EDSA Magazine

Spring 2020

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Community water fluoridation - a salutary or a devastating policy?

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Messages From The Team

Dear European dental students,

When we started working on this issue of the magazine in September 2019, we didn't expect to be facing a situation like this. I thought my opening message would be filled with wishes to enjoy the meeting in Istanbul; unfortunately, it's a little different. For the first time in the history of EDSA, a global pandemic has made it impossible for us to meet. We can't even print the magazine for everyone and give it to you in person.
This uneasy time teaches us to be grateful for our health, to value doctors, scientists, nurses, public-health workers, caregivers and grocery-store workers. This virus has shown us how much human contact matters -what it feels like to be without our family and friends and how much we have taken our community for granted.
I publish this magazine with the hope that it will make you forget problems for a while and that it will teach you something new about the world of dentistry.
I hope you are healthy and safe, and that we will see each other again soon.

Ivana Ligusová, *Editor-in-Chief*

Dear EDSA family,

Welcome to the first edition of this year's EDSA Magazine. Firstly I would like to thank our Editor-in-Chief, Ivana Ligusová and Co-editor Neil Unnadkat for their remarkable work and for creating this issue which you can enjoy reading from the safety of your home. Throughout this term, EDSA was focusing on improving its internal and external affairs by working with our partners, starting new projects, and striving to improve the existing ones. I need to send a big thank you to all the members of the Executice Committee and the Supervisory Committee for their dedication and the tremendous job they did so far, I am truly thankful for having an opportunity to lead this great group of individuals. Last but not least, I would also like to thank all the EDSA members for their great contribution to this term. Following their example, I would like to motivate you to join EDSA and create a wonderful journey which you will cherish for a lifetime.

Tin Crnić
EDSA President

Dear EDSA family,

Thank you so much for taking the time out to contribute to, and read this issue of the magazine.
Ivana, myself, and all of the writers have invested countless hours into making sure that we uphold the high standard that the EDSA magazine always lives up to. Unfortunately, you won't be reading this sat amongst the rest of the Istanbul congress due to the recent outbreak of COVID-19, which has brought the world to its knees. Therefore, I can only hope that each and every one of you is safe and can take some time to read through some interesting, contemporary articles on dentistry! I look forward to seeing you all very soon, when we can once again celebrate, as well as share our outlooks and developments in modern dentistry. Again, a special thank you to our writers and sponsors; without you, there would be no magazine!

Neil Unnadkat
Magazine Co-Editor

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State of Health in the EU Initiative: a Dental Student's Perspective

If we want to make sure that healthcare in Europe works today and in the future, we need better knowledge. We need data and insights on the health of European citizens, on how we organize care and how much our health systems cost. What if we had the information about the EU countries' health all in one place? The European Commission's „State of Health in the EU" initiative is making it possible. Reading EU institutions' official documents or statements might seem like an intricate process and this is the reason that motivated me to address the topic and highlight the importance of the initiative in this article.

Ivana Ligusová, EDSA Vice President for Public Relations, Slovakia

The State of Health in the EU is a project whose main aim is to provide factual, comparative data and insights into health and health systems in the EU countries. The data can then be used by policymakers, interest groups and health practitioners. Everyone who helps to shape health policies will have easily accessible information and expertise about the health systems and practices in Europe.

It's a collaborative initiative undertaken by the European Commission (EC), in cooperation with the Organisation for Economic Co-operation and Development (OECD) and the European Observatory on Health Systems and Policies.

The „State of health in the EU" initiative exists to gather the latest evidence on health and share the knowledge across the EU, and the outcomes are published as a series of digestible reports.

According to the EC official website, the project stands on four main stages: (1) Health at a Glance, (2) Country Health Profiles, (3) A Companion Report and (4) Voluntary exchanges.

Each of these address specific aspects of healthcare in all the EU countries and aim to share best practices, as well as underline challenges and difficulties faced by different countries or Europe as a whole.

1. Health at a Glance: Europe

The Health at a Glance is a document issue by the OECD and the European Commission which is published every two years. The report provides a neutral descriptive comparison of all EU health systems' performance, based on publicly available data and indicators. While the amount of information might seem exhaustive, the document provides an excellent comparison of the pivotal healthcare aspects in EU countries. To evaluate a country's health status, we need to look at the trends in life expectancy, main causes of mortality in a country, infant health, self-reported health, or prevalence of diseases like diabetes, dementia, cancer, HIV or tuberculosis. It's also necessary to look at the risk factors that may cause these diseases, like smoking, unhealthy diet and alcohol consumption. After having enough information on prevalence of the diseases and exposure to risk factors , we need to focus on the way healthcare is delivered and financed in this particular health system, and rate its affordability, availability, efficiency and fiscal sustainability.

The document has around 200 pages and it's full of interesting evidence-based public health information. The data is then used to specify the main health policy priorities. The last Health at a Glance report from 2018 pointed out two main priorities: promoting mental health and reducing inefficient spending.

According to recent estimations, more than one in six people across the EU had a mental health issue in 2016, equivalent to about 84 million people. Moreover, in 2015 the deaths of more than 84 000 people in EU countries were attributed to mental illness or suicide.

Wasteful spending occurs when patients receive unnecessary tests or treatments or when care could have been provided with fewer and less costly resources. Evidence from various countries suggests that up to one-fifth of health spending is wasteful and could be reallocated to better use.

Other priorities focus on reducing behavioural risk factors in the EU population. Up to 20% of adult EU citizens are smokers and 38% adolescents reported binge-drinking during the past month. The prevalence of obesity continues to increase among adults in most EU countries, with at least one in six defined as obese. Inequality in obesity remains marked: 20% of adults with a lower education level are obese compared with 12% of those with a higher education.

The „Health at a Glance: Europe" report gauges progress towards effective, accessible and resilient health systems across the EU.

2. Country Health Profiles

The Country Health Profiles are a set of 30 documents covering all EU Member States, as well as Iceland and Norway. Each profile provides a short description of the health status in the country, focusing on behavioural risk factors, the organization of the health system, as well as an analysis of each health system's

effectiveness, accessibility and resilience.

To be able to transform health systems across Europe and make them fit for the future, it is necessary to compile information on each country's health system and put it into perspective of a cross-EU comparison.

Each document covers the latest health policy challenges of a country, and puts it in an understandable way useful to the broad audience. It's a very interesting read for healthcare students – you can learn how many people smoke or drink in your country, what are the main causes of death, how many doctors and nurses you have or how much your government spend on healthcare. Everything is shown in comparison to other EU countries, so it's not hard to understand. The last edition went out in 2019, and if you are an EU country citizen, you can find your country's profile on the European commision website.

3. Companion Report

The Companion Report is a document which outlines some trends that are the same for most, if not all, EU Member States. This document points out five key conclusions from the Country Health Profiles:

- Vaccine hesitancy is a major public health threat all across Europe. It can be tackled by improving health literacy, actively involving health workers and countering disinformation.
- Digital solutions, such as apps, smartwatch and online fora hold great potential for health promotion and disease prevention. These innovative approaches help raise awareness and empower citizens to take control over their healthy behaviour and lifestyle choices.
- More evidence is needed to gain a clearer picture of the individuals across Europe who genuinely experience barriers in access to health care, factoring in socio-economic characteristics as well as clinical profiles.
- The health workforce faces many challenges - workforce ageing, uneven geographical distribution and recruitment and retention issues. The quality of care provided by nurses is at least equivalent to physicians for a wide range of services, shifting tasks among workforces could make visiting a doctor more accessible to everyone.
- The last point is to ensure access to safe and effective medicines. Policymakers struggle to balance the affordability of medicines, enhancing innovation and protecting our health-systems at the same time.

The second part of the Companion Report provides short one-page reviews of key findings from the Country Health Profiles document. If you want to have an overview of healthcare in each EU country, this is an ideal document to read.

4. Voluntary exchanges

The fourth and the final deliverable of the State of Health in the EU cycle consists of a series of voluntary exchanges. Health Ministries can request these exchanges, and they are operated by experts from OECD and the Observatory. There have been seven voluntary exchanges between May and September 2018 and they took place in Austria, Cyprus, Finland, Italy, the Netherlands, Poland and Sweden. Topics covered health workforce, health financing, health promotion and disease prevention, use of health data and integrated care. Policymakers can understand the concerned issues better, and develop possible policy responses.

For instance, when Cyprus started preparing and implementing their new National Health Service and public hospital reform, government officials learnt from practices from no fewer than nine other Member States which tackled similar reform processes. The voluntary exchange in Sweden focused on actions to strengthen health promotion and disease prevention, including experts from Belgium, France, Ireland and the United Kingdom.

The State of Health in the EU initiative started in 2016. These four documents „run in a cycle" – Health at a Glance (1) has been published in November 2016, followed by the Country Health Profiles (2) and the Companion Report (3) in 2017, and the Voluntary Exchanges (4) and Health at a Glance (1) again, in 2018. The aim is to carry on with this two year cycle to deliver up-to-date knowledge about health in the EU.

Without gathering all the valuable data, it would be impossible to take action and tackle health problems in the EU population. To solve any issue, we must be aware of the issue itself and evaluate all of its aspects. Through prevention of health problems, individuals can spend most of their years in good health, and on the long term, the life expectancy of the EU population can grow.

The „State of Health in the EU" documents can be found at https://ec.europa.eu/health/state/summary_en and is free to access - we encourage all students to read the key papers.

Why Students Engage in Extracurricuar Activities, Even Though Dentistry is a Time-Consuming Course to Study?

„How do you spend all day looking inside someone's mouth? I could never do it!"
– The average person when you tell them you do dentistry

Neil Unnadkat, EDSA Magazine Co-Editor, UK

Annual British Dental Students' Association Sports Day

Although this might be a part of the job, it certainly is minor compared to some of the other issues faced as a dental student. Whether it be the long, arduous hours both inside and out of university, or continually cramming information within an apparently limitlessly morphing profession; the perils faced when studying dentistry are seemingly endless. Therefore, as students, it is important to remember that there is a life outside of the bounds of the oral cavity!

Taking a break

If nothing else, an extracurricular activity gives you the opportunity to stop dreaming of perfectly obturated canals and smooth crown margins. It allows you to take a step back from the dental setting and re-engage with the rest of the world. Whether taking short breaks, such as the Pomodoro Technique, or spending a longer time on an extracurricular activity, time away from work is scientifically proven to help boost your performance when you come back to it.

A transferrable skillset

Dentistry is a multifactorial profession; one which requires ample competencies. Whether it be manual dexterity, or the ability to lead a team, there are a multitude of skills needed to train and develop as dental students. One of the huge benefits of extracurricular activity is that you can develop these without necessarily having to be sat in a chair with a drill 24/7. Activities such as team sports and playing an instrument in a band can develop manual dexterity, teamwork and communicative skills. When you come back to dentistry, you will be utilising these skills to improve your work with your patients and the rest of your multidisciplinary team without even realising it!

People apart from Patients

On a course where you're surrounded by people talking about teeth all day, an extracurricular activity can be an excellent way to meet others. It serves as an opportunity to meet individuals from different walks of life without being obliged to look in their mouth. Whether it be just to make new friends, or to find a special someone, being able to socialise outside of dentistry can be extremely revitalising, providing a great way to interact with new people.

Looking at all this, we can see that extracurricular activities really are worth the time. Keeping a healthy mind and body is imperative in a profession as taxing as dentistry; taking a bit of time in your week to do something outside of work can pay enormous dividends. As such, if you don't already have a hobby outside of dentistry, I'd say it's time to put down the drill and learn a new skill!

Smoky Mouth: Impact of Tobacco on Oral Health

According to World Health Organization data, tobacco – one of the biggest public health threats ever – causes more than 8 million deaths a year. Its consumption (smoking and/or using smokeless forms) is associated with many systemic diseases and is described as a major risk factor for oral diseases. Different constituents of tobacco or their metabolites harmfully affect both hard and soft oral tissues and alter physiology and microbiology of oral cavity. According to many studies, tobacco is associated with periodontal diseases, oral cancer, caries and post-therapy complications.

Amina Ibrahimpašić, Slovenia

Tobacco and periodontal diseases

Periodontal disease is a chronic inflammatory disease which is characterized by the destruction of the supporting structures of teeth including the gingiva, cementum, periodontal ligament, and alveolar bone. Tobacco consumption is a significant, prime and independent risk factor for periodontal disease. Elevated values of commonly evaluated periodontal endpoints suggest progression and development of periodontal inflammation. The symptoms of inflammation are commonly hidden, since the human immune responses are suppressed. Additionally, nicotine causes acute periodontal vasoconstriction at the end-arterial vasculature and vessel defects, which suggests decreased frequency of bleeding on probing, regardless of probing depth. Recent studies show that use of tobacco prevents tooth anchoring in dental alveoli by:

- increasing collagen-degrading ability of gingival fibroblasts,
- increasing autophagy of periodontal ligament cells (PLC),
- decreasing proliferation rate and migration ability of PLC, and
- impairing bone formation, development and healing.

Some studies suggest that tobacco increases the prevalence and amount of some oral bacterial strains which play a central role in dental biofilm formation and maturation (i.e. S. gordonii, P. gingivalis, and T. denticola). However, more recent studies show that the differences between smoker and non-smoker groups were not significant and that stress reaction elicited by nicotine serves as an environmental modulating factor for bacterial metabolism and survival.

Response to periodontal therapy

Tobacco consumers respond less favourably to nonsurgical and surgical periodontal therapy than non-consumers, exhibiting less improvement in terms of pocket depth reduction, resolution

of gingival inflammation, and clinical attachment level. Furthermore, their healing ability is hindered by persistent sub-gingival infection and clot disrupting effect of negative intraoral pressure produced during smoking. Periodic periodontal therapy may assist in managing periodontitis, but may not reduce the larger systemic burden smoking has on patient's susceptibility, resistance, and healing.

In addition to effects on periodontal therapy, the use of tobacco can compromise a patient's long-term prosthetic outcome – whether the prosthesis is natural tooth or dental implant supported. It is associated with increased risk of implant failure due to poor osseointegration, postoperative infections and greater marginal bone loss, and affects bone remodeling.

Leukoplakia and oral cancer

Carcinogens in tobacco can induce changes in DNA, thus inducing abnormal mucosal lesions (i.e. epithelial oral dysplasia and oral leukoplakia) and increasing risk of developing oral cancer. Use of tobacco and excessive alcohol intake synergistically increase the risk due to alcohol's ability to dissolve carcinogenic compounds in tobacco and/or increase the permeability of oral epithelium.

Tobacco and prevalence of caries

Tobacco leaves brown or black stains on enamel and composite restorations of consumers due to retention of tar and nicotine components on teeth and the reaction of smoke chemicals with pellicle glycoproteins. Being a cholinergic agonist, the nicotine from tobacco products immediately stimulates salivary secretion. However, the pH of saliva over longer time periods of tobacco consumption is slightly reduced and its buffering capacity and cystatin activity are reduced, which leads to caries formation. Additionally, it has been reported that tobacco increases the number of caries-associated bacteria (i.e. S. mutans and lactobacilli). Furthermore, high proportions of sugar in some types of smokeless tobacco seem to act cariogenic and are associated with increased caries incidence.

How to help our patients?

According to the World Health Organization dental professionals, due to their regular contact with patients, have a significant role in smoking prevention and in supporting smokers who indicate a desire to quit. They have introduced a stepwise approach model (i.e. 4As model) which can easily be incorporated into daily clinical practice:

1) ASK about smoking status,
2) ADVICE to stop giving clear, personalized advice and highlighting oral health effects of tobacco use,
3) ARRANGE – refer patients to smoking cessation clinic and provide encouragement,
4) ASSIST the interested in quitting and provide support and encouragement,
5) Re-assess at the next appointment.

Although it has been proven that providing help for patients wishing to quit can offer substantial oral and general health benefits, there are some barriers dental practitioners need to overcome (i.e. lack of time, reimbursement mechanism, confidence and skills, patient education materials, concerns over effectiveness of support, and expected patient resistance). There is evidence that these barriers can be addressed.

Dental teams should themselves be educated and informed on the impact that tobacco has on oral and systemic health. They should serve as role models to their patients and the environment and be open to questions and discussions. It is crucial to make the first step towards your patients even if they do not show the desire to quit smoking. Educating and kindly reminding your patients could help more than you think. Dedicating some of your time and energy can be beneficial for both – the patient and the dental practitioner. Caring for your patients as well as providing help, understanding, support and encouragement helps an individual and reduces the global burden.

Community Water Fluoridation – a salutary or a devastating policy?

„Prevention is better than cure."
– Hippocrates of Kos, 460-377 B.C.

Grigorios Plemmenos, Greece

Since preventive dentistry has been set as the main vehicle towards oral health diseases, societies have felt the need of taking initiations in the field of spreading the message of maintaining a high level of oral health. For sure, changes in our lifestyles as a result of globalization have contributed to that way. By reducing, for instance, the consumption of food containing fermentable carbohydrates, the prevalence of tooth decay is consequently reduced.

However, more action needed to be taken on. And for that reason, governments all over the world decided to invest in finding solutions to protect their people massively and with an affordable cost. And then the idea of fluoridating the water came up. According to the Centers for Disease Control and Prevention, CWF was named to be 1 of the 10 greatest public health achievements of the last century.

CWF: Yesterday and Today

The first country that decided to fluoridate the water was the USA just after the end of World War II (1945). Fluoride is ingested in chemical compounds because when it is free, it is a real biohazard. The purpose of that policy was and still is the reduction in the prevalence and severity of dental caries. According to the US Department of Oral Health and Human Services Federal Panel on CWF, it is estimated that the access of the population to the fluoridated water in the US was 49% in 1975 and 72,8% in 2016. Given these stats, it is worth worrying why these percentages of CWF haven't reached or even approached 100% yet. Despite the fact that the main target hasn't changed, it is apparent that in our days' water cannot be considered the one and only source of fluoride in our days. Toothpastes containing fluoride, dietary products as well as the professional fluoridation taking place in dental health centers have limited the effect of CWF, underestimating indirectly its significance.

An overview of Today: two different worlds

But let's see what is actually going on around the world. Is it truth or a myth today that CWF is an efficient method of countering dental caries, one of the most common chronic diseases among childhood?

Opinion opposed to CWF

Unexpectedly, the majority of the countries have been opposed to adding fluoride to the community water. Dr. Arvid Carlsson the Nobel Prize winner in Physiology or Medicine in 2000 supports that it is irrational to try to cure tooth decay in a way that other parts of the human body are in danger of toxic reactions. Furthermore, he claims that there is no sufficient explanation to drink fluoridated water since the quantity of water each citizen consumes daily is undetermined. Therefore, a great concern comes up also about the usefulness of the CWF. And that is because today fluoride is accessible to everyone through many other sources which are highly more controllable and adjustable.

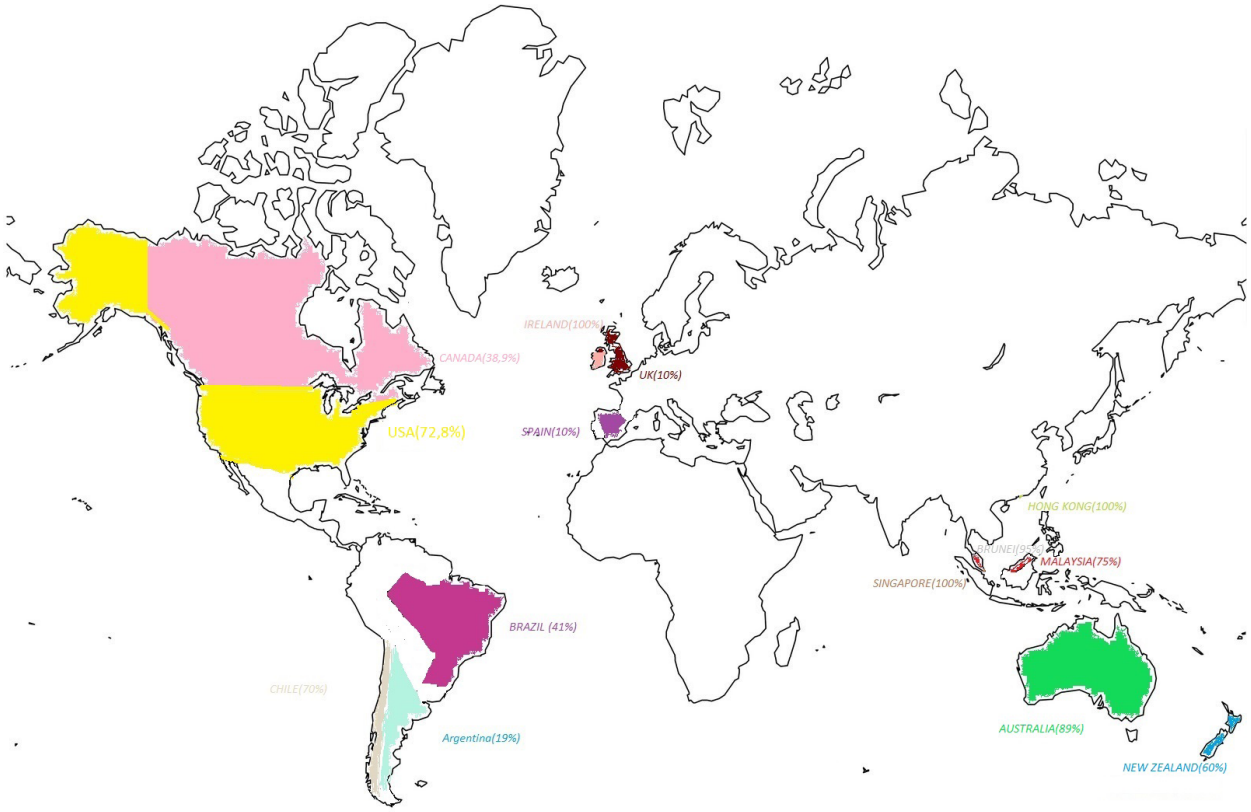


Fig.1: The percentage of people who consume artificially fluoridated water.

Toxicity

In accordance with the International Association of Oral Medicine and Toxicology (IAOMT), these toxic effects may vary from thyroid dysfunction and skeletal fluorosis (osteoarthritis, temporomandibular joint disorders) till neurological problems as ADHD (Attention-Deficit/Hyperactivity Disorder). In addition to it, dental fluorosis which results in mottled teeth is a consequence that is difficult to be ignored. With the term dental fluorosis we refer to the change in the mineralization of the dental hard tissues caused by long-term ingestion of fluoride during the period of tooth development prior to eruption into the mouth (CDC). Changes range from barely visible lacy white markings to converged opaque areas. Due to that, specific concentrations of fluoride have been suggested. For example, in the USA the recommended fluoridation levels are between 0.7-1.2mg/ml. At the same time, the WHO had proposed that fluoride levels should not exceed 1.5mg/ml to avoid toxic effects.

Research paper

According to a study in the US (Prevalence and Severity of Dental Fluorosis in the United States, 1999–2004, Eugenio D. Beltrán-Aguilar, Laurie Barker and Bruce A. Dye, 2010) dental fluorosis' prevalence was around one quarter among people between 6-49 years old. More specifically, dental fluorosis was more common among children aged 12-15 than all other categories while the total number of people diagnosed with moderate and severe dental fluorosis was 2% and less than 1% respectively.

Friends of fluoride

On the other hand, in other places of Earth the perception is quite different. That can be explained by variations in culture, politics or even the economic system. CWF, as a proactive step towards tooth decay, is grounded on the basis that by investing money in a social good which is accessible to everyone, more funds can be saved for the community. The cost-benefit will come from the reduction of expenses for dental caries' treatment. In that way, CWF is transformed into a solution that aims to counter social exclusion and promotes prosperity. At this point what needs to be clarified is that there are many countries, such as Tanzania, Kenya, Algeria, and Nigeria, in which the water consumed is naturally fluoridated. That is a fact that distinguishes them from other countries which have consciously chosen the CWF policy. Reasoning this categorization, I would suggest that it is essential because in that way the evaluation of the effectiveness of CWF is feasible. Aiming to delve deeper, a comparison of statistics in the prevalence of tooth decay amongst the three categories (naturally fluoridated, artificially fluoridated, non-fluoridated) could be useful. However, considering that preserving healthy teeth does not depend exclusively on the concentration of fluoride but also on other factors such as brushing and diet, it would be careless to get down to a result well supported on the dilemma of the title of the article.

Conclusion

What comes out is that CWF may be necessary for countries in which the income of the majority of the people is under the poverty line and for that reason their access to other sources of fluoride is extremely limited. In that case, CWF could be considered as an optional choice with the disadvantage of causing side effects and applying obligatory medication. The latter is an action that violates the right to free will and could not be imposed in a contemporary democratic society unless the vast majority agrees to it.

Teeth Whitening - Safe To Do It Yourself?

Various psychological studies confirmed that a white set of teeth make people seem more attractive. In this context, showing of teeth through smiles is a characteristic feature of human social interaction. Many cosmetic companies realized the potential and started offering various whitening products available for everyone. Claudia-Ioana Cojocaru is about to tell you more about safety and effectivity of whitening kits, and the risks that arise without the dentist's supervision.

Claudia-Ioana Cojocaru, Romania

The smile is one of the most important concerns of today's society. Social media has played a big role in establishing some of the patterns people should adopt if they want to avoid stigmatization, as the physical aspect counts for the first impression. Hence, cosmetic treatments have become more and more popular and various products are now offered without the supervision of a specialist. In this category, teeth whitening is included, which is considered by some to be normal self-care. There are no doubts that people want to have a gorgeous smile with a white dentition, but trusting the whitening kit sold on the internet or in beauty salons is not a long-term advantageous option. There are numerous reasons why you should heed the advice a dental professional gives you and follow the given treatment because only by a competent person in the dental field you can have the best (and the healthiest) result.

First of all, what active substances do whitening products contain? Most common home-whitening products are presented as gels and strips which contain bleaching agents that actually have whitening properties, like hydrogen peroxide and carbamide peroxide.

The difference between these two substances is their capacity of bleaching, hydrogen peroxide being much effective, carbamide peroxide is a less powerful whitening agent. In order to understand the differences between store bought whitening kit and the professional whitening made in a dental office it's important to know that whitening procedure can be divided into 3 situations:

1) whitening made in a dental office by a professional;
2) whitening applied at home AND prescribed by a dental professional;
3) store brought – the least effective.

A dentist can apply a whitening treatment by using variable concentrations of active agents, depending on the 3 situations mentioned before: the whitening made in the dental office can contain up to 40% hydrogen peroxide and the prescribed professional whitening made at home can have up to 6% hydrogen peroxide according to European legislation. The lower concentration of 6% hydrogen peroxide or 10%-16% carbamide peroxide correlated with the longer time of exposure (about 2 weeks of the daily appliance) has also a promising response to the treatment. Also, the doctor can apply a whitening with a combination of the 2 situations, in which the patient benefits from the prescribed whitening for 2 weeks and a final session made in the office. The category number 3 is the store bought one, in which the products can not contain more than 0,1% hydrogen peroxide according to the European legislation. In conclusion, these products do not have a major impact on making the dentin layer whiter, so the whitening

could show visible results. We didn't even mention that some products are sold as whitening products, even if they do not contain bleaching agents, but sodium bicarbonate, EDTA, sodium perborate, and chlorophyll.

"We should be aware of the fact that there is no official guideline for getting a home-whitening with maximal results in a safe manner."

Because the confidence that comes with a whiter smile is not easy to get, there are potential risks in doing a self whitening that could affect long-term oral health. Gum and tooth sensitivity can occur, due to bleaching agents that cause a burning sensation and ill-fitting whitening trays that hurt the gingiva.

Even though this symptom might also occur in the process of professional whitening, there are studies which conclude there are increased chances of having tooth sensitivity if pursued the home-kit method. To have a satisfactory result, the procedure of whitening must be correctly done in order to not deteriorate healthy tissues, so medical knowledge and experience are mandatory. Only a dental professional can manage dental bleaching techniques and make a personalized diagnosis, considering the potential damage of dental substrates (e.g. using a toothpaste which works on the abrasive principle might "brush off" the top of the enamel, the result is the exposure of the yellow layer of dentin, which makes the whitening procedure a failure). There are more factors that contribute to a maximal result of this procedure and which must be taken into account: the chemical properties of the bleach (especially the pH) and his adhesion to the enamel, the tooth size and the method of the appliance.

When we talk about teeth whitening, everybody thinks of its esthetic benefits, but what we do not really consider are the consequences our dentition is suffering. The process of whitening doesn't occur after a singular appliance and there must be followed a rigorous guideline. If we trust a product sold on-line which promises a spectacular and easy-to-get result and decide to use it at home, we should be aware of the fact that there is no official guideline for getting a home-whitening with maximal results in a safe manner.

Dental whitening is not for everybody and before we are determined to have this procedure, we must see a dentist get his recommendation and resolve potential problems concerning oral health that could interfere with the whitening. An oral professional must be present on the continuous process of teeth whitening, because they might observe enamel pigmentation and thus treat it, depending on its etiology. Also, they are the one capable of giving proper prophylaxis, therefore they must explain to the patient that substances like coffee and tea might produce pigmentation.

As a conclusion, there are multiple arguments that suggest the concept of store-bought whitening products is not a good option, neither for those who desire for it and nor for the dental community. Not asking for dentist's services and doing it yourself can have an unwanted impact on oral health and on aesthetic aspects, since the available products on the internet do not have the same properties the ones used in professional whitening have. There are indirect consequences for the dental field practitioners, who are contacted by patients who pursued home whitening but noticed unwanted effects, caused by inadequate manipulation of the whitening product, combined with oral untreated problems.

How To Manage The Dentally Anxious Patient?

Monisha Dey, UK

The prospect of visiting the dentist for a check-can be a daunting one for many, having to have dental treatment can be even more distressing. As dental students we must ask ourselves, why is it that so many patients fear even stepping into the dental surgery before they even take a seat in the chair? The irony lies in the fact that a dentist acts in the best interests of the patient; nonetheless, people hesitate to even book an appointment in fear of the dentist. Fortunately, there are pharmaceutical interventions in place, such as anaesthesia and sedation, to help the patient through the treatment. However, the dentist themselves can adapt the way they communicate with their patient in order to ease them into the dental procedure, and there are a number of proven methods to achieve this.

Non-verbal communication plays an important role in our daily interactions. In maintaining the patient's best interests, the dentist may adopt open body language to reverse the patient's fear, be it something as irrational as the smell of the dental surgery or the fear of the dreaded drill. First impressions can go a far way forward and if the dentist can rid themselves of any negative preconceptions the patient has from the first consultation, the rest of the treatment can progress positively. Maintaining good eye contact and greeting your new patient with a friendly smile and firm handshake can often go a long way in terms of helping the patient mentally prepare themselves for their appointment. Hence it is paramount to establish a good relationship with your patient from the onset so that the patient feels comfortable in confronting their fears.

Of course, reality is constructed through talk and the dentist must tailor their verbal communication so that it is sensitive to the patient. When the dentist starts conducting a history and examination, they should make a point of asking open-ended questions. For example, if your patient reveals they have feared the dentist from a young age, it is your role to probe into their previous experiences at the dentist and gain an understanding of the patient's attitudes towards visiting the dentist. This is being seen more and more in modern day dentistry, but the idea of having an open conversation establishes a mutualistic dentist-patient relationship (Bishop, 2018); by asking the patient an open question, the control shifts to them to deliver an answer as detailed as they desire. This makes the patient feel involved with the dentist and allows them to cope better with the treatment.

Once you have built a good rapport in your first consultation, you may face the challenge of dealing with the patient's anxiety during treatment. Being able to reassure your patient can make all the difference for the patient's experience in the chair and yourself as the operator. This is necessarily not only for easing your patient into the treatment, but for the entirety of the procedure to ensure they feel as relaxed as they possibly can. Cue controlled relaxation has proven to be very successful in reducing patient anxiety (Appukuttan, 2016). This requires the dentist to instruct the patient to inhale and exhale in a rhythm, until the patient becomes so focused on their breathing pattern that the patient's pain sensation becomes secondary to their breathing. Alternatively, distraction works just as well to direct the patient's thoughts away from the pain experienced. For example, getting the patient to wriggle their toes

or something as simple as the patient putting in earphones to listen to music. This can distract the patient from the dentist's actions, which often allows the patient to detach from the procedure that the dentist is carrying out.

The dentist themselves can influence the level of anxiety the patient feels towards the treatment by controlling the information they give to the patient. The patient is known to fear the worst and more times than not exaggerate their sensations. This can be achieved

"The dentist themselves can influence the level of anxiety the patient feels towards the treatment by controlling the information they give to the patient. "

through a simple technique known as reframing, which forms part of cognitive behavioural therapy (Dumitrache et al, 2014). For instance, when administering an injection instead of using the words 'sharp scratch' to describe the imminent sensation, it may be better to reframe it and warn the patient of 'gentle pressure'. This alters the visual picture that the patient holds in their mind when the needle is injected and helps them cope better with the treatment. Managing the patient's behaviour impacts how easily the dentist can perform the treatment, and is something every dental student should strive to master.

More times than not, it is not what you say but it is how you say it that makes a difference. Interestingly enough, voice control is a substantial part of communication and plays a major role influencing patient behaviour. Aspects of voice control include tone and pace and these can be alternated under subconscious effort. For instance, when explaining a particularly frightening dental procedure to an anxious patient you may want to consider your delivery of speech. Using a softer tone to reassure the patient comes into handy and suggests that you empathise with them. Moreover, employing a slower pace allows the patient to conceptualise the details of the procedure. This allows them to develop a schema of what may occur which puts them at ease and prevents the fear of the unknown, as well as encouraging patient compliance.

As dental students it is our responsibility to put the patient's interests first, and in the case of a dentally anxious patient, this means helping them have a comfortable experience at the dentist. Of course there is a plethora of pharmaceutical interventions, such as sedation, that can facilitate the dentist; nevertheless, we should aim to avoid using pharmacological techniques. In fact, we should aim to improve our anxiety and pain management techniques, as this article discusses. And if we can produce a generation of dentists with improved patient management skills, then perhaps the patient may be able to let go of their dental anxiety.

Interview: "For most people, toothbrushing is an unconscious action. iTOP changes this."

Although toothbrushing is the most decisive factor in preventing oral disease, only a few patients and dental professionals know how to brush perfectly. After earlier working as a dental technician and also as a dancer, Dr Fabio Angelini qualified as a dental hygienist and is now teaching internationally as an instructor in CURADEN's iTOP programme. Individually trained oral prophylaxis (iTOP) is an interactive programme that teaches dental students and professionals perfect oral hygiene habits, so that they, in turn, can train their patients to achieve oral health that will last a lifetime.

curaden
academy

Dr Angelini, what is iTOP and what does individually trained oral prophylaxis mean?

In the iTOP programme, dental professionals become a personal coach to their patients, guiding them and teaching them how to keep their gingivae and teeth clean and perfectly healthy using the correct tools and the correct techniques on their own and with conscious thought. I say "conscious" because, for most people, toothbrushing is a purely unconscious action. iTOP changes this. The word "individually" is very important to iTOP, as dental professionals and, later, their patients are literally taken by the hand and individually instructed on how to brush their teeth perfectly.

iTOP is also based on the scientific statement that a clean tooth cannot become diseased, or at least that the risk of periodontal disease, caries or tooth loss is significantly reduced by mechanical prevention. iTOP has become a philosophy over the years, thanks to the hard work of all the people who believe in it and teach it.

Is correct brushing a skill that is often overlooked?

When clinicians start their careers, they already have many years of studying behind them and have been taught the best flap techniques, how to place an implant the best way and so on. However, what they have never been taught is how to brush correctly, although it is the most fundamental skill of all to prevent oral disease. More often than not, we have been doing it the same way since we were just old enough to hold a toothbrush. It is often just an automatic movement and we have never learnt exactly how to brush. In reality, however, brushing teeth is an art; it's a science. Brushing teeth properly, efficiently and atraumatically is not easy, nor is it something you should do without thinking.

How can iTOP help patients and dental professionals?

iTOP helps patients because dental professionals can offer them the knowledge which they themselves have gained at a seminar. They can teach patients to control biofilm formation on their teeth and gingivae and how to do this in the most effective and atraumatic way. Patients who incorporate the techniques taught at an iTOP seminar into their daily brushing routine can expect to achieve optimal oral health. The tools and techniques used at an iTOP seminar are really a gateway to lifelong oral health, which in turn offers benefits to the whole body.

For dental professionals, the acquired iTOP skills can play a key role in their daily practice, for instance, as an essential part of therapy after oral surgery or periodontal treatment. iTOP gives professionals the skills to work to the best of their ability, and it is really personal teaching which allows clinicians to ally with their patients in order to obtain and maintain good oral health.

What is touch to teach?

Touch to teach is the most important aspect of iTOP. It means that, as an instructor, you take participants by the hand and let them feel or discover a specific movement or sensation. As Dr Jiri Sedelmayer, the dentist who invented the iTOP programme, once said: "It is impossible to understand how to brush your teeth from reading a book". What this means is that theory is not enough to develop the best skills. You have to do it yourself, practise, have an instructor correct you and try again. Because of touch to teach, participants have the opportunity to truly understand and experience the sensation of having the thousands of bristles of a CS 5460 working together in the sulcus. For the professionals we teach, it is an exciting tactile experience and they can teach their patients in turn. If no one shows them how it is really done, then how can they achieve the best oral hygiene?

What is the main lesson participants take home from an iTOP seminar?

The greatest lesson clinicians take home is the knowledge of how significant the impact of instruction is on their patients' long-term oral health and how the iTOP skills can be used right away. From the very next day, patients can put prevention into practice and see how a change in their oral hygiene habits will help to improve their oral health.

For more info on an iTOP seminar near you, visit www.itop-dental.com/en/seminars.

Bruxism: What Can A Modern Dentist Do?

Angelakis Dimitrios, Papadopoulou Christianna-Iris, Greece

Bruxism is grinding and clenching of teeth when the individual is not chewing or swallowing. It's usually an involuntary activity, which can happen when the individual is either awake (awake bruxism) or asleep (sleep bruxism). According to a 2010 Journal of the American Dental Association article, it's often associated with fatigue, stress, anxiety, emotional stress, or fear. It is also frequently triggered by tooth interference in dental occlusion or the anatomy of the bony structures of the stomatognathic system. Some studies suggest the possible involvement of genetic factors in the pathogenesis of bruxism. In most of the cases, according to a 2018 IJADS study, bruxism does not cause serious complications, but in severe conditions it can lead to damage of teeth and restorations, tension-type headaches, facial or jaw pain and temporomandibular disorders.

Patients can both clench or grind their teeth unconsciously. The results of those actions are similar. While many people audibly grind and silently clench, these are different actions. Clenching is defined as clamping the teeth together firmly and tightening the jaw muscles. Clenching causes less tooth damage, but still results in muscular soreness, pain and damage to the temporomandibular joint (TMJ) and periodontium. Grinding involves repetitive movement of the TMJ with the teeth held together or by bracing or thrusting the mandible. Grinding visibly shows wear and flattening of the teeth along with substantial muscular soreness, pain and damage to the TMJ and periodontium.

Over the years research has identified many reasons why people grind their teeth. The term "bruxomania" is derived from the French word "la bruxomanie," suggested by Marie and Pletkiewicz in 1907. In 1931, Frohman created the term bruxism. The term bruxism originates from the Greek word "brychein", meaning to grind or gnash the teeth. As mentioned in a 2014 JIOH study, Miller suggested a differentiation between nocturnal grinding of the teeth that he called bruxism and habitual grinding of the teeth in the daytime, which he called bruxomania. In 1954, Kimball stated that bruxism (grinding the teeth in the sleep) and bruxomania (clenching or gritting the teeth when awake) are habits, which along with the habits of chewing and tripping the dentures, often contribute to the production of tissue tenderness.

Common causes of bruxism:

Bruxism is said to have multiple causes. Many researchers, such as V. Psarras and M. Tzakis (2011), seem to believe that is part of a micro-arousal procedure, altered by various neurotransmitters. Stress, lifestyle habits, medications, medical conditions and occlusion are some of the major contributing factors to grinding.

Stress is defined as a factor that causes bodily or mental tension and may also cause diseases. Bruxism may be related to a person's state of mind. Our bodies react to stress whether we want it or not. Stress

is simply a reaction to a stimulus that disturbs our physical or mental balance creating unresolved emotions such as frustration, anger, competitiveness, aggressiveness, anxiety, tension, hyperactive personality or unresolved conflict. Since bruxism can be considered an emotional response, people who tend to suppress their feelings of frustration and anger and who tend to have aggressive and competitive personalities are at an increased risk of grinding their teeth.

Many lifestyle choices can intensify bruxism, especially with the use of substances such as alcohol, tobacco, drugs and caffeine. Alcohol is known to break up sleeping patterns, which causes tooth grinding. Smoking stimulates the dopaminergic system, which causes bruxism related symptoms to be three times higher in smokers than non-smokers. Recreational drugs such as ecstasy, cocaine, methamphetamine (meth) and heroine stimulate the central nervous system and, therefore, increase bruxism. Their mechanism of action is based on the neuronal transmitters in the brain, which are essential for functions that involve learning, memory, sleep cycle, body movement. They also initiate motor disorders causing bruxism. Last but not least, drinking caffeinated drinks such as soda, high energy drinks, tea and coffee (six or more cups a day) increases the risks of bruxing, since caffeine increases muscle activity.

Bruxism is commonly considered to be related to deviations in dental occlusion. It has been mentioned in a 2003 General Dentistry Journal study, that for effective management of bruxism, there should be harmony between maximum intercuspation and centric relation. Nevertheless, recent literature studies on this aspect, such as the 2010 DPJO study, have agreed that there is hardly any relationship between bruxism and occlusal factors.

Symptoms and treatment

Diagnosis of bruxism tends to be rather complicated since both bruxers and healthy individuals may indicate parafunctional nocturnal activity. According to a 2019 OAMJMS study, it is vital for the dentist, when diagnosing, to take all the symptoms that the patient reports into account, as well as the ones that are found during the clinical examination. Basic symptoms include damaged teeth, sensitivity to heat and cold and pain in the face, TMJ and the ear. In most cases of bruxism it is typical to encounter microfractures of the tooth enamel, flattened and worn surfaces, revealing the underlying yellow dentin layer, even broken or chipped teeth. In addition to that, bruxism causes intense muscle activity and contraction leading to chronic facial pain and severe headaches.

Lobbezoo F. et al mention in their 2008 study, that bruxism treatment requires a multidisciplinary approach including occlusal therapy, pharmacological medication and behavioural modifications. Applying interocclusal inserter (splints), as part of an occlusal therapy, will certainly reduce the symptoms of bruxism but won't treat it. Splints are made from a variety of materials and present different characteristics. There are two types of splints; hard and soft. Both types are used to prevent further bruxism-related attrition. According to Kapusevska B. et al (2015), dentists prefer hard splints because they are more effective and easier to adjust.

Stress is a very important cause of bruxism and needs to be managed for the whole treatment to succeed. That is why early treatment of bruxism involves managing the patient's stress through exercises, massages and physiotherapy. Other types of stress management include mediation, sleep and self-monitoring. The patient is usually advised to cut down on alcohol, cigarettes, intense mental or physical activity before going to bed in order to ensure a relaxed state of mind.

A very different treatment for bruxism is the injection of botulinum toxin (BTX) into certain facial muscles. As mentioned in a 2019 Maxillofacial Plastic and Reconstructive Surgery article, BTX is mostly used for cosmetic purposes, since it is considered safe and can reduce facial wrinkles, but it is also used to treat some disorders regarding muscle movements. BTX weakens the muscles and causes temporary muscle paralysis. In the case of bruxism it can be used to reduce bite pressure. By inducing BTX into the muscles that form the bite forces this reduction can, theoretically, be of up to 40%. To et al. reported that 3 months after the BTX injection masseter muscle mass went down by 31% on ultrasonic and electromyogram. In addition, 6 out of 9 masseter muscles maintained an atrophic state for one year. Presumably, we can come to the conclusion that reducing the bite forces by injecting BTX into the masseter muscles will temporarily prevent bruxism due to an environmental change in occlusion.

Discussion

Bruxism is a disorder that has interested the medical community for many years. It is a very complicated condition that has to be dealt with on many different levels, from psychological and behavioural to purely clinical and pharmacological. A definitive treatment has yet to be established. Splints of many types, chemical injections and other means of coping with the disorder are in every dentist's disposal. Despite all that, we still seek a solution that not just minimizes the symptoms but wipes them out completely.

What Happens In Your Mouth When You Overthink Things?

At a global level, over 300 million people are estimated to suffer from depression, equivalent to 4.4% of the world's population.

Recently, researchers have shown that there is a relationship between oral diseases and conditions such as diabetes, heart, lung, and kidney diseases. Arzu Şeyma Demir is here to tell you more about this.

Arzu Şeyma Demir, Turkey

At a global level, over 300 million people are estimated to suffer from depression, equivalent to 4.4% of the world's population.

Recently, researchers have shown that there is a relationship between oral diseases and conditions such as diabetes, heart, lung, and kidney diseases.

The most common problems of the oral cavity are dental caries and periodontitis; however, these two are preventable. Based on the World Health Organization (WHO), 5%–20% of adults have periodontal diseases. It is proved that these two conditions can influence physical health through several pathophysiologic mechanisms. Enhancing the risk of infections by modification of the immune system function and increasing pro-inflammatory cytokines and thereafter induction of vascular inflammation is of the most proposed mechanisms of action of depression and anxiety on the human body.

It is proposed that these two conditions can cause oral and dental problems since emotional changes can influence oral mucosa. Several pieces of research have also shown a relationship between anxiety or depression and periodontal health, while others have not.

The question then arises as to would you reduce the mental health conditions with a good periodontal treatment? Science is still searching for it but what we know is dentists can possibly see the symptoms of chronic stress and mental health problems during the dental examination.

It is necessary to develop oral health promotion programs for adults and help them maintain a good quality of life and mental health.

What is stress?

The term "stress", as it is currently used was coined by Hans Selye in 1936, who defined it as "the nonspecific response of the body to any demand for change". Selye had noted in numerous experiments that laboratory animals subjected to acute but different noxious

physical and emotional stimuli (blaring light, deafening noise, extremes of heat or cold, perpetual frustration) all exhibited the same pathologic changes of stomach ulcerations, shrinkage of lymphoid tissue and enlargement of the adrenals. At the time, it was believed that most diseases were caused by specific but different pathogens. Tuberculosis was due to the tubercle bacillus, anthrax by the anthrax bacillus, syphilis by a spirochete, etc. What Selye proposed was just the opposite, namely that many different insults could cause the same disease, not only in animals but in humans as well.

Many scientists complained about this confusion and one physician concluded in a 1951 issue of the British Medical Journal that, "Stress in addition to being itself, was also the cause of itself, and the result of itself."

Stress was generally considered as being synonymous with distress and dictionaries defined it as "physical, mental, or emotional strain or tension" or "a condition or feeling experienced when a person perceives that demands exceed the personal and social resources the individual is able to mobilize." Thus, stress was put in a negative light and its positive effects ignored. However, stress can be helpful and good when it motivates people to accomplish more.

According to The Human Function Curve (*Nixon, P: Practitioner 1979), increased stress results in increased productivity – up to a point, after which things go rapidly downhill. However, that point or peak differs for each of us, so you need to be sensitive to the early warning symptoms and signs that suggest a stress overload is starting to push you over the hump. Such signals also differ for each of us and can be so subtle that they are often ignored until it is too late. Not infrequently, others are aware that you may be headed for trouble before you are.

While everyone can't agree on a definition of stress, all of our experimental and clinical research confirms that the sense of having little or no control is always distressful – and that's what stress is all about.

The mechanism of stress

The brain is the central organ of stress and adaptation to social and physical stressors because it determines what is threatening, stores memories and regulates the physiological as well as behavioural responses that may be damaging or protective.

The immune system may be heavily influenced by stress. The sympathetic nervous system innervates various immunological structures, such as bone marrow and the spleen, allowing for it to regulate immune function. The adrenergic substances released by the sympathetic nervous system can also bind to and influence various immunological cells, further providing a connection between the systems. The HPA axis ultimately results in the release of cortisol, which generally has immunosuppressive effects. However, the effect of stress on the immune system is disputed, and various models have been proposed in an attempt to account for both the supposedly "immunodeficiency" linked diseases and diseases involving hyper activation of the immune system. One model proposed to account for this suggests a push towards an imbalance of cellular immunity(Th1) and humoral immunity(Th2). The proposed imbalance involved hyperactivity of the Th2 system leading to some forms of immune hypersensitivity, while also increasing the risk of some illnesses associated with decreased immune system function, such as infection and cancer.

The physiological responses that produce adaptation via "allostasis" include not only the hypothalamic-pituitary-adrenal (HPA) axis and the autonomic nervous system but also their non-linear interactions with the metabolic system and the pro- and anti-inflammatory components of the immune defence system.

Allostasis is the active process of adapting to stressors via mediators such as cortisol and the autonomic, metabolic and immune system that act together in a non-linear fashion to maintain homeostasis.

Relation between stress and periodontal diseases

Emotional factors have a potential influence on the body; it causes pathological changes or subjective symptoms in the normal oral mucosa. Several studies have attempted to elucidate the possible role of psychological state, emotional instability and personality modulation in precipitation of various oral diseases.

Present studies showed a positive association between psychological alterations and changes in the oral

mucosa, particularly conditions like Oral Lichen Planus, Recurrent Aphthous Stomatitis and Burning Mouth Syndrome. Thus psychogenic factors like anxiety and depression may act as a risk factor that could influence the initiation and development of oral mucosal diseases. Hence psychological management should be taken into consideration when treating patients with these oral diseases.

Chronic stress is likely to contribute to the progressive, long-term development of oral disease through at least two distinguishable pathways. First, stress can motivate individuals to cope in unhealthy ways that foster oral disease (e.g., substance use, including illicit drugs, alcohol and tobacco, poor diet, and sedentary behaviour). Second, chronic stress contributes to high allostatic load that can lead to the dysfunction of physiological systems critical to homeostasis, and thus, affect the underlying mechanisms of disease progression, more generally.

The effects can be physiological and behavioural. Patients with these disorders are not willing to keep oral hygiene. Dentists should pay more attention to the oral health of people with a history of depression.

The potential role that psychosocial stressors may play in initiating a cascade of events in the corticotropin-releasing hormone[NU7] /HPA axis, the autonomic nervous system and the central nervous system, the physiological consequences of which are to depress immunity, enhancing the likelihood of infection and specifically, periodontal disease. Recent studies had confirmed the fact that the concentration of cytokines (IL-6, IL-1 β etc.,) cortisol in GCF is higher in person showing depression sign.

How Important Is The Treatment Of Temporomandibular Joint Disorder?

Evie Georgiadou, Cyprus

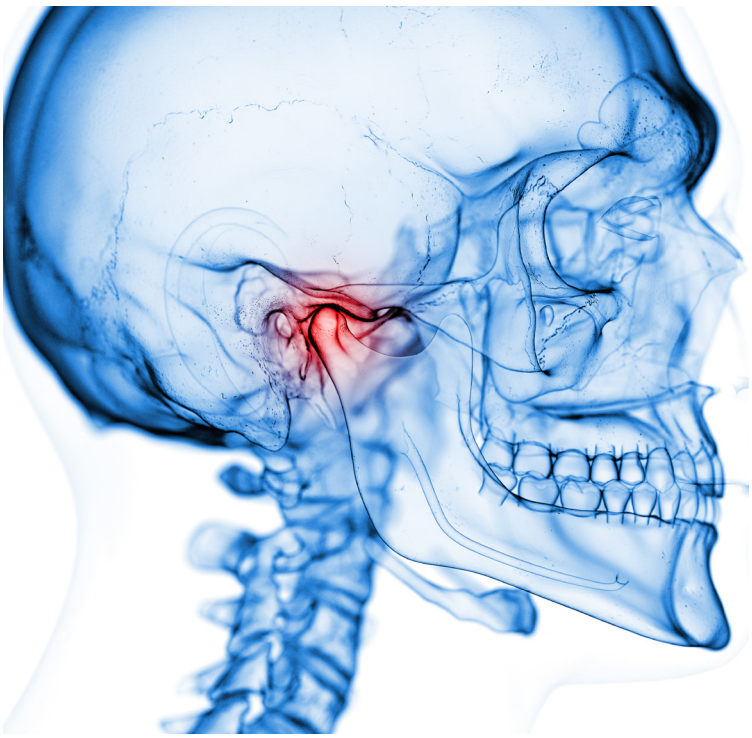
The temporomandibular joint is a hinge that connects the jaw to the temporal bones of the skull, which are in front of each ear. It lets the jaw to move up and down and side to side, so we can talk, chew, and yawn. Temporomandibular joint disorder (TMJD) is any disorder that is affected by deformity, disease, misalignment or dysfunction of the temporomandibular articulation. This includes occlusal deflection of the temporomandibular joints (TMJs) and the associated responses in the musculature, displacement of one or both joints, misalignment of the disc, various diseases that affect bone or the articular surfaces and other pathologic disorders, inflammations or injuries to specific intracapsular structures. Occlusal disharmony that affects the positions of the TMJs and disorders of the masticatory musculature are also included as specific types of TMJD.

Epidemiological Studies

According to studies in the 1980s detected TMJD symptoms in 16% to 59% of the population, although only 3% to 5% of the adult population seek treatment of the pain and dysfunction associated with TMJD. Furthermore, TMJD symptoms present varyingly, depending on both sexes and age. There is a higher incidence reported in females (female to male ratios range between 2:1–8:1) and in patients between 20-50 years old. Overall, epidemiology reports state TMJD to affect up to 25% of the population, yet their etiology and progression are poorly understood.

Symptoms

The patient who suffers from TMJD must achieve proper treatment, otherwise, it gets progressively worse in time, accompanied by inflammation and osteoarthritic changes. There are many factors that play a crucial role in the pathogenesis of the TMJD, the challenge for the dentist is to diagnose the condition that causes the disorder. The following causal factors or diseases may lead to TMJD and should be addressed carefully.



Excessive Loading

Excessive joint overload is the most common cause of the disorder. This pathologic process causes the fibrillation of cartilage and leads to functional failure which decreases the sliding of the articular surfaces. The patient at this stage detects the joint noise like “clicking”. Therefore, patients who continue to overload articular structures cause pain, synovitis, intra-articular adhesions, osteoarthritis, and disc perforation.

Systemic arthropathy

Many systemic and rheumatoid disorders can cause inflammatory/degenerative arthropathy and affect the structure and function of articular tissues. As a result, the TMJ function may fail under normal joint loads. Examples of systemic disorders, which can cause TMJD, include rheumatoid arthritis, psoriatic arthritis, juvenile idiopathic arthritis, pseudogout, ankylosing spondylitis, polymyalgia rheumatica, chondrocalcinosis, Ehler-Danlos syndrome, Lyme disease, lupus erythematosus, and other connective tissue disorders.

Localized arthropathy

Usually affects one joint only and it is not caused by joint overloading or any systemic disease. Symptoms include joint pain, noise, limited function, and changes in the occlusion. The localized arthropathies and the secondary inflammatory component may cause or mimic TMJD.

To conclude, despite the causes of the TMJD previously mentioned, patients often seek treatment because of the pain, the headaches and the noise they experience in their everyday life.

Steps for Diagnosis

The most logical way to simplify any treatment protocol is to first identify what it is that is being treated, so we

make a diagnosis. For a correct diagnosis, the dentist should first complete medical history, clinical and radiological examinations. The most frequent signs and symptoms mentioned by the patients are pain on TMJ region, trismus, and laterotrusive movements, TMJ noise, an intermittent lock of the joint, deflexion or deviation of the mandible during mouth opening and headaches.

Furthermore, there is an orderly process for the diagnosis of orofacial pain. The process starts with an understanding of the signal that is sent by pain. The International Association for the Study of Pain (IASP) offers one of the most widely accepted descriptions of pain: "Pain is an unpleasant sensory or emotional experience associated with actual or potential tissue damage, or described in terms of such damage". If there is pain within the masticatory system, including the region of the TMJs, the first step in the analysis should be determined: what is the source of the pain? In most pain responses, the source of the pain is in the tissue that has been structurally altered. A logical diagnostic process requires a structure by structure analysis to determine which tissues are the source of pain.

Another diagnosis method is by Imaging. Imaging of TMJ is necessary to establish the proper diagnosis, to select the appropriate treatment, and to assess the treatment results. The following techniques are most commonly used: Panoramic radiography or arthrography, Computed tomography or cone-beam computed tomography, Magnetic resonance imaging, Single-photon emission computed tomography, Electromyography, Ultrasonography.

Sustainable Treatment Plan

One of the most important rules for a dentist to follow in dental practice is that if TMJs cannot accept firm compressive loading with complete comfort, the dentist always has to find out why before proceeding with any irreversible occlusal treatment.

The ultimate goals of a successful treatment are: 1) increase mandibular range of motion, 2) decrease joint and masticatory muscle pain and inflammation, and 3) prevent further degenerative change in articulating tissues, including direct or indirect joint damage. (1)

A patient with TMJD should first be treated with non-invasive modalities, which includes physical therapy, such as electrophysical modalities and manual/exercise techniques, occlusal splints and/or adjustments, and medication. Non-invasive modalities are used to relieve pain in the joint and masticatory muscles and improve range of motion.

One important element in the joint system is the bite position. That's why all non-invasive modalities work to establish balance in the occlusion and TMJs. Adjustments and splints may be used to achieve the most stable and least joint-traumatizing bite position.

Regarding pharmacologic agents, commonly prescribed non-steroidal anti-inflammatory drugs (NSAIDs) offer advantages in reducing inflammation. Muscle relaxants may also be prescribed for treatment of muscle pain and/or spasm.

Minimally invasive modalities for the management of TMJD symptoms include intra-articular injections such as sodium hyaluronate and corticosteroid injections, arthrocentesis, and arthroscopy. These modalities lubricate articulating surfaces and reduce inflammation although there are researches, who prove that their use remains controversial.

Patients whose nonsurgical methods fail, open joint surgery may be necessary to restore mandibular motion and mitigate orofacial pain. Most commonly open joint surgery may include discectomy, reshaping or reconstruction of the articulating surfaces, disc replacement and implantation of autologous or alloplastic materials.

To conclude, the most important aspect of treatment is to educate the patients about the natural course, etiology, and pathogenesis of the TMJ disorder. Patient education is the first and essential part of the management that makes the patients important partners for their care. The diet modification improved sleeping, and awareness of mandibular parafunction should be established by patient education. Education is the first crucial step for control of all causal factors leading to TMJD.

Conclusion

Dentists have never been better equipped to serve their patients with the highest level of quality and predictability. Nowadays, that TMJD is more frequent in the everyday practice, dentists must be able to identify the disorder, give the proper information to the patient and finally find the most suitable and less stressful treatment for each patient.

Every year EDSA runs it's 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 - keep an eye out as new ones are added all the time!

EVP Reims France 3rd-9th February 2020

EDSA EVP

EVP Paris France 13th-20th October 2019

VP Zagreb, Croatia st-7th March 2020

EVP Istanbul, Turkey 8th-15th March 2020

Trauma From Occlusion And Its Radiographic Detection

Redjon Isai, Albania

The periodontal ligament faces even greater occlusal forces, presenting with changes from trauma of occlusion, locally to the tooth where it happens. Subsequently, the whole pathology is followed by radiographic changes at the periodontal attachment or at the level of temporomandibular articulation (TMA), to be presented there the distinct radiographic signs of occlusion trauma. As a soft tissue, PDL (periodontal ligament) can be localized in a radiograph by the radiolucent space along the root space, at apex and at furcation. The margin between this space and alveolar bone is lamina dura.

What is trauma from occlusion?

Trauma from occlusion is determined as an injury of periodontal structures, which results from excessive occlusal forces that exceed the adaptive capacity of periodontal tissue.(, ,3) The periodontal structure has adaptive capabilities, changing its shape, depending on the forces applied to the teeth, in order to withstand the pressure by subsequently converting these forces into harmless ones. Not always an excessive occlusal force causes the characteristic radiological changes of trauma from occlusion at periodontium. This refers to acute occlusal trauma, which occurs suddenly at one moment of jaw's movement. Otherwise, chronic occlusal trauma occurs, which usually develops from gradual changes in occlusion caused by tooth structure wear, tooth movement or extrusion, combined with parafunctional habits such as bruxism not associated with nightguard wear.(1,2,3)

Predisposing factors of occlusal trauma

Although physiologic occlusal forces may not be traumatic, in periodontally compromised teeth they become harmful and cause further attachment loss. 60% of teeth that were subjected to occlusal trauma, were treated with crowns, endodontic or restorative dentistry, and this indicates that occlusal surface modeling of tooth and the level of filling height after dental therapy is a very common factor for trauma development. The second most common predisposing factor of trauma is the pathology of TMA resulting in deviations of the mandible closure trajectory and occlusal discrepancies.(1). If the direction of the exerted forces are nonaxially, than these forces may be deleterious.(1) Divergence, convergence of tooth roots also predetermines the size of the lost bony area where these forces from occlusal trauma exert a significant oppressive effect according to or in opposition to the longitudinal axis of the tooth.(1) Short, conical, slender, or fused roots rather than divergent roots are more predisposed to occlusal traumatism.(1)

Fig.1: Injury stage. Apparent trabecullar parallelization, bone resorption, enlargement of the ligamentous space on tooth number 36.

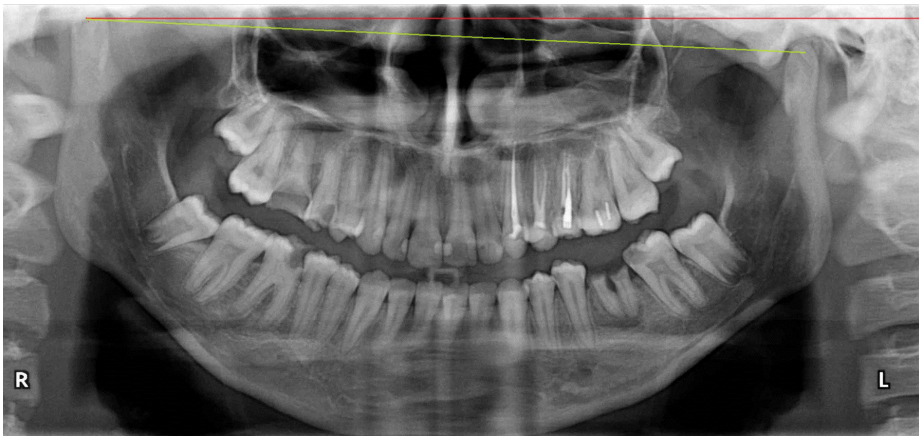


Fig.2: Repair stage. Thickening of lamina dura on tooth number 36 associated with condylar assymetry

"Injury" stage

Tissue changes as a result of excessive occlusal forces, go through 3 stages. The suppression of periodontal structures is associated with the compression of the arteries, resulting in the lack of oxygen and glucose that these vessels mechanically transport through the blood to the relevant periodontal tissues. This is where the first stage of occlusion trauma begins, which is the injury. Overloaded pressure compresses PDL fibers, damages fibroblasts and other connective tissue cells, and causes necrosis of ligamentous areas. Furcations are areas most vulnerable to damage forces. Under the influence of exaggerated forces in the pressure areas, osteoclastic bone resorption of the alveolar bone begins, resulting in enlargement of the ligamentous space.(1,2,3)

Bone resorption is the primary sign of injury that is subsequently followed by the repair stage. Radiographically the ligamentous space appears unequally

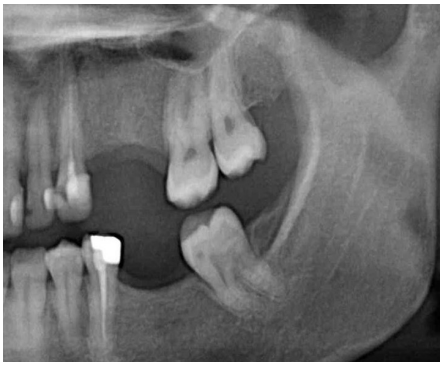


Fig.3: Adaptive remodellig stage. Funnel shape of PDL at the cervical level of tooth, angular bone loss.

widened mostly under apex and furcation, when referring to teeth that are not affected by periodontitis. Typical for this stage is the parallelism of the bony trabeculae in the interdental bone which indicates for thinning and bone weakening. Bone under the tooth in some cases also may appear somewhat radiolucent compared to the bone density of the entire jaw.

"Repair" stage

After necrotizing ligamentous areas are cleared by macrophages, bone secretion begins with an attempt to strengthen the weakened bone trabeculae, and this phenomenon characteristic of the repair phase is known as buttressing bone formation. During this process, the pulp chambers of the teeth affected by occlusal trauma are reduced, but this change is not strongly visible during radiological examination, a histological analysis would confirm this more accurately. (1,3) Buttressing bone formation occurs not only in the bone trabeculae of the jaws but also in the periphery, by thickening the facial and lingual alveolar plate, and creating a protuberance, referred as border.(1,2) The trabecular parallelization that indicated bone loss now disappears on radiography, and the bone becomes more radiopaque. In a tooth with a normal periodontium, the lamina dura is presented as a continuous radiating line along the perimeter of the root, whereas at this stage the line becomes thicker. If the periodontium fails in the repair stage, then begins the last stage of tissue changes that is adaptive remodeling.

"Adaptive remodelling" stage

In this stage the periodontal structure changes its shape to withstand the traumatic forces, and to turn them into harmless one for the periodontal tissue. The thickened PDL develops a funnel shape at the cervical level of tooth. Angular bone loss occurs, and vascularization in these tissues increases. In 13% of cases of resorption of the roots, is observed the angular bone loss. Subsequent effects are observed at the level of the condylar heads, with inconsistency in relation to fossa and articular eminence. If the damage forces were diminished in the first stage, then the repair phase would occur immediately and the supporting tissue would return to normal.(1,2)

At the end, the classic radiographic signs of occlusal trauma are:

- PDL enlargement mostly in the tooth, bifurcation and apex (funnel shape)
- The thickening of the lamina dura along the entire surface of the root
- Frequent vertical rather than horizontal bone loss in 5 / 3 ratio
- Root resorption.(2)

Effects of occlusal trauma in TMA

If occlusal trauma is chronic, it can be distinguished in the positions of the condylar heads versus the fossa and the articular eminence, which are not symmetrical. An imaginary or computerized horizontal line can also be added at the level of one of the articular heads, and if the other side of the articular head is not found in this line, this indicates the asymmetry and effect of occlusal trauma on the articulations, found on 32% of radiographs. Occlusal trauma injuries are expressed at the balance between the maxillary and mandibular occlusal plane, inducing alteration of intercuspal distance between the two sides, in 11% of subjects. (Figure 2)

Association of trauma with periodontitis, and differential radiodiagnosis.

Many studies have shown that occlusal trauma cannot initiate periodontitis, because the latter is caused by bacteria and is associated with an inflammatory process. But according to Glickman and Smulow, a traumatic occlusion can aggravate the conditions of periodontal diseases, known as "co destructive theory." Unlike trauma, periodontitis is more often associated with horizontal bone loss and reduction in alveolar crest height. As in the acute stages of periodontitis invasion and bone destruction begin, the continuous radiographic line of the lamina dura disappears. Also a localized periodontitis such as periapical or cystic form can be easily differentiated from occlusal trauma.

Association of trauma with pathologic migration

Pathological migration is the inclination of the teeth and their displacement in the direction of the edentulous areas. Often, since these teeth have no lateral contact, they need to support alone the occlusal loading from the opposite jaw. Pathological migration to the mesial direction was observed in 50.5% of patients, usually due to extraction of first permanent molars, causing an increased slide from centric relation to centric occlusion. The anterior teeth hit each other with increased force during mastication resulting in labially drift. (1) The radiographic signs of trauma mentioned above are also present in extruded teeth subjected to trauma.

Conclusion

Occlusion trauma from the level of dental structures extends its action to the level of temporomandibular articulation structures in 32% of patients. The dentist is one of the causes of this pathology, failing to restore occlusion to the patient with missing teeth in the oral cavity. The use of articulation papers immediately after restorative procedure is of great importance. Trauma from occlusion can not initiate periodontitis as the bacteria are not responsible for its cause, but it can aggravate the condition of periodontal disease. Trauma from occlusion is a phenomenon which is associated with pathologic migration of tooth. The alteration of tooth position induces occlusal discrepancies. In most cases the migration is at mesial direction. The more effected teeth are second molars, because of extractions of first molars and premolars.

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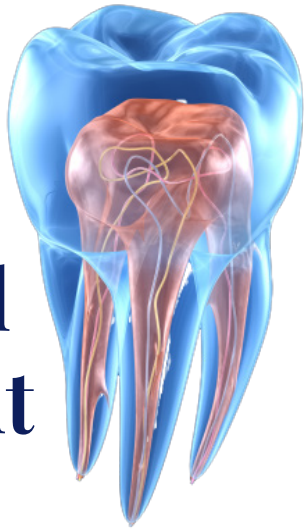


Comparison of Success Rate of Recent and Traditional Material Used in Pulp Capping Treatment

Şennur Üstün, Turkey

The aim of vital pulp therapies is to maintain pulp vitality by eliminating various microorganisms from the dentin-pulp complex and to seal with biocompatible dental material to facilitate the formation of reparative dentin and maintenance of a vital pulp.

Pulp tissues can be exposed due to restorative procedures, deep caries, trauma. According to the study of Ibrahim Umar named investigating of the effect of Pulp Capping Materials on Mesenchymal Dental pulp Stem cells, Direct pulp capping therapy was performed on young patients with traumatic pulp exposure who come for treatment during the first 24 hours. Capping of the exposed pulp is indicated for pulp tissue been clear from microorganisms and pulp bleeding controllable for 3 to 5 minutes after exposure and the pulp should be without the without the sign of inflammation or necrosis. In addition the diameter of exposed pulp tissue that is asymptomatic should be less than 1 mm. It should not be forgotten that percussion, palpation and spontaneous pain sensitivity are contraindicated for direct pulp capping therapy.

The purpose of this study was to evaluate the success of four different pulp capping agents on capping therapies.

Materials and Methods

An electronic search was conducted in the Researchgate, PubMed, MeSH Headings, CiteSeerX databases. As keywords "TheraCal LC" "MTA", "pulp capping" "recent pulp capping agents" were used for the study.

Review

The aim of direct pulp capping therapeutic material, to promote healing, to maintain pulp vitality, and to protect the pulp from thermal, chemical, and noxious stimuli and ensure adequate restoration.

The ideal pulp capping material should:

1) Protect the pulp from against residual bacteria and to control infection
2) Prevent color changes of the tooth
3) Secure the pulp against thermal shocks
4) Prevent microleakage for adhering strongly to dental hard tissues and be insoluble in oral fluids
5) In order to prevent cytotoxic effect pulp tissue be biocompatible
6) Have some antibacterial activity so as to sterilize underlying dentin and residual caries in deep caries lesions.
7) İmprove dentin bridge development (to contribute healing process)
8) Be clinically simple to handle

For Higher Success Rate

1) The right material must be chosen
2) Tooth must be asymptomatic
3) The correct control of hemorrhage must be ensured quickly.
4) Microbial contamination of the pulp should be avoided during treatment.

Caries excavation should be done from the periphery to the center, so the pulp chamber should not be perforated before cleaning the walls and a rubber dam should be used.

However, the period of time elapsed until treatment; patient's age, general state of health and size and type of pulp exposure play also a critical role in the success of direct pulp capping.

According to the retrospective study conducted by Al-Hiyasat et al in the Journal American Dental Association 2010 and called "The radiographic outcomes of direct pulp-capping procedures performed by dental students: A retrospective study " :

The treatment outcomes of 193 patients with 204 pulp exposures with direct pulp capping were followed by the authors. The outcome of pulp capping radiographically was determined using periapical radiographs taken at least three years after pulp exposure. The retrospective study conducted shown that the success rate of pulp exposed by mechanical reasons is %92.2 while the success of rate pulp expose by deep carious lesions is % 33.3.

Conclusions

DyCal has many favorable features, such as having antibacterial properties, creating a limited necrotic area and inducing hard tissue formation. It is also clinically proven to have excellent longevity. However, it does have its drawbacks. These include being highly soluble, having poor sealing and adhesive properties. Most importantly, it can cause tunnel defects.

MTA is biocompatible, has low cytotoxicity and forms an excellent dentine bridge. In addition, it has an ability to set in the presence of moisture and blood. Unfortunately, it is expensive and has a long setting time.

TheraCal releases fewer Calcium ions than MTA and Biodentine, but more than that by DyCal. It exhibits less interfacial microleakage and has a better sealing ability as a pulp capping agent than MTA and Biodentine.

TheraCal also has more compressive strength than Biodentine and MTA. Biodentin, however, is more cytocompatible than TheraCal. TheraCal also has the shortest working time of all the materials.

Materials	Components	Advantages	Disadvantages
Dycal [Ca (OH)2]	Two-paste system made of a base paste (1,3-butylene glycol disalicylate, zinc oxide, calcium phosphate, calcium tungstate, and iron oxide pigments) and a catalyst paste (calcium hydroxide, N-ethyl-o/p-toluene sulphonamide, zinc oxide, titanium oxide, zin stearate, and iron oxide pigments)	The dental materials with calcium hydroxide used in capping procedures have antibacterial properties. When Calcium hydroxide placed in contact with vital pulp tissue, it can be stimulated the formation of tertiary dentin. Calcium hydroxide reduces anaerobic microorganism by absorbing CO2 on the tissue. however, the agent hydrolyzes the cell walls of bacteria, neutralizes endotoxins.	The major problem of calcium hydroxide is its tendency to dissolve in time. High solubility caused empty spaces of material is a convenient zone for bacterial invasion. Dentin bridges formed by Ca(OH)2 have tunnel defects that allow bacterial infiltration, thereby failing to provide against secondary inflammation.
MTA	Powder containing type3 Portland cement, bismuth oxide, tricalcium silicate, calcium aluminate	Mineral trioxide aggregate (MTA) is a biocompatible, bioactive, antibacterial material with stability and high sealing ability. The material also has the lowest cytotoxicity values. MTA stimulates faster dentin bridge formation than calcium hydroxide, when applied in direct contact with tissues and ensures an antibacterial environment by releasing calcium ions. According to the research conducted by Roisin Holland et al in Brazilian Dental Journal February 2001: When applied MTA as a direct pulp capping material, some of the bridges that were completed had tunnel defects, but these defects were closed at their more coronal portion. All these favorable features of MTA were caused it has been thought in alternative against Ca(OH)2. Ability to even set even moisture and blood.	MTA exhibits drawbacks such as difficulty handling, long setting time, potential discoloration of the tooth, high costs.
Biodentine	Biodentine (Septodont) powder contains tricalcium silicate, calcium carbonate, and zirconium oxide; the liquid contains water, calcium chloride and modified polycarboxylate.	Biodentine stimulates differentiation of mesenchymal stem cells regenerating and results in process tertiary dentin formation when it in direct contact with vital pulp. The material has a low cytotoxic effect on the pulp, fast set capability (approximately 12 minutes) and it exhibits thorough sealing properties in order to prevent microleakage and pulpal inflammation. The fast set capability is an advantage compared to MTA which has setting time of about 3 hours. Shayegan., et al. showed that biodentine constitute hard tissue and ensure good marginal integrity with no pulp inflammation response and can maintain this marginal compatibility. Furthermore, does not cause tooth discoloration. Under these conditions, Biodentine is reasonable capping material by comparison with other materials. According to the study conducted by Laurent et al: Biodentine increase TGF1 secretion from pulp cells. TGFB-1 induces differentiation of progenitor cells into odontoblast-like. These cells secrete restorative type of dentin matrix. Biodentine had the potential to significantly stimulating angiogenesis and the formation of mineralized areas.	There are no long-term studies present. Taking into consideration that TheraCal which has setting time of 20 seconds, Biodentine certainly has a drawback.
TheraCal LC	Portland type III cement (45%), fumed silica as a thickening agent (7%), resin(43%), bismuth oxide (3%), and barium sulfate (3%) as radiopaquers	TheraCal LC display high calcium release properties. The increase in adverse pulpal effect is not observed during the polymerization of TheraCal LC inasmuch as The polymerization of TheraCal occurs with low heat generation. Cannon et al. reported that the light-cured TheraCal LC groups had 4 International Journal of Dentistry significantly more frequent hard tissue bridge formation, a greater thickness of the dentinal bridge and better dentinal bridge qualities than the Glass ionomer and VLC Dycal groups. According to Meraji and Camilleri, TheraCal LC had higher bond strength values than Biodentine.	Jeanneau et al. showed that TheraCal is toxic to pulp fibroblasts and has a higher inflammatory effect and a lower bioactive potential than Biodentine. It is claimed that remain unpolymerized components such as BisGMA, HEMA, TEGDMA, and UDMA after polymerization produces a cytotoxic effect. There are no long-term studies.

Looking at all of this, we can see that MTA is an alternative material to DyCal but still should be worked on drawback for more practical clinical use. In addition, studies have shown that TheraCal LC not only has the most toxic effect on the pulp tissues, but also upon the material that promotes mesenchymal stem cell regeneration, which is necessary for the healing process. Therefore, while Jeanneau et al. have stated that in terms of its cytotoxic effects, TheraCal cannot be recommended for direct pulp capping. Some researchers have expressed that based on the success of stem cell regeneration that TheraCal LC can be applied by leaving some affected dentine on the pulp. However, some authors have also indicated that there are very few studies on the properties of newly developed materials such as Biodentine.

Consequently, it is necessary to be discuss the new materials, even if newer materials such as Biodentine and TheraCal hold promise for the future.

EDSA Summer Camps

Summer camp offers the opportunity to exchange experience in various aspects of dental care. This project has a long history - it started in 2011 as an idea to bring dental students together during summer. We feel that during summertime people can see the relaxed and fun sides of each other, away from all of the stress they experience in their studies. This is a camp is organized by students for students, and in 2019 we had Summer Camps in Antalya, Dubrovnik and Malta.

With EDSA being a constantly growing European society, the variance of our summer camp attendees expands every year. Students leave with more and more new international friends and connections.

The educational side of the Summer camp offers students various workshops, lectures and exploring education systems in foreign countries. Summer camp offers a perfect combination of fun, friendship, education and networking.

Malta
1st-7th September 2019

Antalya, Turkey
16th-22nd September 2019

EDSA Berlin Lecture Competition Participants

Winner

Oana-Gabriela Vrabie, University of Medicine and Pharmacy "Iuliu Hatieganu" - 6th Year

Biocompatibility of Titanium scaffolds realised by Selective Laser Melting Technique (SLM)

INTRODUCTION:

The complex pathology of the oral and maxillofacial areas leads to even more complicated repercussions affecting the patient in functional aspects and, also, at a psychological level, considerably reducing the quality of life. The bone reconstruction of the defects occurring in these areas is an old and at the same time very topical issue, giving the fact that an ideal material to re-establish all the lost functions is yet to be found.

The aim of this study was to assess the osseointegration of two series of titanium scaffolds manufactured by Selective Laser Melting with different cell size in the internal structure. Half of the scaffolds were coated with nanohydroxyapatite on the surface and the influence of nanohydroxyapatite in the osseointegration process was evaluated.

MATERIALS AND METHODS:

The scaffolds were surgically implanted in the femur of six White Californian male rabbits: three animals received 0.8 mm cell size scaffolds and the other three received 1 mm cell size scaffolds. To minimize the number of subjects included in the study, each one received two scaffolds, one with the titanium surface unmodified, and the other one coated with nanohydroxyapatite on the surface. Two, four and respectively six months after the placement of the scaffolds, a general anaesthesia was induced and the euthanasia of the subjects was carried out for the harvesting of the bone fragments containing the scaffolds. After bone decalcification and the separation of the two structures, the bone fragments were histologically analysed using conventional light microscopy (LM) and the surface of the scaffolds was analysed using scanning electron microscopy (SEM) for the qualitative evaluation of the osseointegration.

RESULTS:

Titanium scaffolds with the cell size of 0.8 mm showed a higher osseointegration compared with 1 mm scaffolds.
LM revealed that the bone formed in the proximity of nanohydroxyapatite coated scaffolds was better organized than the bone associated with unmodified ones.
SEM images at 6 months revealed that the bone developed not only in contact with the scaffolds, but also inside the cells of the structures. Nanohydroxyapatite coated titanium implants with 0.8 mm scaffolds were completely covered and filled with new bone.

CONCLUSIONS:
The titanium scaffolds were well received by the animal organism and the osseointegration process depended on the cell size and the surface properties. The 0.8 mm scaffolds had a better interaction at the bone-implant interface inducing the development of a more condensed tissue.
The presence of the nanohydroxyapatite on the surface of the scaffold augmented the process of bone development and helped forming a stronger structure.

ACKNOWLEDGEMENTS:
This study was supported by the internal grant No. 4995/20/08.03.2016 within the "Iuliu Haţieganu" University of Medicine and Pharmacy, Cluj-Napoca, Romania.

Matei Sebastian-Roberto, University of Medicine and Pharmacy "Iuliu Hatieganu" - 5th Year
Microbiological and SEM evaluation of root canals final irrigation: A comparative in-vitro study between Qmix and Sodium Hypochlorite activated with EndoUltra system

INTRODUCTION:
The main purpose of the endodontic treatment is to perform a proper shaping and cleaning of the root canal system. The aim of the present study was to assess the effect of the QMix irrigant in comparison with the classic sodium hypochlorite irrigant actuvated with the EndoUltra System.

MATERIALS AND METHODS:
The study was conducted on 40 extracted monoradicular teeth, prepared using One Curve System (MicroMega, France). After finishing the mechanical-antiseptic treatment, the already prepared specimens were subjected to a wet sterilization process.
Each tooth was inoculated with E. faecalis ATCC 29212 .The inoculation was made using an insulin syringe and each tooth was placed in a well of a 12 wells plate in a Brain Heart Infusion (BHI) for 14 days.
On the 14th day the teeth apex was sealed with a resin (Herculite, Kerr, Germany) to prevent the retrograde infiltration. After the apical sealing, the root canals were irrigated 3 times with a buffer solution until 1 microlitre of the inoculum was obtained. The colonies were scored on a Petri dish counting the CFU (colony forming units) prior to the treatment, in order to confirm the teeth infection.
For the final irrigation of the endodontic canals ,the teeth were divided into 2 categories , as follows: 1)3 ml of Sodium Hypochlorite 5,25% (Cerkamed, Poland) for 1 minute, improved using the EndoUltra System (MicroMega, France); 2)1 ml Qmix 2in1 (Dentsply, Tulsa, USA) for 1 minute using an irrigation needle.Twenty prepared teeth were assigned to each group. (n=20)
After the final irrigation was done inoculation of 1 microliter per Petri dish with blood agar was done , then incubation at 37 °C 24 hours. After incubation the CFU post-treatment (colony forming units) were counted.
In order to evaluate the specimens by Scanning Electron Microscopy (SEM) (magnification of 45x-2000X), 6 random specimens were selected from each category. The teeth were sectioned lengthwise, using sterile instruments.

RESULTS:
The highest CFU mean value was observed for the second group (20), where the irrigation and the disinfection of the canals was performed using only a manually activated Qmix (Densply, USA). The lowest mean value was obtained from the first group (2,85), where the EndoUltra System (MicroMega, France) was used to activate the irrigation solution in the canal.
When the CFU mean value of the 2nd group was compared to the one from the 1st group, statistically significant differences ($p=0.001$ and $p<0.01$) were detected.

CONCLUSIONS:
Given the microbiological tests and SEM results, final irrigation protocol using sodium hypochlorite activated with EndoUltra system is superior compared to the protocol that used manually activated Qmix.

Miloš Todorović, University of Belgrade - 1st year graduated
The effect of electronic cigarette vapour on aesthetic characteristics of direct and indirect composite resins

INTRODUCTION:
Today vaping industry is in rise. As of 2018 3,5 million high- and middle-schoolers were using e-cigarettes. Since 2014 e-cigarette use has overtaken traditional smoking among children. As vaping is trending it is important, more than ever, to know it's effects on health, oral tissues and materials we use in dentistry. It is well known that esthetic properties of composite materials are susceptible to changes

The participants of the EDSA Berlin Lecture Competition, the winner Oana Vrabie is wearing loupes. Our thanks to Dana Timuș, EDSA Research Officer in making the event happen.

when influenced by various factors. The external factors are of special interest since composite fillings are under their constant influence in oral cavity. Although the effect of some of these factors on different composite resins has been well documented, there is lack of data on their effect on novel group of composite materials with improved aesthetic characteristics and innovative shade concept.

MATERIALS AND METHODS:

The research was conducted on polymerized composite resign discs which are made with standardized process of pressing composite resign out of tube into the square shape mold with dimensions 10x10 mm and 2mm thickness. One side was exposed to air, and other was made in contact with celluloid tape to ensure that oxygenic layer could not form. There were 10 discs made from Filtek Z250 (3M ESPE, St. Paul, MN, USA) composite of shade A1, 20 discs made of GC Essentia (GC Europe, Belgium) composite of universal shade, 10 discs from GC Gradia Direct (GC Europe, Belgium) composite of shade A1 and 10 discs from GC Gradia Plus Paste Heavy (GC Europe, Belgium) composite.

Experimental groups were formed based on finishing protocol: Two experimental groups from 3M Filtec Z250 each of 5 discs, polished with Sof-lex discs (3M ESPE, St. Paul, MN, USA) and unpolished; three experimental groups from GC Gradia Direct composite, polished with Sof-lex discs, polished with GC Gradia Diapolisher (GC Europe, Belgium) and unpolished; three experimental groups were made from GC Gradia Plus Paste Heavy, polished with GC Gradia Diapolisher and Gradia Plus Lustre Paint (GC Europe, Belgium), and unpolished. All techniques of polishing and polymerization were done as per instruction of manufacturers for respected products.

Only sides that were made with contact with air were polished.

These samples were exposed to simulation of vaping of electric cigarettes. Samples that were exposed to vapor were treated with 200 simulation cycles in specially designed chambers. The number of cycles is equivalent to smoking half of a packet of normal cigarettes. Each cycle would start by simulation of inhaling that would create negative pressure and pull air though e-cigarette into the chamber so that vapor could fill it. After the vape is in the chamber for 3 seconds, the e-cigarette is removed so the vape can exit the chamber. The exposure time in single cycle was 3 seconds. The cycle ended with elimination of vapor from the chamber. The changes of optical properties of the samples were measured by Vita EasyShade (3M ESPE, St. Paul, MN, USA) spectrophotometer. Color change and translucency were calculated before and after exposure to vapor.

RESULTS:

The vapor from e-cigarette showed significant influence on both color change and translucency in polished and unpolished samples. Change in optical properties has been documented in all experimental groups. The change of Filtec Z250 composite resign's optical properties were clinically acceptable, as well as those of Gradia Direct and Essencia. Gradia Plus Heavy Paste saw clinically visible change in its optical characteristics.

CONCLUSIONS:
Vapor of e-cigarettes had led to the change of esthetic and optical qualities of all composite resign discs.

Florin Froimovici, UMF "Carol Davila" Bucharest - 4th Year
Assessment of the biocompatibility of 3D-printing polymers in the background of dentistry digitalisation

INTRODUCTION:
In the background of dentistry digitalisation, minimizing workforce and increasing efficiency, we aim to present aditive manufacturing methods for prosthodontic appliances and to assess the biocompatibility of 3D printing resin-based polymers.

MATERIALS AND METHODS:
Materials were chosen based on the lenght of usage and comercial succes, taking into account both widely used for over 30 years PMMA, as well as polymers available for less than nine months. For the assessment of biocompatibility, type hs27 human fibroblast cell cultures were used, in which disks of the chosen materials were placed. The cell cultures were observed for reactions to the presence of these materials. For biocompatibility measuring, two types of essays were chosen. We took into account the release of lactate dehydrogenase and the metabolisation of MTS tetrazolium to formazan dye.

RESULTS:
After observing cell reaction to the range of materials some differences were seen between usual polymers and modern ones, the practitioner's choice largely taking into account the ease of usage, the higher precision and the considerable lowering of manufacturing costs for 3D-printing polymers. Even so, the results point out that current 3D-printed resins are not suited for long term usage and should only be considered when the contact time with the tissue is limited.

CONCLUSIONS:
3D printing is a future solution with the potential to revolutionise dental practice through numerous applications. Among these, prosthodontic appliances are in full development and require further research for the study of resistance to wear. Moreover, research into new polymers is to be considered, taking into account the amount of time spent in contact with oral tissues.

Anton Sharapo, Moscow State University of Medicine and Dentistry - 2nd year graduated
Treatment of internal disorders of the TMJ using plasma rich in growth factors on hyaluronic acid substrate.

INTRODUCTION:
The aim of our study was to evaluate the effectiveness of the use of plasma rich in growth factors on hyaluronic acid substrate carrier in the treatment of internal disorders of TMJ.

MATERIALS AND METHODS:
For the study, a group of 30 patients was formed. The inclusion criteria: consent to participate in studies, presence of a triad of symptoms (pain, restricted mouth opening, presence of internal disorders according to MRI-diagnosis), age from 18 to 55 years. Exclusion criteria: refusal to participate voluntarily in the study, presence in the anamnesis of decompensated forms of cardiovascular insufficiency. The main indicators on which the result of the treatment was evaluated included: the extent to which mouth opened, laterotrusive movements of the lower jaw, the degree of pain on the visual analogue scale of pain (VAS). All patients underwent surgery in succession: arthrocentesis, arthrolavage of both TMJs with the injection of hyaluronic acid and plasma rich in growth factors (PRGF) into the joint according to the protocol developed by the Department of Maxillofacial and Plastic Surgery. In addition, electron microscopy of the drugs was conducted.

RESULTS:
Assessment of the main indicators was conducted: immediately after treatment, 2 weeks and one month after treatment. The extent to which mouth opened one month after the operation increased by 11.38 mm (33% $p \geq 0.05$), the value of laterotrusive movements to the right increased by 3.54 (42.1% $p \geq 0.05$) to the left increased by 2 mm (23% $p \geq 0,05$), pain reduction according to the VAS is 4.34 (74.3% $p \geq 0.05$)

CONCLUSIONS:
This study proves that the protocol developed by us is highly effective and can be successfully used as a primary or auxiliary surgical stage in the complex treatment of internal disorders of the TMJ of varying severity.

EDSA Berlin Roundup

Tanguy Pinedo-Tora, EDSA Vice-President of External Relations, France

On the 18th until the 24th of august EDSA had the pleasure to organise the 2019 summer meeting at Berlin's Charite University joined with the Association for Dental Education in Europe.

Trainings, Lectures and workshops

The summer meeting is a great opportunity for delegates to train on association management and personal skills to prepare the new year : our traditional 'introduction to EDSA" training, Sponsorship training, Making a video, writing policy papers… The "EDSA Alumni" discussion group which was introduced at the Kazan meeting in April was repeated, giving the association a number of ideas on EDSA's future.

Delegates also had the chance to hear interesting lectures, for example Mark Jacovak on the "advantages of the microscope in esthetic dentistry" , or Botiss "360° of bone regeneration" for example.

Much awaited workshop took place on Thursday, a short Itop for student by Curaprox, a suture training by Hu-Friedy and much more!

Board of delegates

The Board of delegates ,introduced in Kazan, was held on tuesday, discussing major EDSA topics between National Delegates, representatives of each member country. One of the outcomes was the creation of an EDSA Alumni Network, on the example of the European Pharmaceutical Students Association's Alumni Network. The forthcoming prevention campaigns were also presented to National Delegates.

New President and Board

During the Kazan meeting Tin Crnic was elected at the "president-elect" position, taking over Alyette Greveldinger term in Berlin, in order to facilitate presidential handover. The rest of the executive committee and officers were elected in Berlin, you can find out the entire new team on page X.

For the first time, the policy Officer was elected as a new position : the goal is to determine relevant subjects with delegates, and write evidence based Policy Papers so EDSA can have a strong standing point on many topics. The topics chosen by delegates were Clinical Education and Sustainable dentistry.

Presentation of the CED Intern.

The Council of European Dentists is a long standing partner of EDSA, representing european dentists in Brussels. During last term, it was agreed that the CED will host an intern chosen in good intelligence with the EDSA board.

Daniela Timus was selected for the position, and gives us an insight of her work role

"The CED-EDSA intern is involved in various aspects of CED work, including activities of Working Groups and Task Forces, communication activities and administrative tasks. For the past months the work focused mainly on the update of one of the main CED publications - the EU Manual of Dental practice, under the guidance of a Board Taskforce. The intern took part in the organization of several events, including the "One Health" conference in Warsaw and the CED General Meeting in Brussels.

The intern provides a crucial link between the CED and the European Dental Students Association, facilitating close collaboration of the two organisations. Bringing the students' and young professionals' point of view to the table is one of the main principles on which this cooperation relies and will work in the future."

Round Table

The subject chosen was "Sugar, Nutrition and Dentistry" : in modern dentistry, our main enemy is sugar provided by high sugary industrial junk food. Delegates could enjoy a new format of roundtable , with a documentary (That Sugar Film) shown before debating. Stephanie Tubert Janin (ADEE President, Clermont, France) and Henk Donker (CED Netherlands) joined us for the discussion. The goal was to show that dentists had an important role in giving nutrition advice to patients, especially on sugar intake to limit tooth decay, seeing the pathology in a global way in order to prevent it.

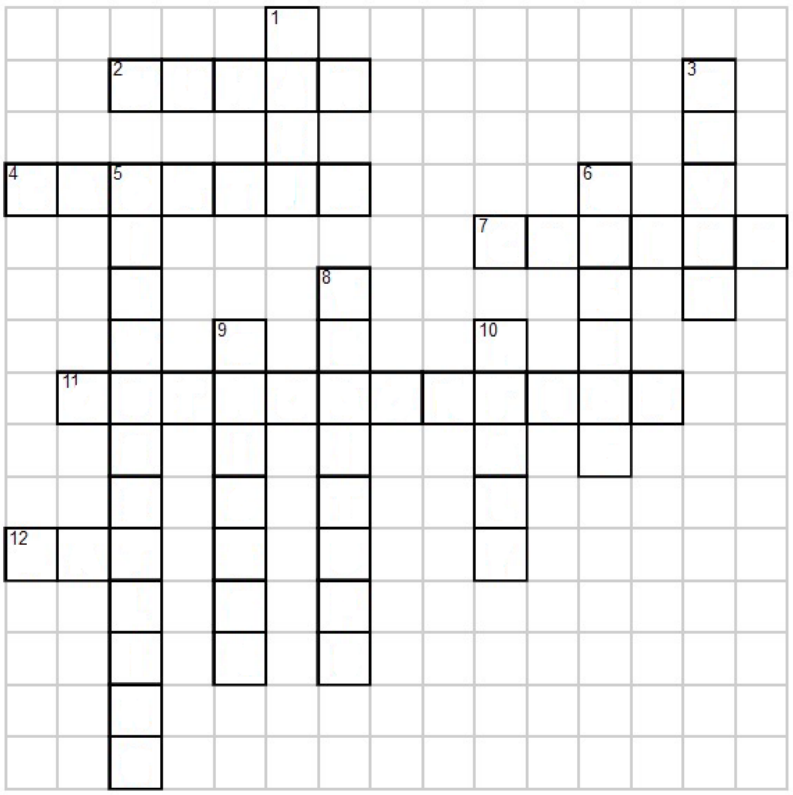
Hackathon Session with ADEE

On friday morning EDSA delegates and new exco members went to participate in the ADEE-EDSA-ADEA joint Hackathon session, trying to design the "perfect dental faculty", focusing on which goal should this faculty prioritise.The ADEA is our american counterparts, representing both teachers and students. This session was conducted by Irina Dragan of Tufts University (USA). Students and teachers worked in groups against each other and presented their ideas at the end of the session to a jury.

EDSA B

Berlin

EDSA Crossword



Across

2 The city where coronavirus is said to originate from
4 What country is EDSA president from?
7 Another name for tooth decay
11 What area of dentistry most commonly involves braces?
12 The animal associated with COVID 19

Down

1 Turkey's famous Anise flavoured alcoholic drink
3 How many members are there in the ExCo
5 Turkey's national sport
6 Which of Turkey's bordering countries is famous for their gyros?
8 What University was EDSA Istanbul to be held at?
9 What Meat might you find in your tavuk gogsu dessert?
10 Stefano might study in Romania, but what country he grew up in?

OPPORTUNITY FOR EUROPEAN DENTAL STUDENTS.

BECOME AN INTERN AT THE COUNCIL OF EUROPEAN DENTISTS

We are very excited to announce that the applications for the CED-EDSA Internship are open. If you want to work with the Council of European Dentists in Brussels and represent EDSA in the heart of the EU, this is an opportunity you don't want to miss!

After a successful first collaboration, EDSA has teamed up with the CED for a second time, in order to offer an incredibly exciting and unique opportunity for one lucky individual.

The CED-EDSA internship is a 9-month payed work experience in Brussels. The position was established in 2019 and provides a crucial link between the Council of European Dentists and the European Dental Students Association, facilitating close collaboration of the two organisations.

The Council of European Dentists (CED) is a European not-for-profit association which represents over 340,000 dentists across Europe.

The CED concentrates its activities on promoting high standards of oral health and aims to contribute to safeguarding the protection of public health by actively lobbying the European Institutions.

The internship is available to all EU students who are members of EDSA and will be for 9 months starting 1st October 2020.

The timeline for the application is as follows:

Applications open: April 1st 2020
Applications close: May 15th 2020
Online interview period: May 20th – June 10th, 2020

A CV and cover letter should be sent to the EDSA General Secretary at secretary@edsaweb.org. Successful applicants will be invited to an online interview.

If you want more details on the position or have any questions, do not hesitate to contact our current CED-EDSA intern, Daniela Timuș.

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