UK ranks low in dentist per capita

New Eurostat figures add to concerns over shortages after Brexit

By DTI

LUXEMBOURG: Despite some growth in the overall dental workforce within the last five years, the UK still has one of the lowest ratios of dentists per capita in Europe, only ahead of four other countries, latest figures released by Eurostat in Luxembourg indicate. Fewer dentists per 100,000 inhabitants were only found in the Netherlands, Slovakia, Malta and Poland, according to the EU statistical office.

The ratio of dentists per capita in the UK falls significantly short compared with Germany, Sweden and Portugal, which have almost 60 per cent more dentists per 100,000 people. Leading the list of the 28 EU member states with over 126 dentists per 100,000 in 2014 was Greece, followed by Bulgaria and Lithuania, which also saw the highest increase of all countries surveyed, with 21 more dentists compared with the number in 2009.

With almost 35,000 active dentists, the UK currently has the fourth-largest dental workforce in the EU after Italy, France and Germany.

The figures have been made available at a time when there is increased concern of shortages in UK dental care owing to the large number of EU professionals feared to leave the UK after the Brexit. In a statement released in February, Dr Steve Williams, the Clinical Services Director of mydentist, one of Britain’s largest dental chains, warned that the withdrawal of EU dental professionals from the UK would be devastating and could add to an already understaffed workforce, particularly in rural areas. Currently, almost one-fifth of dentists registered with the General Dental Council are from the EU.

“Dentistry is one of the areas most dependent on EU-trained professionals. It will be vital to ensure that Brexit does not undermine our ability to provide NHS dental care by inadvertently disrupting the supply of dentists in the UK,” Williams said.

Similar concerns have been expressed by other medical bodies, like the British Medical Association, which recently conducted a survey among EEA-trained dentists and found that four in ten are contemplating moving to another country after the UK split from Europe.

By invoking Article 50 of the Treaty on European Union, the UK government has said it will officially start Brexit negotiations with the EU later this month. Prime Minister Theresa May announced earlier this year that the UK would not remain in the single market, which provides freedom of movement, regardless of the trade deal negotiated with Brussels.

Bupa acquisition of Oasis announced complete

By DTI

LONDON, UK: The acquisition of the Oasis Healthcare Group has been completed, the Bupa health care group has said. The news comes after the European Commission referred the multimillion-pound transaction to the Competition and Markets Authority (CMA) in February. Bupa took over one of Britain’s largest networks of dental practices last November for a total of £835 million from private equity investor Bridgepoint.

With 380 practices and over 1,800 dentists, Oasis is currently the second-largest dental provider in the UK. It will continue to operate as a separate entity once the acquisition has finally been cleared by the CMA, according to Bupa.

“Bupa is a fantastic permanent home for the Oasis business; both organisations care deeply about patients and people, and both are focused on delivering high-quality clinical care. We look forward to the continued success of Oasis under Bupa ownership,” Oasis CEO Justin Ash commented.

“There’s strong customer demand for high-quality, value-for-money dental services that are convenient and easy-to-use,” Bupa UK Managing Director David Hynam added. “Bupa and Oasis have a shared commitment to putting patients first, and we look forward to welcoming the Oasis team into the Bupa family.”

Prior to the acquisition, Bupa operated 40 clinics in Britain. Worldwide, the company employs over 84,000 people in its health care operations.

Established in 1996, Oasis currently serves over two million patients.
UK dentists lack money and training to use CAD/CAM technology

By DTI

LONDON, UK: Computer-aided technology is evolving rapidly to meet the demands of patients and dentists. However, thus far, no published information existed on dentists’ use of and reporting on CAD/CAM technology in the UK. Therefore, a recent open market research survey was conducted to determine the infiltrations of CAD/CAM technology in UK dental practices and to investigate the relationship between various demographic factors and use or non-use of this technology.

The survey was distributed online to 1,031 UK dentists. The questionnaire sought to obtain information regarding type of usage, materials, perceived barriers, access and disadvantages of CAD/CAM dentistry. In analysing the responses, the influence of demographic variables such as country of work, experience, level of training and type of work (NHS or private) was considered.

Of the 385 dentists who responded, most did not use any CAD/CAM technology. The main barriers were initial costs (especially for NHS dentistry) and a lack of perceived advantage over the conventional methods. Dentists performing mostly private work and those with further training, however, were most likely to have adopted a digital workflow.

However, 32 per cent of dentists surveyed reported being interested in incorporating this technology as part of their workflow, particularly in light of the cost reduction for patients (54 per cent) and improvement of the quality (69 per cent). Thirty-nine per cent of the respondents felt that CAD/CAM technology had led to a change in the use of dental materials, with increased use of zirconia and lithium.

The demand for aesthetic and metal-free restorations has led to the development of high-strength ceramics in dentistry, which may only be used in conjunction with CAD/CAM technology, the researchers explained.

A number of respondents (90 per cent) reported being concerned about the quality of the chairside CAD/CAM restorations. Furthermore, 27 per cent did not perceive any advantage over conventional production methods and this was particularly the case for dentists with further postgraduate training in restorative dentistry and specialist prosthodontics.

Most respondents were either self-trained or trained by companies to use CAD/CAM, and a third felt that their training was insufficient. This finding highlights a gap in dental education and the need for continuing professional development. Nevertheless, the majority of those surveyed (90 per cent) believed that CAD/CAM technology had a major role to play in the future of dentistry.

The survey results, titled “Survey of UK dentists regarding the use of CAD/CAM technology”, were published online on 18 November 2016 in the British Dental Journal. The study was conducted by researchers at UCL Eastman Dental Institute in London.
3D technology that facilitates osseointegration with instant volume measurement and bone density assessment

- Exceptional image quality and 75 μm resolution
- Wide range of field of view (110x80; 80x80 60x60; 40x40) focused perfectly on the region of interest
- Powerful and adjustable artefact reduction filter
- Simplified implant planning and a substantial and scalable implant library
- Considerable accuracy in endodontic analyses
- Reduced doses for improved patient and medical staff safety
- 3D reconstruction time in 29 seconds
- Comprehensive and intuitive software
- A complete and illustrated implant report in less than a minute
New device detects bacteria during root canal treatment

By DTI

LONDON, UK: A new method of detecting bacteria during root canal therapy could eradicate the need for follow-up appointments and prevent treatment failure, according to a new study. The SafeRoot device, created by a team of researchers at King's College London, enables rapid bacterial detection inside the root canal, ensuring the procedure has been successful and reducing the need for tooth extraction or surgical intervention.

During root canal treatments, bacterial infections are removed from the root canal space while as much of the natural tooth as possible is retained. Around a quarter of these treatments fail over time owing to secondary infections, and most procedures require one or two visits to the dentist, each of which involves drilling and the removal of part of the tooth.

The SafeRoot device was developed to detect any existing bacteria once the root canal treatment has been completed, with the aim of eliminating persistent or secondary infections and reducing the need for further treatments. Through fluorescence staining and microscopy, it can optically detect minute amounts of residual live bacteria in the root canal space. During trials, the research team was able to successfully detect bacterial cells after just 3 minutes of testing.

Using conventional sterile endodontic paper points, the process is performed during the treatment, preventing any impact on clinical treatment time and minimising additional clinical steps. "The resilient nature of bacteria, combined with often complex root canal structures, makes disinfection challenging, leading to a considerable number of persistent infections. This is one of the main causes of root canal treatment failures," explained Dr Francesco Mannucci, Professor of Endodontology at King's College London Dental Institute.

"SafeRoot will reduce the time for root canal completion and will increase the success rate of treatments by letting the dentist know when it’s safe to proceed with filling the tooth. This should produce fewer acute ‘flare-ups’ and failed root treatments, as any residual infection in the root canal will be identified," said Dr Tim Watson, Professor of Biomaterials and Restorative Dentistry at the Dental Institute.

One million root canal treatments are performed under the National Health Service each year, costing £50.5 million. "The treatments are not only time consuming and painful for the patients, but cost the NHS a significant amount. If we can reduce the number of root canal treatments and re-treatments required, it could mean sizeable savings to the NHS," added lead researcher Dr Francesco Mannucci, Consultant in Endodontics at King’s College London, testing the SafeRoot device on a patient.

"SafeRoot could be applied to a wide range of biological infections as well, ranging from wound or respiratory, to implant related infections, to prevent harm, whilst putting public protection at the heart of what we do," he said.

GDC reappoints Moyes as chair

By DTI

LONDON, UK: The Privy Council of the General Dental Council (GDC) has approved the appointment of William (Bill) Moyes as chair for another term. He will continue to head the regulatory body for four more years until September 2020, the GDC announced in a statement.

Moyes was first appointed as chair in 2013. Prior to that he worked as founding Executive Chairman of Monitor (now part of NHS Improvement), which authorised and regulated the finance and governance of NHS Foundation Trusts. He has also held positions at the Bank of Scotland Group and the British Retail Consortium, among others.

As GDC chair, he received criticism by the British Dental Association (BDA) and other organisations in 2015 over a report issued by the Professional Standards Authority that pointed out deficiencies in the GDC’s performance and fitness to practise process. Addressing some of these issues, he spearheaded a recent initiative that aims to improve the current system of dental regulation. It was published in January this year and proposed fundamental changes in areas like the complaints system.

"I am delighted to be reappointed to the GDC," said Moyes in a statement. "This is an exciting time for the organisation as we press ahead with a series of reforms. While there are challenges which lie ahead, there is a real opportunity for the sector to work together to make the system of regulation work better for patients, and remain fair for dental professionals so that public confidence in dental services is strengthened."

"Under Bill’s leadership, the Council has not shied from taking difficult decisions and has been willing to think radically about the way the GDC works in pursuit of our ambition to become a high-performing, effective regulator. That focus and determination is delivering results and has laid a solid foundation for further improvements," commented Chief Executive Ian Brack. "This reappointment provides consistency in strategic vision which will help the GDC to realise the ambitious plans recently set out in Shifting the Balance—using regulation to enable and support dental professionals to prevent harm, whilst putting public protection at the heart of what we do.”

In an initial reaction, the BDA expressed disappointment at the reappointment.

"The GDC Chair’s term in office has been defined by a total collapse in trust in professional regulation among this profession, and the question remains whether such a figure can ever deliver the change we need," BDA Principal Executive Committee Chair Mick Armstrong said. "While this reappointment represents a missed opportunity, our priority remains clear. Patients and practitioners deserve a regulator and a chair that really understands dentists and dentistry."
Increase in healthy life years through sugar, fat and salt taxes

By DTI

MELBOURNE, Australia: Modelling the effect of different combinations of taxes on sugar, salt and fat and a subsidy on fruits and vegetables on the death and morbidity rates of Australians, a new study has found that imposing a tax on sugar could avert about 270,000 disability-adjusted life years. In addition, the research estimated that, when combined to maximise benefits, taxes and subsidies could reduce the country’s health care spending by A$3.4 billion.

In the Western world, non-communicable diseases, such as obesity, diabetes, cardiovascular disease and dental caries, are mainly attributable to an unbalanced intake of fats, sugars and salt. In order to tackle the burden of those diseases, an increasing number of countries have already implemented or proposed taxes on unhealthy foods and drinks. However, the actual cost-effectiveness of levies and subsidies on certain nutritional items to reduce the burden of diet-induced diseases is uncertain and can only be estimated.

In the current study, researchers at the University of Melbourne simulated the effect of different combinations of taxes on unhealthy foods and a subsidy on fruits and vegetables based on the Australian population of 22 million in 2010. The model analysis set the sizes of the taxes and subsidy such that combined there would be less than a one per cent change in total food expenditure by the average household.

The results showed that a tax on sugar had the greatest impact among the taxes simulated. A sugar tax could avert 270,000 disability-adjusted life years (DALYs), the researchers calculated. DALYs are years of a healthy lifespan that are lost to disease. This equals a gain of 1.2 years of healthy life for every 100 Australians alive in 2010, which is a health outcome that few other public health interventions could deliver across the whole population, according to the researchers.

In comparison, a salt tax was estimated to save 130,000 DALYs, a saturated fat tax 97,000 DALYs and a sugar-sweetened beverage tax 12,000 DALYs. As for a fruit and vegetable subsidy, the study was unable to determine an isolated clear health benefit, although it too made for additional averted DALYs, and reduced health sector spending, the researchers wrote.

The study adds to growing evidence of large health benefits and cost-effectiveness of using taxes and regulatory measures to influence the consumption of healthy foods. Based on the results of the model, the formulation of a tax and subsidy package should therefore be given more prominent and serious consideration in public health nutrition strategy, they concluded.

The study, titled “Taxes and subsidies for improving diet and population health in Australia: A cost-effectiveness modelling study”, was published online on 14 February in the PLOS Medicine journal.
A preventative health care system is also a cost-efficient health care system

An interview with Prof. Jörg Eberhard, Australia

By Kristin Hübner, DTI

On the occasion of this year’s World Oral Health Day (WOHD) on 20 March, Prof. Jörg Eberhard from the University of Sydney will be presenting the Australian WOHD lecture, titled “Putting The Mouth In the Middle.” Dental Tribune had the opportunity to speak with Eberhard, who was appointed the university’s first Chair of Life-span Oral Health in 2015, about the role of preventative care in research and clinical practice and the general need for a more holistic view on medical conditions and oral health.

Prof. Jörg Eberhard: Research over the last several decades has shown that oral disease is linked to general health and other diseases, including cardiovascular disease, diabetes mellitus and rheumatoid arthritis. The available evidence demonstrating this association is based on epidemiological studies, clinical intervention trials and knowledge of sound biological mechanisms. Irrespective of this body of knowledge, a holistic view on medical conditions that includes oral health has not been established in clinical medical practice. “Putting the mouth into health” stands for the strategic vision of overcoming this shortcoming and is aimed at improving the community’s health. How does oral health affect general health?

Dental caries and periodontal disease are the most common diseases worldwide and responsible for a large part of today’s disease burden. Caries results in pain, tooth loss and enormous treatment expenses. Each of these conditions negatively affects school attendance during childhood, reduces the ability to ensure good nutrition and to participate in a healthy social life among older people, and increases the load on health care systems. Periodontal disease is not limited to the oral cavity, but releases inflammatory mediators and bacteria into the bloodstream over decades. This may initiate or propagate the development of atherothrombotic plaques, leading to stroke or heart attack, and detrimentally affect blood glucose levels in pre-diabetic states.

Do you think there is enough awareness among the public about the relationship between oral health, overall well-being and quality of life? There is very limited awareness of the link between oral and general health among the public; however, many health care professionals too are not aware of the association between oral and general health, even though it may significantly affect the well-being of patients. Oral health literacy education of the community and health care professionals is a major challenge for the dental profession. Furthermore, teaching of the association between oral and general health to medical students is necessary to establish a holistic view of health in the future.

What is the dental community’s role and that of national health care policies in this matter?

The dental community must realise that dentistry is not limited to caries and infected root surfaces, the work of the dental community should be aimed at easing a significant global disease burden and improving the health of the community. Policies must recognise oral health as an integral part of general health and health services, inseparable if the population’s health is to be maintained or improved.

Do you think that there should be an increased interdisciplinary exchange between dentistry and medicine?

The exchange between dentistry, medicine and other health professions is fundamental to make substantial contributions to medical research and clinical health care in the future. A holistic view on health and disease is obviously highly relevant for clinical decision-making, since medical research has repeatedly demonstrated the interdependence of the various organ systems owing to similar generalised mechanisms.

With the rising burden of diseases such as periodontitis and diabetes on one hand and increasing awareness of prevention on the other, where does dentistry stand today?

Since the introduction of fluoridation, the dental research community and the dental profession have neglected preventative pathways for decades, and research and clinical activities have focused on restorative treatments and do not support preventative dental treatments anymore. What role does the increasing use of highly advanced and complex technology in dentistry play in achieving the goal of retaining the natural dentition for as long as possible?

Highly advanced and complex technologies should be limited to those patients who have suffered trauma or who have severe disease or genetic deteriorations. Health care systems are not able to provide these technologies to the broader community and therefore these cost-intensive technologies are limited to the privileged. A preventative health care system is also a cost-efficient health care system, relieving individuals and the public from suffering and high costs.

In your opinion, concerning the promotion of oral health and prevention among the public, what will the main challenges to modern dentistry be in the years to come?

The main challenge in the future for health professions will be to introduce the concept of a holistic health care approach based on preventative treatments rather than on therapeutic interventions.

Thank you very much for the interview.

Editorial note: Eberhard will be holding the 2017 WOHD lecture on 20 March from 5 p.m. to 7:30 p.m. at the Australian Dental Industry Association’s office in Alexandria in New South Wales. Registration for the event is open at www.wohd.org/au/register.html.
Don’t blink—You may miss something!

By Chris Barrow, UK

I recently took five weeks off work to go catamaran sailing in the Caribbean, got married while there and then leave my lovely new wife behind to explore the mountains and deserts of Oman with seven friends. On my return, the back issues of dental magazines were full of General Dental Council changes to its regulatory systems, the National Association of Specialist Dental Accountants and Lawyers revealing a 53 per cent increase in UK practice goodwill values in the last year, mydentist taking a break from practice purchases, the FGDP (UK) seeking independence, the risk that NHS dental contract reform could force associates to become employees and Simplyhealth announcing their name change for Denplan. Add in the Bupa purchase of Oasis before I started my second opinion before I started my wanderings and the rise and rise of digital dentistry and we have what can safely be described as a rapidly changing and disruptive marketplace.

Predictions are a dangerous game. I have been asked to submit prophetic articles on many occasions in the past. Perhaps unusually (because I am wired that way), I have always made a point of returning to the predictions some years later, just to see how close I came to getting things right. I am delighted to tell you that I have maintained an average score of 50 per cent on my guesses as to what may happen next.

The challenge, as they say, is knowing which 50 per cent and, frankly, I never have a clue. Sorry! So my purpose here is not to add yet another list of half-truths to the speculations of my peers in writing and speaking, I would rather offer some thoughts on how to survive the disruptive dental market.

Rule 1: Stay focused on the patient

No matter what big business, private equity or shareholder pressure does to the dental industry, the independent dental business owner will be able to deliver a unique selling point built on customer service. The patient experience will always be the way in which you can positively differentiate yourself. Staying in touch with patient expectations is arguably the single most important way to survive the future.

In a recent blog post, I mentioned a presentation given at the London-based WIRED Retail symposium. There Westfield Labs Chief Operating Officer Antony Ritch gave an interesting insight into the future of shopping.

“Shoppers don’t differentiate between online and offline. Omni-channel is the only way that retailers can survive. As virtual reality, augmented reality and full-body scans of shoppers proliferate—and with Amazon launching bricks and mortar stores, the way forward is to act as matchmaker between customer and product in every environment.”

Shoppers always have their phones and 80% of all physical sales are influenced by the internet. Stores are a social environment where friends and family come out to enjoy a day of shopping, dining and entertaining. We see the digital world in the same manner.”

When one considers this quotation alongside the conventional approach to the provision of dental customer service, there is much that will need to change in the next ten years. My belief is that disruption will be applied to the premises from which dentistry is delivered and the current model of reception, lounge, consultation room and surgery.

The patient experience will change and the device-toting, connected consumer will be at the centre of it. Something new this way comes, but as yet I am having trouble imagining what it will look like.

Rule 2: Take the time to research, listen and plan

There seem to be too many dental conferences, websites, publications and social channels. There are nowhere near enough hours in the day to stay abreast of what is happening in clinical dentistry and in business innovation. I have no miracle cure for information overload. If you are committed to your vocation, then you must prioritise that which will keep you ahead of the game and that will include attending, listening to, watching and reading the events, broadcasts and publications that will maintain your edge.

This comes at a price and the need to manage your time very carefully to avoid burn-out. Maria Popova, creator of the excellent Brain Pickings weekly e-newsletter, reminds us that: “Of all ridiculous things, the most ridiculous seems to me, to be busy—to be a man who is brisk about his food and his work.” Kierkegaard admonished in 1843 as he contemplated our greatest source of unhappiness. It’s a sobering sentiment against the backdrop of modern life, where the cult of busyness and productivity plays out as the chief drama of our existence—a drama we persistently lament as singular to our time. We reflexively blame on the Internet our corrosive compulsion for doing at the cost of being, forgetting that every technology is a symptom and not, or at least not at first, a cause of our desires and pathologies.”

Rule 3: Have good conversations

All problems exist in the absence of a good conversation. Many years ago, one of my original mentors advised me to establish a personal board of directors (PBD), defined as people whose opinions I trust and who have the opportunity to give me honest feedback without judgement. The only qualifications are trust, respect and mutual admiration. They do not have to be in the same business, country or demographic. My PBD has changed over the years as members have come and gone, but I still refer many of my ideas and strategies to them for a second opinion before I take risks.

I often attend meetings with owners, managers and teams in which it is obvious to me that the main reason they have progressed so slowly is that they simply do not make the time available in the working calendar to stop and listen to each other. The chase for production becomes all-embracing, whether a unit of dental activity or a sales target, and there are never enough timeouts to take the pulse of the business and its people.

The main characteristic of a Champions League dental business (if I may use that football metaphor) is the meeting schedule, which should be designed to ensure that verbal communication is the primary means by which information is shared. Here too is another way in which the independent can beat most big businesses.

Benjamin Franklin is alleged to have said, “When you’re finished changing, you’re finished.” Focus on your patient experience, stay connected to innovation and stop to listen. Master those three habits and you will be able to take advantage of whatever the world plans to throw at us next. There is, of course, a 50 per cent chance that what I have just said is correct.

Chris Barrow is the founder of Coach Barrow consultancy practice. An active consultant, a trainer and a coach to the UK dental profession, he regularly contributes to the dental press, social media and online. Chris Barrow can be contacted at coachbarrow@me.com.
“With more females entering the dental profession, changes will be evident”

An interview with Women in Dentistry Society members Janki Solanki, Radhika Ladwa and Roxanne Mehdizadeh

More women are expected to graduate in dentistry in the UK than men in the years to come. With a larger share of female dentists in the overall workforce, the profession will face new challenges that need to be addressed. A society, Women in Dentistry, recently founded by King’s College London Dental Institute students is seeking to find means of raising the profile of female dental leaders through a nationwide network. Dental Tribune had the opportunity to speak with members Janki Solanki (Co-President), Radhika Ladwa (Co-President) and Roxanne Mehdizadeh (lead writer and publicity) about the initiative and how it intends to help female students achieve their full potential in dentistry.

Dental Tribune: Dentistry has traditionally been a male-dominated profession. Why do you think an increasing number of women have been entering the field in recent years?

Janki Solanki: The general trend in the UK is that more females are going to university than males across the board. Educationalists say the under-representation of male university students is down to attainment patterns in schools and girls outperform boys up to the age of 18. Female students who perform well at GCSE and A levels are more likely to consider high-profile courses with high entry requirements such as dentistry.

It is unclear why certain subjects attract more women than men, or vice versa. One of the key predictors of what someone will study is what subjects he or she took at A level, and recently attempts have been made to encourage girls to study science, technology, engineering and mathematics (STEM) subjects.

That the profession offers both lifelong learning and career progression opportunities, as well as the option of flexibility and part-time work, means it is suited to a variety of women, whatever their priorities in life may be. However, it is challenging to pinpoint a single reason for the increase in women entering the profession, as people have a diversity of requirements from and aspirations in life and so varying aspects of a career in dentistry will appeal to different women.

With more women entering the profession than ever before, why do they still seem to be under-represented, particularly in leadership positions?

Radhika Ladwa: While females share similar leadership aspirations, there has been a failure to create and sustain an environment in which they feel fully accepted and supported to succeed. Gender bias, especially when it comes to leadership, is evident across all industries and the profession of dentistry is no different. The assumption that a woman cannot be a good leader or be one while exhibiting female traits, must be addressed.

Gender difference is dynamic and socially constructed, and what is considered stereotypical gender behaviour can be changed over time. Therefore, the goal is not just ensuring equal numbers of men and women (gender equality), but also acquiring fairness and justice in the pathway to higher positions (gender equity).

With our society, we hope to help provide the networks, resources and mentoring that will not only make people aware of equality issues, but also recognise the role of female leaders, and support and develop the qualities they offer, which will only strengthen the industry.

Was this the main reason for founding the group?

Solanki: Having recognised the under-representation of females in leadership positions prompted important discussions. However, we felt a suitable forum for this did not exist. Fortunately, being students at the Dental Institute, we are surrounded by incredibly successful females at the top of their field in the dental profession, and we wanted to take the opportunity to make these role models accessible to all students and learn from their experiences.

Is the society open to anyone?

Ladwa: The group was established to help students achieve their full potential in dentistry. It is open to all and in essence any dental student can become a member.

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Ladwa: The group was established to help students achieve their full potential in dentistry. It is open to all and in essence any dental student can become a member.
Solanki: As such, we are the first society across all UK universities to focus on women in dentistry. We have received positive feedback from fellow dental schools, such as Leeds, and hope to create links that could potentially lead to national events for all dental students.

What does the society aim to achieve in the long run?

Ladwa: Raising the profile and celebrating the contributions of individuals in dentistry, and understanding and addressing any barriers women may be facing in the dental profession are two of our main goals. Furthermore, we aim to promote the furtherance of attitudes encouraging the role of women as integral in all areas of the dental field and provide accessible role models and mentors for undergraduate students. Members should also engage in outreach and promote the ethos of always giving back.

The long-term goal of Women in Dentistry is to provide a link between undergraduate dental students and practising dentists, allowing for the fostering of a solid network. This will enable dental students to develop the skills they need to achieve in the profession at this fundamental stage. It is vital to cultivate these skills now when the resources are at our fingertips and not wait for difficulties to arise in the future or when the pressures of working life increase.

It is estimated that in 2020 over half of all dentists will be female. What impact, in your opinion, could this gender shift have on the profession overall?

Roxanne Mehdizadeh: With more females entering the dental profession, changes will be evident. In addition to bringing more women likely to work part-time, female GDPs are more likely to take career breaks (6% as compared to 27% for males) and take longer breaks when they do (Nine months as compared to four months). This, in conjunction with the fact that the number of female GDPs is overall increasing, has implications for the balance of work in the future and needs to be accounted for in workforce planning.

It is important, however, to consider the societal context of the issue. It is difficult to predict whether the situation would be the same if shared parental leave were more viable, and families were re-munerated more than the current sum of £139.58 if the father decides to take maternity leave. A move towards this type of co-parenting, as seen in countries such as Sweden and Norway where over 80% of fathers take part, as compared to 1% in the UK, may lead to more women returning to work sooner, thus evening out the negative effects their leave may place on the system.

The greater relative uptake in such countries, compared with the UK, is attributed not only to a different societal attitude towards co-parenting, but also to the fact that families receive at least, 60% of the father’s income while he is on leave.

Furthermore, it has been argued that the feminisation of the dentistry has implications on the perception and status of the profession. Historically, fields which have undergone a predominately male to female shift in their workforce have lessened in their standing within society. This is a controversial issue, and perhaps the real subject of concern is questioning why such a perception exists when there is a lack of evidence to suggest that women are not able to deliver the same quality of care for their patients as their male colleagues.

Ultimately, the feminisation of dentistry does indeed need to be addressed, purely on the basis of achieving gender equality and a balanced workforce. The notion that women inherently devalue the profession’s societal standing or that their maternity leave is a negative factor should be challenged and viewed within the wider context. In addition, hidden inequalities such as the disparity of pay, unequal proportion of female to male specialists and lack of women in leadership roles should not be overshadowed due to the increased overall proportions of female GDPs.

Thank you very much for the interview.
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What would Dr Mo Lar do? Part I

By 4dentists, UK

As a dentist, you will be presented with a number of challenges in your personal and professional life, from the minute that you become a dental student right through until the end of your career and beyond. These might include transitioning after graduation, becoming an associate, buying a home, getting married, starting a family or becoming a principal. Business expansion, selling a practice, managing tax, retirement and preparing for the future by making a will are further examples.

Over the course of an 11-part series, the 4dentist group will explore ways to tackle these challenges by providing advice and guidance to fictional character Dr Mo Lar (see what we did there?). In this first article in the series, we will explore Lar’s transition from student life to his role in dentistry.

Finding a job

Dr Mo Lar’s university career is coming to an end, which means goodbye studying and hello foundation training. At this point, Lar is in the same boat as everyone else. He needs to secure a vocational dental practitioner (VDP) position in a suitable practice that puts him in good stead for future employment. What advice could be given to someone in Lar’s position?

Foundation training is designed to help new dentists improve their practical skills and increase their knowledge of general dental practice, so it is crucial for Lar to secure a position that is suitable for him. Not doing so could impact his future and the options that are available to him.

As such, the best advice for Lar would be for him to take into consideration what he hopes to achieve from his first VDP position before he applies or accepts a job. Indeed, there are a number of pathways to follow in dentistry, so it is always wise to give thought to the type of career that you would like to have. The role must also be able to offer the necessary support to ensure that there is time to reflect on your strengths and weaknesses.

As for finding the role, someone new to the profession like Lar can benefit from a recruitment platform like careers4dentists, as it affords a graduate a means to discover the range of VDP vacancies available throughout the UK.

The dreaded student loan

Once Lar has accepted a role, he will need to give thought to paying back his student loan. Owing to financial support from family members, Lar only had to borrow £8,000, but this is not the case for most students. Indeed, many will have borrowed the maximum loan that was available to them, whatever it was at the time. Currently, maintenance loans vary from £7,097 to £11,002, depending on whether students live at home or in student accommodation or are due to spend a year studying abroad. The repayment of the loan is repaid through the tax system and only begins if you are earning above a certain amount. For English and Welsh students who started their course before 1 September 2012, that amount is currently £24,000, and it is £21,000 for those who started on or after that date. As for the amount of interest that will be added to the loan repayments, there are also two different rates that can be applied, depending on whether the loan was taken out before or after 1 September 2012: if it was before, the interest rate is 1.25 per cent. If it was after, however, the rate varies depending on the circumstances.

As a VDP, Lar’s income will be around £30,000 per annum, so he will be required to make repayments in line with his earnings. The income contingent repayment system tapers the repayment obligation according to the gross income of the account holder, so the more Lar earns, the more he will be required to pay back each month. Of course, should he wish to, he could increase the amount that he pays each month to pay off the loan quicker, which would prove to be beneficial later on in life when he has more financial responsibilities.

Cover yourself

Lar will also be advised to take out income protection insurance, which would provide an income should he be prevented from working owing to sickness or injury. Typically, the payout received if a claim is made is equivalent to 50–65 per cent of a person’s usual income and can be paid until termination of the policy.

For Lar, it is advisable that he take out occupation cover, as it will ensure that he will receive a payout based on the fact that he cannot perform his duties as a dentist. Indeed, there are plans out there that will only pay a benefit if the policyholder is sick or disabled that he or she cannot work at all. For that reason, it is always wise to seek the services of a specialist independent financial adviser, since not doing so could leave you with the wrong protection insurance. Further to that, you should always check what your contract covers with respect to sick pay, as this will affect what you will need from your insurance.

In all, there are a number of factors to take into consideration during the initial stages of becoming a VDP, none of which have to be undertaken alone. With the right help, dentists like Dr Mo Lar can enter dentistry confident that they have a financially sound future.

In the next edition: Dr Mo Lar becomes a self-employed associate.
"The field of tissue engineering has exploded during the last decade"

An Interview with Dr Ibrahim Abu Tahun, Jordan

By Kristin Hübner, DTI

Being actively involved as a founding member and president of several endodontic societies, Dr Ibrahim Abu Tahun has experienced the changes in the field significantly over the last decades. Dental Tribune had the opportunity to speak with Tahun, who is an associate professor in the Department of Conservative Dentistry at the University of Jordan, about the most influential developments in the specialty and how these advances are changing the way endodontics is practised.

Dental Tribune: Dentistry is changing rapidly, with new materials, devices and treatment protocols being introduced constantly. What is the situation in endodontics in particular? What are the major developments currently?

Dr Ibrahim Abu Tahun: At the beginning of the 21st century, we have greater understanding of the pulp biology, pathophysiology and its powers of healing. The field of tissue engineering has exploded during the last decade, and extensive reviews on dental applications are available, producing a critical mass of knowledge and methods that are likely to answer the challenge issued decades ago.

Various animal and human studies have shown high success rates for vital pulp therapy. These investigations have demonstrated that the amputated pulp can be repaired by itself or after regenerative treatment. Case reports published during the last 15 years have demonstrated convincingly in humans that this type of environment may create the ideal clinical outcome if disinfection can be achieved, just as it is for the canals in the case of dental avulsions. The varying treatments for the tooth pulp during the last three centuries illustrate this clearly. Recently, various treatment concepts have been suggested using less-invasive approaches. Even though an optimal treatment protocol is lacking, however, many case reports and case series on pulp therapy have been published.

Once considered taboo, vital pulp treatment of symptomatic permanent teeth with mineral trioxide aggregate has been reported to be successful, and greatly improved prognoses for permanent retention are now possible. More high-quality cohort studies would strengthen the evidence-based recommendations. However, the current best available evidence allows clinicians to provide these treatment modalities safely to patients.

Globally, what is necessary to implement this new approach to endodontic treatment?

A reparative, biological approach to pulp therapy is not only welcome, but also absolutely essential. Ideally, the delivery of biologically based endodontic procedures must be more clinically effective than current treatments and the method of delivery must also be efficient, cost-effective and free of health hazards or side-effects for patients. A recent study has suggested that endodontic practitioners are supportive and optimistic about the future use of regenerative endodontic procedures.

In your opinion, what innovations will influence endodontists most in the years to come?

The tremendous and exciting research on regenerative endodontics from Japan, the US and other countries has made the cultivation of potential in this field a strategic priority without underestimating the efficacy of conventional endodontic therapies, but positioning practitioners at the forefront of this field.

We are changing protocols for going biological. This path to the future with various potential approaches based on clinical and scientific results presented in the professional literature will lead to predictable conservative treatment that may enable practitioners to fill a root canal with nature’s tissue instead of plastic materials or artificial surgical prostheses. The important challenge facing us now is to develop and adapt a safe, effective and consistent method for regenerating a functional pulp–dentine complex in our patients.

Thank you very much for the interview.

Editorial note: At the 19th Scientific Congress of the Asian Pacific Endodontic Confederation, which will be held from 5 to 8 April in New Delhi in India, Tahun will be addressing current endodontic challenges and conflicting priorities between conventional therapies and new treatment modalities in his lecture “Can we do it forever?”.

What are the advantages of new treatment modalities compared with conventional root canal therapy?

The potential benefits to patients and the profession are groundbreaking. From a public health point of view, the recent advances in tissue management and wound healing, compared with the current form of root canal therapy, which is more of a mechanical and chemical process, should be reflected in our clinical management to develop more biocompatible treatment modalities and increase tooth longevity.

In the past, it was unthinkable that the tissue in the periapical region of a non-vital infected tooth could regenerate. Case reports published during the last 15 years have demonstrated convincingly in humans that this type of environment may create the ideal clinical outcome if disinfection can be achieved, just as it is for the canals in the case of dental avulsions.

When it comes to implementing new treatment modalities in daily practice, do you think the endodontic community is somewhat divided or is the specialty as a whole on the verge of a major paradigm shift?

The debate on clinical technique and the concept of regenerative and revascularisation per se is not a product of modern medicine. The varying treatments for the tooth pulp during the last three centuries illustrate this clearly. Recently, various treatment concepts have been suggested using less-invasive approaches. Even though an optimal treatment protocol is lacking, however, many case reports and case series on pulp therapy have been published. Once considered taboo, vital pulp treatment of symptomatic permanent teeth with mineral trioxide aggregate has been reported to be successful, and greatly improved prognoses for permanent retention are now possible.

Best practice guidelines must be updated to include guidance to maintain the self-respect of the dental profession and the trust of the patients we serve, as the fact remains that more biological endodontic treatment means endodontics that is more ethical than today.

A very recent study has found that regenerative endodontic treatment has the potential to be used to retreat teeth with persistent periapical periodontitis after root canal therapy.

More high-quality cohort studies would strengthen the evidence-based recommendations. However, the current best available evidence allows clinicians to provide these treatment modalities safely to patients.

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Ceramic dental implants: What benefits do they offer?

By Brendan Day, DTI

Although the search for metal-free implant materials began in the late 1960s, recent improvements in ceramic materials have made their development process considerably easier. As an alternative to titanium-based implants, ceramic implants offer greater aesthetic appeal and possess antiallergenic and tissue-friendly properties. This article highlights some of the companies that currently offer ceramic implants and explore why they are still much less commonly used than their titanium counterparts.

For the better part of four decades, titanium and titanium-alloy dental implants have been successfully used as tooth replacements. However, recent research findings have raised fears regarding these implants’ tendency to corrode and decay. During the corrosion process, titanium implants release particles or ions into their surrounding tissue, which could lead to implant failure and bone disintegration. A 2014 paper published in the Open Journal of Stomatology, titled "Corrosion aspect of dental implants—An overview and literature review", detailed this process by explaining that the compatibility of titanium implants is largely the result of a thin layer of oxide that forms on their surface. This layer can erode due to movements between bone tissue and the implant during loading conditions, which could lead to corrosion, leaking and an overall weakening of the implant. Given their non-metallic nature, ceramic implants are not susceptible to this form of decay.

However, the lack of concrete evidence concerning the mechanical properties and osseointegration of ceramic implants has impeded their uptake, although this is partially due to their relative newness. The FDA only approved ceramic implants in 2007. Additionally, there have also been relatively few clinical studies conducted on their long-term use. However, in the Clinical Implant Dentistry and Related Research journal, a 2015 study of zirconia implant abutments that supported entirely ceramic crowns found that after 11 years of use, these abutments had a cumulative success rate of 96.3 percent. In addition, a 2010 study in the journal for Clinical Oral Implants Research found that the osseointegration of zirconia implants is similar to that of titanium implants. Despite these positive findings, the sheer lack of depth in research has deterred the majority of dental professionals from using ceramic implants.

The one-piece design of ceramic implants is another element that has both positive attributes and drawbacks. A one-piece implant eliminates the connection between the abutment and the fixture, ideally reducing bacterial growth and improving overall oral health. However, a high level of attention to detail with regards to the implant’s placement is required, as it does not possess the same capability as titanium implants to correct errors in placement with an angled abutment. This inability to correct errors in placement created the demand for two-piece ceramic implants that allow for more flexible placement options and better healing.

The American Academy of Implant Dentistry estimates that, while three million Americans currently have at least one dental implant, this number is rising by half a million each year. Given the growing global demand for dental implants, it is more important than ever to provide patients with options that best suit their individual needs. Although they are an expensive option, ceramic implants are increasingly meeting the standards for stability, compatibility and osseointegration that titanium-based implants have set. Combining this with their aesthetic appeal and antiallergenic nature, ceramic implants should continue to grow in popularity.

"Ceramic implants today, in my experience and for many fellow ceramic implantologists, have the same success rate as titanium implants. They are now as versatile as metal implants thanks to the evolution in design, surface enhancement protocols and biomaterial improvements", says Dr Sammy Noumbissi, President of the International Academy of Ceramic Implantology (IAOCI), an association entirely dedicated to ceramic alternatives of metal-based
implants. “Various treatment modalities are applicable with ceramic implants: immediate placement, immediate temporization, full arch and full mouth rehabilitation can be performed with excellent and predictable outcomes.” However, believe that adopting ceramic implants should be accompanied by training or shadowing from an experienced clinician, even if one has experience with titanium implants.”

Only a few implant manufacturers focus on ceramics

Interestingly, most of the major implant manufacturers do not have a ceramic implant on the market, let alone in development. The most notable exception is Straumann. Headquartered in Basel, Switzerland, Straumann is an international leader in implant and restorative dentistry, with its products and services available in more than 100 countries. Straumann currently offers Pure, a completely zirconia-based implant that is ivory-coloured, similar to a natural tooth. The company recently announced that it has entered into a partnership with maxon motor, which will allow it to develop dental implant components through ceramic injection moulding rather than conventional cutting techniques. The move demonstrates the company’s recognition of the growing market for aesthetically pleasing, metal-free implants. Given that one of the main barriers to zirconia implants is their comparatively high price, Straumann aims to make it a more widely available and affordable option.

In addition, TAV Dental is one of the few companies that offer both one-piece and two-piece ceramic implants. Their primary focus is to create state-of-the-art zirconia dental products through an innovative approach to technology, fostered by their parent company, TAV Medical. TAV Dental offers a variety of one-piece and two-piece zirconia implants that are entirely white, a distinct aesthetic improvement from the metallic colour of a titanium implant that is often visible. Furthermore, the inert nature of TAV Dental’s zirconia implants make them less likely to fracture and highly resistant to foreign compounds as well as the application of heat, further benefiting patients.

Another company manufacturing ceramic implants, Ceraloof, introduced its zirconia implant system to the European market in 2005 and the US market in 2011. Located in Barcelona, Spain, the company utilised improvements in ceramic materials to design a one-piece ceramic implant. Whereas titanium-based implants have two separate parts—the fixture and the abutment—Ceralooft’s product incorporates both elements into one implant. This ensures that there is no prosthetic connection where bacteria can grow, theoretically leading to better periodontal health.

One of the primary players in ceramic implantology is Dental implant with their metal-free Zeramex system. Established in 2005, the company spent four years researching and developing a two-part implant made of zirconia, presenting it to the world in 2009. Zeramex offers a revolutionary approach to ceramic implantology through their metal-free, screw-in implant, allowing for a flexible restoration with a high level of biocompatibility. Combining this with a higher resistance to corrosion results in a product that rivals titanium implants in performance.

Zystems is a Switzerland-based company that, through their Zirkolith range of products, offers extensive ceramic implant options. Similar to TAV Dental, they offer both one-piece and two-piece implants and their osseointegration rate is similar to leading titanium implants. Another company, VITA, has entered the ceramic implant market with its own one-piece zirconia-conical ceramic implant in operation since 1994, and with a focus on innovation, VITA claims their ceramic implant offers faster, safer healing than titanium-based implants. With a compatibility rate of 98 per cent for more recent models, zirconia-based ceramic implants are increasingly matching the standards set by titanium implants but have largely become a more viable option.

As Noumishi concludes, “The future of ceramic implants is really bright for many reasons. Patients increasingly ask for safer, less invasive solutions, as well as metal-free alternatives for teeth repair or replacement. Dental attitudes and understanding of zirconia and bio-ceramics are slowly but steadily evolving, with a definite shift toward biological and inert materials. There has also been a shift in the healthcare industry towards wellness and wellbeing, and providing therapies that have little to no side effects.”

Since some of the larger players in the implant industry are incorporating, or have already adopted ceramic implants in their product lines, either by development or by corporate acquisitions, implantologists could eventually look at ceramic implants as a viable alternative to titanium.

**Treatment plan should be adapted for smokers**

By DTI

**XTAN, China:** A Chinese study comparing implant stability and peri-implant tissue response in heavy smokers and non-smokers has found that smoking did not affect the overall success of implant surgery, as all implants achieved osseointegration without complications at least by the end of the 12th week after placement. However, smoking did cause the bone around the implants to heal more slowly: thus, implants began to osseointegrate considerably later than in the non-smoking group.

Research has demonstrated that smoking can negatively affect implant and bone integration. In order to improve treatment outcomes and avoid implant failure, surgeons need to have a precise understanding of how the habit will affect the healing process.

In the current study, 45 ITI (Straumann) implants were placed in the partially edentulous posterior mandibles of 32 male patients, of whom 16 were heavy smokers and 16 did not smoke at all. Implant stability and peri-implant tissue response were assessed at three, four, six, eight and 12 weeks post-surgery.

Although implants in both groups achieved osseointegration by the end of the 12th week, the healing process differed significantly between non-smokers and heavy smokers. In non-smokers, stability improved and implants began to better integrate into the bone after the second week. In the smoking group, however, implants only began to osseointegrate and become more stable after the third week.

Despite successful short-term outcomes in both groups, smokers experienced more problems, including greater bone loss around the implants and deeper soft tissue pockets. However, smoking had no significant effect on plaque build-up or sulcular bleeding in the study group.

In light of the findings, the researchers suggested that surgeons might need to change their standard implant loading schedule for patients who smoke heavily. In addition, smokers should be aware that their habit promotes the loss of marginal bone and the further development of dental pockets and could thereby lead to complications even after osseointegration, they concluded.
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Shifting consumer preferences and positive uptake of CAD/CAM technology

By Artur Kim & Dr Kamran Zamani, Canada

Europe has some of the most highly penetrated markets for dental implants in the world, including Italy, Germany and Spain, but it also contains regions with considerably under-developed markets, such as France and the UK.1 A shift in consumer preferences will be a key characteristic of the European market in the future, in both the dental implant fixture market and final abutment market. Although the shifts will contrast one another, they will both have a significant impact on the market in terms of overall pricing, the competitive landscape and technological innovation.

Historically, premium dental implant companies have dominated in Europe, but have recently faced increased competition from the value and discount brands. A growing prevalence of local manufacturers and an increasingly cost-sensitive consumer demographic will contribute to overall price depreciation and the declining presence of premium implants in the future.1

Region-specific growth of the premium segment is highly reliant on the prevalence of domestic, lower-cost dental implant brands. In countries such as Italy, Germany and Spain, there is a plethora of local value and discount dental implant companies that have emerged to cater to the growing cost sensitivity expressed by dentists. In these regions, the premium segment also contributes to price depreciation and the introduction of Ti-base abutments.1

Similar to the historical dominance of the premium segment in the implant market, the market for final abutments has traditionally been controlled by the stock abutment or prefabricated abutment segment. Although the majority of stock abutments lack many benefits associated with patient individualised solutions found within the custom-cast abutment and CAD/CAM abutment segments, they still provide a relatively simple and cost-efficient solution in most implant procedures. The segment is expected to continue experiencing price erosion owing to rising pricing pressure from local, low-cost and generic manufacturers.1 Another recent development within the stock abutment segment also contributing to price depreciation is the introduction of Ti-base abutments.1

Ti-base abutments, also known as titanium bars or titanium interfaces, are a recent innovation within the stock abutment market that are a cost-effective alternative to traditional CAD/CAM abutments, since they are intended for in-house or independent milling machine use. Examples include Straumann’s Variobase and Nobel Biocare’s Universal Base, which give dentists the option of placing a cement-retained or screw-re-tained restoration. Ti-bases also allow dentists to choose between a hybrid abutment and a hybrid abutment crown (a combination of an abutment and a monolithic crown). The presence of Ti-base abutments has grown rapidly across most regions in Europe and it is expected that this will become the predominant stock abutment type in the near future. The cost-effective nature and flexibility of options offered with Ti-base abutments will help maintain the position of the total stock abutment segment in the overall market. Stock abutments currently represent over 50 per cent of the total final abutment volume in the majority of markets across Europe, but this share is expected to steadily decrease.1

Recent improvements in production capability and technological innovation have made CAD/CAM abutments significantly more affordable than in the past. CAD/CAM abutments are now relatively comparable in price to custom-cast abutments and are more easily accessible, especially in regions where milling laboratories with CAD/CAM production are in greater abundance. Furthermore, CAD/CAM abutments are primarily required in cases in which aesthetic outcomes are of higher priority, such as the anterior region of the mouth. CAD/CAM abutments are expected to continue to experience double-digit growth, and the expanding market share of the segment will limit ASP of the overall abutment market, since it carries a slightly premium relative to stock abutments and custom-cast abutments.1

Consolidation and emerging players in the competitive landscape

In addition to investments in value and discount companies, the market for dental implants has been distinguished by consolidation among the top competitors. Most recently, Dentsply Sirona was established after the merger of DENTSPLY International and Sirona Dental Systems in February 2016, combining the strengths of each company in dental consumables and innovative technology, respectively.1 The premium implant company acquired ASTRA TECH in 2011 and announced the acquisition of MIS in June 2016.1 In June 2015, Zimmer Biomet was formed through the merger of Zimmer and Biomet, combining the dental divisions of each company. Zimmer Dental and BIDMET are other notable developments in the European market for dental implants and include the increased uptake of ceramic materials, growing presence of implant companies in the biomaterials space and rising demand for modern surgical protocols, such as immediate loading and full arch restorations. Overall, growth within each segment will be highly dependent on the aforementioned factors and region-specific characteristics.1
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One week diary with our X-Mind Trium 3D CBCT in practice

By Dr Diyari Abdah, UK

There is mounting evidence in the literature in regards to the diagnostic superiority of 3-D imaging versus 2-D. As a result, many clinicians today are using 3-D imaging either by referring their patients to a CBCT-scanning centre or having mobile units visiting them, and the only benefit of this method is that there is no initial capital outlay to buy the machine. In contrast, the benefits of having your own in-house CBCT machine are many, including the total convenience of an on-demand service at any time (pre-op or during and after if needed), learning one software and fully utilising it rather than having to learn different software for different machines (manufacturers), thus not utilising it to its fully intended use.

Additionally, patient appreciation that they do not have to travel to another location and that fact that you care enough to have a machine installed in your clinic for their convenience and yours.

Our X-Mind Trium CBCT unit from ACTEON is rather young in our practice, and we have yet to fully utilise it. Every day we find new uses and ways to benefit our patients by using 3D imaging where applicable.

Following the latest evidence from experts in the utilisation of 3D imaging can help a lot in deciding where and when to use it, consequently minimising dosage and improving diagnostics and planning.

We owe our patients the lowest possible dose with the corresponding acceptable diagnostic value, and sometimes a 2-D image is just not enough to give satisfactory diagnostic value. A lot of guesswork is often involved with 2-D imaging that could affect our decision-making and treatment planning.

Judging every case individually is important in order for the benefits of using a CBCT scan to outweigh the potential risks involved with the use of any type of X-ray unit. A modern CBCT machine should allow for different fields of view (FOV) to be utilised, in order to minimise the dose to the patient.

Despite the choice of four different FOV settings on the X-Mind Trium, and other settings that reduce the radiation significantly, individual assessment of every case is still very important to get the most of the 3-D image without exposing the patient to extra radiation.

In many cases, a small FOV that is enough for one to several teeth could be equal to a few periapical radiographs but with a much higher diagnostic value.

In order to show how a CBCT scanning machine can affect the day-to-day dentistry in a small family practice, it would be beneficial to share a week’s diary, bearing in mind each practice’s needs are different, but one thing should be common above all, and that is to assess every case individually and never take 3-D scans routinely, even despite their clear benefits.

When a 3-D image is necessary, patients appreciate the information and education they get by discussing the case with them while pointing to vital structures and solutions in 3-D versus an old fashioned 2-D image that did not make sense to the untrained eye in most cases.

So here are a small selection from a week’s diary utilising the X-Mind Trium 3D CBCT scan in the clinic. More CBCT scans were probably obtained on any one day depending on the cases on that day, however, due to space limitations in this article, only one to two cases per day were selected.

Day 1

The patient had all his lower teeth extracted many months ago, due to mobility and infections and preferred to have a fixed solution through implant therapy. Patient currently is wearing a well-fitted temporary lower denture. Initially the idea was to take a scan of the existing denture with radiopaque markers (gutta-percha in 6–8 holes made in the denture) to plan for the placement stage. However, a decision was made to duplicate the existing denture using a Lang duplication flask in order to fabricate a clear acrylic radiographic guide (Figs. 1 & 2).

A 3-D scan was obtained using the X-Mind Trium 3D CBCT scanner to be utilised as an invaluable resource in the treatment planning of the case. Through the scan, the type and position of the implants in relation to the density of the surrounding bone were checked.

The AIS 3-D Software that comes with the device, includes a library of most current implants on the market, allowing to place the right implant in the right angulation plus abutments and crowns in order to maximise the predictability of positioning the implants, thus improving its success.

For clinicians who use more than one implant system, to change the implant model that was inserted from the library, we simply click in the middle of the implant and the implant library is opened again and it is possible to choose another implant model, the software will keep the same insertion point and direction of the previous one. In addition, the software will easily evaluate the bone density around the implant. The aim is to show both through colour maps and numerically (Figs. 3 & 4) the values before commencing surgery (green if the values are acceptable and high and red if the values are low—Fig. 5), allowing the clinician to make the right decision. This can also be a very good educational tool to show patients how their bone density potentially is around the implants.

In our experience, patients like this feature once shown what they mean.
Day 2

An implant is planned to replace a missing lower molar, and the position of the mandibular canal is not very clear on a 2-D image anyway and even on the 3-D image the position is still a little confusing. Here we decided to use the AIS software’s FlyMode option, which is like a virtual endoscope that follows the mandibular canal from within, and aids to clarify the path and double check if our nerve tracking was correct (Fig. 6).

This is one of the unique features of the software that can help clarifying and controlling nerve-tracking.

Day 3

Obtaining the correct position and trajectory of a retained upper left canine has been traditionally dealt with by taking different 2-D images (periapicals) at different angles and possibly an occlusal view to determine the correct position in the buccopalatal aspect together with some guessing work.

3-D imaging can be an invaluable tool for this matter. The patient refused orthodontic extrusion of the upper left canine and wanted both the deciduous and permanent canines extracted in order to be replaced by an implant support crown. In planning the case, a CBCT scan was obtained to serve many purposes as to assessing the positions including any anatomy and bone surrounding these teeth. Since this image was taken, both teeth were extracted and the socket was grafted fully to prepare the site for a later placement (Figs. 7 & 8).

Day 4

Case 1

A lower molar case was in the planning stage, and the position of the mandibular canal was located.

At this stage, different implant sizes were tested to check for best fit and maximum integration prospects in the future.

The AIS software indicated that the first implant was too long and there was a risk of nerve damage (Fig. 9), thus another implant size was chosen to allow sufficient clearance above the nerve and the density of the bone was chosen at the time of implanting good “green” values that the patient also could understand (Fig. 10).

These tools as mentioned above can be quite an eye opener for patients and their engagement can affect the outcome positively.

Case 2

A broken and lose bridge was planned to be removed. The lower left second molar which served as the most posterior bridge abutment tooth was beyond saving (visual inspection and probing).

3-D imaging helped with planning the case. It helped tracking the position of the mandibular canal in relation to the proposed implants (Figs. 11 & 12).

In addition, the density of the bone was also checked (Fig. 13), indicating that a wider implant possibly is a better choice to improve integration rather than the current one used from the implant library. This will also allow us for deciding to perhaps perform an under preparation of the osteotomy site in order for the implant to engage in the bone better, this obviously depends on the type of implant used and other factors that the expert clinician will be familiar with.

Day 5

This case was performed by another clinician who was hoping for an implant to engage in the bone after placing two anterior implants with grafting material.

According to the colleague, primary stability was good at the time of placement and the implants were ‘buried’ in the bone with some buccal fenestrations; hence the grafting so-everything indicated success.

After the patient complaining about some threads showing through the soft tissue, the colleague suggested further grafting to ‘secure’ the implants.

A CBCT scan was obtained (Fig. 14) as part of case planning and clearly the scan shows that this may prove difficult or at least very challenging. In addition, on the 3-D image we noted that the tip of the implant on the left side might be colliding with the root of the adjacent tooth, with long-term uncertainty as a result (Fig. 15). In this scanning slice (Fig. 16) we also noted the challenge ahead for grafting this implant successfully, which indicated that a lot of consideration has to be given and careful planning has to be employed in order to make the case successful.

However and despite the outcome so far with these two implants, the patient appreciated the high value of the 3-D technology and being able to see the problem clearly and from different perspectives, eliminating any guesswork that might affect the final outcome, and guiding the treatment in the right direction.

Conclusion

These cases and many more every week pass through any dental clinic with patients hoping for best available treatment under best circumstances (clinical, timescale, financial etc).

We know that 3-D imaging is here to stay and in order to make treatments safer and more predictable for our patients, we have to engage in these technologies and involve the patients more in showing them their clinical conditions and perhaps the limitations (anatomical, structural etc.) together with other factors that may affect treatment planning and outcome, hopefully for the better. We hope to be able to use our CBCT scan for more indications, especially in endodontics as few times we have seen amazingly positive results in using a CBCT scan in some difficult endodontic cases since we acquired this 3-D technology. It is the way forward and we wish we had the X-Mind Trium 3D Scanner earlier.

References


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