or coating in order to scan. Standard tissue retraction is required, as the system will not compensate for inadequate preparation or tissue-management issues.

As each scan is taken, the system stitches together images of the target area, as well as the adjacent and opposing teeth, along with a virtual bite record to create a real-time, 5-D digital model. This digital model is magnified 50 times and presented on the system’s flat-panel display, along with real-time analytical tools that bring attention to areas that may need adjustment (such as occlusal clearance).

The entire process takes just two to three minutes, depending on the scanning process selected (quadrant, half arch or full arch). The digital file is then uploaded via wireless Internet and sent for model milling at Cadent (or direct to your preferred laboratory — such as Aurum Ceramic). Any type or number of restorations can be fabricated from the models.

CAD/CAM

Today, dental CAD/CAM systems are being utilized to fabricate metal, alumina and zirconia frameworks as well as for the creation of stronger, better fitting and more esthetic all-ceramic restorations. The ability of the computer to scan, design and mill in five axes is a great advancement. Single crowns, bridge frameworks, implants, inlays, Maryland bridges, implant bars and much more all can be created with unparalleled accuracy for outstanding fit and easy seating.

That being said, there are many options in terms of material, technology and technique. Physical properties vary; milling systems vary. Laboratories such as Aurum Ceramic offer a comprehensive suite of CAD/CAM solutions including systems such as Zeno® Tec, LAVA®, IPS e.max®, Cerec, Cercon and Procera. In consultation, practitioner and technician can decide on the best combination to meet each individual clinical situation.

Conclusion

The use of CAD/CAM has revolutionized the practitioner’s ability to deliver predictable, strong, precise and esthetic restorations with minimal effort. Digital dentistry has an economic impact as well. More predictable and superior fitting restorations lead to dramatic drops in seat times and the virtual elimination of remakes.

Do you need to completely embrace all of the technology today to take advantage? While that’s probably the best course to optimal results, there are multiple entry points. For example, Aurum Ceramic can scan models created from conventional impressions with its unique 3-D adaptive laser scanner (ensuring outstanding accuracy of < 20 um) and use that data to mill restorations through its CAD/CAM systems.

For more information on how digital dentistry might assist your practice, call Aurum Ceramic at (800) 681-1169, visit www.aurumgroup.com or stop by the booth, No. 527, during the AACD.