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THE MAGAZINE FOR DENTAL PROFESSIONALS IN IRELAND

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1 year, 6 issue subscriptions: UK £48; overseas £65; students £25. Back issues: £5, subject to availability.

ISSN 2043-8060
Ireland's Dental magazine is designed and published by Connect Publications (Scotland) Ltd
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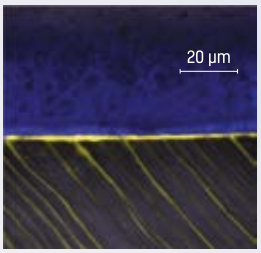

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A confocal micrograph of a gap-free Stela-dentine interface. Note the penetration depth of Stela Primer (yellow) within the dentine tubules.

Source: Dr Salvatore Sauro

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Photos courtesy of Prof Dr Rocio Lazo (Peru)

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Looking ahead

The challenges facing the dental profession in Northern Ireland and the Republic of Ireland need to be addressed

The dental profession in Northern Ireland and the Republic of Ireland faces a complex array of challenges that affect service delivery, professional satisfaction and patient outcomes. These challenges span economic pressures, workforce shortages, health inequalities and the changing regulatory landscape – each uniquely shaped by the healthcare systems in their respective jurisdictions.

Economic challenges are among the most pressing issues affecting the dental sector in both regions. In Northern Ireland, funding constraints within the National Health Service (NHS) have placed significant strain on dental practices. Dentists operating within the NHS often report that reimbursement rates for treatments are insufficient to cover costs. This has led many to either reduce their NHS commitments or switch entirely to private practice. Such trends exacerbate inequalities, as those unable to afford private care face limited access to services.

Similarly, in the Republic, public dental services under the Dental Treatment Services Scheme (DTSS) and the Dental Treatment Benefit Scheme (DTBS) have come under criticism. The DTSS, designed to provide dental care to medical cardholders, suffers from outdated fee structures and insufficient funding, leading many dentists to withdraw from the scheme. This limits access for vulnerable populations and shifts the burden onto overstretched public dental clinics.

Workforce shortages pose a critical challenge in both jurisdictions. In Northern Ireland, there has been a decline in the number of NHS dentists due to dissatisfaction with working conditions and remuneration. Additionally, recruitment and retention of dental professionals in rural and underserved areas are particularly challenging. Post-Brexit immigration policies have further restricted the movement of EU-trained dentists, exacerbating these shortages.

In the Republic, workforce challenges are similarly pronounced. Reports indicate a significant gap between the number of dental graduates and the demand for services. This shortfall is compounded by the emigration of Irish-trained dentists to countries such as Australia and Canada, where pay and working conditions are often more favourable.

Additionally, the Covid-19 pandemic delayed clinical training for dental students, potentially creating a future bottleneck in the workforce pipeline. Health inequalities remain a pervasive issue, disproportionately affecting vulnerable populations in both Northern Ireland and the Republic of Ireland.

In Northern Ireland, socioeconomic disparities play a significant role in oral health outcomes. Communities in areas of higher deprivation tend to have poorer access to dental services and higher rates of dental decay.

The NHS dental system, struggling with underfunding, often cannot adequately meet the needs of these populations. In the Republic, oral health inequalities are also stark. Many low-income individuals rely on the DTSS, but the scheme's limitations often result in restricted access to necessary treatments. Moreover, migrant and refugee populations face additional barriers, including language and cultural challenges, further marginalising these groups.

The cumulative effects of financial pressures, administrative burdens, and workforce challenges have taken a toll on the mental health of dental professionals in both regions. High levels of stress and burnout are frequently reported, with many practitioners citing unrealistic workloads and a lack of support.

In Northern Ireland, NHS reforms are often discussed as a potential solution, but uncertainty surrounding implementation creates additional stress for practitioners.

In the Republic, dentists have called for more mental health resources and a supportive professional environment to address these concerns.

Efforts to address these challenges require coordinated action from governments, professional bodies, and other stakeholders. In Northern Ireland, reforms to the NHS dental system are critical. Adequate funding and fair reimbursement rates are necessary to retain dentists within the system and improve access for patients. Increasing investment in dental education and incentivising work in underserved areas could also help alleviate workforce shortages.

In the Republic of Ireland, revising the DTSS and DTBS to reflect modern practice costs is essential. Greater investment in public dental services, coupled with targeted programmes to reduce health inequalities, would improve access for vulnerable populations. Collaborative efforts to support mental health and professional development for dentists are also crucial.

The profession in Northern Ireland and the Republic faces a multitude of challenges that threaten the sustainability of services and the wellbeing of practitioners.

Addressing these issues requires a balanced approach that considers the financial, regulatory and social dimensions of dental care.

Only through comprehensive reform and increased investment can the profession ensure equitable access to high-quality oral health services for all.

Dr Paul O'Dwyer BDS MSc (Healthcare Management)

Famous dentists through history

From gunfighters and revolutionaries to scientific leaders and musicians, the pioneers of dentistry have some colourful backgrounds

At the American Dental Association (ADA)'s annual meeting in New Orleans in October, I was struck by the many historical figures within dentistry that are sometimes overlooked – or, in some cases, not remembered at all. Sitting on the banks of the Mississippi, the Ernest N Morial Convention Center played host to the ADA's SmileCon, which attracted more than 16,000 attendees.

During the opening ceremony, mention was made of Dr Clarence Edmund Kells Jr. If that is a name you do not recognise, you are not alone. He was an American dentist who practised for almost 50 years in New Orleans. He was the most prominent pioneer of dental radiology, holding more than 30 patents on dental devices. He introduced dental X-rays at a meeting of the Southern Dental Association in North Carolina in 1896 – and the rest is history.

In 1868, another American dentist, George F Green, is credited with refining the pneumatic drill. Still staying State-side, many will be familiar with Professor Albert Porter Southwick.

He was a professor at the University of Buffalo School of Dental Medicine (now known as the State University of New York). Southwick was also largely responsible for the introduction of the electric chair for use in capital punishment from the 1890s!

Further back in history, we find Paul Revere – that American Revolutionary – who is most widely remembered as a silversmith, but was also an amateur dentist.

John Henry Holliday – better known as Doc Holliday – was a gunfighter, gambler... and a dentist! His actions at the OK Corral are the stuff of screen legend.

Closer to home, in France, Dr Pierre Fauchard is often called the "father of modern dentistry'. His treatise *Le Chirurgien Dentiste (The Surgeon Dentist)*, published in 1728, was the first to give a scientific basis to dentistry.

When thinking about dentists, it's often remarkable to consider the people who could have been in the profession. Roger Taylor of Queen had initially signed up to study dentistry in London and formed a band called 'Smile' with Brian May in 1968. The monster dancefloor classic of 1992, *It's My Life*, by Dr Alban was created by the eponymous DJ who had moved to Stockholm to study dentistry and used his gigs to finance his studies. Back in the day, dental students at UCC will recall it echoing in Gorby's in Cork City.

> "FROM GUNFIGHTERS AND REVOLUTIONARIES TO SCIENTIFIC PIONEERS AND MUSICIANS, THE PROFESSION CONTINUES TO SEE EVERY WALK OF LIFE FEATURE"

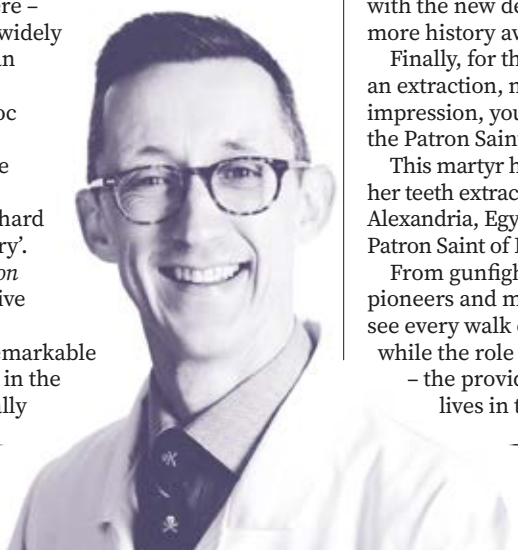
Many practices use Facebook, thanks to the development of this ubiquitous tool by Mark Zuckerberg. But how many of you are aware that Mark's father is a dentist? Dr Edward Zuckerberg has long been a pioneer of integrating technology into dental practice and was a recent investor in Perceptive, the Boston-based start-up responsible for the world's first dental procedure performed by a robot (see cover story).

The study of dentistry in these islands has a storied history too, with the first ever appointed Professor of Dentistry – in either England or Ireland – occurring in 1884 with the appointment of Professor Theodore Stack at the Royal College of Surgeons in Ireland (RCSI). And, with the new dental school at RCSI due to open in 2025, more history awaits.

Finally, for those of us who might be struggling with an extraction, negotiating a canal or taking a tricky impression, you might well say a prayer to St Apollonia, the Patron Saint of Dentists – and toothache!

This martyr had the unfortunate experience of having her teeth extracted/broken in a purge of Christians in Alexandria, Egypt, in 249AD and is now recognised as the Patron Saint of Dentistry and patients with dental pain.

From gunfighters and revolutionaries to scientific pioneers and musicians, the profession continues to see every walk of life feature. We sometimes forget that while the role of dentist is a vital part of overall health – the providers of treatment can have colourful lives in the background.



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Northern Ireland's GDS probed

Stormont's Health Committee took evidence from health officials on access to dentistry

MEMBERS of Northern Ireland's Legislative Assembly have questioned Department of Health officials on a range of issues affecting the provision of dentistry.

Issues raised included timelines for dental payment reform and a new GDS contract, failure to consult with the British Dental Association (BDA) ahead of the £9.2m Dental Access Scheme launch, patient access to high street dentistry and regulating dental tourism.

Members of the committee voiced their concerns about dental access issues and the shrinking of the service resulting, they said, from a "failing contract model". They probed the officials on what had been done to cost the Scotland model in a Northern Ireland context. They also warned of "an urgent need for clarity on the future of this service".

Diane Dodds, Member of the Legislative Assembly (MLA), warned against continued delay on the contract, saying: "As long as this continues, shrinkage of NHS dentistry will continue."

Danny Donnelly MLA, Vice-Chair of the committee, asked for a clear timeline for a new contract. He quoted from the *Review Body on Doctors' and Dentists' Remuneration 52nd Report* which stated "the current contractual arrangements are not enabling NHS dentistry to be sustained or to grow", and that governments must embark on contract reform. Questions were also raised about the regulation of "dental consultations" from non-domiciled overseas companies meeting in hotels in Northern Ireland.

Responding to committee questions, Gearóid Cassidy, Director of Primary Care, said there was no timeline for a new contract. He referred to "an iterative process" with "incremental" changes to the GDS, learning from British models and focusing on maximising benefits to the population within the existing budget.

The committee agreed that a letter should be written to Michael Nesbitt, the Health Minister, asking for a commitment to be given on a timeline for contract reform.

It also agreed to write to the Regulation and Quality Improvement Authority (RQIA) on the regulation of dental tourism.

Komet Dental launches UK sales company

Carsten Cieslik, Director of the Komet Dental business unit, and Heidi O'Carroll, CEO of the new Komet UK sales company

KOMET DENTAL, a global leader in dental innovation, has established a dedicated sales company designed to enhance customer service and provide tailored solutions for the UK market. The move builds on Komet's successful partnerships with dealers and reflects its unwavering commitment to meeting the unique needs of dental professionals.

"The establishment of Komet UK marks a significant milestone in our global growth journey, reinforcing our position as a leading international partner for innovative solutions in the dental sector. As part of the Brasseler Group, we are committed to direct customer engagement to deliver unparalleled support and expertise," said Carsten Cieslik, Director of the Komet Dental business unit.

The launch of Komet UK ensures localised support with direct customer contact, specialised advice and exclusive, customised offers. Customers will benefit from faster access to new innovations, flexible delivery options and services tailored to their individual requirements.

This initiative enables Komet to work more closely with practitioners, offering high-quality tools and services that make dental and laboratory work more efficient, economical and reliable.

"We specialise in creating exclusive, customised solutions tailored to the specific needs of dentists and dental technicians. By maintaining close relationships with our customers, we remain agile and responsive, enabling us to support their daily workflows effectively. Our goal is to contribute to enhancing the quality of patient care," said Heidi O'Carroll, CEO of Komet UK.

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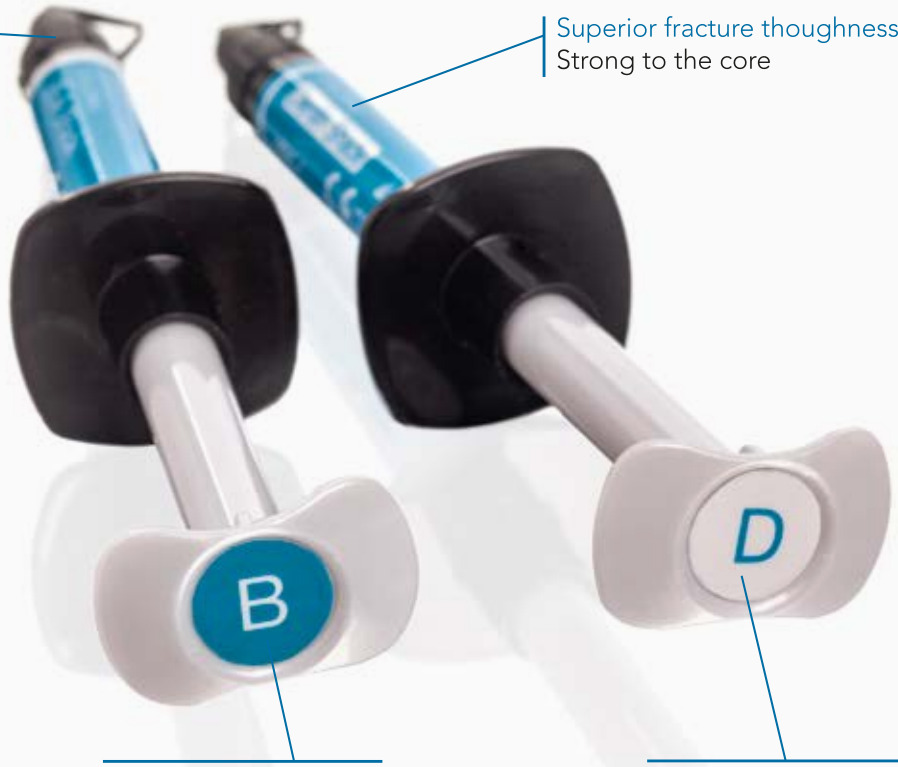

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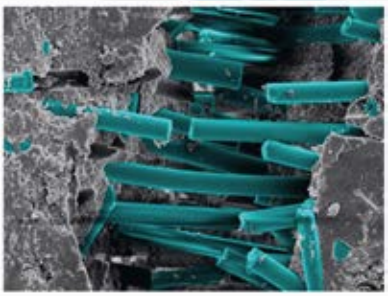

Colourised SEM image of everX Flow
Courtesy of UCL Eastman Dental Institute

Kamourieh N et al. Fracture Toughness of Short Fibre-Reinforced Composites-In Vitro Study. Materials (Basel). 2024 Nov 2;17(21):5368. doi: 10.3390/ma17215368. PMID: 39517645; PMCID: PMC11547670.

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Calcification in infancy

Study provides new insights into inherited phosphate and pyrophosphate disorders

NEW antibody and enzyme replacement therapies may improve oral health in patients with disorders that reduce mineralisation.

This is according to a study *(jada.ada.org/article/S0002-8177(24)00370-2/abstract)* published in the November issue of *The Journal of the American Dental Association*.

The development of the four mineralised tissues that make up the dentoalveolar complex — enamel, dentin, cementum and alveolar bone — are affected by inherited disorders that disrupt phosphate and pyrophosphate homeostasis.

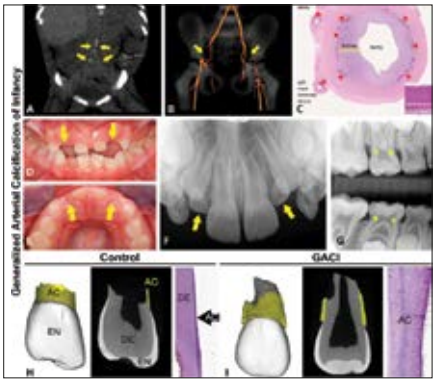
These conditions can lead to reduced mineralisation or inappropriate calcification of soft tissues.

The cover story, *Inherited Phosphate and Pyrophosphate Disorders: New Insights and Novel Therapies Changing the Oral Health Landscape*, is JADA's latest addition to its Oral Science Trends series.

The series is made up of invited reviews that explain where biomedical and clinical sciences are leading to impactful changes in dentists' ability to provide care and improve health.

In it, the authors discuss original data from experiments and comparative analyses and review articles. They say research over the past two decades has expanded the understanding of mineral metabolism and led to novel treatments for mineralisation disorders.

"Newly implemented and emerging therapeutic strategies affect the dentoalveolar complex and interact with aspects of oral health care that must be considered for dental treatment, clinical trial design and coordination of multidisciplinary care teams," the authors said in the article.



Researchers develop interactive mouthpiece

RESEARCHERS have created a dental brace which combines sensors and components to capture in-mouth interactions and data.

The team from the MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) and Aarhus University believe that the device could potentially assist dentists and doctors in collecting health data.

They said it could also help motor-impaired people interact with a phone, computer or fitness tracker using their mouths.

"The mouth is a really interesting place for an interactive wearable and can open up many opportunities, but has remained largely unexplored due to its complexity," said Michael Wessely, senior author of a paper about the device (tinyurl.com/2a7fau89).

"This compact, humid environment has elaborate geometries, making it hard to build a wearable interface to place inside. With MouthIO, though, we've developed a new kind of device that's comfortable, safe and almost invisible to others.

"Dentists and doctors are enthusiastic about MouthIO and its potential to provide new health insights, tracking things like teeth grinding and potentially bacteria in your saliva."

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EFP calls attention to interactions between diabetes and gum disease

Studies show that people with diabetes are at a higher risk of developing severe gum disease

THE EUROPEAN Federation of Periodontology (EFP) has drawn attention to the often underestimated interactions between diabetes and gum disease.

Studies show that people with diabetes are at a threefold higher risk of developing severe gum disease. The connection between these conditions is particularly evident in patients with poorly controlled blood sugar levels. The higher the level of hyperglycaemia, the more severe the gum disease tends to be.

As diabetes continues to impact millions of lives globally, understanding its effects on oral health (as well as the effects of gum disease on diabetes) is essential for improving overall health. This year's EFP theme, diabetes and wellbeing, emphasises the need for accessible care and support for all individuals living with diabetes – and that includes prioritising gum health.

"Recent research has shown that diabetes is not only a major risk factor for periodontitis but that the relationship between the two conditions is bidirectional, meaning they both influence and exacerbate one another," said Anton Sculean, Chair of EuroPerio11, the congress of periodontology hosted by the EFP. "Moreover, moderate/severe periodontitis is associated with an increased risk of all-cause and cardiovascular disease-related mortality in adults with diabetes."

People with diabetes are significantly more susceptible to developing severe gum disease. Additionally, diabetes disrupts the body's inflammatory response, resulting in an exaggerated immune reaction in the gums that leads to further tissue damage.

Conversely, periodontitis can complicate diabetes management. The inflammation caused by gum disease isn't confined to the gums; it can spread throughout the body, in turn impairing insulin sensitivity.

DATES FOR YOUR DIARY

2025

31 JANUARY
Irish Endodontic Society Annual Scientific Meeting
Hilton Hotel, Dublin
tinyurl.com/4dcd2zpk

15-17 MAY
IDA Annual Conference
Lyrath Estate, Kilkenny
www.dentist.ie

20-21 JUNE
Scottish Dental Show
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sdshow.co.uk

20-21 JUNE
Dental Golf Tour Ireland
Adare Manor, Limerick
cloverdentalfitout.co.uk/event/dental-golf-tour-ireland-june-2025

20-22 AUGUST
ADEE Annual Meeting
Dublin Dental University Hospital
adee.org/annual-meetings/dublin-2025

28-29 AUGUST
International Conference on Oral Dermatology and Oral Pathology
Dublin, venue tbc
waset.org/oral-dermatology-and-oral-pathology-conference-in-august-2025-in-dublin

Note: Where possible this list includes rescheduled events, but some dates may still be subject to change.

THE EDWARD LEO SHERIDAN MEMORIAL LECTURE

3D tissue models and novel approaches for dental tissue infection management and repair

The 2024 Edward Leo Sheridan Memorial Lecture was delivered to the RCSI Faculty of Dentistry's Annual Scientific Meeting by Professor Alastair Sloan of the University of Melbourne.

Professor Sobtained his BSc (Hons) in Biomedical Sciences from the University of Wales in 1993 and his PhD in Oral Biology and Pathology from The University of Birmingham, UK in 1997 in the Faculty of Medicine and Dentistry. Following postdoctoral research, he was appointed to a Lectureship in Oral Biology at the School of Dentistry in The University of Birmingham in 2000.

In 2005, he moved to the School of Dentistry, Cardiff University and was awarded his personal chair in 2012. He was Head of Oral and Biomedical Sciences at the School of Dentistry between 2010-2015, Director of International (2012-2015) and Director of Research (2015-2017). Between 2015-2017 he was Chair/Director of the Cardiff Institute for Tissue Engineering and Repair (CITER), a cross-University research network.

Professor Sloan was appointed Head of School in 2017, a post which he held until January 2020 when he relocated to The University of Melbourne to take up his present role as Head of School of the Melbourne Dental School.

He is a Fellow of the Higher Education Academy and a Fellow of the Royal Society of Biology (FRSB). In 2020 he was elected Honorary Fellow of the International College of Dentists (FICD) and in 2021 awarded an Ad Eundem Fellowship of the Faculty of Dentistry Royal College of Surgeons, Ireland in recognition of his contribution to dental education and research. He was the recipient of the 2021 International Association for Dental Research Distinguished Scientist Award, The Isaac Schour Memorial Award for his research programmes in tissue engineering and stem cells.

Professor Sloan's research is multi-disciplinary and in the broad field of mineralised connective tissues. He is interested in the reparative potential and behaviour of the dentine-pulp complex and bone, specifically the potential therapeutic manipulation of the dental pulp stem cells (DPSCs) and the cellular and molecular responses of these cells to natural biomatrices and compromised biological environments to understand their functional behaviour during tissue injury.

Complimentary to this work he is also interested understanding the heterogeneity within dental pulp progenitor populations and their function in 3D environments in vitro. In addition, he is interested in the potential therapeutic roles of these DPSCs in the wider context of regenerative biology.

His research is also focused on understanding the dentinogenic and osteo-inductive properties of dentine and bone matrices to facilitate novel tissue engineering methodologies and natural regenerative processes and is related to the development of novel clinical therapies and methods in relation to dentistry and orthopaedics regarding tissue regeneration and repair. Directly related to this, his research is also focused on understanding bacterial invasion and attachment in dental and bone infections and development of novel antimicrobial carriers/restorative materials for clinical endodontics and orthopaedics.

His group have established liposomal nanocarriers for antimicrobial delivery and prototype restorative materials and model systems to better understand the nature of the bacterial / pulp environment during pulpal infection. He also has a long standing interest in developing novel in vitro/ex vivo organ 3D culture model systems for mineralising tissues to provide innovative models for tissue regeneration/engineering and testing of novel therapeutic agents and advancing the 3Rs (reduction, replacement refinement) in biomedical research and bioengineering.

Read Professor Sloan's lecture in full here: www.irelandsdentalmag.ie/2024-edward-leo-sheridan-memorial-lecture

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- Repairability – if you incur any damage to your Signature Smile teeth, it is very straight forward to repair your original specification

Introducing Mary Catherine

Mary Catherine is an Enniskillen native, who was initially drawn to dentistry because of her interest in art and design. After graduating from undergraduate study at Queens University Belfast, Mary Catherine moved to Edinburgh where spent time honing advanced skills within specialist departments; specifically, special care dentistry, paediatric dentistry, oral and maxillofacial surgery and restorative dentistry.

Following training in Restorative and Surgical specialities, Mary Catherine provides advanced dental treatment such as dental implants, surgical extractions, crown and bridgework. At present her most popular treatment is the Align, Brighten and Contour procedure, which entails Invisalign, Whitening and Composite Bonding, a skill that she honed by learning from Dr Monik Vasant.

Building on a knowledge base of surgical and restorative techniques, Mary Catherine is currently undertaking training in dental implantology, and is on course to complete a postgraduate diploma in 2023. She is also studying for a master's degree in advanced aesthetic restorative dentistry, accredited by the University of Portsmouth.

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OPEN WIDE

How AI, robotics and 3D imaging will transform patient care

WORDS
DR CHRIS CIRIELLO

The healthcare landscape is changing at an astonishing rate with the advent of artificial intelligence (AI). Notwithstanding all the advances, dentistry has been slow to adopt AI, despite numerous technological innovations in the last decade – from digital X-rays and intraoral scanners to the adoption of 3D printing. While these tools have undoubtedly improved dental care, the industry is now on the cusp of a far more transformative leap: the integration of AI, robotic systems and 3D imaging technologies.

This new wave of innovation promises not just to improve diagnostics and treatment but to revolutionise the very way dental care is delivered. AI-driven robotic platforms, combined with cutting-edge imaging technologies, could enable fully automated dental procedures, increase diagnostic accuracy, and reduce the need for invasive treatments. This new era will provide patients with safer, faster, and more personalised care while making dental practices more efficient and accessible.

But what exactly will this technological transformation look like? How will it impact the way dentists diagnose and treat patients? And perhaps most importantly, what will it mean for the millions of people who currently avoid or delay dental care due to anxiety, cost, or lack of trust in the system?

Challenges in modern dental practice

Before delving into the future, it's worth examining the challenges that persist in today's dental care. Despite many technological advancements, dentistry still faces several limitations that can impact both patient outcomes and experiences.

One of the primary challenges is diagnostic accuracy. Traditional X-rays, while widely used, often fall short in detecting the full range of dental issues. For instance, X-rays only provide about 30 per cent diagnostic accuracy, meaning that many problems

such as early-stage cavities, cracks, or issues beneath the gum line can go unnoticed. This can lead to delays in treatment and the potential for more severe issues down the road.

Another issue is patient trust and understanding. Many patients, particularly those without visible symptoms or pain, are often sceptical of diagnoses based on X-ray images that are difficult to interpret. This scepticism is reflected in treatment acceptance rates. Around 70 per cent of patients decline recommended dental treatments, often because they do not fully understand the diagnosis or the necessity of the procedure. This reluctance to proceed with treatment can exacerbate oral health problems, leading to more invasive and costly interventions down the line.

Beyond the diagnostic and patient communication challenges, there's also the issue of time and efficiency. Many dental procedures require multiple visits, long chair times, and significant waiting periods for lab work, such as dental crowns or bridges. This not only inconveniences patients but also puts a strain on dental practices, limiting the number of patients a practice can effectively serve.

Taken together, these challenges highlight the need for a more efficient, accurate, and patient-friendly approach to dental care. Fortunately, recent advances in AI, robotics, and 3D imaging technologies offer the potential to address these issues head-on.

A new era of precision and efficiency

One of the most exciting developments in dentistry is the integration of AI and robotics into the treatment process. While these technologies are already making waves in fields like surgery and radiology, their application in dentistry is only just beginning. However, the potential impact is profound.

> "THE POTENTIAL FOR FULLY AUTOMATED DENTAL PROCEDURES IS ALREADY BECOMING A REALITY"

AI has the power to revolutionise how dentists interpret diagnostic images, manage treatment plans and even predict patient outcomes. By analysing vast amounts of data from previous cases, AI algorithms can help dentists identify patterns and anomalies that might otherwise go unnoticed. For example, AI can be trained to detect early signs of oral diseases, such as periodontal disease or oral cancer, at a level of precision far beyond human capabilities. This can lead to earlier interventions and better outcomes for patients.

In addition to diagnostics, AI can assist in treatment planning by providing predictive models for how a patient's condition will progress. This allows dentists to offer more personalised care, tailored to the specific needs and risk factors of each patient. For instance, AI can predict how a patient's teeth will shift over time, enabling orthodontists to create more accurate and efficient treatment plans for braces or clear aligners.

Robotic systems can assist dentists in performing high-precision tasks

AI-powered imaging software has been used to analyse dental X-rays and detect signs of decay and gum disease that dentists might miss

Robotics, meanwhile, are set to transform the way dental procedures are performed. Robotic systems can assist dentists in performing high-precision tasks, such as drilling, cutting, and placing implants, with an accuracy that surpasses the human hand. By eliminating the variability and fatigue that can affect human practitioners, robotic systems offer a level of consistency and reliability that can significantly improve patient outcomes.

The potential for fully automated dental procedures is already becoming a reality. In the future, robotic systems could take over routine tasks, such as filling cavities or performing cleanings, allowing dentists to focus on more complex cases or patient communication. This would not only increase the efficiency of dental practices but also reduce the risk of human error, improving the overall quality of care.

The rise of 3D imaging technologies

While AI and robotics promise to enhance the precision and efficiency of dental procedures, 3D imaging technologies are poised to revolutionise diagnostics and patient communication.

Traditional X-rays provide a two-dimensional image of a highly complex, three-dimensional structure. This can make it difficult for dentists to accurately assess the full extent of a problem, particularly in hard-to-reach areas beneath the gums. Moreover, the flat, black-and-white images produced by X-rays are often confusing or unconvincing to patients, leading to scepticism and lower treatment acceptance rates.

3D imaging, by contrast, offers a far more detailed and accurate view of the patient's oral structures. Technologies such as optical coherence tomography (OCT) provide high-resolution, cross-sectional images that allow dentists to see inside the tooth and below the gum line with unprecedented clarity. This level of detail enables the early detection of issues like cavities, cracks, and infections that might otherwise go unnoticed until they cause more severe problems.

More importantly, 3D imaging can help build trust between dentists and patients. When patients can see a clear, three-dimensional image of their dental problem, they are far more likely to understand the need for treatment and agree to the recommended procedures. This not only improves patient outcomes but also helps dental practices build stronger relationships with their patients.

The combination of AI-driven 3D imaging and robotics could be particularly transformative in the diagnosis and treatment of complex dental issues. For example, AI could analyse 3D images to identify potential problems, while a robotic system could perform precise, minimally invasive procedures to address the issue. This integrated approach would enable earlier, more accurate interventions, reducing the need for invasive treatments and improving patient satisfaction.

Real-world applications of AI and robotics in dentistry

While many of these technologies are still in the early stages of development, there are already promising examples of AI, robotics and 3D imaging being applied in dental practices around the world.

One recent example is the world's first fully automated dental procedure performed by a robotic system, which was conducted by our team at Perceptive Technologies. In this groundbreaking trial, a robotic arm, guided by AI-driven 3D imaging, successfully performed restorative dental work on a human patient.

The system completed the procedure for a dental crown in just 15 minutes, compared with the two lengthy office visits typically required for similar procedures. This trial not only demonstrated the potential for robotics to improve the efficiency and accuracy of dental procedures but also highlighted the feasibility of fully automated dental care in the near future.

In another case, AI-powered imaging software has been used to analyse dental X-rays and detect signs of decay and gum disease that even experienced dentists might miss. This software has been shown to significantly improve diagnostic accuracy, particularly in the early stages of disease when treatment is most effective. As AI algorithms continue to improve, they will become an invaluable tool for dentists, helping to ensure that no potential problem goes unnoticed.

As these technologies continue to develop, the future of dentistry will continue to evolve. AI, robotics, and 3D imaging have the potential to address many of the challenges that have long plagued the field, from missed diagnoses and delayed treatments to patient scepticism and inefficient procedures.

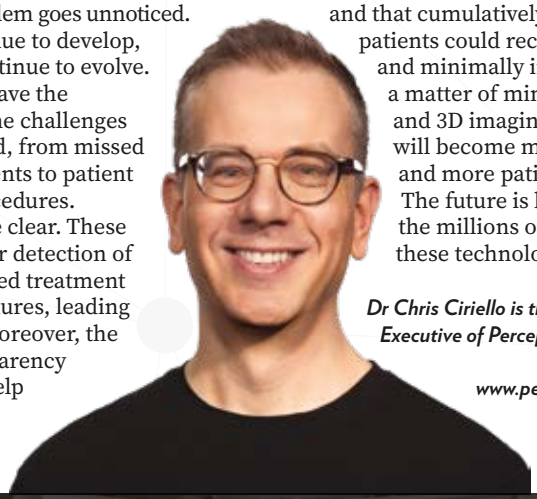
For patients, the benefits are clear. These technologies will enable earlier detection of dental issues, more personalised treatment plans, and less invasive procedures, leading to better overall oral health. Moreover, the increased accuracy and transparency provided by 3D imaging will help build trust between dentists and patients, encouraging more people to seek care and adhere to treatment recommendations.

For dentists, the integration of AI and robotics will streamline workflows, reduce the risk of human error, and allow practitioners to focus on what matters most: providing high-quality, personalised care to their patients. These technologies will also enable dental practices to see more patients in less time, improving both efficiency and profitability.

Of course, the widespread adoption of these technologies will require significant investment and training. Dental schools and continuing education programmes will need to adapt their curricula to ensure that practitioners are well-versed in the use of AI, robotics and 3D imaging. Regulatory bodies will also need to establish guidelines and standards for the safe and effective use of these technologies in clinical practice.

Despite these challenges, the potential benefits of AI, robotics and 3D imaging in dentistry are too great to ignore. As these technologies continue to evolve, they will undoubtedly transform the way dental care is delivered, improving both patient outcomes and the overall dental experience.

In the not-so-distant future, a visit to the dentist may look very different from today. Instead of treatments involving more than one appointment, and that cumulatively take hours to complete, patients could receive a precise diagnosis and minimally invasive treatment – all within a matter of minutes. And with AI, robotics and 3D imaging leading the way, dentistry will become more efficient, more accurate and more patient-centred than ever before. The future is bright for dental care – and for the millions of people who will benefit from these technological advancements.



Dr Chris Ciriello is the Founder and Chief Executive of Perceptive Technologies.

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LOOKING AHEAD

With Fianna Fáil and Fine Gael set to form a majority coalition in the Republic, the parties have outlined their stance on dental reform

Will you commit to support publishing a Bill to update the Dentists Act of 1985 within the first year of the next Dail?

Fianna Fáil: Yes.
Fine Gael: We are committed to updating this legislation to enhance patient protection and ensure safe practices within the profession.

How will you address the difficulties for working adults and families in accessing dental care?

Fianna Fáil: We have invested more than €200 million annually in the provision of oral healthcare, targeting those most in need of state support to access care.

This includes an additional €15m in core funding since 2019/2020, which is supporting progression of the National Oral Health Policy, Smile Agus Sláinte, and an additional €17m in one-off funding to address service backlogs. Looking at the payments for contractor claims between January and August this year, 200,570 additional treatments were provided under the Dental Treatment Services Scheme (DTSS), with more than 41,800 extra patients treated when compared with 2022.

There has been a decrease in the number of patients waiting to commence orthodontic treatment. A further €3.35m is being invested in 2024 on a one-off basis to support the continuation of measuresto reduce orthodontics waiting lists.

Fine Gael: More than €200 million is invested every year in the provision of oral healthcare, targeting those most in need of support and enabling access to care through the HSE Oral Healthcare Services, HSE Orthodontic Services, the DTSS for adult medical card holders, and the Dental Treatment Benefit Scheme.

We believe everyone who pays into our system should benefit from it. During our time in government, we restored some of the most popular treatment benefits available through Pay Related Social Insurance (PRSI), introduced new benefits and ensured people who are self-employed can also benefit.

We will continue to keep the Treatment Benefit Scheme under review to build on what we have already achieved.

Our manifesto also commits to placing the Dental Treatment Services Scheme on a sustainable footing.

How do you propose to address the failure to provide vital school screening appointments to more than 100,000 primary school children last year?

Fianna Fáil: The HSE is progressing the development of oral healthcare packages for children aged from birth to seven years of age, supported by additional funding.
Fine Gael: Fine Gael is committed to ensuring there is adequate access to prevention-focused oral healthcare and to hiring and retaining more HSE employed dentists. In doing so, we are very conscious of the need to focus these efforts on dental care in schools. We will also work to ensure a strong pipeline of graduates and have recently announced support for a new Bachelor of Dental Surgery in the RCSI. We are committed to further increases in training places.

Will you support the introduction of mandatory Continuing Professional Development (CPD) for dentists in the next Dail?

Fianna Fáil: Yes.
Fine Gael: CPD is essential to ensuring patient care and maintaining high standards. We are committed to engaging with representatives on this issue.

Will you support the recognition of dental specialties as advocated by the Dental Council and the Irish Dental Association?

Fianna Fáil: Will examine.
Fine Gael: Fine Gael's manifesto commits to acknowledging additional dental specialities, to improve the delivery of care available to patients.

Will you reform tax relief to reduce the cost of dental treatments to patients?

Fianna Fáil: Yes.
Fine Gael: We will keep these tax reliefs under review.

Will you ensure that a new dental school is built in Cork?

Fianna Fáil: Yes.
Fine Gael: Fine Gael is committed to working with University College Cork and the HSE in providing a new dental school in Cork. The minister, Patrick O'Donovan, has already engaged in this regard and is committed to doing so in the future.

Will you commit to properly fund dental schools to reduce their reliance on registration fees from overseas students?

Fianna Fáil: Yes.
Fine Gael: Fine Gael is committed to working with the Higher Education Authority to ensure a strong pipeline of graduates. We have recently announced support for a new Bachelor of Dental Surgery with the RCSI and are committed to further increases in dental training places in our universities.

Will you support the immediate commencement of talks on a new scheme to replace the DTSS medical card scheme with the Irish Dental Association?

Fianna Fáil: Yes.
Fine Gael: A range of measures was put in place on 1 May 2022 within the DTSS for adult medical card holders to introduce and reintroduce elements of preventative care and increase the fees paid to dental contractors for most treatment items by 40-60 per cent. Fine Gael's manifesto commits to reviewing the DTSS and placing it on a sustainable footing to improve service delivery and accessibility for patients.

Will you commit to providing funds to begin the roll-out of the 2019 oral health policy, Smile agus Slainte?

Fianna Fáil: Yes.
Fine Gael: Smile agus Sláinte was published by Simon Harris when he was Minister for Health in 2019, our manifesto commits to fully implementing this important policy.

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WELCOMING

Dublin will host the European Dental Students' Association annual summer meeting

Dublin is set to host the annual summer meeting of the European Dental Students' Association (EDSA) from 17 to 22 August 2025, featuring lectures and workshops aimed at enhancing the skills of dental professionals and students.

EDSA is a non-profit, student-led organisation dedicated to shaping the future of dentistry. Founded in 1988, it represents the collective voice of more than 70,000 dental students from 35 countries across Europe.

The association advocates for and supports dental students throughout Europe, ensuring their voices are heard on key issues. Its mission is to empower and unite future dental professionals through a range of initiatives, including educational programmes, leadership opportunities and international collaboration.

"We are thrilled to welcome dental students from across Europe to our vibrant city," said Roisin Tang, President of the local organising committee, "and to showcase both the rich heritage of Dublin and its contributions to the field of dentistry.

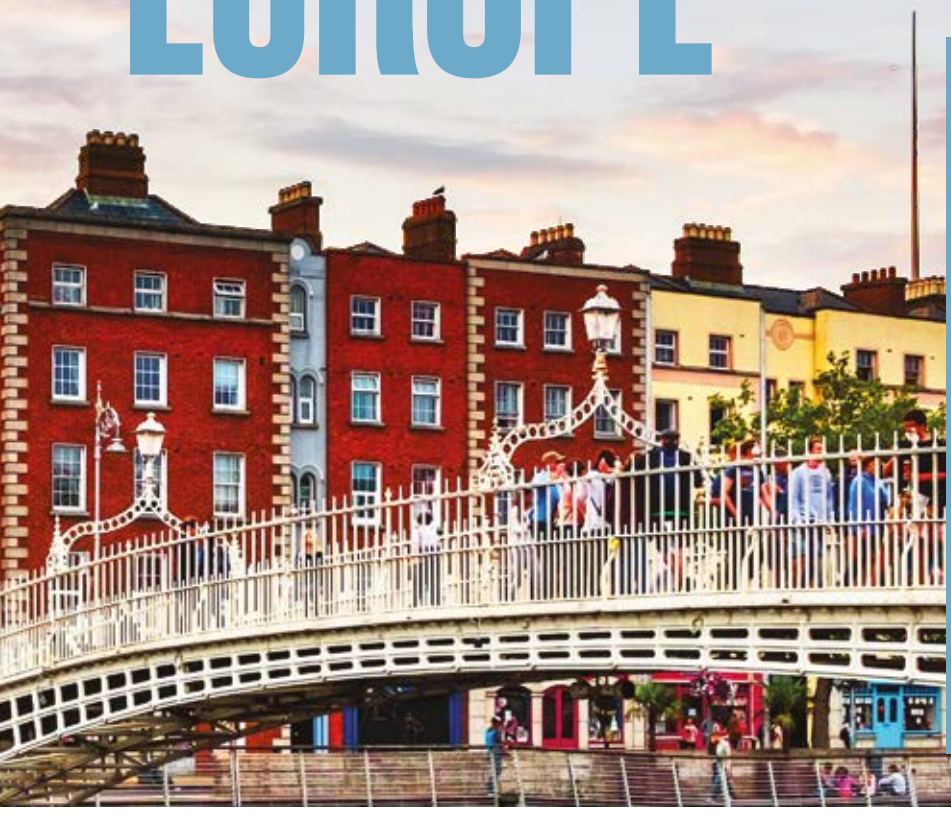
"This meeting represents an exciting opportunity for collaboration, learning and innovation and we look forward to playing our part in shaping the future of European dentistry. It will feature a dynamic mix of educational and social activities, providing students with opportunities to learn, collaborate and connect with one another."

The meeting features workshops led by dental experts from Ireland and Europe, immersing attendees in the latest advancements in dental technologies, techniques and research. The event provides opportunities for students to network with dental professionals from across Europe. Hands-on training sessions will allow students to apply theoretical knowledge, gain valuable experience and engage with guest speakers for insights into dental practice and research.

During the day, participants will also engage in standing committee sessions, policy discussions and debates on key issues affecting dental education. In addition, there is a research competition, which allows students to present their research to their peers and be rewarded for their hard work. A highlight of the week is Sponsors Day, on which sponsors have the chance to present lectures and workshops, showcasing their brands and vision to the future leaders of dentistry.

Evenings will offer a vibrant social programme. One of the most anticipated events is EDSAvision,

EUROPE



The event will showcase Dublin's rich heritage

1. **Advocacy**
   Championing the rights and interests of dental students on a global stage
2. **Networking and collaboration**
   Fostering connections and partnerships among students, educators and industry leaders
3. **Research and innovation**
   Promoting cutting-edge research and encouraging innovative practices in dentistry
4. **Access and inclusivity**
   Ensuring equal opportunities and inclusive practices within the dental community
5. **Oral health promotion**
   Leading efforts to improve oral health awareness and education
6. **Fun**
   Creating enjoyable and memorable experiences that enhance student engagement and community spirit

with representatives from each country performing a song on stage – a much-loved EDSA tradition at every summer meeting. Another special evening will feature a collaboration with the Association for Dental Education in Europe (ADEE), when students will have the opportunity to connect and share ideas with their professors.

The meeting will culminate in a formal gala dinner, hosted at the Hyatt Centric Hotel. The gala will be a night of celebration, networking and recognition of outstanding contributions to dentistry across Europe. The week will conclude with a closing ceremony, summarising the key takeaways from the meeting and celebrating its success. The ceremony will feature farewell speeches and special award presentations.

Hosting the EDSA event in Ireland's capital will ensure that students gain valuable academic insights into the world of dentistry and immerse themselves in the Irish culture and the social experiences, making it a wonderful positive impact above and beyond the field of dentistry.

"We believe that Dublin is an exceptional choice for the 76th EDSA general meeting due to its unique balance of academic prestige, vibrant cultures and historical scenery," said Roisin. "The city's dedication to sustainability aligns with many dental professionals' goals in maintaining a green environment.

"Furthermore, ADEE will also host its meeting in Dublin next year in the Trinity Business School. This will establish a partnership with our EDSA event and enhance networking opportunities for both Ireland and the rest of Europe, creating a supportive environment for advancing dental practices and education globally."

Follow @edsasummermeeting on Instagram.
Any queries, email dublin2025@edsaweb.org

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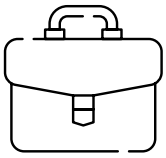

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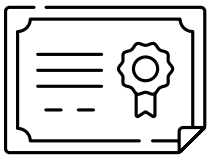

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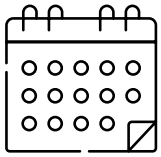

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JUST SHOUT FOR STEPHANIE!

NSK's new Product Specialist for Northern Ireland and the Republic of Ireland describes how her experience of working in a dental practice brings a different perspective to the role

My name is Stephanie Gilliland. I live in Co Fermanagh with my husband and three children who give me the support I need to do the work I love – working in dentistry. I've been working in dentistry for more than 20 years. I first qualified as a dental nurse in Belfast and worked in practice for 18 months before moving to Fermanagh to join Blueapple Dental, a private dental practice in Belcoo.

Blueapple was a very forward-thinking practice, working a lot with dental implant patients. They were always looking to offer something different to other practices. I was lucky enough to work there as a dental nurse for 11 years before being given the role of treatment coordinator. When the practice changed ownership, I became the practice manager. This was a busy but enjoyable role, which I held for three years before becoming a sales representative for one of the world's leading dental implant companies.

After five years working in the field of dental implants, I was offered the chance to join NSK as Product Specialist for Ireland. I had been using NSK products for a long time in practice and because of my previous roles I was very familiar with NSK's surgical equipment, including Surgic Pro micromotors for implants and oral surgery and the VarioSurg ultrasonic bone surgery system.

I therefore felt very comfortable in my new role at NSK. I knew I was working with really good products and understood not only how they work in practice but also the benefits they can bring to dental professionals. I cannot sell a product that I don't truly believe in. I have to know it's a good product before I talk to any dentist or practice manager, so being able to work with NSK and sell products I truly believe in is paramount to me.

MY WORK IN PRACTICE

I will never forget working in practice, seeing how dental treatment can completely change a person's life. I've witnessed patients transform from being quiet and self-conscious to bursting with new-found confidence once treatment was complete – and that was all to do with changing their smile.

Working in dentistry and being able to be involved in patients' journeys is what makes me love my role so much. Good dentistry makes such a difference to people's lives and their confidence, and we should never forget that the patient is at the centre of everything we do.

I've had many roles over the years but being a practice manager was definitely the hardest. It's a role that demands constant juggling and you wear many different hats. You need plenty of help and support to keep things running smoothly.

Knowing that I'm working with a company that prides itself on providing outstanding customer support is very important to me. As a practice manager, NSK was exactly the type of company I wanted to partner with. Basically, a company that could take some of the pressure off my day-to-day role, be that a product specialist to come in and train the team on a new product or providing aftercare for new products. And, of course, if something goes wrong, those in the practice rely on support on the ground to get things sorted as quickly as possible.

> "KNOWING THAT I'M NOW WORKING WITH A COMPANY THAT PRIDES ITSELF ON PROVIDING OUTSTANDING CUSTOMER SUPPORT IS VERY IMPORTANT TO ME"

HERE TO HELP

Although I'm only seven months in, I'm looking forward to putting my own stamp on my role at NSK and carrying on all the good work my predecessor did before me. I'm here to support every practice in any way that I can, so please reach out to me and let me know how I can help. I'm an open door and you can reach me by phone, email, through WhatsApp, or I can arrange a practice visit wherever you are based and at a time to suit you.

Remember – just shout for Stephanie!

Stephanie Gilliland
Contact details
M: UK: +44 (0)7435 840097
E: sgilliland@nsk-uk.com

Aesthetic crown lengthening and minimally invasive laminate veneers to resolve altered passive eruption

Cimara Fortes Ferreira, Edival Barreto Magalhães, Barbara Zini

Introduction

The aesthetic appearance of an individual's smile plays a significant role in their social and psychological wellbeing[1]. A "gummy smile," characterised by an excessive display of gingival tissues (>3 mm) during smiling, is considered unattractive[2,3]. A pleasant smile is when the gingival margin of the maxillary teeth is approximately 1mm from the upper lip. To maintain a pleasant smile, it is recommended that this distance does not exceed 2-3mm.

Several factors, including altered passive eruption (APE)[4], vertical maxillary excess[5] and hypermobile upper lip[6], can contribute to this condition. APE, a localised tooth-related factor classified as developmental or acquired condition[7], is subdivided into two types. Type I involves the gingival margin being incisal or occlusal to the cementoenamel junction (CEJ), with the mucogingival junction (MGJ) positioned apical to the crest of the bone. Type II is characterised by a normal gingival dimension, with the free gingival margin incisal or occlusal to the CEJ and the MGJ positioned at the CEJ. Both types have subdivisions, with subdivision A indicating that the alveolar crest is 1.5 to 2 mm apical to the CEJ and subdivision B indicating that the alveolar crest is coincident with the CEJ[8].

Treatment options for APE type I include gingivectomy, apically positioned flap, and osseous resective surgery. A comprehensive treatment plan involving prosthodontics, orthodontics and periodontics is necessary for addressing APE type II. However, caution must be exercised during osseous resective surgeries to prevent excessive bone resection and subsequent gingival recession, which can lead to aesthetic complications[9].

Case description and results

The case was a Coslet type I subdivision B that required surgical crown lengthening using selective osseous correction[10]. The patient, a 46-year-old female, presented to a private clinic with a chief complaint of unpleasant aesthetics. Her medical history was non-contributory. A clinical evaluation was conducted at the first appointment following the clinical protocol described in the literature[11]. Her dental history revealed significant dental restorative work that had been done in the last 16 years.

Her periodontal probing depths were within 1-3 mm. She was diagnosed with periodontal health and with a developmental and acquired condition[7], APE[12], and Coslet type I subdivision B[8]. She presented facial and lip symmetry and normal lip mobility. The maxillary anterior teeth showed normal width but reduced length, and she showed a slight right deviation of her maxillary anterior midline.

An intraoral evaluation revealed that the position of the mucogingival junction was approximately 5mm from the gingival sulcus, characterising excessive gingival display[4] (Figure 1).

Figure 1 (a) Frontal view. Note the excessive gingival display and reduced height for the anterior maxillary teeth during patient's high smile. (b) Perspective view. Note the reduced size of the patient's #9 and 10

THE USE OF A DIGITAL WORKFLOW IN DENTISTRY HAS BEEN DETAILED AS A STEP-BY-STEP PROCESS TO ENHANCE THE GINGIVAL ARCHITECTURE IN THE AESTHETIC ZONE”

The use of a digital workflow in dentistry has been detailed as a step-by-step process to enhance the gingival architecture in the aesthetic zone[13]. The patient’s dental casts were created, and a mock-up was developed using the Digital Smile Design protocol[14] to achieve an aesthetically pleasant dental arrangement that harmonises with the patient’s facial features[15] (Figure 2). The patient expressed satisfaction with the proposed aesthetic solution and approved the treatment plan.

The initial assessment using the pink aesthetic score (PES)[16] indicated scores ranging from eight to nine for the six anterior maxillary teeth, primarily due to tooth contour. The white aesthetic score (WES)[16] for the same teeth varied from three to five, mainly attributed to the lack or absence of tooth form, volume, colour surface texture and translucency.

The treatment plan included crown lengthening and 0.4-0.6 mm wide ultrathin ceramic laminates, as well as lithium disilicate laminate veneers (LDLV) from teeth #5-13. The successful use of layered pressed-ceramic LDLV technique has been described in the literature[17]. The patient approved the treatment plan, and in the following week, the crown lengthening was conducted.

The surgical appointment involved using the mock-up as an aesthetic stent for the crown lengthening procedure (Figure 2). After administering anaesthesia, the aesthetic stent was inserted, and the future position of the CEJ was marked. An internal bevel incision was made based on the markings for each tooth, preserving the interdental papilla. Subsequently, an intrasulcular internal bevel incision (Swan Morton, UK) was made with a 15C blade (Figure 3a), and a collar was obtained. After collar removal, subgingival enamel was exposed. The golden proportions were rechecked using a periodontal probe (Figure 3b).

Next, a full-thickness buccal flap was elevated to the level of the mucogingival junction. After flap reflection, the bone showed to be at the CEJ (Figure 4a). The distance from the bone crest to the CEJ was measured transsurgically, using the aesthetically driven surgical stent (mock-up), for the osteotomy. The osteotomies were performed to achieve 2mm between the CEJ of the crown line angles and the aesthetic gingival stent margins. A 1mm bone reduction was carried out from the line angles to the mesial and distal proximal sites of the proposed restorative margins. No bone reduction was performed interproximally for the mesial sites of the central incisors. A periodontal probe was used to assist the bone reduction procedure. Manual (#2 Fedi, #36/37 Rhodes chisels) and rotatory instruments were used for osteotomy and osteoplasty.

Following bone reduction (Figure 4b), the surgical sites were thoroughly irrigated with saline solution, and the buccal flap was repositioned. Next, digital compression was conducted for one minute, and a 3/8 circle 13 mm needle with a 6-0 polypropylene thread (Atramat, Japan) was used to stabilize the flap with simple interrupted sutures.

The patient received postoperative instructions and was placed on a pain control regimen (750 mg of paracetamol four times a day for the following three days). Oral hygiene instructions, including the use of 0.12% chlorhexidine gluconate oral rinse (PerioGard, Colgate, Johnson & Johnson) twice daily for two weeks, were provided, and the patient was advised to refrain from mechanical plaque control in the operated sextants for two weeks.

Additionally, the patient was instructed to refrain from toothbrushing for two weeks, apply ice packs for the first 24 hours post-surgically, consume only soft foods during the first week, and avoid any other mechanical trauma to the surgical sites. Flossing was permitted for the mesial aspect of the central maxillary incisors after 10 days postoperatively and 21 days

Figure 2 (a) Frontal and (b) perspective views of the patient’s smile using the mock-up. Note an aesthetically pleasing smile

postoperatively, to allow sufficient healing of the interproximal sites that received a bone reduction procedure.

After seven days, the patient was instructed to use a two-year-old soft bristle paediatric toothbrush, brushing only in the direction from the gingival tissues towards the tooth. The patient was discharged, and the sutures were removed at the 10-day appointment.

At the 15-day postoperative appointment, the patient received prophylaxis prior to suture removal (Figure 5a). The provisional restorations were placed after 60 days of healing and the definitive restorations were cemented six months postoperatively using a photopolymerizing resin-luting cement (Variolink Esthetic, Ivoclar Vivadent) (Figure 5b).

Figure 3 (a) Mock-up used as aesthetic stent for the crown lengthening procedure planned for teeth #4-14. (b) A periodontal probe was used to assist during the bone reduction

Figure 4 (a) Frontal view after a full-thickness flap was elevated. Note the presence of the bone at the level of the cementoenamel junction from teeth #6-11. (b) Frontal view of the bone after bone reduction was conducted. Note the presence of extensive overhang of the mesial aspect of the restorations for tooth #8

Figure 5 (a) Fifteen days postoperatively after the sutures were removed and the provisional restorations were placed. The patient returned for suture removal. Note the presence of slight marginal erythema, which may be expected at this follow-up period. (b) Frontal view six months postoperatively with the final laminate veneers

Figure 6 (a) Frontal view of the patient's smile six months postoperatively. Note the aesthetic smile. (b) Perspective view of the patient's smile six months postoperatively

Figure 7a Preoperative frontal view of the lack of lip in repose. (b) Postoperative frontal view of the lip in repose showing the presence incisal edges of the anterior maxillary teeth

During the six-month follow-up, the patient exhibited an aesthetic smile (Figures 6a and 6b), attributed to achieving aesthetic equilibrium through adhering to the golden proportion measurements for the anterior maxillary teeth. The patient's final PES[16] was 10 for the six anterior maxillary teeth due to recovery of the gingival contours. For the same teeth, the patient's final WES[16] was 10 due to complete tooth form, volume, colour, surface texture and translucency.

Discussion

The altered passive eruption is commonly addressed with an aesthetic crown lengthening procedure, which involves gingivectomy or apically positioned flap with or without ostectomy[10]. Aesthetic crown lengthening procedures have been documented in a controlled clinical trial[18]. In this case, the patient exhibited gingival display of 3mm or more when smiling, a finding known to impact aesthetics negatively[19]. The proposed treatment of crown lengthening and LDLV successfully addresses the patient's aesthetic concern. The concept of patient satisfaction has been evaluated in dentistry and medicine revealing its multidimensional characteristic and the need for a better definition[20]. This treatment combined aesthetic crown lengthening, using the Digital Smile Design (DSD) concept, and a digital wax-up to fabricate pressed LDLV layered with feldspathic porcelain[17].

> "THE PROPOSED TREATMENT OF CROWN LENGTHENING AND LDLV SUCCESSFULLY ADDRESSES THE PATIENT'S AESTHETIC CONCERN"

In addition, Belser et al's proposed modification to the PES and the WES[16] was used to evaluate the esthetics before and after treatment. This method of evaluation quantifies aesthetics, allowing for comparison of treatment results between studies. The proposed treatment of an APE type I subdivision B, with aesthetic crown lengthening and the use of ultrathin LDLV, resulted in an increase in the PES from 8 to 10 and a significant increase in WES from

3.5 to 10. These scores quantify the deficient patient. However, the "gummy smile," which would be represented by the pink aesthetics, was shown to be of lower importance when using the scale when compared to the WES, which was significantly low at the patient's initial visit. The authors suggest a limitation of the PES score for "gummy smile" cases. Adding the length of the gingival tissues to this evaluation would facilitate giving them a more accurate aesthetic score.

Mootha et al[21] compared the use of different tools for aesthetic treatment planning the anterior maxillary teeth and their relation to the various geometric proportions in an Indian population sample. In this study, the use of the Digital Smile Design software protocol and Chu's proportion gauge[22] range leads to pleasing smiles in the studied population. The present case report used the Digital Smile Design protocol for the aesthetic treatment planning of the anterior maxillary teeth.

The literature supports the use of digital workflow to improve treatment planning for gingival/tooth architecture in the aesthetic zone. The use of a diagnostic mock-up or overlay as a crown lengthening surgical guide to improve the "gummy smile" has shown to be a viable option as a surgical guide for crown lengthening[13]. This case report used a digitally made aesthetic stent to guide the surgeon during the surgical procedure, and the patient accepted outcomes presented during the treatment planning phase.

The cement system used in this case utilises a novel dibenzoyl germanium derivative photoinitiator which exhibited statistically superior colour stability and a higher degree of conversion when compared to Calibra, Variolink-N and NX3 resin cements in an *in vitro* setting[23].

A limitation of this case report is the lack of use of digital technology to precisely measure the amount of increased lip support reached with the executed treatment.

Conclusion

An APE type I subdivision B case was treated with aesthetic crown lengthening and minimally invasive LDLV to resolve the patient's aesthetic concern. The proposed treatment reduced the gingival display significantly and increased the crown height to length proportions, resulting in an aesthetic smile and patient satisfaction.

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Jordi graduated as a dentist at International University of Catalunya (UIC). He also completed a Master's Degree in Clinical Research and a three-year International Master's Degree in Oral Surgery and Implantology at the same institution. Since then, he has collaborated with several clinics in London, Spain, and recently Belfast. Jordi's clinical practice is in the field of implant dentistry. He has significant experience and expertise in the treatment of bone tissue regeneration, implant related surgical procedures, as well as soft tissue management. Jordi is a university professor and a clinical lecturer at UIC where he teaches only masters and postgraduate students from the Oral and Maxillofacial Surgery department. He regularly attends congresses, lectures, and conferences, on all aspects of implantology to maintain his knowledge in this field. Jordi's aim is to always make patients' oral surgery experiences as pleasant as possible. In his spare time, he enjoys practicing a variety of sports and travelling.

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EXPERIENCE SPEAKS VOLUMES

SIMON GARTHWAITE is a Business Development Manager at AeronaDental – a cloud-based dental practice management software company (DPMS) based in Northern Ireland, with a customer base in both Ireland and the UK, as well as Romania, Argentina, Cyprus, Spain and Malta.

With almost 40 years of experience in the dental profession, Simon has fulfilled various technical support, customer service and digital integration roles. Having worked with several providers of dental practice management software and NHS systems, Simon is thrilled to be part of the AeronaDental team.

"AeronaDental listens to customers and implements changes quickly, ensuring that software features reflect the needs of our dental practices," said Simon. "Consistently delivering excellent customer care and support is at the heart of the business, and this is very much something that aligns with my own values. The product itself is also unique in that it is a truly cloud-based solution, offering customers an unparalleled level of security and flexibility.

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