

1985 – 2010 ; new technologies and their impact into the art of dentistry

By Dr Julian Holmes

Let me paint you a picture. Every Monday morning, dental practices over the world power up for a week's worth of drilling and filling, tooth removal, and reconstruction work. Queues of fearful patients, tearful children being comforted by anxious parents, people in considerable pain, line up outside the doors to their dental surgeries. Once inside, these patients are subjected to the traditional smells of oil of cloves, disinfectants, and the noises of the high pitch whine of the dental drill; the odd scream or two filters through the hushed, usually silent waiting room into the street outside. It is a sad fact of life that every dentist is trained that if there is an area of decay in your tooth, the only way to treat this is to drill the decay out or amputate it, and then place a filling that will have to be replaced at some stage.

For a small minority of patients, where their dental practices have chosen to invest in new technologies, the opposite happens almost every day. The queue is one of bright, cheerful adults and children; there are few smells to associate this practice with the traditional one down the road. The noise of the drill is seldom heard, and happy smiling faces emerge from the treatment room.

There is in all our mouths a natural balance. Your tooth surface losses minerals into your saliva at certain times, usually just after you start to eat. These acidic conditions favour mineral loss. The normal acid/alkaline balance exists in the oral cavity. When bacteria attach themselves to a tooth surface, they set up a complex community of some 450 different bacterial types over a period of time. If patients (or dentists!) skimp on using a tooth brush, or forget to use dental floss on a regular basis, these communities of bacteria evolve into one which produces large volumes of acids. These acids attack the tooth surface, dissolving out the minerals, leaving a hole or cavity. As this cavity now gives the bacterial colonies a degree of protection, tooth brushing cannot remove the bacteria and so the process of decay accelerates.

Yet decay is only an infection process that leads to the softening of the tooth, and the formation of a cavity, so could this infection be treated with, say, antibiotics? The bacteria that cause tooth decay are often found deep within the structure of the tooth, so their removal has to date only been by amputating the infected part of the tooth. Antibiotics and other pharmaceutical agents cannot penetrate deep enough through bacterial pellicle and tooth structure to eliminate acid niche environment. This teaching and technique is based on sound engineering principles that originate from the Victorians! Despite modern advances, there is no simple test that can be applied to a cavity to tell the dentist if they have removed all

the infection; or enough tooth material! And if areas of infection are left behind, there is a good chance that the filling placed will fail at some time in the future.

In an attempt to prevent further infection and to restore the tooth to its original shape and function, a filling is then placed. Studies over the years have shown that fillings do not last very long, anywhere from 6 months to several years. But once a tooth has had part of it amputated, there is no going back. For each time the filling needs to be removed and replaced, there is a little less of the original tooth left and a larger filling. A point is reached where there is no option but to opt for expensive reconstruction work with advanced dental care or have the tooth removed.

The dental profession's goal is to help and educate the patient, how to avoid them entering into this cycle of tissue amputation and periodic filling replacement. Oral care education and modern toothpastes have helped reduce the number of cavities, but in poorer communities, those with disabilities and in long term institutions, as well as our aging population, decay is still prevalent. And diet advice is often lacking, so although patients may think they are doing well at home, the process of decay continues! The days of 'Wait & Watch' are over and as harsh as it may sound, the profession is usually not entirely sure of what it is watching unless clinicians are using advanced clinical diagnostic tools.

Over a series of monthly articles, I will be looking at how research has brought a range of technologies together for use in everyday dentistry. What was once the preserve of the research institute is now available to every dentist who wants to offer a different treatment pathway for their patients. I will be looking at different preparation systems, some materials that have stood the test of time, techniques that you were taught but abandoned on the treadmill of managed care, and drawing it all together in the final chapters. And I will touch on some of the management issues that we face as clinicians, how life events can impact into our professional careers and how we should deal with those events. Having been through the GDC system, I will share with you the stress, cost and how some simple steps in a computerised management system could have made life more simple.

So, perhaps a Monday morning at a dental practice that has invested in modern technology is no longer the stressful, painful, anxious and challenged visit that it used to be. The waiting room in your practice could be full of smiles, people chatting to the dental team members as they wait with happy anticipation at being called through for their turn in the treatment room. Mums and dads with children have no fear or anxiety, as they are reassured that modern technology has opened a door for them, that most of the older population had never believed possible. For both the

patient and the dental practice, technologies can have winning solutions for both; for the patient, modern technology has allowed them to have a 21st century treatment, rather than one that is old fashioned, and out-dated.

In a lead article published in 2003 I wrote;

'In the vast majority of dental practices - not just in the United Kingdom and Europe, but throughout the world - the primary method to reverse the effects of decay remains 'drill and fill'. The entry of a patient into the cycle of drill and fill is irreversible. Once a hole is drilled into a tooth, the patient always will have it; and no matter how good a clinician each dentist perceives themselves to be, any restorative material will fail at some time.'

The dental profession has not kept up with their medical counterparts in finding holistic treatment methods for what is a prevalent infection. The Victorian principles of amputation to establish a sound foundation for restorative care no longer are valid in the light of new published research and clinical experience.

Dr Julian Holmes, 2011.