

# EDSA

## Magazine



*Summer 2019*

*Berlin, Germany*

# All Worn Out

*Why tooth wear is a growing  
problem in Europe*

# Contents

p5 EDSA Team

p6 Editorial - Lancet Oral Health

p8 Introduction to MRONJ

p10 Implants for all?

p12 CT-guided RCT

p14 Curaden Student Camps

p18 Interview with a president

p20 Integration of Oral Health

p22 ioDent® Smart Dental Solutions

p23 Hu-Friedy University Program

p24 Implants and MDTs

p26 EVP Roundup

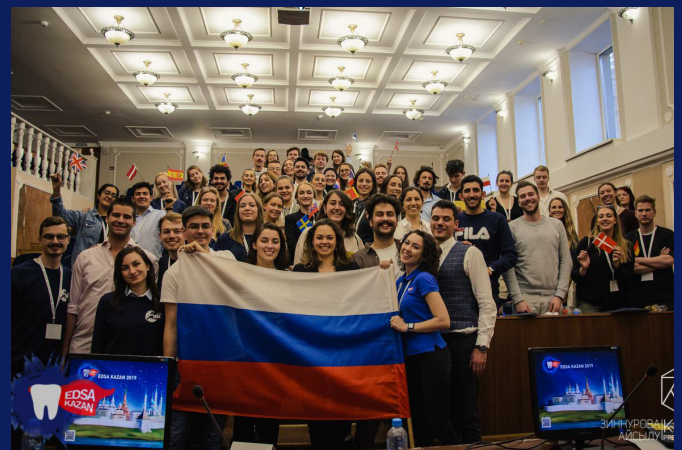
p28 Erosive Tooth Wear

p30 Lecture Competition Winners

p36 EDSA Crossword



p15 Treating patients with aesthetic concerns - are students ready?



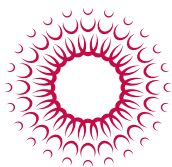
p32 EDSA Kazan - From Russia with Love

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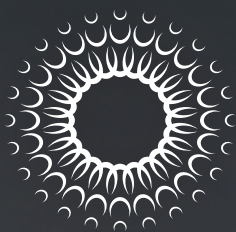
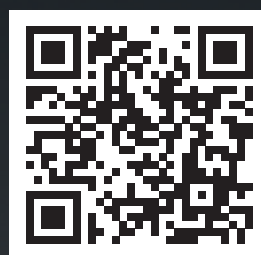
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# Messages From The Team

Dear EDSA family,

Welcome to the Summer Magazine of 2019! This will be my final magazine as EDSA Magazine Editor-in-Chief, and so I am delighted to have such a range of articles from some great student writers for you to read. I would like to thank all the writers who I have worked with for their hard work and dedication - it takes a lot of time and effort to produce the articles you see so they deserve great credit. I would also like to thank the committee for all their help and support in this role over the last year. They work tirelessly throughout the year to improve the association, to represent students at the highest level, and to help organise the wonderful events (along with the LOCs) such as the meeting here in Berlin.

It has been an honour to be VPPR this year, and I wish my successor all the best in what is an exceptionally rewarding role, and encourage all those with energy and ideas to consider getting involved in the EDSA committee!

**James Coughlan**, *Editor-in-Chief*



Dear EDSA family,

Welcome to those of you in Berlin and to everyone reading this in their own countries. I would like to thank our Editors - James Coughlan and Ivana Ligusová for this remarkable final magazine of the year 2019, a great testament to their many hours of work.

I would also like to thank the entire team with whom I have had the pleasure of working with during this mandate, and to thank you all for the pleasure of leading EDSA over the last year. I am very proud of everything we have achieved, and I wish Tin Crnic, the President-Elect, and his new committee the best for the coming mandate - I am sure they will do the association proud and continue the important work of EDSA. Being part of EDSA for the last 5 years has been the most amazing experience, and I would encourage everybody to get involved - you will not regret it!

**Alyette Greiveldinger**  
*President 2018/19*



Dear EDSA family,

I am very glad that so many of you decided to write an article into the EDSA Magazine, and I'd also like to encourage everyone to do it in the future. I believe that some of us will be giving lectures on dental congresses in the future - writing articles now is a great training exactly for that. Ability to write in an interesting way is the first step to a perfect public speaking. The best speaker is a prepared one - and most of the speakers have their presentation in the written form first.

The magazine has given me many opportunities to grow and I want to thank both of the Magazine editors who let me work with them - Linnea Borglin and James Coughlan. It's been very enriching to me.

I wish everyone to have a nice meeting in Berlin and I hope you'll learn a lot new from this magazine.

**Ivana Ligusová**  
*Magazine Co-Editor*





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# The Lancet Oral Health Series – An opportunity to take global oral health out of the shadows



**James A. Coughlan, EDSA Vice President Public Relations, UK**

It is not very often that those outside the world of dentistry pay attention to oral health. There has been a strong historical split between medicine and dentistry that recent calls to “put the mouth back in the body” have not quite managed to rectify.

This could be about to change. At UCL's Bentham House in central London, oral health leaders, representatives from civil society organisations, NCD pressure groups, and journalists gathered for the launch of the first oral health series in *The Lancet*, one of the most influential and widely read medical journals in the world.

Lead by Richard Watt from UCL's Department of Dental Public Health, the series contained 2 key articles, alongside two correspondence articles and two commentary pieces. Drawing attention to the long-time neglect of oral health, the series noted that over half of the global population suffer with untreated oral

disease, with untreated dental caries in the permanent dentition being the most prevalent disease. It strongly criticised the current dental care systems as inadequate, with the current “treatment focussed, interventionist, and technical philosophy” of dental care rendering it inaccessible to the global poor and other vulnerable groups and for failing to reduce inequalities in oral diseases.

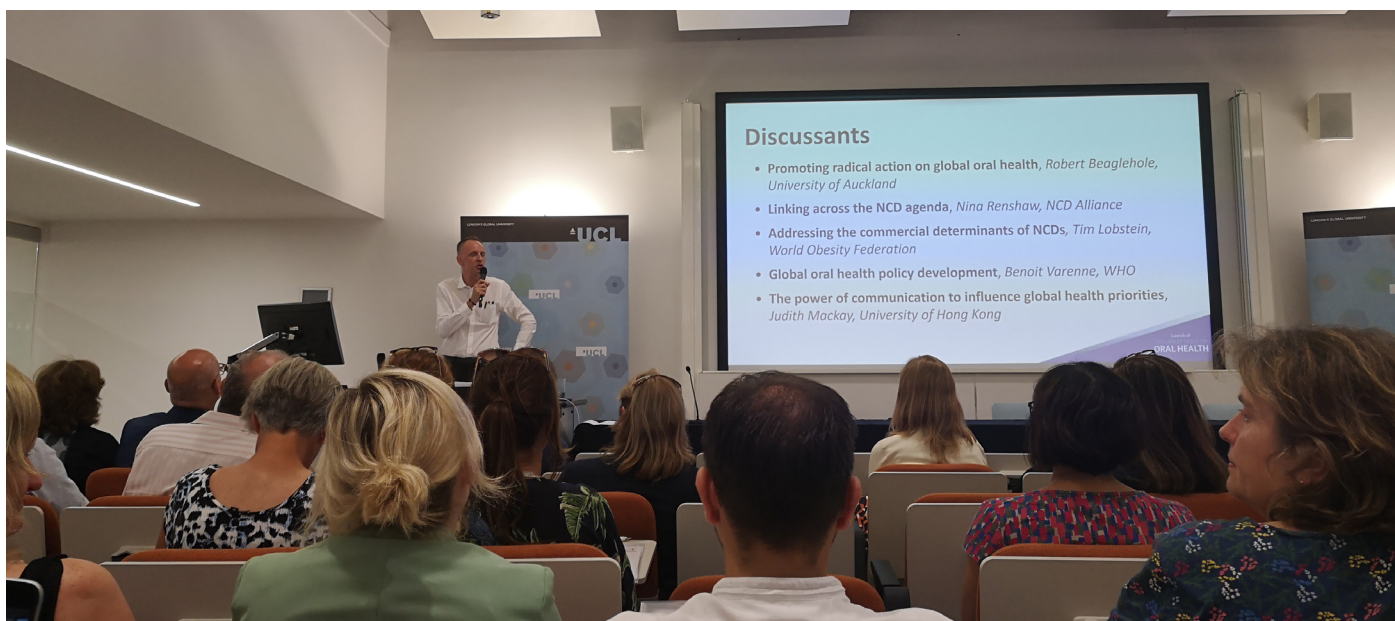
## **The Sugar Industry – A common enemy**

The knowledge that sugar is a key cause of dental caries is a fundamental tenet of oral health, yet the series largely reframed the issue not as a personal responsibility to reduce intake, but as a “battle” with the sugar industry. The commercial determinants of health were given extensive space in the two key articles and were a hot topic of discussion at the event.

Professor Judith Mackay, an expert in tobacco control, drew parallels with

the fight against the tobacco industry, calling on attendees to counter industry misinformation on health and economic data presented to governments, while Dr. Cristin Kearns from University of California emphasised the need for dental organisations to address conflicts of interests with the sugar industry. Her article in the series pointed out that organisations like the European Organisation for Caries Research (ORCA) and the International Association of Dental Research (IADR) included corporate members who, as well as making oral health products such as toothpastes and xylitol chewing gum, were also producers of sugary drinks and chocolates. She warned such funding can promote research towards interventions, and but away from the principle harms of sugar.

The series advocates for stronger action on sugar – taxes such as those in Mexico and the UK, restrictions on



*Richard Horton, Editor-in-Chief of The Lancet*

placing high sugar snacks by checkouts, and stricter food guidelines for schools and workplaces, but also bringing more attention to the globalised nature of sugar production, with aspects of international trade such as sugar production quotas and price subsidies also being important.

## **Criticism Abound**

The authors' appraisal of the current approach to oral health were stinging – underfunded, ignored, isolated from the rest of healthcare systems, and poorly advocated for on the global stage. Editor-in-Chief of the Lancet and Global Health heavyweight, Richard Horton, described such self-criticism as “unprecedented in my experience”. Yet the truth is that such self-criticisms have been around for a while - what differentiates this Lancet series is the cohesiveness of the arguments as a whole, rather than fragmented in disparate publications by different groups. Drawing together these strands in two compelling papers provides a powerful narrative that is

more difficult to ignore.

There were also clear steps towards proposals. The authors called for increased use of skill mix and community workers to provide basic services, with a shift from a dentist-centred model. A move to outcome-based payment systems incentivising prevention. Calls were also made to make oral health more accessible for governments and policy makers, with simpler, more relevant indicators, and the promotion of applied health service and implementation research to aid planners. Concrete proposals, however, were largely absent, with Horton noting in his closing remarks “a plan is something I haven't heard today”.

The lack of a specific mention of either education or youth involvement was disappointing, considering the reliance of the proposed changes on a radical overhaul of both who is trained and how they are trained. Benoit Varrene, the WHO Dental Officer, called for greater

involvement of dental students and young dentists – a welcome interjection, but participants under 30 at the event were few. Meaningful involvement of the youth is urgently needed on a much greater scale than at present and we at EDSA stand ready to contribute.

## **A way forward?**

Some solutions were readily proposed by all – using the UN high level meetings as launch boards to include oral health in universal health coverage (UHC) for example, was strongly supported, as was the importance of the upcoming WHO global oral health report. In other areas, however, consensus remained elusive.

Some believed that integration into the non-communicable disease (NCD) agenda was the way forward, while others believed that global oral health community should maintain its independence and create a new body to bring together stakeholders (the proposed name – the Lancet Oral Health Advocacy Network, or LOAN – amusingly failed to see it's obvious flaw in moving beyond from the money-centric view of dentists).

Interestingly, there was a pledge from Horton to create a Lancet Oral Health Commission, in which more concrete proposals might be formed and disseminated. This is welcome – The Lancet has a track record of positive impact from its commissions and their influence in the arena of global health is formidable. These papers provide a unique opportunity to begin real progress in addressing the scourge of oral disease, but to do so will require a paradigm leap, less shift, from the oral health community. As one panel member rightly pointed out – more of the same simply won't change anything.



(L-R: Professor Richard Watt - Lead author of the Lancet Oral Health Series, Ave Pold - IADS President, James Coughlan - EDSA VPPR, Benoit Varenne - WHO Dental Officer)

*The Lancet Oral Health Series can be found at <https://www.thelancet.com/series/oral-health> and is free to access - we encourage all students to read the key papers.*

# Introduction to MRNOJ: Diagnosis and Treatment

As cancer therapeutics becomes more targeted, increasing numbers of patients will be taking anti-angiogenic medication, leaving them at risk of MRONJ. Amna Sačić gives us an overview of the condition and the current treatment regimes.



## Amna Sačić, Bosnia and Herzegovina

Medication Related Osteonecrosis of the Jaws (MRONJ) is a disease characterized by the presence of exposed bone in the maxillofacial region, which persists for a long period, that occurs as a result of the use of antiresorptive drugs such as bisphosphonates and denosumab, as well as antiangiogenic drugs. (1)

According to the AAOMS (American Association of Oral and Maxillofacial Surgeons) specification, the diagnosis of MRONJ is based on the following criteria:

- Presence of exposed bone or bone probing through the existing intraoral or extraoral fistula in the maxillofacial region, persisting for more than 8 weeks.
- Current or earlier treatment with a group of antiresorptive or antiangiogenic drugs.
- The patient has not undergone

radiotherapy in the maxillofacial region in the past and has no obvious metastatic processes in the bone. (2)

To date, more than 1300 scientific papers have been published with more than 15000 cases discovered. (4)

### Evolution of MRONJ concept

MRONJ was first described in a 2001 book by Marx and Stern. The authors point to the development of a new clinical condition observed in patients with multiple myeloma treated with bisphosphonates. They called it „Drug-induced avascular necrosis“, due to the significant vascular atrophy in the area of the affected bone. (5)

In 2003, Marx published the first scientific paper describing the appearance of exposed bone in the maxillofacial region in 36 patients treated with intravenous

bisphosphonates.

Later, with the emergence of new cases, atrophy of nutritional vessels was found to be a consequence of the toxic effect of bisphosphonates on osteoclasts. It was established that atrophy of the blood vessels is a consequence and not the cause of the disease, so the existing name was replaced by the new name – BRONJ (Bisphosphonate related osteonecrosis of the jaws) (1,6)

In 2010, scientific papers were published describing osteonecrotic changes in the jaws of patients treated with denosumab and antiangiogenic drugs. Currently, 9 drugs in this group are associated with the occurrence of the jaw osteonecrosis. There has been a large expansion in the use of these drugs due to the increasing tendency to treat malignancies in a more targeted manner- more cases can be expected in the future. Considering this discovery, AAOMS changes the name BRONJ to MRONJ in 2014. (7)

### First treatment recommendations

Treatment for MRONJ is based on the elimination of symptoms such as pain and infection. Treatment includes a rigorous oral hygiene regimen, local antiseptics, antibiotics and analgesics. (8)

It has been observed that a significant number of cases occur immediately after tooth extraction. Surgical procedures are considered strictly contraindicated as they are thought to be the cause of MRONJ development or significantly exacerbate the existing condition. (9)

The first evaluation studies of MRONJ treatment by conservative methods have yielded extremely disappointing results: Marx et al. report a 100% failure to treat MRONJ with conservative methods in



MRONJ- Stage III (3)

119 patients. Since then, similar studies on evaluating the success of conservative methods have emerged, which, like Marx's study, do not produce better results.(8)

There is therefore a need for a new therapeutic protocol that will offer better therapeutic success in treatment. More radical treatments, including surgical therapy, are beginning to be utilised. (10)

#### AAOMS staging and stage specific treatment guidelines

AAOMS has published guidance on the staging and treatment recommendations for MRONJ, as seen below (8).

Stage	Description	Treatment recommendations
0	No clinical evidence of necrotic bone, but nonspecific clinical findings and symptoms.	Systemic management, including use of analgesics and antibiotics.
I	Exposed and necrotic bone in asymptomatic patients without evidence of infection.	Antibacterial mouth rinse Clinical follow-up on quarterly basis Patient education and review of indications for continued bisphosphonate therapy.
II	Exposed and necrotic bone associated with infection as evidenced by pain and erythema in region of exposed bone with or without purulent drainage.	Symptomatic treatment with oral antibiotics. Oral antibacterial mouth rinse Pain control. Superficial debridement to relieve soft tissue irritation.
III	Exposed and necrotic bone in patients with pain, infection, and one or more of the following: exposed and necrotic bone extending beyond the region of the alveolar bone (i.e., inferior border and ramus in the mandible, maxillary sinus, and zygoma in the maxilla), resulting in pathologic fracture, extraoral fistula, oroantral/oronasal communication, or osteolysis extending to the inferior border of the mandible or the sinus floor communication, or osteolysis extending to the inferior border of the mandible or the sinus floor.	Antibacterial mouth rinse Antibiotic therapy and pain control. Surgical debridement/resection for longer-term palliation of infection and pain.

The therapeutic procedures used in MRONJ treatment can be divided into two categories-conservative and surgical methods.

**Conservative treatment** can be used on its own, but in most cases, it is used to support surgical treatment in order to help eradicate the infection and improve bone and soft tissue healing. Conservative treatment involves local and systemic antibiotic use, low-level laser therapy, ozone, and hyperbaric oxygen therapy.

(1,8)

**Surgical treatment** involves the surgical removal of the necrotic bone. Depending on the extent of the osteonecrotic process and the general health of the patient, we decide on a surgical treatment that can be: conservative and radical.(8)

**Conservative or minimally invasive surgical treatment** involves procedures that require minimal incision and traumatization of surrounding tissue. They can be performed with the use of piezo-devices and Er: YAG lasers that minimally traumatize surrounding bone

and soft tissue to create more favorable conditions for healing .(11,12)

**Radical surgical treatment** involves the complete removal of the osteonecrotic bone, using conventional surgical techniques. Depending on the extent of the necrosis , it can involve osteotomy of the affected region, removal of the entire bone segment, or in extreme cases, partial or total maxillectomy and mandibulectomy. After resection, there

is a need for defect closure to prevent bacterial contamination, which is achieved by applying local or free flaps. (8)

In cases of major bone defects that occur after resection, there is also a need for bone reconstruction using bone flaps and grafts. (1,13)

#### Innovative treatment options

Innovative therapeutic procedures in the treatment of MRONJ include the use of stem cells, growth factors such as bone morphogenetic protein and leucocyte and platelet-rich fibrin (L-PRF) and teriparatide.. In recent years, evaluation of their clinical applicability has been intensified with an increasing number of clinical studies indicating the efficacy of these procedures. (14–16)

#### Conclusion

There is no universal therapeutic protocol in the treatment of MRONJ and given the multifactorial nature of the disease , it may never exist.. Years of research have led to the introduction of various therapeutic procedures in the treatment. The realization that surgical treatment is not contraindicated, has significantly improved the outcome of treatment for these lesions. When choosing the type of treatment, one should always keep in mind: the existing disease of the patient and whether the potential benefit of the selected treatment outweighs the potential risks for the patient.

#### References

- De Ponte FS. Bisphosphonates and Osteonecrosis of The jaw: A Multidisciplinary Approach. 1st ed. Messina: Springer -Verlag Italia; 2012. 195 p.
- AAOMS. American Association of Oral and Maxillofacial Surgeons Position Paper on Bisphosphonate-Related Osteonecrosis of the Jaws. J Oral Maxillofac Surg. 2007;65:369–76.
- Otto S, Pautke C, Van den Wyngaert T, Niepel D, Schiødt M. Medication-related osteonecrosis of the jaw: Prevention, diagnosis and management in patients with cancer and bone metastases. Cancer Treat Rev.2018;69:177–87.
- Marx RE. A Decade of Bisphosphonate Bone Complications: What It Has Taught Us About Bone Physiology. 2014;247–58.
- Marx R, Stern D. Oral and maxillofacial Pathology:A Rationale for Diagnosis and Treatment. 1st ed. Chicago: Quintessence Publishing, Co,Inc; 2001. 36 p.
- Marx R. PAMIDRONATE (AREDIA) AND ZOLEDRONATE (ZOMETA) INDUCED AVASCULAR NECROSIS OF THE JAWS: A GROWING EPIDEMIC. J Oral Maxillofac Surg. 2003;61:1115–7.
- King R, Tanna N, Patel V. Medication-related osteonecrosis of the jaw unrelated to bisphosphonates and denosumab—a review. Oral Surg Oral Med Oral Pathol Oral Radiol. 2019;
- Otto S, Aguirre JI, Dayisoylu E.

Medication-Related Osteonecrosis of the Jaws: Bisphosphonates, Denosumab, and New Agents. 1st ed. Heidelberg: Springer-Verlag Berlin; 2015. 216 p.

9. Badros A, Weikel D, Salama A, Goloubeva O, Schneider A, Rapoport A, et al. JOURNAL OF CLINICAL ONCOLOGY Osteonecrosis of the Jaw in Multiple Myeloma Patients: Clinical Features and Risk Factors. 2015;24(6).

10. Ruggiero SL, Fantasia J, Carlson E. Bisphosphonate-related osteonecrosis of the jaw: background and guidelines for diagnosis, staging and management. Oral Surgery, Oral Med Oral Pathol Oral Radiol Endodontology. 2006;102(4):433–41.

11. Vescovi P, Manfredi M. Surgical approach with Er : YAG laser on osteonecrosis of the jaws ( ONJ ) in patients under bisphosphonate therapy ( BPT ). 2010;101–13.

12. Merigo E, Cella L, Oppici A, Arbasi MC, Clini F, Fontana M, et al. Combined approach to treat medication-related osteonecrosis of the jaws. J Lasers Med Sci. 2018;9(2):92–100.

13. Soutar DS, Scheker LR, Tanner NSB, McGregor IA. The radial forearm flap: a versatile method for intra-oral reconstruction. Br J Plast Surg. 1983;36(1):1–8.

14. Khan AA, Morrison A, Hanley DA, Felsenberg D, McCauley LK, O’Ryan F, et al. Diagnosis and management of osteonecrosis of

the jaw: A systematic review and international consensus. Vol. 30, Journal of Bone and Mineral Research. 2015.

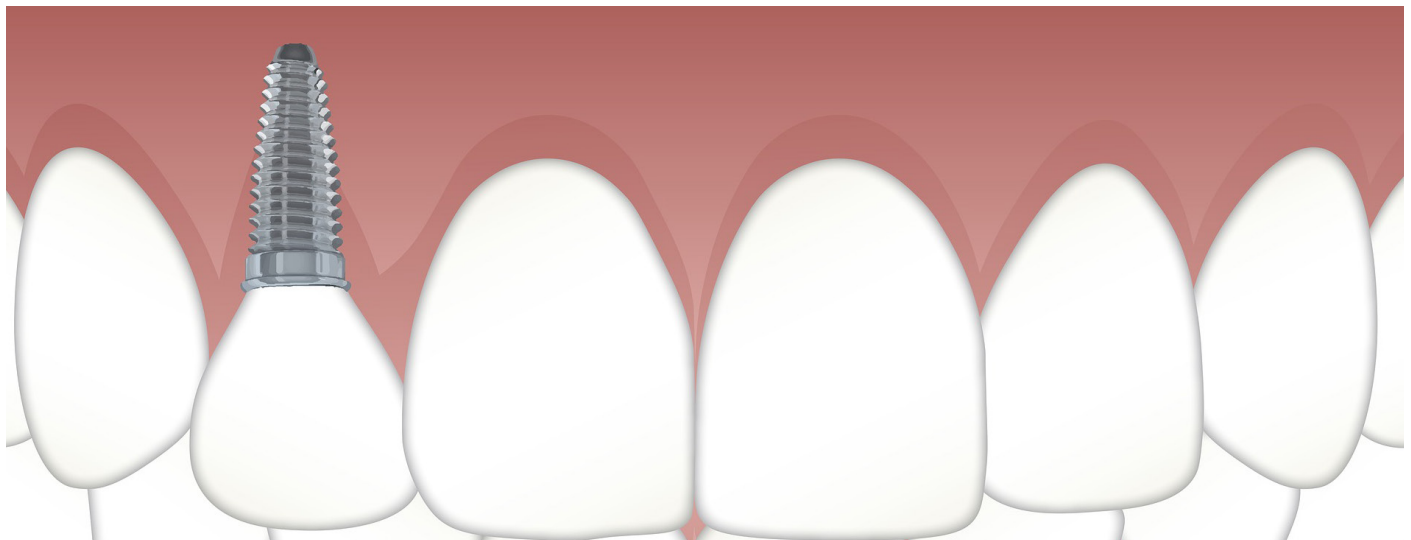
15. Park JH, Kim JW, Kim SJ. Does the Addition of Bone Morphogenetic Protein 2 to Platelet-Rich Fibrin Improve Healing After Treatment for Medication-Related Osteonecrosis of the Jaw? J Oral Maxillofac Surg. 2017;75(6):1176–84.

16. Yamachika E, Matsubara M, Ikeda A, Matsumura T, Moritani N, Iida S. Treatment of Osteonecrosis of the jaw. J Craniofac Surg. 2015;26(7):e575–7.

# Should All Dentists Provide Implants?



**Eduoard Cristofari & Rooxana Rutgers, Spain**



## Introduction

Today, missing teeth are replaced by removable or fixed dental prostheses but also dental implants. Invented 30 years ago, the implant is inserted in the alveolar bone to replace the root of the missing tooth. Composed of titanium or zirconia, it is the support of the prosthetic crown. The implant has been a revolution, with the missing tooth replaced with an artificial tooth that functions almost exactly like its predecessor. The rate of success after 10 years is around 95%. In USA, 69% of adults aged between 35-45 years have lost at least 1 permanent tooth. By the age of 74, 26% have lost all their permanent dentition (figure 1).

## Can all general dentist provide implants?

Dental implants are typically placed by oral surgeons or periodontists. Nowadays,

many clinics and institutes offer teaching courses on how to place an implant. Implantology has become a classic subject in general dentist curriculum, and many general dentists can place them according to their skills. It is often the dentist who is providing ongoing care to the patient who can best coordinate the treatment plan.

In the first appointment, the general dentist will treatment plan for an implant. They collaborate with the oral surgeon. Oral surgery specialists are often more able to treat difficult cases of implant placement. Periodontist, with their surgical skills are also well suited to place an implant. During the

course of their studies, prosthetics specialist have an extra course in implant placement.

Indeed, implantology is not a specific specialty field. Most dentist who feel confident enough and are sufficiently trained are able to place them. However, if the general dentist is not sufficiently

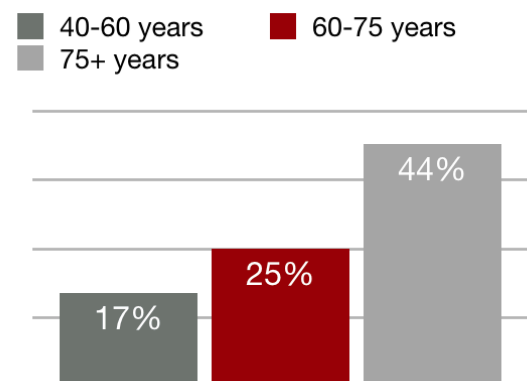
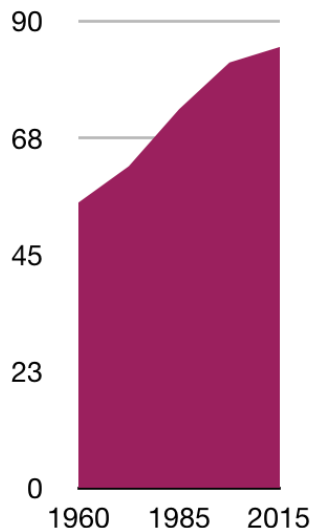


Figure 1: Total edentulous population in % in USA

■ Figure 2: Life Expectancy



qualified, they should refer the patient to a trained specialist. Indeed, as a comparison, literature say that a root canal treatment performed by general dentists have 89,7% success rate compared to 98,1% success rate for an endodontist specialist.

#### **Are implants the current gold standard?**

Edentulism (the total loss of teeth) have consequences on bone, soft tissue and esthetics alterations. Life expectancy has increased more rapidly since 1960 than at any other time in history (figure 2). As tooth loss is correlated to age, there are many adults who have missing teeth. With age, the width and the height of the supporting bone decreases. The loss of the anterior ridge and nasal spine, causes an increased denture movement and sore spots during function. Advanced bone loss can increase the risk of mandibular fracture. With bone retraction, soft gingival tissue is lost. The thickness of the tissue decreases with age whereas the tongue increases in size, being more active during the mastication. The facial height decreases as do the horizontal angle line. The labiodental angle is lost. The chin rotates, giving a prognathic appearance to the patient.

Dental implant can be useful in single, multiple or full edentulism situation. To replace a single tooth loss, a dental bridge is an option in replacing it. But studies show that 80% of abutment teeth prepared for a 3 unit fixed dental prostheses have no existing restorations. A dental implant may replace the single tooth without removing tooth structure. It will reduce risk of caries,

risk of endodontic problems and risk of abutment loss that could be provoked by a bridge preparation of adjacent teeth. Also, the implant will improve the bone maintenance in edentulous site.

If the patient lost more than one tooth, a complete denture (in case of totally edentulous patient) or a removable partial prostheses are options of treatment. Unfortunately, mastication forces will be decreased with complete denture, causing worse mastication for the patient.

According to the literature, compromised dental function is responsible for swallowing and masticatory problems, increasing the risk for illnesses and shortened life expectancy.

The partial dental prostheses also have their issues with a survival rate of 35% after 10 years, with increased mobility, plaque, bleeding and caries of abutment teeth. The implant bone supported prostheses have the ability to maintain bone, occlusal vertical dimension, facial esthetics and to improve psychological health and oral proprioception. Implants also improve the stability and retention of removable prosthesis, increasing their survival rates.

#### **Is price still an issue? Can it be taken in charge by the healthcare system?**

According to the WHO definition from 1946, the health is a "state of complete physical, social, and mental wellbeing, and not merely the absence of infirmity". A tooth loss affects social interaction (avoidance of social environments, affected romantic situations) patients suffer a decrease of self esteem and a dissatisfaction of appearance. A dental survey about edentulous patients found that 66% of patients wearing mandibular completed denture were dissatisfied.

Health care systems aim for the health of an entire population without socioeconomic distinction. It has the obligation to respond to the expectations of the population. On the other hand, the health has to respect a restricted budget. Cost-effectiveness analysis estimates the costs and health gains of an alternative intervention. Cost effectiveness studies showed root resection was the most cost effective treatment for the failed root canal treatment of a molar. A single implant supported restoration, despite its high survival rate, is the least cost-effective option.

Dental implant cost can vary widely from case to case. The fee for the surgery alone does not include the additional restorative cost of the crown placed on top of the implant. Depending on the materials used and the specificities of each case, the cost is likely to increase and a generous response from insurance companies is not to be expected. Most insurance companies will choose the most cost effective treatment which will however impact the practitioners choice of materials.

A great range of prices exist in Europe, provoking a phenomenon called medical tourism. During the last decade, the dental tourism exploded. Implants can cost three times less depending on the country. Medical travel agencies that are specialized in booking everything from flights and treatments to accommodations and even sightseeing trips. Shorter waiting times, english speaking doctors, private facilities and overall cost far cheaper, attracts many patients each year from all across Europe.

#### **Conclusion**

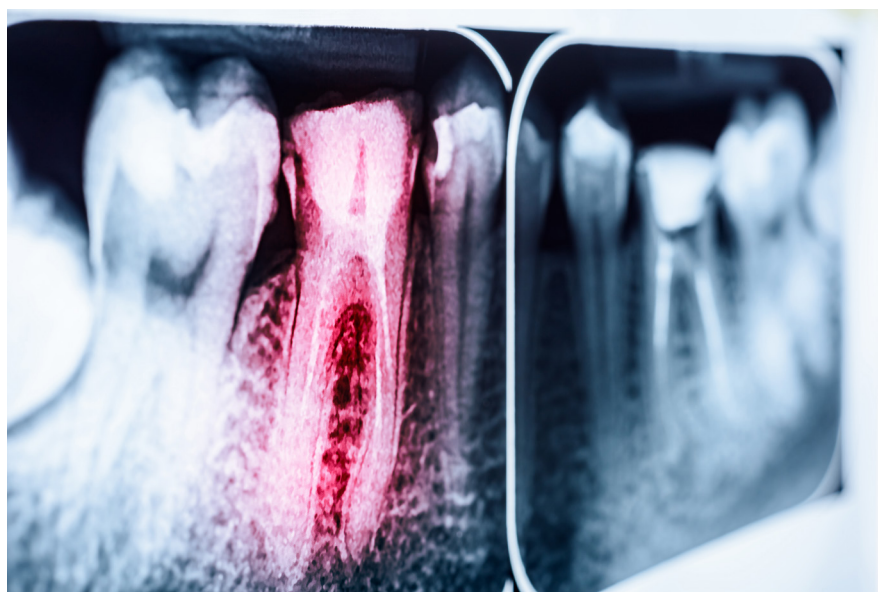
When it comes to restoring a patient's smile and masticatory function in terms of comfort and esthetics, dental implants are nowadays a very popular option. According to the American Dental Association, more than 5 million US citizens between 65-74 have complete tooth loss. However, tooth loss is not just a problem of the elderly. 27% of caries in patients between 20-64 are left untreated which will result in tooth loss. It is evident from available statistics that the demand for implants is increasing given the aging population as well as the evident advantages that dental implants provides to patients of all ages. Having fixed permanent prosthesis is more convenient for patients as this provide them the comfort of not having to worry about their dentures falling out. In 2017 in USA, 50% of dental implants were placed by general dentists. Thanks to the digital workflow like the CAD/CAM technology, more and more general dentists have the tools and confidence to offer this treatment to their patients. With time and with the rapid improvements in dentistry, dental implants will grow to be a widely spread method of treatment. The era of implants provided by public health systems has not yet arrived, but as costs falls and patients increasing demands, it is surely only a matter of time.

# CT-guided treatment options for teeth with root canal pathology

New technologies are making previously difficult treatments, such as root canal treatment of calcified canals, possible. Magazine Co-Editor, Ivana Ligusová tells us more about how this can help dentists and patients.



**Ivana Ligusová, EDSA Magazine Co-Editor, Slovakia**



Carrying out a root canal treatment on teeth with pulp canal calcification is a significant challenge, as the treatment is very hard to control, even under a microscope. Calcification is a common consequence of dental injuries, luxation, prolonged infection, dental caries, or it can be a result of natural process of aging. The most severe cases can require clinicians to cut through 12mm of radiographically-hidden tooth structure before getting into one of four canals. Cutting access into calcified root canal systems is one of the most anxiety-provoking procedure in endodontics.

Until recently, access to the canals has been gained exclusively by freehand methods with a wide range of outcomes, depending totally on the clinician's training and experience.

Luckily, new technology has brought a novel approach for root canal preparation using a 3D case planning software and a guided access approach.

## **1. Static CT Guidance**

This technique uses a 3D-printed template with incorporated sleeves that guide a bur in the correct direction to the calcified root canal. First, the CBCT scan is made, which allows us to see the 3D view of the anatomical structures, including the root canal system. Special software creates a virtual model of a situation and evaluates a drilling path. Template is printed

on the 3D printer and fits the teeth perfectly. A small, prefabricated titanium sleeve is placed in the hole of the template - its function is to control the path and depth of the preparation. The template is positioned on the tooth surface and guides the drill through the obliterated part of the root canal and obtains minimally invasive access to the apical part.

The story of this procedure started in implant surgery. Many implant surgeons are very proud of inserting the implant freehand – despite this confidence, wrong implant positioning is still the most common reason for failure in implant surgery. In 2001, Klein and Adams proposed a milled CT-based guide as a solution. In 2003, Sarment et.al. reported that the implants placed using the 3D-printed drill guides had significantly better outcomes than the ones inserted freehand.

In 2007, Pinskey, Champeboux and Sarment (the same author as above) proposed using a CT-based drill guide for endodontic periapical surgery, and few years later the author worked to apply this technology to conventional access – through the occlusal surface of the tooth. He used a static drill guide to direct an Erbium/Yag laser while it cut a 0.4mm opening through the occlusal surface of a maxillary molar. The accuracy of that guidance allowed a 15 K-file to drop directly into the DB canal orifice.

However, static drill guides come with some challenges when used to enter the conventional access cavity of a tooth. Not every patient has sufficient inter-occlusal distance to accommodate the additional 10mm of drill or bur length required by the guide ring position over the tooth.

The second difficulty experienced when using static drill guides is that it is not suitable with high speed handpieces. When drilling through enamel, ceramics and cast restorations, one could encounter issues with cooling. One option is to mark the point of entry with the help of the guide through the sleeve, then remove the enamel or restoration through freehand preparation, and finally, drill the dentine with the guide.

The main disadvantage is that static guidance is not suitable

in acute cases. We can use it in planned endodontic treatment only, when the patient isn't in acute pain.

There is an increased cost of endodontic treatment using this technique, which may be a disadvantage when many canals are being treated, as every root canal requires a new drill guide. Considering these issues, it is clear that static guidance can help us in certain situations, but not in every case.

A research team in Basel, Switzerland compared guided endodontics vs. conventional access cavity preparation. They used 3D printed anterior teeth and let 3 operators with different levels of experience prepare access cavities on each tooth with the conventional technique and guided endodontics. Canal location was successful in 10 of 24 cases (41.7%) using the conventional technique and 22 of 24 cases (91.7%) with the guided approach. The guided procedure also lasted shorter time and the success of the guided approach was not influenced by the experience of the operator. The study concluded that guided endodontics gives a more predictable and efficient location and negotiation of calcified root canals with significantly less substance loss.

In the near future, our endodontic practice may be revolutionised by another treatment option – dynamic CT-guided endodontics, without the disadvantages of static guidance.

## **2. Dynamic CT-Guided endodontics**

In 2016 Emery and Block introduced the X-Guide Dynamic Guidance System and proved its accuracy in clinical implant surgery. XNav works by referencing two scanning drums -

one secured to the patient's jaw before CT imaging, the other secured to a handpiece attachment with two overhead cameras. The computer uses the patient's CBCT scan to create the avatar of the jaw. The cameras allow the computer to create the avatar of the drill and show the real time position and angle of the drill above the avatar of the jaw. The clinician can look exclusively on the computer screen as implant is drilled. In 2016, Dr. Charles Maupin used this system designed for implant surgery to cut access cavities in calcified teeth. He understood that optically-driven dynamic guidance solves all the problems that static drill guides present in endodontic application.

This type of guidance doesn't require long burs or drills, high-speed burs can be used without creating the heat in the guide ring, acute patient doesn't need to wait for any templates and multi-canalled posterior teeth can be easily treated without printing multiple drill guides.

In August 2017, the author and co-investigators did preliminary research on the accuracy of DGA when used for access procedures in teeth with calcified pulp chambers. The results were remarkable as all of the canals were easily entered with a 15 K-File after each drilling plan was completed.

## **Conclusion**

Dynamic and static CT-guided procedures have a greater body of research compared with implant surgery. However, only a minority of implantologists use static or dynamic guidance. No doubt it will take a lot of time for endodontists to embrace this new tool in managing the most difficult cases we treat. The advantages of using dynamic guidance to treat calcified root canal systems so far outweigh the costs of this new method. It's possible that in the future, CT-guided treatment will be the common way of treating cases of root canal pathology in our daily clinical practice.



**Dr  
Judit Bohács**  
*demonstrates the  
perfect technique  
for using interdental  
brushes, so students can  
teach their patients  
too!*

## Curaden Student Camps

*Learning more about oral prevention, by the beach*

In summer last year, Dr Judit Bohács graduated as a dentist from the University of Debrecen in Hungary. During her studies, she had attended oral disease prevention programmes and seminars, and so when she learnt about CURADEN's iTOP programme for individually trained oral prophylaxis, she decided to take part in a summer camp with iTOP training in France. CURADEN Student Camps offer unique opportunities for dental students in terms of learning about dental prevention through iTOP, connecting with others and having fun. Judit shares her summer camp experience with us.

When I finally graduated after years of studying dentistry, my only wish was to have a memorable and fun summer, so when I was introduced to CURADEN's iTOP programme by a friend of mine and saw there was a Surf'n'Brush Student Camp in Bordeaux in France, I saw it as an opportunity to combine fun and learning all about prevention at the same time. I couldn't wait to travel there with some of my friends to gain a deeper understanding of oral hygiene and have an amazing summer surfing and making friends with other dental students from all around Europe.

The camp programme was separated into two parts. In the beginning, we attended interesting lectures about gingival inflammation, oral hygiene and the importance of prevention. We took

**“I came home with  
memories, new  
friends and a new  
understanding of  
oral prophylaxis”**

part in intense iTOP training sessions where the instructors literally took us by the hand and taught us correct brushing techniques we could also show our patients. Part of that included instruction on how to use interdental brushes correctly and education on how important they are to keep the interdental spaces clean and healthy.

During the second part of the camp programme, we grabbed a board and we learned to surf. We also had the opportunity to try out paddle boarding. I also want to mention the early morning yoga sessions and the unforgettable

international evenings, where we learned more about each other's cultures and could try different national dishes. I enjoyed every moment! I came home with so many memories, new friendships and

a new understanding of oral prophylaxis.

I later even travelled to Prague with my brother and one of my best friends to perfect our brushing techniques in an

iTOP for students. It was a very special three-day event, where presentations were given by Dr Jiri Sedelmayer, the founder of iTOP who sadly passed away recently. The afternoon training sessions were useful to refresh my knowledge and improve my techniques. At the end of the course, we enjoyed a sight-seeing trip that evening and dinner on a boat.

To sum up, I am very grateful that I could meet these wonderful people and gain a new mindset about proper oral hygiene, prophylaxis and important skills to use on an everyday basis on myself and on my patients.

*The next iTOP for Students seminar will be held in Prague from 14 to 17 November. Students who would like to take part can apply from September onwards on the [www.curadenstudentcamps.com](http://www.curadenstudentcamps.com) website.*



# Once upon a time in Hollywood... and now in your dental practice

We all strive to make our work as beautiful as possible, but with patients now coming to dentists for purely for aesthetic treatment, it can be difficult for students to know how to deal with these situations. Holly Skypala tells us more.



## Holly Skypala, UK

**A**cross Europe, cosmetic dentistry is on the rise, and with a brilliant white, straight smile no longer the domain of the rich and famous, general dental practitioners must be prepared to answer questions and make decisions regarding cosmetic options for their patients.

### The ethical dilemmas in cosmetic dentistry

As healthcare professionals we all pride ourselves on having a good moral compass, yet making the most ethical decision for our patients is not necessarily something that can be taught in dental school. For a treatment to be

strictly ethical, the four main entities of non-maleficence, beneficence, autonomy and justice must be realised, however it is recognised that usually one or more items predominates while the others are sacrificed. Cosmetic dentistry, unlike other areas, can include the treatment of non-diseased teeth, something which forces young dentists to weigh up the balance of meeting patient expectations vs unnecessary treatment, knowing that patient satisfaction is now hugely influenced by aesthetic outcome.

A survey of members of the American Academy of Esthetic dentistry showed

that they perceived overtreatment to be the biggest threat to aesthetic dentistry today (33.04%) and the biggest problem they faced in aesthetic dentistry was unrealistic patient expectations (22.89%). Alarming this shows that dentists themselves are aware that they may be carrying out unnecessary treatment, when, interestingly, dentists tend to opt for more conservative options when asked what treatment they would allow to be carried out on themselves or family. Other ethical issues surrounding this area of dentistry include financially driven practice, pulpal health compromise, consent issues and dentists working

beyond their knowledge and skills.

During our time at dental school, we are very much sheltered and protected from the outside world, with clinicians more experienced than ourselves guiding our every decision. But on the cusp of qualification, do students feel prepared enough to make decisions regarding cosmetic cases, especially those which may test our ethical boundaries? In a study I carried out with Cardiff Dental School (UK), 58% of final year students at Cardiff said they didn't feel confident to make these decisions which indicates more support and teaching may be required in this area.

#### **Minimally invasive or minimal idea?**

Most of us are aware of the concept of minimally invasive dentistry and the shift to more conservative options to reduce destruction of sound tooth tissue and in turn provide a more ethical option for the minimally restored patient.

Adult or cosmetic orthodontics are a relatively new, effective treatment option which can be used in solely or in conjunction with other treatments, to correct malpositioned teeth. It refers to the movement of the anterior 6-8 teeth,

over a period of months, on average 6 months. This can be achieved using brackets or clear aligners to move the teeth to create a more aesthetically pleasing smile.

In the aforementioned study at Cardiff Dental School, only 40% of students knew what short course orthodontics are despite 94% indicating they think it could be a more ethical alternative to other options such as porcelain veneers in the right cases. Students indicated low levels of confidence at explaining the treatment as well as the risks, benefits, and alternatives. Whitening also received a variable response, with many students reporting they were not at all confident at explaining whitening to patients. On the other hand, they were, on the whole, more confident with offering information about veneers to their patients. Unsurprisingly, there was a positive correlation between the topics which are covered in dental school (i.e. veneers, implants and crowns) and higher reported confidence among students compared to the other treatments which are not taught, at least not in any depth. Clearly not every single aspect of dentistry can be taught at dental school, but how are young dentists meant to offer minimally invasive options to

their patients when they are far more confident with conventional and perhaps more invasive options? This is not to suggest that students should come fresh from their undergraduate degree with full competence in carrying out the spectrum of minimally invasive cosmetic treatments themselves, but a baseline knowledge of the different options would allow them to formulate the best treatment plan for their patients, and refer appropriately if it is out of their scope of practice.

#### **The role of social media on cosmetic dentistry**

What happens when the patient thinks they know more about the treatment than you do? With developments in treatment options for patients also comes changes in the way which people find out information.

The internet and social media are fast becoming a major source of information for patients, with a study by Chestnutt and Reynolds in 2006 showing one half of dentists being asked about content from online. In the same study, 1/3 of dentists commented that inappropriate or complex treatment being sought is a result of patients finding information





online. With current statistics showing an estimated 2.77 billion social media users worldwide, which is about a 3 fold increase since 2006, it is likely that these figures have only increased over time. Aesthetic dentistry is particularly affected by this due to the rise of social media and subsequent adjustment to social norms with respect to people's appearance and smiles. More young people are viewing dentistry as a method of personal enhancement and are basing the treatment they request on cases seen on TV or social media. It is important students are taught about dealing with these situations and are able to properly educate their patients on the potential

risks, benefits and alternative options, which is often not made apparent within the material patients are reading. But if the dentist doesn't have this knowledge, how can they best inform the patient?

Recent advice out of the UK from Rana and Kelleher (2018) suggests that "Dental professionals should not be encouraged to provide electively destructive 'cosmetic' treatment merely to satisfy some new media-informed 'consumer', which may open the dental professional up to serious litigation."

#### **Conclusion**

Cosmetic dentistry is an exciting, ever-

growing area, however arguably the least taught in dental school, due to its advanced and specialised nature. It is therefore unsurprising, yet maybe slightly worrying that many dental students lack confidence in dealing with cases that could walk through their door soon after qualifying. The results from the study at Cardiff University suggest that students are aware of the issues in this area but do not feel prepared to tackle cases without further teaching. These results are, however, specific to one University, and therefore more research is needed to find out if students across Europe share similar experiences.

# Alyette Greiveldinger – EDSA President

We sit down with Alyette Greiveldinger, the current EDSA President and previous General Secretary for two years, to talk about her experience of EDSA and plans for the future.



## EDSA Magazine

Being EDSA President is no small task. You are the main voice of over 70,000 dental students in 33 countries at the European level, making sure their issues are being heard by those with the power to change things. One day you might be in Brussels or Paris at meetings with our professional partners, and other days helping organise volunteer projects, or talking to sponsors. You are also responsible for a team of committee

members, each with different tasks and projects that need managing.

Alyette Greiveldinger has been doing this job since the beginning of the year, so EDSA Magazine sat down with her to discuss her experiences and to find out a bit more about her.

### Firstly what is something most people don't know about you?

I love hiking !

### How did you get involved in EDSA?

It was step by step really. I started at the local level by representing my faculty in the French Dental Students' Association (UNECD). As I got more involved, I moved to be Vice President of International Affairs, which meant I attended IADS and EDSA meetings and saw how they worked. I was really encouraged by EDSA past presidents such as Marco Mazevet and Valentin Garyga as well to get more involved!

### What made you decide to join the Committee?

Having seen the workings of EDSA by attending the meetings, and having been on the UNECD committee, I thought I could bring some processes/ fonctionning from the UNECD to EDSA. UNECD is one of the oldest student organisations in France (it has been running for 58 years), whereas EDSA is relatively new in comparison. So I applied for General Secretary!

### What have been some of the biggest changes to EDSA during your time as GS and President?

I have never changed things by myself, it has always been in collaboration with the team. Different people see things in different ways so given the big changes this has been important. I think that the elements I brought from the UNECD in terms of organisation, functioning and





presentation helped the association become more mature and more professional. Obviously a big move has been to increase the size of the committee from 5 to 12. You move from a small group of people doing things together, to a proper committee with a proper delegation of roles. It has allowed us to expand our activities and become a more professional organisation.

**What has been the best advice you've been given on being President?**

It is not so much advice but more of an important question - "Can you still bring something to EDSA?". It is really important to make sure you are always bringing something to the team and the organisation, otherwise you are just wasting your time.

**You have been in leading a team of 11 people as President, what has this year taught you about leadership and your leadership style? What do you think makes a good leader?**

I found it very important to listen to everybody's point of view and feedback when discussing things and to take them into account when making decisions. You can't just make everybody go along with you, you have to involve them meaningfully. It's also important to balance pragmatism and try to make things evidence based when making a decision or making changes.

I like to keep a good team spirit when working as all our backgrounds and different skills and points of view can all be complementary and produce good results. So I think being a good listener and pragmatism is what makes a good leader.

**What are you most proud of during your time in EDSA?**

I think probably all the good friends I have made during my time at EDSA.

**What have been some of the biggest challenges during your time as GS and President**

Trying to help with harmonising the level of dental studies across Europe - there are a lot of legal and political barriers and we are collaborating with lots of different stakeholders to try and modify annex V of the Professional Qualifications Directive (PQD) to ensure that students get the training they need and deserve.

**What are some of the biggest challenges facing dental students across Europe right now?**

Obviously the lack of harmonisation of dental studies is a very big problem - some students are not getting enough practical experience during their studies and that is bad for patients across Europe and it's bad for the students, who will lack the confidence to excel in their professional lives.

Then there is the big digital transition that dentistry is going through right now, it affects everything from new 3D printing, digital images, digital systems and note taking. Our research findings show that students welcome this change, but we don't see many dental courses adapting to this.

I think the final issue is the money driven aspects of dentistry. There are a lot of structures and ways of practicing where it is very easy to be influenced by making money instead of practicing safely in high quality. It is really important that we talk about these risks with students so they are not tempted to cut corners when they leave dental school.

**What advice would you give to someone thinking of getting involved in the EDSA committee?**

If you have something to bring to EDSA, come and join! We always need new people with new ideas to take the organisation forward - if you're unsure come and talk to us.

**Finally, what are you plans after your term ends?**

I think the first thing will be to rest - it has been a really busy year and so I will be just relaxing! After that, I will try to use what I have learnt during my terms of office to benefit my patients and the population as much as I can. There are multiple ways of helping others so I'll take the time to find which path I will be most helpful in!



# Integration, integration, integration – the antidote to rising dental needs?

EDSA VPPR James Coughlan discusses whether integration of medical and dental services could help the high burden of oral disease in Europe.



**James A. Coughlan, EDSA Vice President Public Relations, UK**

People have always fallen ill. 100 years ago, you were more than three times as likely to die from an infectious disease, such as influenza or pneumonia, than you were to die from heart disease.

Times have changed. Diseases linked to social determinants of health, non-communicable diseases (NCDs), are now the biggest killers. In his best-selling book *Homo Deus*, historian Yuval Noah Harari makes the striking point that sugar kills more people than gunpowder does.

Thankfully, in Europe, people are now largely living with diseases, rather than dying from them. Diabetes, heart disease and asthma are mostly treatable, through a combination of lifestyle changes and medication. But as our populations get older and more people are living with one or more health condition, there is an increasing burden placed on healthcare systems. The rate at which demand for healthcare services is fast outstripping the growth of economies, putting pressure on those managing and providing services.

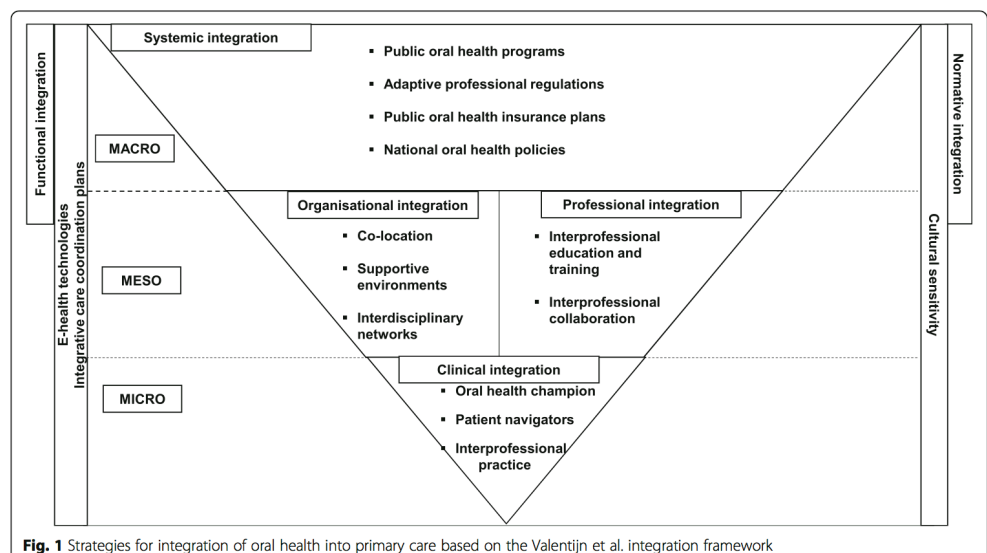
But what does this have to do with dentistry? Firstly, like their more well-known NCD counterparts, oral diseases are still a huge issue in many European countries. Spending on treatment is currently around €90 billion per year in the EU (and rising), without any significant decrease in the burden of oral disease. This causes needless pain suffering for millions, while further impacting on the economy with missed days from school and work.

One postulated solution for both of these connected issues is integrated care. Dentists hope that better collaboration with their medical and social care colleagues can help flag up oral diseases earlier, as well as improving oral health in more diverse settings such as care homes and hospital wards. As the evidence for a bidirectional link between oral diseases and other medical

conditions grows, improved awareness of this from health professionals could facilitate improved outcomes. A recent policy brief by Harvard estimated an overall reduction in treatment costs of \$1000 in patients with one or more chronic illnesses who received regular dental care.

The concept of integrated care is not a new one. Based firmly in the WHO Alma Ata Declaration on Primary Health Care, early definitions focused on a basic aim of connecting services for improved patient outcomes. Others have since elaborated on this, splitting integration into levels, with macro (system level), meso (organisational level), and micro (at the person level), as well as between horizontal integration (between services at similar levels – i.e. between family doctors and general dentists) and vertical integration (between different levels, for example between general dentists and specialist oral surgery departments in hospitals). These different levels have been summarised in the below model adapted from the Valentijn et. al. framework by Harnagea et al. to make it specific for oral health.

While theoretical concepts are abundant, there are signs that policy makers locally and nationally are taking notice. In 2018, as a response to the countries poor oral health, especially that of the poorer population, the Portuguese government announced



**Fig. 1** Strategies for integration of oral health into primary care based on the Valentijn et al. integration framework



# INTEGRATION

a policy to have at least one dentist present in a health centre in each municipality, in order to meet the needs of these people who cannot afford care privately. Notable for the fact that it will be local GPs screening patients, this provides an example of how co-location of professionals can benefit patients.

This can work both ways; most people visit their dentist more often than their doctor, making it an effective place for basic screening to take place. While care has to be taken to ensure that the screening carried out is effective (and not leading to overdiagnosis and overtreatment) and cost-efficient, studies have been carried out in screening for diabetes, high blood pressure and HIV.

In other places, integration has been pursued at a system level. In Manchester, a northern city in the United Kingdom, a city-wide partnership of health and social care organisations has brought oral health closer to general health, in an effort to make care more responsive to population need. Part of this is making health care more responsive to local needs. By using local health data to find out where specialist dental services are most needed, Manchester is moving to provide these services in primary care settings, rather than in hospitals, which may be over an hour away. Increased collaboration between care

homes and dentists can improve the oral health of vulnerable older people, as well as lowering complications. Manchester are also looking to integrate oral health into other health projects, as well as ensuring that population health measures (such as supervised brushing in schools) are at the forefront of their local plan.

These examples are not the only ones of local integration, but there is still a huge gap in most places between medicine and dentistry. Barriers include personal values, whereby many people still do not see oral health as particularly important, prevailing negative professional values – a perceived lesser status of dentists compared to doctors and mostly private dental markets with little public provision.

Bickerstaffe proposed that four factors are required to successfully integrate care: a long-term investment mindset, aligned incentives, effective use of technology and a flexible workforce. For dentistry, these are mostly all absent. Large private markets make an investment mindset and aligned incentives difficult, and even where dental care is largely public, it is often seen as an area where savings can be made, rather than invested in. Shared systems and data could provide a key way of flagging up patients that are at risk, but stringent regulation of data transfers by the EU's GDPR rules and security concerns makes this difficult. Effective use of skill mix, such as greater use of nurses, hygienists and therapists to provide care has been shown to be safe and effective but is opposed in many countries by dentists who fear their jobs may be put under pressure.

Integration is increasingly being seen as beneficial in health systems, and it is important that dentistry doesn't miss the boat, as has happened before. In order to make it a success, dental systems must be ready to adapt and reform, including changes that may be unpopular among the dental profession. Whether this hurdle can be overcome remains to be seen.



# Implantmed Plus: Smart ioDent® system saves time



Digital networking is changing the way we live. Products are becoming an increasingly intelligent part of our everyday life. Interconnected devices assume the function of little helpers, advisers and wizards. They show us how to get to places, coordinate our calendar and connect us to our friends. Ultimately, these tools give us back something that we can never have enough: time. The Internet of Things is no longer just a 'future vision' in dental practice. The new Implantmed Plus with its ioDent® system is the new smart assistant in implantology.

## Efficient planning and configuration with the ioDent® online platform

Whether you're at home, on the way to work or about to begin a treatment: thanks to the new ioDent® system, with the Implantmed Plus, treatments can be planned quickly and easily online using a computer or mobile device. The ioDent® online platform's intuitive user interface enables the user to predefine all the treatment details. Implant positions and all the necessary program steps, customized for each patient, may be planned and configured prior to the treatment. The package is rounded off with an implant manufacturer database in ioDent®. The background implant data enables you to quickly select the appropriate implant system. The program steps recommended by implant manufacturers are implemented into ioDent® 1:1,

which eliminates the time-consuming need for program steps to be configured manually. The program details can also be customized in the ioDent® user interface really easily. The defined settings may simply be sent to the Implantmed Plus at the start of treatment.



## Automated documentation process makes day-to-day work simpler

Transferring documentation data using a USB stick is history with ioDent®, which enables automated data management. Be it torque progression, threading curve, drill protocol or implant stability values, all the documentation data can be transferred from the Implantmed Plus surgical device to the online platform. The benefit is not only the time being saved each day, but also the safety of having access to an overview of all the data at all times. Implantologists can give their patients an insight into the insertion data as soon as the treatment is finished and provide details about the progress. If the patient needs to be referred, all treatment documentation can simply be exported and sent to whoever is due to perform the post-treatment.

## More service with ioDent®

Are the devices working perfectly? Is a service due? Or is a device malfunctioning? With ioDent®, the user can easily obtain answers to all these questions and more. Using the ioDent® platform, users have a complete view of all their Implantmed Plus devices. ioDent® provides information not only on the device parameters, such as the first operation or the operating hours. The smart system from W&H informs the user about upcoming services and also warns users and W&H Service Support if malfunctions occur. W&H Service Support can therefore respond early, arrange any necessary repair measures and provide replacement devices even more quickly. This minimizes downtime and means resources are being used more efficiently.

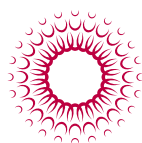
Alongside the smart ioDent® solution package, Implantmed Plus features a range of tried-and-tested product features including state-of-the-art design, a maximum motor torque of 6.2 Ncm and a motor speed range of 200–40,000 rpm. There is also a variety of optional product features that can be selected individually and retrofitted on request, such as the W&H Osstell ISQ module – a unique system for measuring implant stability.



# IN HU-FRIEDY WE BELIEVE THE UNIVERSITY WORLD REPRESENTS THE FUTURE OF THE DENTAL SECTOR

**That's why we decided to make an important investment creating our dedicated Hu-Friedy University Program, developed to establish a direct connection between students, Universities, Institutions and our Company.**

Our main goal is to promote a high level of support for students and faculties, providing them with innovative products and solutions throughout their careers. Furthermore, we really think that behind an important project and a study path there is always a **person** or a group of individuals who have the same mission but different experiences and backgrounds. What makes the Hu-Friedy University Program stand out from any other company program, is the importance we give to the strength of the relationship between individuals and our dedicated team. Each student, tutor or professor will have a direct contact with us as a member of Hu-Friedy University Program and can count on our support from the beginning till the end of his or her professional growth. Thanks to this tool, each member can share their personal and professional experiences with the Community. When developing the University Program we thought about how we can grow closer to students and guide them in their career path.



## EASY ACCESS TO HU-FRIEDY WORLD

Initially, we want to provide students with an exclusive opportunity to experience Hu-Friedy instruments with special purchasing conditions, along with unparalleled support from our Technical Care Center when making decisions on what options work best for them.



## PROFESSIONAL EDUCATION

No matter if a member is a student, tutor or a professor all participants of HFUP have access to benefits specifically designed for enhancing their learning experience.



The most important of these advantages is the opportunity to organize workshops, hands-on and trainings using Hu-Friedy loaner kits.

Our experience along with the precious commitment of our Key Opinion Leaders have enabled us to create 250 kits worth of training stock including different setups to help cover the needs of various practice types. We also offer expert support as speakers for non surgical instrumentation, sharpening, IMS, suture courses and much more.



## NETWORKING AND COMMUNITY

This continues to be the heart of the Hu-Friedy University Program concept. A dedicated website with a private area that gives members the ability to easily reach Hu-Friedy product portfolio, exclusive educational content and webinars, our growing social media platforms and more.

We continue developing an online and offline community, based on content sharing event opportunities, professional meetings and entertainment activities that will be the bridge between the HFUP members and our team!



## WHAT'S NEW?

From January 2019, **Giulia Gennaro**, an active member of the Hu-Friedy team for years, started her role of University Program Coordinator EMEA as 2019.

**"I really believe that students are the future of our company and, besides sharing our experience, we can also learn a lot from them. My personal objective is to guarantee the same level of support for all the different study paths in terms of professional growth but also in terms of a concrete relationship with us! Let's be all together the pioneers of a new vision in dental sector."** ■



Visit University Program site:

**[universityprogram.hu-friedy.eu](http://universityprogram.hu-friedy.eu)**

# Implantology: The importance of a multidisciplinary approach



**Dora Srdoč, Croatia**

In complex cases, implants need a multidisciplinary approach to ensure their success. Dora Srdoč tells us why.

Dental medicine has always been subject to change and advancement throughout history. The introduction of dental implants significantly changed contemporary therapeutic methods in dental medicine. For successful implant-prosthetic therapy, a proper and detailed treatment plan is needed. Dental implantology is a branch of dental medicine that describes the anchoring of alloplastic material to the jaws which provides support and retention at the prosthetic replacement of lost teeth. An increase in the need to use dental implants results from the combined action of a number of factors, including psychological aspects of tooth loss, the extended life span of the population, anatomical consequences of lack of teeth, weak retention of the mobile prosthesis and the advantages of dentures on implants. However, the greater the lack of teeth, the greater the difficulty to achieve the goal with traditional therapeutic methods. Up to this date, overall positive experiences and research are focused on the use of dental implants as a routinely applied treatment in dental medicine. The results of numerous researches led to great progress in the design of implants, materials and implantation techniques. It also led to success in their use and several types of implants are now available for use in the rehabilitation of various clinical problems. The aim of modern medicine is to establish a normal profile and restore function, aesthetics, speech, and health, regardless of atrophy, disease or injury to the stomatognathic system and due to the complexity of therapy a multidisciplinary approach is necessary.

Dental implantology has led to significant improvements in therapeutic

procedures in dental medicine. The implant procedure involves the use of an alloplastic material and its anchoring in the jaws to replace one or more teeth. Implant-prosthetic therapy requires a good co-operation between the specialist of oral surgery, dental prosthetics, periodontology, and orthodontics due to its complexity. Their collaboration is of utmost importance in order to provide the best therapeutic solutions to the patient regarding his current situation. Before the therapy begins, it is necessary to take a detailed history and make a thorough clinical examination and radiological analysis considering the condition of the surrounding teeth, soft tissues, bone quality, and the proximity of the surrounding important anatomical structures. Before deciding on implant-prosthetic therapy, attention should be paid to indications and contraindications for implant placement.

Implanto-prosthetic therapy almost always includes some of the preprosthetic therapeutic procedures to prepare hard and soft tissue and surrounding teeth for further therapy. The multidisciplinary approach is very important because in this way the specific need for therapy is considered from various clinical aspects and leads to a variety of therapeutic solutions in approaching the problem. Tooth loss leads to a gradual recession of alveolar bones and soft tissue, but also to mesialisation, rotation, inclination and antagonist eruptions. For these processes, it is necessary to make a preprosthetic preparation that may include orthodontic tooth movement, bone augmentation, and plastic mucogenic therapy. Without adequate pretreatment, implant therapy has a poor prognosis.

Orthodontic therapy aims to move the displaced teeth back to the initial position to create enough space to compensate for the loss of teeth.

In addition to the surrounding teeth before implantation, attention should be paid to the state of soft tissue in the toothless area. It is commonly known that soft tissue almost always follows the bone recession of the tissue it covers. Such conditions lead to an insufficient amount of bone and soft tissue to implant the implant. Periodontology and oral surgical therapy are used to repair the defects of soft and hard tissue by using connective tissue transplants in order to re-create the conditions needed for successful implant placement and adequate prosthetic enhancement in the toothless area. Therefore, periodontal plastic surgery is described as a series of surgical and non-surgical procedures for correcting morphological defects, position and volume of soft tissue and supporting bone tissue around the teeth or implants.

Periodontal plastic surgery, with classic therapeutic procedures, sometimes includes orthodontic therapy because it is known that during orthodontic extrusion, bone and soft tissue follow the direction of the tooth movement. Before deciding on implant placement, it is necessary to estimate the amount and quality of alveolar bone using two-dimensional and three-dimensional radiological methods. If the bone is missing, some of the therapeutic methods of bone augmentation in the form of osteoinduction, osteoconduction or osteogenesis should be performed.



After successfully performing all the therapeutic procedures related to the replacement of lost hard and soft tissue, the toothless area is ready for implantation.

It is recommended to use titanium cylindrical implants with threads and a rough surface without any additional surface layer of any other material and after the appropriate period of osseointegration, the implants are ready for their prosthetic upgrade.

From the point of view of prosthetics, therapeutic solutions are fixed or mobile restorations. Fixed restorations include bridges and individual crowns, most commonly used for: replacement of one or more teeth in the esthetic zone as well as for compensation of a distally shortened dental arch, toothless areas in between teeth in the distal area and replacement of one tooth in the distal areas of the jaw. Mobile restorations with anchoring on implants are used to compensate complete tooth loss, thus achieving very good retention, stabilization and aesthetics, therefore fixed restorations in such cases are only used if the patient requests it.

Multidisciplinary approaches to the selection of appropriate therapies for an individual is of the utmost importance when planning implant prosthetics.

More complex therapeutic procedures require a large number of specialists to provide the patient with better therapeutic care. The final prosthetic implant supply has the role of re-establishing the aesthetics and function of the stomatognathic system. It is important to choose the best possible solution for the patient according to their wishes. In planning such complex therapeutic procedures, the role of each member of the team is equally important in the choice of a therapeutic procedure because each member in its own way contributes to the ultimate successful outcome. With the development of modern dental medicine today there are many possibilities to compensate the lack of teeth, with a good multidisciplinary approach and detailed planning there are not many obstacles that are impossible to overcome.

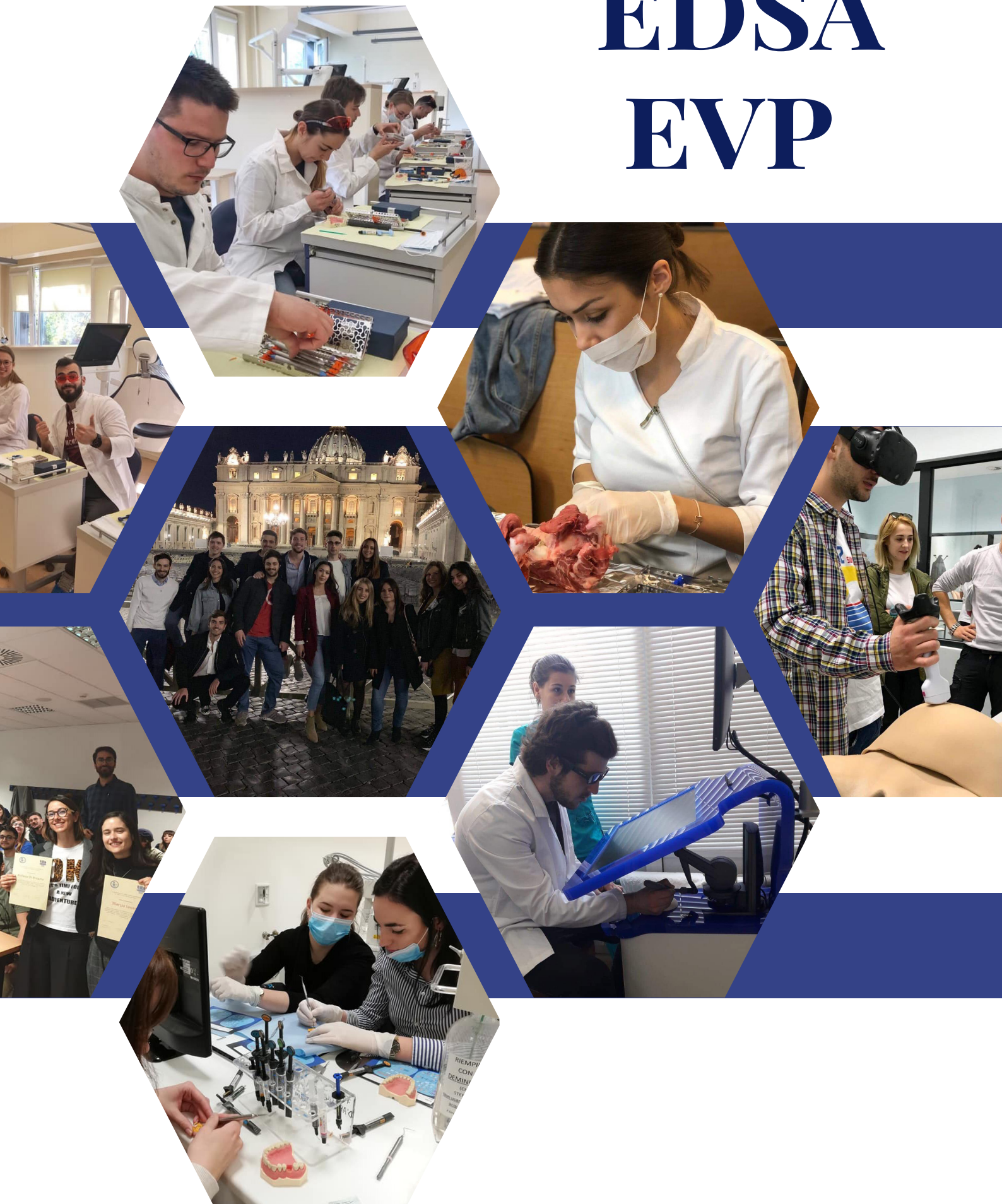
A Multidisciplinary approach to implant-prosthetic therapy involves the cooperation of orthodontists, periodontologists, oral surgeons and

prosthodontics. This collaboration is of great importance, in order to ensure the success of implant-prosthetic therapy. Incorporating orthodontics into planning therapy stems from the need for leveling teeth that have changed their position due to premature tooth loss. Accordingly, alveolar bone resorption followed by soft tissue deformation is an obstacle to implant placement. The importance of the collaboration between periodontologists and oral surgeons is crucial in bone restoration and soft tissue management to restore their broken integrity. Bone augmentation techniques and mucogingival plastic surgery are procedures needed to ensure successful osseointegration of implants, and also to the aesthetics of the final prosthetic treatment. In the selection of prosthetic replacements, in the ability to reach the patient's desires, sufficient retention, stabilization, and aesthetics are essential, as well as the patient's oral hygiene and compliance along with eventually temporary prosthetic replacement. In conclusion, every individual case is unique in its course of therapy, and multidisciplinary collaboration is key in planning for the best result possible.

Every year EDSA runs its European Visiting Programmes, where students can visit another university to see how dental education works in other countries. There is an clinical, scientific and social programme, with great dinners and parties to get to know the other participants. All new EVPs can be found at [www.edsaweb.org/evp](http://www.edsaweb.org/evp) - keep an eye out as new ones are added all the time!



# EDSA EVP



# All Worn Out

## Erosive Tooth Wear Foundation: Raising awareness on a modern dentistry issue

Erosive tooth wear affects 30% of young Europeans, but despite this widespread issue, it has previously been poorly understood by dentists and the public. A research group at King's College London hopes to change this with their new campaign - Tanguy Pinedo-Tora interviews Professor David Bartlett to find out more.



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**Tanguy Pinedo-Tora, EDSA Prevention Officer, France**

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Professor David Bartlett is Head of Prosthodontics and Graduate training at King's College London, member of the Erosive Toothwear Foundation.



## Why is erosive toothwear a modern issue?

Our society demands healthy living. So we eat fruit and follow advice. But in common with everything too much of a good thing damages us. Snacking on fruit for those susceptible to erosive tooth wear results in destruction of teeth. Erosive tooth wear is the acid mediated dissolution of teeth that can eventually lead to obliteration of the tooth. It occurs

on plaque free surfaces in patients who clean their teeth and are motivated. Snacking on acidic foods more than 3 times a day raises the risk of erosive tooth wear by 13 times. Eating fruit at meal times is totally safe.

Erosive tooth wear first appears on the buccal surfaces of upper central incisors and the occlusal surfaces of lower molars. The initial change is difficult to detect as it is the subtle changes in tooth morphology with smoothing of tooth contour and loss of surface features. As the condition progresses deeper tooth loss occurs and cupped out lesions appear on the occlusal surfaces of molars and flattening of the buccal surface of the incisors. Ultimately the structure of teeth is lost and can lead to extraction.

## What are the goals of the erosive toothwear foundation ?

Our goal is to inform and raise awareness of the public and dentists to erosive tooth wear. The website is targeted at patients and dental care professionals with guidance for both. Helpful guides are written for patients seeking self-help and for dentists the same but in more detail and learning modules for further information. the foundation is funded by 3 major oral care industries who realise the importance of erosive tooth wear in society.

How can we prevent or detect the key factors of erosive toothwear in our patient mouth?

By taking care and using the same guidance we give for dental caries. Avoid snacking between meals, consume fruit at meal times and visit your dentist regularly. dentists should examine erosive tooth wear at every examination. 30% of patients show signs of erosive tooth wear so it is common and needs dentists attention!

## Erosive tooth wear : using the BEWE index

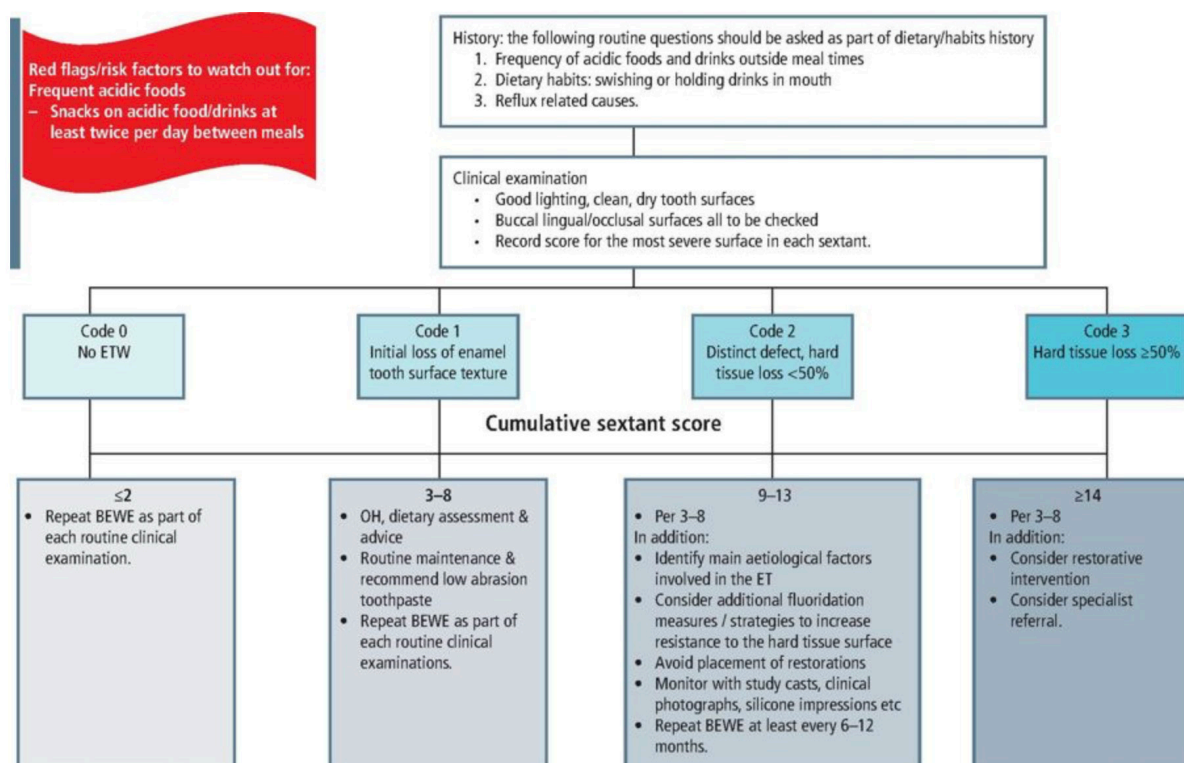
Monitoring erosive tooth wear is a major challenge in modern dentistry, as the third most common oral condition. Risk factors include diet, or intrinsic factors like acid reflux.

## What is BEWE?

The Basic Erosive Wear Examination is a convenient way to record the severity of erosive tooth wear, adopted in 2008 and used since then in international publications. Code 0 is the absence of defect, code 1 less severe case, to code 3 being the most advanced.

Grade 0 is seen on newly erupted teeth, but is not likely to be recorded on patients after the age of 25.

## How to record BEWE and How can we use it to assess treatment needs?



# Forty Winks: Why Dentists Should Ask Their Patients About Sleep

Should dental professionals be concerned about the quality of sleep their patients have?



**Ji-Yun Stephanie Yeung, UK**

We are not sleeping the way nature intended. In a generation dominated by the ideas of more, new and now, twenty-four hours in a day is simply not enough. Electrical lighting has made it possible to trade sleep for nocturnal working. Cities come alive at night. Today's widespread 'you snooze, you lose' attitude is only perpetuated by electrical screens and round-the-clock connectivity. The fabric of modern society has brought about a change in sleep conditions but cutting the time that should be spent in slumber has consequences. Ranging from sleep deficiency and insomnia to obstructive sleep apnoea, sleep problems are on the rise.(1)

## **Good Sleep Equals Good Health**

A strong bidirectional relationship exists between sleep and health. Both quality and quantity are important, with good sleep preventing disease and poor health. Risk of all-cause mortality is lowest for 7-hour sleepers, whereas adverse health outcomes are associated with both the shortest and longest sleep durations.(2,3) The adverse effects of poor sleep are numerous, including neurocognitive disorders,(4) adverse cardiovascular outcomes,(5,6) negative effects on glucose metabolism and increased obesity risk.(7) Sleep deprivation can even put one onto the path to being prediabetic.(8) Not merely beneficial for wellbeing, a good night's sleep is demonstrably essential to normal functioning. If physiological imbalance wasn't enough, poor sleep also poses a threat to individual safety through an increase in risk-taking behaviours and human-error related accidents.(9) Collateral damage ensues as this in turn jeopardises public safety.

## **The Societal Fallout of Poor Sleep**

Sleepiness on the job has repercussions beyond just a reputation for untimely nodding off. In the operation of large machines or heavy equipment, as is the case for airline pilots and commercial vehicle drivers, there is a serious safety risk. Falling asleep while driving accounts for a considerable proportion of vehicular accidents under monotonous driving conditions.(10) Sleep disorders have been significantly associated with increased risk of self-reported adverse safety outcomes in police officers(11) and healthcare professionals.(12) There are also elevated medical costs to individuals and/or healthcare systems and indirect costs incurred from work absenteeism and property damage.(13) Up to \$680 Billion is lost each year over five OECD countries due to insufficient sleep.(23) Ensuring high-quality sleep is therefore a public

health priority.

## **Sleep: A Determinant of Health Status?**

Health is not merely the absence of disease and is influenced by a number of social determinants. Similarly, numerous behavioural and environmental factors influence sleep: among others, these include personal choice, work demands, and illness. There is also a social patterning of sleep. Lower socioeconomic status (SES) is associated with higher rates of sleep complaint.(14) Sufficient and high-quality sleep is distributed in favour of economically-advantaged higher levels of SES,(15) so might addressing sleep as a proxy for health help ameliorate health inequalities? Given that sleep has become a social behaviour closely related to our social environment, there is underappreciated potential for sleep deficiency unrelated to a primary sleep disorder as a determinant of health status.(13)

## **Addressing Sleep Problems: The Role of Dental Professionals**

More people are seeking help for sleep-related problems. Having substantially increased in prevalence over the last two decades, sleep disorders include insomnia, narcolepsy and sleep-disordered breathing, a group of conditions including simple snoring and obstructive sleep apnoea (OSA).(16) Healthcare professionals must be prepared to address what has been deemed a 'sleep-loss epidemic'.

The dental profession has continually met the challenge of reconnecting the mouth to the rest of the body. Sleep medicine is another speciality enhanced by dental contribution. Sleep bruxism and orofacial pain are conditions for which the dentist already has diagnostic and management skills. Given that apnoeic episodes are only witnessed during sleep and there is a lack of particularly egregious daytime symptoms, dentists can play a critical role in detecting the impact of a poor airway on patient craniofacial development. Features readily available during dental examination include oral impairment and occlusal dysfunction such as bruxism, erosive reflux, myofascial pain and malocclusion. These may well present before clinical presentation of systemic disease. The dentist may even be the first to recognise a patient's sleep disorder by witnessing apnoeic events in patients undergoing sedation for dental treatment.(16)

Until the 1980s, the only effective treatment for OSA was tracheostomy.(17) The current gold standard is a device that

covers the face, providing continuous positive airway pressure (CPAP) while patients are asleep. But CPAP compliance is poor; systems are noisy and wearing the mask can be uncomfortable, even causing claustrophobia in some users. (18) Prosthodontists can offer oral appliance therapy as a non-surgical, conservative treatment alternative. Devices protrude and stabilise the mandible to maintain a patent airway during sleep. (19) Custom-made oral devices worn in the mouth during sleep have proven both comfortable and effective for mild to moderate cases of OSA, as well as in treatment of simple, non-apnoeic snoring. Besides OSA, prosthodontic appliances are also used to minimise damage caused by toothwear in sleep bruxism. (20) With their expertise in the oral cavity, dental professionals can be valuable members of the sleep medicine team.

### The Pursuit of Wellness

We live in an era of unprecedented medical innovation. But we also face the rising burden of chronic non-communicable diseases, attributed to the non-essential lifestyle behaviours of unhealthy diets, physical inactivity, alcohol and tobacco use. (21) In practicing prevention, asking patients about tobacco use now features in most health consultations. But while not everyone uses tobacco or alcohol, everyone sleeps. Improving sleep quality (another health-related behaviour) is an intervention that could very well be more easily implemented than exercise or dietary change. (13) After all, sleep is an equal opportunity benefactor. Research also suggests that improving sleep could result in greater adherence to medical treatments. (22) Incorporating questions about patients' sleep into healthcare screenings might be a first step towards denormalizing the problem of poor sleep.

Healthy, well-rested societies are productive societies. In the pursuit of wellness, health-promoting environments and attention to autonomous behaviours are key. However, despite evidence of the deleterious effects of systems and sleep conditions keeping people up, there remains a disconnect between research and implementation. Public awareness of the health importance of sleep, whilst growing, remains low. Multisectoral engagement is needed to bridge the gap. Healthcare professionals – including dentists – are pivotal in this, furthering public engagement, influencing buy-in from policymakers, and providing patients with appropriate sleep-related help. Granted, dentists are not sleep medicine specialists, but good sleep is essential to good health. If whole patient health is the priority, our profession must open-mindedly embrace the possibilities of taking dentistry beyond waking hours.

1 Ferrie JE, Kumari M, Salo P, Singh-Manoux A, Kivimäki M. Sleep epidemiology—a rapidly growing field. *Int J Epidemiol* 2011; 40: 1431–1437.

2 Grandner MA, Hale L, Moore M, Patel NP. Mortality associated with short sleep duration: The evidence, the possible mechanisms, and the future. *Sleep Med Rev* 2010; 14: 191–203.

3 Cappuccio FP, D'Elia L, Strazzullo

P, Miller MA. Sleep duration and all-cause mortality: a systematic review and meta-analysis of prospective studies. *Sleep* 2010; 33: 585–592.

4 Miller MA. The Role of Sleep and Sleep Disorders in the Development, Diagnosis, and Management of Neurocognitive Disorders. *Front Neurol* 2015; 6. doi:10.3389/fneur.2015.00224.

5 Cappuccio FP, Cooper D, D'Elia L, Strazzullo P, Miller MA. Sleep duration predicts cardiovascular outcomes: a systematic review and meta-analysis of prospective studies. *Eur Heart J* 2011; 32: 1484–1492.

6 Yin J, Jin X, Shan Z, Li S, Huang H, Li P et al. Relationship of Sleep Duration With All-Cause Mortality and Cardiovascular Events: A Systematic Review and Dose-Response Meta-Analysis of Prospective Cohort Studies. *J Am Heart Assoc* 2017; 6. doi:10.1161/JAHA.117.005947.

7 Spiegel K, Tasali E, Leproult R, Van Cauter E. Effects of poor and short sleep on glucose metabolism and obesity risk. *Nat Rev Endocrinol* 2009; 5: 253–261.

8 Gangwisch JE, Heymsfield SB, Boden-Albala B, Buijs RM, Kreier E, Pickering TG et al. Sleep Duration as a Risk Factor for Diabetes Incidence in a Large US Sample. *Sleep* 2007; 30: 1667–1673.

9 Womack SD, Hook JN, Reyna SH, Ramos M. Sleep Loss and Risk-Taking Behavior: A Review of the Literature. *Behav Sleep Med* 2013; 11: 343–359.

10 Horne J, Reyner L. Vehicle accidents related to sleep: a review. *Occup Environ Med* 1999; 56: 289–294.

11 Rajaratnam SMW, Barger LK, Lockley SW, Shea SA, Wang W, Landrigan CP et al. Sleep disorders, health, and safety in police officers. *JAMA* 2011; 306: 2567–2578.

12 Owens JA. Sleep loss and fatigue in healthcare professionals. *J Perinat Neonatal Nurs* 2007; 21: 92–100; quiz 101–102.

13 Luyster FS, Strollo PJ, Zee PC, Walsh JK. Sleep: A Health Imperative. *Sleep* 2012; 35: 727–734.

14 Grandner MA, Patel NP, Gehrman PR, Xie D, Sha D, Weaver T et al. Who gets the best sleep? Ethnic and socioeconomic factors related to sleep complaints. *Sleep Med* 2010; 11: 470–478.

15 Hale L, Hale B. Treat the source not the symptoms: why thinking about sleep informs the social determinants of health. *Health Educ Res* 2010; 25: 395–400.

16 Padma A, Ramakrishnan N, Narayanan V. Management of obstructive sleep apnea: A dental perspective. *Indian J Dent Res* 2007; 18: 201.

17 Young T, Skatrud J, Peppard PE. Risk factors for obstructive sleep apnea in adults. *JAMA* 2004; 291: 2013–2016.

18 Health Quality Ontario. Oral appliances for obstructive sleep apnea: an evidence-based analysis. *Ont Health Technol Assess Ser* 2009; 9: 1–51.

19 Scherr SC, Dort LC, Almeida FR, Bennett KM, Blumenstock NT, Demko BG et al. Definition of an Effective Oral Appliance for the Treatment of Obstructive Sleep Apnea and Snoring: A Report of the American Academy of Dental Sleep Medicine. *J Dent Sleep Med* 2014. doi:10.15331/jdsm.3738.

20 Macedo CR, Silva AB, Machado MA, Saconato H, Prado GF. Occlusal splints for treating sleep bruxism (tooth grinding). *Cochrane Database Syst Rev* 2007; : CD005514.

21 World Health Organization. Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases. 2008. <http://www.who.int/nmh/publications/9789241597418/en/> (accessed 30 Mar 2018).

22 Grandner MA, Malhotra A. Sleep as a vital sign: why medical practitioners need to routinely ask their patients about sleep. *Sleep Health J Natl Sleep Found* 2015; 1: 11–12.

23 Hafner M, Stepanek M, Taylor J, Troxel WM, van Stolk C. Why Sleep Matters—The Economic Costs of Insufficient Sleep. *Rand Health Q* 2017; 6. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5627640/> (accessed 27 Aug 2018).



# EDSA Kazan Lecture Competition Winners

## Winner

Jonni Nykänen, University of Eastern Finland - 5th Year

Surgery First Approach – a promising new protocol for orthognathic treatment?

### Introduction

Orthognathic treatment combines orthodontics and maxillofacial surgery. Treatment can take years and is very demanding to the patient. Studying new treatment protocols such as Surgery First Approach (SFA) could bring major benefits for the patients and for the healthcare system.

### Materials & Methods

A systematic review of literature on SFA was performed in the PubMed database. Patient selection criteria, treatment duration, patient satisfaction and postoperative stability were compared. The search results were filtered using a PRISMA -chart. In the end 31 articles were included in the study. A case study was also included in the study.

### Results

Careful patient selection is vital. With SFA treatment takes 6-12 months in total which leads to improved patient satisfaction when compared to the conventional method. There were no differences in postoperative stability between the conventional method and SFA.

### Conclusion

SFA is an effective protocol to be used for carefully selected patients alongside the conventional method. Suitable patients to be treated with SFA are those with even dental arches with no dental crowding, typically patients with Obstructive Sleep Apnea. Patient satisfaction and treatment have been very positive with similar postoperative stability than with the conventional method when patient selection is done carefully. SFA seems to be a promising method, although more studies are needed to confirm the results.

### Acknowledgements

I thank BDS Jenna Pajunen for co-writing this article. We thank PhD, OMFS, DDS Jarno Savolainen and PhD, Orthodontist, DDS Tiina Ikävalko for guidance and Prof. Jari Kellokoski for performing the surgery presented in our case study.

## Runner-Up

Alina Goncarova, Riga Stradiņš University - 5th Year

Maxillary Soft Tissue Changes After Le Fort I Osteotomy in Angle III Malocclusion Patients

### Introduction

Visual appearance is largely determined by the surrounding soft tissue. Most studies focus on bone changes after orthognathic surgery, but not on soft tissues. For surgeons and orthodontists soft tissue response may be really difficult to determine before surgery. For patients with severe dentofacial deformations, to whom orthognathic surgery is planned, soft tissue changes are expected after surgery. Important is to predict possible changes.

The soft tissue of the middle part of the face is difficult to predict due to the back-pulling forces of the muscles.

Aim is to identify and predict maxillary soft tissue changes in patients with Angle Class III malocclusion after Le Fort I osteotomy.

### Materials & Methods

Soft tissue measurements were made on 3dMdx Vultus scans obtained from a database of orthognathic surgery Le Fort I Angle III malocclusion patients. Soft tissue points were placed, measurements were performed on scans taken before orthognathic surgery (T0), 6 or 9 months (T1) after orthognathic surgery for 22 subjects, age 20 - 43. Paired t-test were used to determine changes between pre-surgery and post-surgery soft tissue position.

### Results

Distance between both lips increased by 0,928mm ( $p < 0,01$ ). Mouth width did not change. Distance between nasal alare increased by 1,554mm ( $p < 0,01$ ). Biggest changes were between points sn (subnasale) and li (lower lip), where distance increased by an average

of 2,03mm ( $p < 0,01$ ), and also between points sn (subnasale) and chL (chelion left) on average by 1,77mm ( $p < 0,01$ ). Changes also occurred in the soft tissue of the lower lip.

## **Conclusion**

Major changes were in the triangle area of nose alares and upper lip. This area moved forward and increased in width.

## 3rd Place

**Yolena Gesheva, Plovdiv Medical University - 2nd Year**  
**Dental Stem Cells in Pulp Regeneration**

## **Introduction**

Stem cells are capable of becoming, depending on the environment, in cellular tissue of different organs. One stem cell gives many active, functional lineages. Stem cells in the oral cavity can be found in the dental pulp (DPSCs), gingiva, apical papilla, periodontal fiber (PDLSCs), alveolar bone. However, highest proliferation potential have stem cells from exfoliated deciduous teeth (SHED). They have become an attractive source for dental tissue engineering. These stem cells can be isolated from patients noninvasively. If they are stored in suitable conditions after extraction – they can treat diseases and even regrow whole tooth structures. The concept of using stem cells for dental tissue engineering was explored by Sharpe. He proved that it is possible to engineer murine teeth, using stem cells of nondental or dental origin.

In this literature review we will focus on tissue engineering of dental pulp with SHED cells. As suffered pulp is usually treated with endodontic approaches leading to devitalization and weakened tooth, we firmly believe pulp tissue engineering will gain more and more popularity in 21 century dentistry.

The experiment is done in vivo and consists of a tooth slice with 1mm thickness from third molar. Its residual soft tissue is removed with a scalpel and the dental surface is wiped down with 70% ethanol. Biodegradable scaffold is prepared within the root canal and then seeded with dental pulp stem cells or dental pulp stem cells mixed with endothelial cells. The tooth slice is implanted in the subcutaneous tissue of immunodeficient mice, observing the predentine formation.

## **Materials & Methods**

Key role plays the choice of scaffold and cells, which show potentiality to differentiate into cells of the pulp like dentin-secreting odontoblasts and vascular cells (providing vitality to the tissue). Polymers, such as polyglycolic acid (PGA) are suitable matrices for seeding of dental pulp fibroblasts, allowing their proliferation and development of a tissue with similar cellularity to normal pulp. Other scaffolds like a spongy collagen, a porous ceramic, and a fibrous titanium mesh can support the attachment, growth, and differentiation of dental pulp stem cells in vitro, and when such constructs are implanted in vivo, the cells organize into a well-vascularized tissue that expresses dentin sialoprotein.

The day before the implantations, the tooth slice/scaffolds are hydrophilized with incubations (5 minutes) in ethanol (100%, 90%, 80%, and 70%) and washed with sterile 1× PBS overnight at 4°C. The tooth slice/scaffolds containing cells are incubated for 30 minutes at 37°C to allow for the setting of the Matrigel.

After 14–28 days, the implants are retrieved, put in 10% buffered formalin at 4°C for 24 hours, demineralized with 10% formic acid at 4°C until the dentin offer no resistance to cutting with a blade (5–8 days) and then process for histology. Histologic sections (5-µm-thick) are stained with hematoxylin-eosin or kept unstained for immunohistochemistry.

## **Results**

A dental pulp-like tissue with characteristics that resemble those of a normal dental pulp is observed. Predentin is formed. Besides SHED alone, endothelial cells are also implanted in the tooth slice/scaffold devices. To begin morphologic characterization of the engineered dental pulps, the number of cells lining the predentin is counted. SHED and endothelial cells show a higher number compared to SHED only. These findings suggest that co-implantation of endothelial cells provides for the quick organization of a microvascular network and influx of oxygen and nutrients to the SHED, improving their survival after transplantation and enhancing tissue cellularity.

Also almost all of the blood vessels found in the pulps engineered with SHED contain blood cells in their lumen, which demonstrates that the transplanted dental pulp stem cells are capable of differentiating into blood vessels that anastomose with the host vasculature.

Transmission electron microscopy reveals the ultrastructure of the cells adjacent to the predentin in engineered dental pulps. These cells show morphologic characteristics that resembled those of odontoblast cells, including the eccentric polarized position of the nucleus at the basal part of the cell body, developed rough endoplasmic reticula, Golgi's complex, and numerous vesicles.

## **Conclusion**

This method offers exciting opportunities for regeneration of dental pulps, one of the most commonly diseased tissues of the body, with consequent potential for impact on healthcare. Importantly, these cells form a functional vasculature as well as connective tissue secreting cells of the soft and hard tissues of the tooth. In the SHED cell-seeded tissue constructs, the cells at the periphery of the tissue show characteristics of active dentin-secreting odontoblasts - DPS-factors, typical for dentine are expressed. When SHED

cells are co-implanted with human endothelial cells, the resulting pulp tissue constructs has even better organization and greater cellularity than when SHED cells alone are implanted.

This work suggests that exfoliated deciduous teeth constitute a viable source of stem cells for dental pulp tissue engineering.



The participants, organisers, judges and spectators of the EDSA Kazan Lecture Competition - our thanks to Dana Timuş, EDSA Research Officer, and the judges from Kazan State Medical University for their hard work in making the event happen.

# EDSA Kazan Roundup

After a hugely successful meeting in Kazan, Russia, Magazine Co-Editor Ivana Ligusová catches you up on anything you might have missed!



**Ivana Ligusová, EDSA Magazine Co-Editor, Slovakia**



On the 14th-19th of April, students from all the EDSA member countries met for the 63rd time in history. The meeting has been hosted by the Kazan State Medical University in Russia, and we haven't had an EDSA meeting with so many changes made to the association for a very long time.

What are the differences to the previous meetings?

## The president election process.

The event of choosing the leader of the association used to happen in August, during electing other members of the Executive Committee and Officers. This year was different – we elected the President Elect in April meeting to enable the President Elect to plan his work in advance and prepare for the difficult position. Tin Crnic, previous General Secretary has been elected in the voting

and his year in office will start upon the election of the Board for 2019/2020 on the 21st of August 2019.

## Board of the Delegates.

The new type of assembly that had its premiere in the Kazan meeting. General Assembly used to be the only way to connect with the delegates – in the large Aula in front of all the people attending the meeting, which can be more than two hundred people. Delegates are sitting in the front, but it's still a hard task, especially for the new delegates or shy people to put their hand out, wait for the microphone and say their opinion on the subject. Board of the Delegates offers a comfortable place to speak up, only in front of the ExCo, Officers, National Delegates and a few guests (IADS, EMSA, EPSA and other representatives), and gives the delegates a valuable chance of being part of the conversation and decision making.

## Constitution.

„The holy document“ that sets up all the rules for our association. In case you attended previous three meetings, you probably heard this word many times or even attended a debate about the changes that were planned to be made. The process has been long, but after many amendments the new EDSA Constitution

passed through the voting and has been successfully implemented.

## Policy Officer.

The new position in the group of EDSA Officers has been suggested by James Coughlan, and the Board of the Delegates agreed it will bring a lot of value to the future of the association. We have to realize our potential as the organization that connects so many dental students of Europe, and if we really want to communicate problems of this large group, we need to be consistent and name the issues properly. But the leadership is changing every year and it's impossible to solve problems of the European scale in one year. We can't achieve this without having a document that will describe the issue in detail and will be handed to the next leaderships who can keep up the work. Policy papers – as the document is called – will be a work to do for the person that will be elected in the EDSA Berlin elections in August 2019.

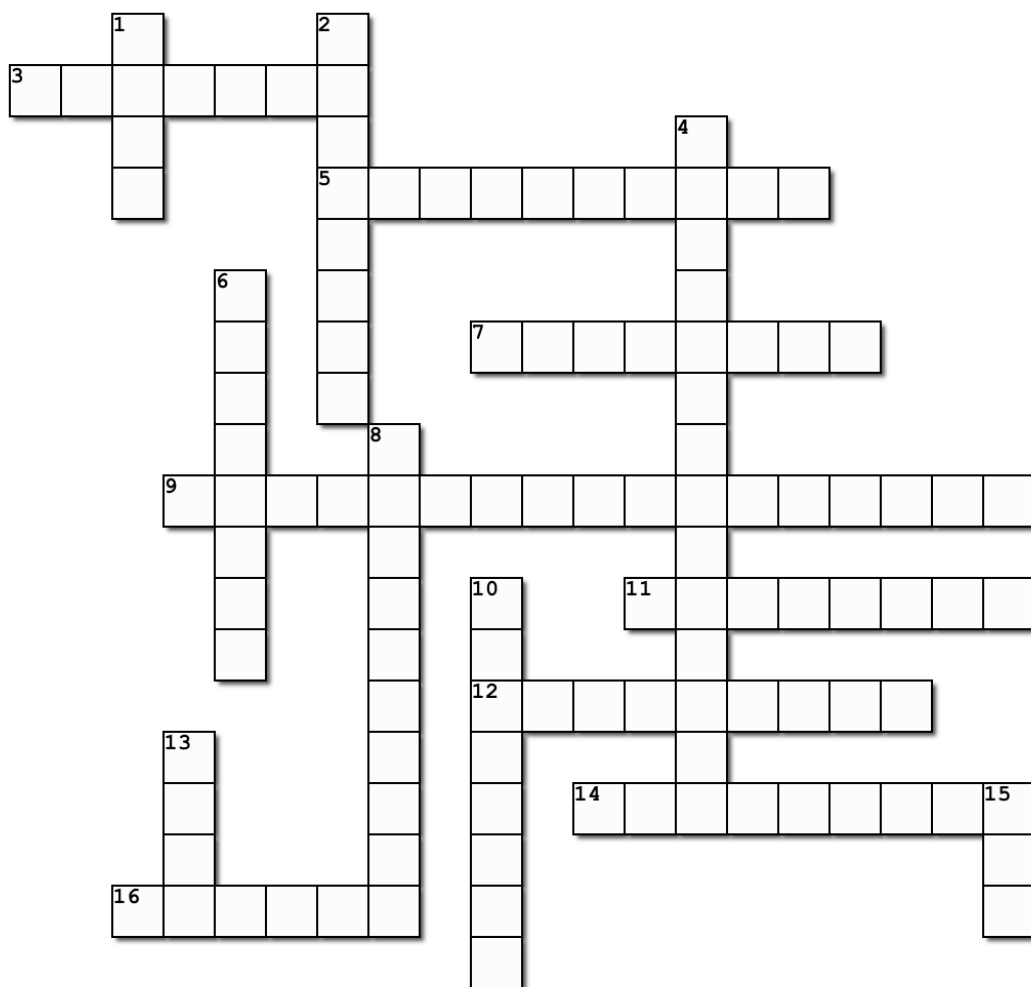
But not everything was new – interesting dentistry lectures, amazing social program and the glamorous gala night are part of every EDSA, and we want to thank the Local Organizing Committee for performing these tasks so amazingly as well as the support of our sponsors – you made this meeting unforgettable.







# EDSA Crossword



## Across

3. University EDSA Berlin is hosted at (7)
5. Karaoke night at every EDSA meeting (10)
7. USSR leader seen kissing on the Berlin Wall (8)
9. Many specialties working together (16)
11. East German leader seen kissing on the Berlin Wall (7)
12. The journal in which new Oral Health Series was published (3,6)
14. Making a change to a motion in the General Assembly (9)
16. Thin dental prosthesis associated with Hollywood (6)

## Down

1. German word for tooth (4)
2. Term for EDSA Meeting attendees (8)
4. Class of medication that can cause MRONJ (14)
6. Country with new dental integration policy (8)
8. Number of EDSA Meetings including Berlin (6,4)
10. Location of EDSA Spring Meeting 2020 (8)
13. Acronym of new erosive wear index (4)
15. First name of EDSA President-Elect (3)

# #meet Eurasia



# April 12-19 2020

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