

Brave new world

Technological pioneer **Adam Nulty** talks to *Implant Dentistry Today* about the vast potential of digital dentistry – and the challenges of implementing in practice

How has implant dentistry changed or developed since you first entered the industry?

I undertook my implant certificate in 2011 – relatively recently, given how long dental implants have been in general use.

But in this time, there has been a significant increase in the uptake of digital technologies – not only in the UK dental market but worldwide.

I've always been interested in technology, and from qualifying I've tried software such as Simplant or Nobelguide. Before what is now known as Co-Diagnostix, when I used Straumann implants, I had been trying the systems as they evolved and I have seen the guided implant surgery software and accompanying tools develop incredibly since then.

Smooth and accurate planning processes in a fully digital 3D environment enhance the long-term successes of implant treatment, when backed up with conventional skills and knowledge.

Which areas of digital dentistry are seeing the biggest developments at the moment?

Intraoral scanners and their software are developing extremely quickly, both in new manufacturers and improvements to the software for the hardware already in place.

A good example of this is the new Cerec software (version 4.5), which has brought increased accuracy and colour matching to the Omnicam camera.

The ease with which we can instantly export data as a 3D STL model has grown as the market embraces open technologies, which only helps with our usage.



Adam Nulty BChD MJDF RCS Eng PGCert MSc qualified from the University of Leeds in 2006 and spent several years in general practice before opening the Dentist On The Rock clinic in Bury. He is an experienced teacher and lecturer on the topic of dental implant restorations, digital dentistry and guided surgery. Adam is currently pursuing a PhD in guided implant surgery at the University of Leeds.



Incorporating scanners and other digital solutions means that we can provide more accurate prosthetic mock-ups, allowing the surgical plan to incorporate a crown down approach to implant planning. This gives the surgeon the ability to quickly measure distance, plan depths and emergence profiles for better planning of the prosthetic components. All of this will lead to an enhanced patient outcome.

Dentists seem slow to adopt digital technologies. Why do you think this is?

Digital intraoral scanners, CBCT scanners, milling machines and 3D printers are all high-cost investments and may well be more expensive than any of the equipment that the practice has ever invested in.

The challenge for the dentist is therefore the worry of choosing the right brand. Every brand has its own inherent advantages and

disadvantages, and most are heavily investing in both updates to their current technologies and better customer service.

It is for these reasons that I started the Digital Dental Academy with Chris Lefkaditis and Patrik Zachrisson. The market was struggling in our eyes, as there was no purely digital platform for surgeons to encourage each other and help with both decisions and previous purchases.

Does digital dentistry negate the need for dental experience?

Absolutely not.

These technologies are aids. They are part of our armamentarium to better treat the patient – albeit expensive ones.

We must still be careful to better our knowledge of conventional techniques so we know how to apply these technologies effectively.

I lecture on a guided implant surgery

course, where I take pains to explain that the clinician is in charge – not the software or the guide. Every piece of software or hardware has inaccuracies inherent to that specific system and the clinician must be able to competently assess and treat the clinical environment without these aids so that they can then judge whether the plan is being adhered to.

There is an ever-increasing variety of implants available to the clinician: do you favour one over the others? Do they all have their place?

I've used quite a few brands of implants over the years and my personal preference is for a tapered implant that is aggressive enough to provide good primary stability, employs a platform switch for biological soft tissue stability and has an accompanying connection that is simple but flexible enough to provide the ability for the clinician to tailor their surgical approach.

For example, Conelog Implants by Camlog have a varying height ti-base and a great guided system that integrates well with Cerec. This means I can vary my design by choosing the appropriate height and, therefore, a smooth emergence profile.

Of course, that is only my own preference and I'm sure there are other highly experienced clinicians who may prefer something different.

Every manufacturer lists benefits for their system and I'm sure they have their place. For me, once I agree with a type of implant and connection, a major issue is the support by the rep and company to provide components and help easily and quickly.

Is it worth a small practice investing in Cerec?

Absolutely. I love my Cerec system and I personally make all of my restorations myself, including staining and glazing.

That said, the practice must be interested in milling in-house for it to work.

In my experience there are two types of clinicians who use intraoral scanners: those who are prepared or enjoy in-house milling

and restoration, and those who would prefer to simply replace putty and wash with a digital scan solution.

What are your views on digital smile design?

I've had mixed success with digital smile design (DSD). It has certainly evolved but in my personal opinion a couple of years ago the 2D mock-up predictions either weren't accurate enough, or they provided an expectation that was unattainable.

However, like any technology, it has evolved massively over the last few years. The new DSD smile app for iPads is excellent and is relatively affordable.

I still, however, use it as a guide and require

Intraoral scanners software are developing extremely quickly

a physical print or design of a mock-up that I can physically place in the patient's mouth so that I can judge whether the design is acceptable. As a result of this, I often use DSD to help guide a lab technician to create a physical wax-up based on a 3D print of the scan or indeed a 3D print of a digital mock-up I have made.

What do you think the future holds for digital dentistry?

I am working on an idea I had to enable edentulous guided surgery to be more accurate. So far my PhD results are extremely promising, and I will be proud to produce a system with it in the future that will make edentulous guided surgery more accurate and more predictable.

Aside from that I think the main advance that surely can't be far off is augmented reality.

I predict that within five years we will see practices that are now embracing digital

intraoral scanners investing in software/mirrors/glasses that will show instant and accurate digital mock-ups of a smile design or treatment plan that will tie into these intraoral scanners.

What advice do you have for implant dentists looking to get involved in digital dentistry?

I would give the same advice I always give: try out various options and see what works best for them in their own circumstances. Speak to other clinicians but keep in mind that what works for them may be different.

Every system has strengths and weaknesses: what's appropriate for you depends on what your needs are. The easiest and lowest-cost way for an implant dentist to get involved would be to firstly undertake a 3D CBCT training course (there are several good courses run across the country) and then try out different guided surgery softwares.

My personal favourite is SMOP by Swissmeda, as it is simple to use and accurate as well as the associated benefits in surgery with the minimal coverage guides, but there are other good software options from 3shape, Blue Sky Bio and Co-Diagnostix that the clinician may prefer to suit their circumstances.

What other resources are available to dentists interested in digital technology?

If you have any questions about digital technologies or anything for that matter please do not hesitate to get in touch with me or join the Digital Dental Academy Facebook group, where these topics are discussed from a variety of perspectives, which will help you find what suits you best. **IDT**

Adam Nulty will be speaking at Biohorizons' next symposium, The Great Clinical Paper Debate, taking place at the Royal College of Physicians, London on Friday 16 February 2018. Adam will be debating 'Digital vs analogue: the future of implant dentistry' with David Murnaghan. To register for a free place, visit theimplantheub.com/symposium-2018. Attendance at the symposium is worth seven hours of verifiable CPD.