The Digital Dentist

Ian Buckle looks at how technology has influenced dentistry

Everyting is turning digital and dentistry is no different. The vast majority of practices have been utilising computers and practice management software for many years but there have also been great advancements in the clinical uses of digital dentistry.

Digital Photography
With the advent of inexpensive high quality cameras, dental photography has become an absolute must for any dental practice. There are three main uses for dental photographs: records, communication and treatment planning. Having a visual record of a patient is an extremely useful adjunct to written notes in monitoring a patient’s condition – periodontal, tooth surface loss, tissue lesions etc.

Perhaps the most important usage is for communication. Once the patient can see what the dentist can see, treatment is no longer something that the dentist has to present to the patient, but something that the patient will see for themselves and will actively ask the dentist for solutions to their problems. We are a very fortunate profession in that our patients place huge trust in us but once our patients can see and understand their problems in a photograph, treatment become common sense.

Photography is also essential in communicating with other members of the dental team from specialists to the laboratory technician. Photographs are essential in creation of the diagnostic wax up, helping to convey the foundation shade of a prepared tooth, to illustrate (together with study models) approved provisional restorations and to provide feedback to the laboratory about the definitive restorations.

Finally, photographs are imperative in visualising the possibilities during treatment planning. Not only do they allow the dentist to plan treatment without the patient being present but also to help work out how best to fit the teeth within the framework of the patients face for function and aesthetics. For example, rest position, E position and tipped down smile views will, together with other views, aid in planning the vertical and the horizontal position of the upper incisors, critical for aesthetics and phonetics.

Digital Radiography and CBCT
Digital radiographs offer many benefits to both the patient and the dentist. Lower radiation doses, immediacy of result and no need for moving to the digital age. The fact that the images get filed automatically to the patient’s record is just an added bonus.

Radiographs have always been very useful but are also limited in the fact that they only provide a two dimensional image. The advent of cone beam computed tomography has allowed the dentist to see a three dimensional image and the step forward is truly amazing. Orthodontic planning has been enhanced, periodontal and endodontic problems can be fully visualised and implant planning and placement have been moved to a new level.
Digital Scanning and Impression Taking

Whether it is the impression or the model that is scanned, somewhere along the way many jobs that enter the dental laboratory become digital. These days it is possible to scan the preparation in the patient's mouth together with the opposing teeth and bite registration and go straight to the digital phase.

There are many advantages to taking digital impressions. Not only does it do away with the need for (and cost of) impression materials but it also allows the dentist to check tooth preparation immediately. Initially this can be a little bit scary (did my margins really look like that?) but the improvement that can be made is both considerable and very worthwhile.

Once a preparation has been scanned the information can be sent electronically to the dental laboratory (e.g. Cerec connect) for construction or the dentist can utilise CADCAM technology themselves to design and mill the restoration. Such technology can allow the patient to have a custom restoration delivered while they wait.

The applications of digital impressions are huge. Already they can be used in orthodontic systems (Invisalign amongst others) to plan tooth movements and provide virtual treatment objectives. In the restorative process it is possible to “mount” the scanned models on a virtual articulator, a digital wax up to be produced and provisional restorations to be milled and ready to place at the preparation appointment.

Perhaps one of the most exciting advances of the digital era is the combination of CADCAM and CBCT particularly in implant placement. The digital impression camera is used to scan the implant site and adjacent teeth. The software generates a virtual 3D model and the dentist can then design the future implant crown. The 3D model with the implant crown is then superimposed on the CBCT image. This allows the clinician to position the implant with reference to the planned prosthesis and the available bone structure. From this a stent can be milled to assist in precise positioning of the implant.

Summary

While conventional methods are not about to disappear overnight, digital technology offers many and significant advantages to both dentists and patients in convenience, accuracy and productivity.

If nothing else, invest in a good quality digital camera designed for dental use and let your patients see what you see. You’ll be amazed at what you see and what your patients will ask for. The return on your investment will be manifold.

About the author

As The Dawson Academy’s Clinical Director, Dr. Buckle lectures nationally and internationally on functional and aesthetic dentistry. He is involved directly with the hands on courses of the Core Curriculum, seminars, & study clubs and provides continuing education to dental professionals more recently across Europe. He spends approximately two-thirds of his time in practice and the other third as an educator. He believes this balance keeps him on the leading edge of both disciplines. Ian qualified from Liverpool University in 1985. He has over 20 years experience in general practice both in the Private sector and with the National Health Service. A member of the American Academy of Cosmetic Dentistry (AACD), British Academy of Cosmetic Dentistry (BACD), British Dental Association (BDA) and Association of Dental Implantology (ADI) he completes over 100 hours of postgraduate education every year and lectures nationally and internationally on functional and aesthetic dentistry. Ian Buckle runs a Private Practice in the picturesque village of Thornton Hough on the Wirral concentrating on comprehensive reconstructive, aesthetic and implant dentistry.

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