Digital dentistry, our future?

What does the term "digital dentistry" mean for the future of dentistry today? In my opinion, digital dentistry has become all-encompassing and without question represents the most important technology that will drive our industry for the next 25 years. Many clinicians think of digital dentistry only as the ability to create a virtual model of a patient's dentition with an intra-oral scanner. While intra-oral scanning was one very important innovation, it is not new, having been developed and utilised for more than 25 years already!

Perhaps other clinicians relate the term "digital dentistry" to restorations that are fabricated utilising CAD/CAM technology rather than conventional techniques in laboratory-intensive wax-ups and casting, whether for natural teeth or for dental implants. Certainly, this methodology has also been around for many, many years. As machining technologies have improved, software applications have become exponentially more powerful and equipment costs have declined. Most major dental laboratories now speak the language of digital workflow and have invested in the proper hardware, software, and training to deliver CAD/CAM restorations for their clinician clients.

Yet, perhaps we are just discovering what digital dentistry really means and the way in which technology will continue to be fuelled by innovation. The advent of computed tomography, and now cone-beam computed tomography, scan devices has allowed clinicians an unparalleled ability to visually inspect a patient's individual 3-D anatomy, yielding information that can be utilised for preoperative diagnosis and treatment planning. The uses are limited only by our imagination. Patients who require orthognathic surgery, bone grafting, dental implants, third molar extractions, orthodontic intervention or endodontic therapy will all benefit from a more complete and accurate assessment of bone, soft tissue and adjacent vital structures, all provided by digital information.

Can we create a synergy between all facets of digital dentistry? As an example, intra-oral optical scanning data can now be merged with 3-D CBCT data, allowing dental implants to be planned with greater precision through interactive treatment planning software applications. The concepts of virtual teeth, virtual occlusion, virtual articulation and implant planning can now be directly married to CAD/CAM of custom abutments and restorations in zirconia, titanium or other materials. The same technology is now being applied to bone grafting through rapid prototyping manufacturing by creating either an anatomical model or virtual model of the defect, and milling or printing the donor graft from a variety of biocompatible materials.

Just as the smartphone revolutionised the manner in which we communicate, the digital workflow will serve as the foundation for improved methods to treat our patients. The industry is now moving toward a common vision, but we are only at the tip of the iceberg in our use of digital technology worldwide currently. Publications such as this provide a valuable service by showcasing the manner in which all phases of digital dentistry will continue to evolve and affect our industry in the next 25 years.

Keep reading these pages to witness the continued evolution!

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