Opinion: A vision and a need for prevention

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When my son Timo was born, late one evening in June this year, we had to wait a few more seconds before we could finally hold our precious little gift in our arms. Shortly before his birth, my girlfriend and I decided to store stem cells collected from his umbilical cord blood. The body of a newborn contains innumerable stem cells that are able to prevent, regrow and regenerate damaged tissue. When speaking to doctors, I do not have to explain the vast medical benefits that stem cells have. However, while speaking to dentists, I would like to explain why we spent a good sum of money for something we will probably, and hopefully, never use. I do not want my son to ever experience any disease. I want him to avoid what can and cannot be cured. And I want my son to never experience caries, periodontitis or tooth loss.

In the same way that stem cells can potentially treat cardiovascular diseases, hematopoietic diseases, and Type 1 diabetes, periodontal pathogens correspond with exactly the same illnesses. Oral science has advanced to such a degree that we have a good understanding of biofilm, caries and periodontal diseases. Yet, while dentists have all the tools and knowledge necessary to prevent disease, they’ve remained the same designers, architects and mechanics as 50 years ago. The dental industry has developed solutions for permanent sub- and supragingival plaque removal, yet the communication with and motivation of the patient remain absent or insufficient.

The authors of this magazine agree that prevention needs to become an integral part of every dental practice. They also agree that dentists should provide general healthcare for their patients and see them multiple times per year for prophylactic treatment and saliva or blood tests. Ideally, they should also refer patients to other doctors and know the referring cardiologist, diabetologist or gynaecologist. Dentists would then not be considered dental artists, but rather doctors of oral health. None of this will be possible without changing the patient’s perspective of dentistry and oral health through education, motivation and repetition.

In other words, the best medication you can prescribe (to your patient and your team) is education.

The world of dentistry has come a long way. Restorative dentistry has been embraced, while digital implantology has paved the way for long-lasting and affordable dentures. CAD/CAM technology produces ceramic perfection within minutes and motor-driven endodontics has become so efficient and simplified that millions of teeth can now be saved instead of extracted. However, while restoration will always be needed, preventive and restorative dentistry have only just begun to collaborate, particularly with regards to diagnosis and treatment.

The success of preventive dentistry remains in the hands of society and politics. Prevention seems to grow in countries with public health care systems and dental hygienists. Dental hygienists are key to providing oral hygiene instructions, education and patient motivation. Although dental hygienists do not even exist in France and Belgium, let alone in developing countries, prevention might be achievable in Western countries soon. However, the centuries-old notion of “prevention is better than cure” has no boundaries and should be the way forward for all medical fields.

We can further agree that preventive dental medicine will take generations to become the new standard in dentistry. 50 years ago, it would have been impossible to publish this magazine, for example. And in 50 years, diagnosis and treatment will have become so advanced that doctors will only debate about the different preventive options that are available.

So, I’m looking forward to smiling at Timo in 50 years. And I can’t wait to see him smile.

Thank you,
Marc & Timo
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content

Editorial
3 Marc about prevention

Opinion
8 A vision for prevention | Ueli Breitschmid: “Curaden believes in prevention like no other company in the world”
10 A need for prevention | Søren Jepsen: “Even in advanced countries, many people have difficulty accessing oral care services”
12 Understanding prevention | Maurizio Tonetti: “Prevention makes excellent economic sense for the dentist”

Advertorial
14 A new perspective | Dayo Oliver: “Proper breathing is important”

Science
20 Oral and systemic health | Periodontal health and systemic conditions
22 The enzymatic system | The oral microbiome and overall health
26 Interdental health | Denis Bourgeois: Why interdental brushes are essential for good oral health

Feature
30 Digital Prophylaxis | How chairside molecular saliva diagnostics boosts oral and systemic health
32 Digital Prophylaxis | Digital diagnostics in practice: Leading Perio Prevention Centers® in Europe
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Opinion

Saliva testing | Tony Hashemian: The importance of saliva testing for prevention

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Individually trained oral prophylaxis | Shifting the paradigm to prevention at home
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Caries prophylaxis | Corrie Jongbloed-Zoet: "The prevalence of caries and other oral diseases is a worrying trend"
Biorepulsivity | Sirid Kulka: "How to put prevention into practice"
Prophylaxis shop | Wolfgang Geiwitz: "We can only achieve good oral hygiene together"
Matrix Rhythm Therapy | Healing by relieving muscular congestion

About the publisher

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Prevention One is a new business model for dental practices. Cover image courtesy of Curaden AG.
Curaden believes in prevention like no other company in the world

When Dental Tribune approached us with the idea of a new magazine on the topic of preventive dentistry, I thought: “Well, it’s about time! You should have done this a while ago!” For those who don’t know me, I often like to speak from the heart and the dental industry lies very close to my heart. I’ve been in the business my entire life and I’ve been the CEO of Curaden AG for 40 years. Curaden produces oral healthcare products, such as the famous CS 5460 toothbrushes, through our brand CURAPROX. We also provide many educational programmes, such as iTOP (individually trained oral prophylaxis). I am so proud to be a part of such a forward-thinking company, since I truly believe that no mouth will ever change without the use of the right instruments and proper education.

At Curaden, we are proud to manufacture all our products in Switzerland, since the Swiss are known for their high quality, perfection and precision. Yet I was disappointed to hear that one in every three dental students in Switzerland leaves dental school before their graduation. There is no other field of study that experiences such a high dropout rate! What’s surprising is that the overwhelming majority of dental students do not simply drop out. The numerus clausus, in Switzerland and many other places in the world, limits the number of university applicants and is very high for human medicine. Also, prospective students for both dentistry and medicine have to pass an admission test in order to study. However, admission is not only easier for dentistry, both medical and dental students spend their first semesters in the same classroom, learning the same things. That’s why pre-clinic dental students who are more interested in becoming medical doctors, can easily take the available spaces of medical students who drop out.

This situation leaves me with two questions: why do we not start educating dentists as medical doctors of oral health? And, why don’t we consider dentistry as another medical discipline that works closely with cardiology, otolaryngology and other specialist fields?
Until now, we have educated dentists to become “tooth-repairers”. Dentists learn to place implants in the most difficult positions possible, they learn how to perform endodontics in the most severely curved canals, but when do they learn how to educate their patients on oral health? When will we understand that a healthy mouth is about more than just clean teeth? And when will we understand that our mission should be to keep patients healthy for a lifetime by providing them with the right products and education?

Of course, as a dental industry, we still need to sell toothbrushes, interdental brushes and mouthwashes. Many other companies in the dental industry need to sell implants, endodontic files and drills. Essentially, all manufacturers, dealers and dental professionals still need to look at remaining profitable or increasing profits. And there is no doubt that as an industry, we will still need to repair. Fortunately, our restorations have improved and can now last forever, but our preventive care can definitely be improved.

**Mind the trends**

The demand for preventive care has rather recent roots. Firstly, the megatrend of having a healthy lifestyle has now also moved into oral care. People want better oral prophylaxis, beautiful teeth and fresh breath. Oral care, however, is about so much more than oral hygiene. Healthy teeth and gums go hand-in-hand with self-confidence, a good morale and can also lead to healthy bodies. Essentially, the desire for a healthier lifestyle has created a demand for new products and new approaches to provide the patient with oral healthcare services in dental practices.

Secondly, scientists have discovered that oral health conditions have a major impact on people’s general and mental wellbeing. Oral health starts from infancy, by preventing jaw deformation and mouth breathing, continues into youth by motivating teens to maintain good oral health, and should not end when a patient becomes an adult. Everyone, regardless of his or her age, should feel attractive and beautiful. This means that we also need to help patients with dentures, implants and dental appliances to maintain their oral health.

Finally, it has also been discovered that the microbiota in the mouth has several very important functions that help maintain overall health. As the dental industry, we need to make sure that patients understand that they need bacteria in their mouths for their immune system. One simply has to destroy the bad bacteria, especially in hard-to-reach areas, such as interdental spaces, while keeping the good ones. While we have done a good job towards improved biofilm management, we need to present more scientific evidence that shows that the natural oral biofilm needs to be kept in a healthy balance. This includes everyone, from babies and children to teenagers, adults and seniors. Everybody needs a healthy mouth for a healthy body in order to reduce the offset of chronic diseases.

**Better health for all**

If health insurance companies, governments and health organisations really want to establish a prevention-driven mindset in society, dentists are key. Dentists have the education, the capacity and the position in society to make prevention a priority—at least in Western cultures. The dental professional has the potential to become the preventive doctor of the future. Of course, this possibility is still very far from our current reality.

However, most oral diseases are preventable, simply through the daily care of teeth and gums. That’s why we want to change dentistry from a field of repairing, to one of health-orientated medicine. In this way, the dentist is responsible for the general health of people and not only for their teeth and gums. Curaden wants the dentist to finally become the gatekeeper of health by taking care of patients’ oral health.

When will we understand that our mission should be to **keep patients healthy for a lifetime by providing them with the right products and education**?

Together, we want to achieve better health for all, therefore a change in approach towards prevention is inevitable.

**A partner in preventive oral health**

As a company with decades of experience, we have contributed significantly to preventive dentistry. First, our CURAPROX brand supports health instead of fighting dental problems, such as caries or hypersensitivity. It is not against diseases, but rather for oral health. Our products have the quality and design to inspire both the dental professional and the patient to change dentistry from a disease-oriented medicine to finally become the gatekeeper of health by taking care of patients’ oral health.

All of this leads up to one important concept: the dentist will become one of the most important medical professionals in the future and we hope to be part of this evolution.
Søren Jepsen: Even in advanced countries, many people have difficulty accessing oral care services

The prevalence of periodontitis is strongly associated with socio-economic status, according to Prof. Søren Jepsen, past President of the European Federation of Periodontology and co-author of its Perio Focus paper. It is up to the oral health care community to help make reliable professional oral health care services truly accessible to the entire population.

What are some of the socio-economic costs and implications of periodontal disease?
We have to realise that periodontal disease is probably the most common disease of all. Because of global population growth, ageing societies and increased tooth retention, the number of people affected by periodontitis has grown substantially. The total burden of disease increased globally by about 67 per cent between 1990 and 2013. A recent Global Burden of Disease study, supported by the Bill & Melinda Gates Foundation, looked at all human diseases and their impact on health and well-being. The results indicate that severe periodontitis is one of the major contributors to the burden of human disease in several ways:

i) directly, through the sequelae of periodontitis itself;

ii) indirectly, through the contribution of severe periodontitis to edentulism and loss of masticatory function; and

iii) through co-morbidity with a host of systemic diseases, such as diabetes, atherosclerosis, obesity and arthritis.

The global cost of lost productivity from severe periodontitis alone has been estimated to be US$54 billion per year, while the total economic impact of periodontal disease accounts for a major component of the US$442 billion that constituted the direct and indirect cost of oral disease incurred in 2010.

Clearly, the costs to society are great. It has been calculated that periodontitis is responsible for lost productivity for a dollar amount similar to a small European country — and then there are the treatment costs! Severe periodontitis is responsible for a significant amount of the financial costs of oral health: in many developed countries, it is about 0.5–0.8 per cent of gross domestic product. What is particularly worrisome is that the social burden is borne disproportionately by the more vulnerable segments of the population. For many citizens, even in developed nations, severe periodontitis may be a handicap and a form of social exclusion.

What kinds of cultural and socio-economic barriers to professional care prevent equal access to the necessary treatment?
There are many barriers, and if we look around the world, we may feel lost in a myriad of cultural and socio-economic barriers. These clearly differ in developed and developing nations. In developed countries, the availability of information on the Internet is probably the greatest barrier to access to
the appropriate evidence-based care that works. A variety of approaches have been proposed — without a grain of scientific evidence — that cater to specific mindsets and beliefs of the population. In this whirlwind of advertisement, the health information is lost and many people find it difficult to differentiate between what works and what does not.

Our Perio Focus paper provides a series of priorities on how to address some of the barriers. Consider, for example, the belief that self-medication with a variety of aids will manage the disease. You really need to read the specific suggestions that have been endorsed by so many periodontal societies around the world, as our colleagues tell us that these are real issues.

Of course, different countries are at different levels regarding gingival health knowledge, care and policy. However, even in the most advanced countries, considerable parts of the population continue to have a high burden of disease and have difficulty accessing health information and professional oral care services.

What are the reasons for this? There are several. For example, the early stages of periodontal disease are often symptomless, and a significant number of affected patients thus do not seek professional care. The relatively silent nature of the early stages of the disease, combined with low public awareness of gingival health, leads to many patients seeking symptom-based care only for advanced disease.

Also, we know that there is an association between low socio-economic status and higher prevalence of periodontitis. Recent insights into socio-economic inequalities in health show that the most important aspect is the effect of social status on health. Social background heavily influences the behaviour of individuals, and health-promoting behaviours become more difficult to sustain further down the social ladder. This is an enormous challenge for societies and health care systems.

How can we empower and educate patients to reduce their risk of developing gingivitis or periodontitis? That is indeed a key challenge. Our global call to action aims to enhance public awareness of the early signs of periodontitis.

We want to inform patients and the public at large that periodontitis can be effectively managed and that it is more cost-effective to conduct treatment in the early stages of disease. For that, we need to address the misunderstanding that periodontitis can be effectively managed by self-care or self-medication.

Besides, we want to enhance public and professional awareness of the interdependence of periodontal health and general health. For that, we have to emphasise the need to address common risk factors, such as smoking and obesity, for both periodontitis and other chronic diseases. That is why we need public health campaigns tailored to susceptible groups, such as pregnant women and diabetics — and we need them urgently.
**Maurizio Tonetti:** "Prevention makes excellent economic sense for the dentist"

Lack of compliance from patients cannot remain an excuse for giving up, says Prof. Tonetti, editor of the Journal of Clinical Periodontology and co-author of a Perio Focus green paper on periodontal diseases. It is up to the dentist to adequately motivate his patient. If the dentist and patient have shared goals, then the failure to achieve them is shared too.

In your Perio Focus green paper, "Impact of the global burden of periodontal diseases on health, nutrition and well-being of mankind: A call for global action", you call for prevention, diagnosis and treatment. Why do you recommend this threefold approach to periodontal diseases?

More than 750 million people suffer from severe forms of periodontitis, while another 3 billion have a milder form of it. With such a widespread prevalence of this disease, we need a multi-pronged approach to treat it, which includes:

- **a) Prevention**, to ensure that fewer people develop the disease. We suggest that we need to work on the common risk factor approach for the prevention of chronic non-communicable diseases, as suggested by the World Health Organization (WHO), with one critical addition: we must include oral hygiene as one of the virtuous behaviours (along with not smoking, eating well, controlling weight and exercise). Prevention requires the implementation of appropriate oral hygiene practices and the effective management of gingivitis, which dental professionals need to play a critical role in providing. In addition, more needs to be done by governments in this regard.

- **b) Diagnosis**, since we think that early detection and early management will lessen the economic burden of treating periodontal disease. We suggest an alliance with the patient to aid early detection with self-assessment, followed by professional screening and a full periodontal diagnosis. In addition, it is critical that dental professionals communicate the message that gingival bleeding is not normal and requires attention.

- **c) Treatment**, which for dentists is the obvious step. The problem is that we know how to treat this disease and we have all been trained in dental or hygiene school on how to do it, but formidable barriers are making access to the best evidence-based treatment difficult—and I am not only talking about money! A complex mix of misunderstandings, incorrect health messages derived from the advertisement of oral
health products, faulty reimbursement systems and a historical focus on restorative dentistry are proving difficult issues to overcome.

Clearly the number of periodontal disease patients is enormous and we need to rethink what we are doing. Fortunately, the endorsement of such a wide constituency of learned periodontist societies from around the world can be seen as a good omen.

Often, prevention is neglected in dental practices in favour of diagnosis and restorative treatment. However, how can dental professionals equally implement these three steps in their daily practice?

In developed countries, and in the higher socio-economic strata of developing countries, health, rather than disease, is the future of medicine and dentistry, since people want to be healthy and for that, prevention is key. The best dental practices have already shifted their business models away from traditional restorative treatments alone and towards a different approach. Prevention makes excellent economic sense for the dentist, but from the patient’s perspective, preventive treatment only works if it is of a very high quality.

What are some of your key recommendations for short- and long-term preventive treatment? And, where does primary prevention end and secondary prevention begin?

You raise an important point. The simple answer is with the diagnosis and choice of appropriate care pathways for different individuals. Primary prevention, or helping healthy people avoid the disease, is key. We know what to do in terms of behavioural modification and the promotion of a healthy lifestyle, oral hygiene instructions and delivery of the traditional periodontal preventive services (scaling and prophylaxis). This approach, however, requires diagnosis, because the dentist must first establish that the patient does not suffer from periodontitis at the time for it to work.

In the conclusions of the Prevention Workshop, organised by the EFP in 2014, we underline the fact that it is inappropriate to deliver professional primary preventive services to patients with undiagnosed periodontitis. So, each dentist needs to create different care pathways. One pathway for healthy subjects that need primary prevention, one for gingivitis patients who require treatment first and then primary prevention, and another for periodontitis subjects whose needs are totally different, including an accurate diagnosis, periodontal treatment planning, the completion of a cycle of effective treatment and then—only then—prevention. Secondary prevention in these cases implies a specific programme for high-risk individuals who have had the disease and who are at a risk of recurrence.

How important is an early and accurate diagnosis of periodontal disease for maximising the effectiveness of treatment?

An early and accurate diagnosis is critically important! Distinguishing between health, gingivitis and periodontitis with an appropriate screening test is the first step—similar tests, based on the WHO Community Periodontal Index, have been introduced in many countries around the world by national periodontal societies. Whenever a patient has periodontitis, a complete examination is mandatory in order to assess the specificity of the case, establish prognosis and choose the most appropriate treatment. Treatment without diagnosis is like walking with one eye shut—sometimes we reach the target, but only when we are lucky. Clinicians should also keep a very important issue in mind: that diagnosis is a statutory requirement in most jurisdictions around the world. Failure to diagnose or perform an accurate diagnosis remains the number one cause of litigation in our field.

Some patients think that the dental professional alone can treat periodontal diseases. What should the role of the dental professional and the role of the patient be for the successful treatment of periodontal diseases?

Here you refer to the need to establish a therapeutic alliance between an informed patient and the dental professional for the treatment of dental diseases, which includes periodontal diseases. The key is communication. Personally, I like to present to the patient the condition of his/her mouth, explain what periodontitis is, how it is treated and how its recurrence can be prevented. This is the time to clarify the importance of oral hygiene and risk factor management. However, your question has a deeper implication. As dentists, we always look at the patient’s lack of compliance as an easy excuse for our lack of success. Allow me to elaborate: if I do not manage to adequately motivate one of my patients I ask myself (and my team) what we did wrong? It is my responsibility to help my patient understand the importance of their role and it is my duty to help them achieve our common goal of good oral health. So, the role of the patient is critical, but if they fail, I fail too.

The paper – “Impact of the global burden of periodontal diseases on health, nutrition and wellbeing of mankind: A call for global action” – was written by four international experts including Maurizio Tonetti and EFP past president Søren Jepsen.

More information: www.efp.org
Proper breathing is important

Immediately after birth, the baby starts to breathe with its first cry. The lungs inflate and the bloodstream responds to life outside the womb—this is a natural reflex that functions perfectly in most cases. Breathing is one of the body's elementary functions, in which oxygen is taken from the airways to the lungs and then the bloodstream, to keep us alive, breath for breath. As a midwife, I have been able to share in this happiness and experience this first breath many times. Whenever a newborn's breathing does not progress properly in the delivery room, I am always reminded just how important breathing is for the other functions in our bodies. As we grow, negative developments in the jaw, palate and oral cavity can massively impair our breathing. It has been estimated that only around 20 per cent of these malformations are congenital. Many of them are acquired, mostly by sucking on a thumb or dummy.

What promotes normal breathing?
There are certain prerequisites for normal breathing in a baby or child. The healthy development of the jaw, palate and tongue position are deciding factors. In children, the jaw is still very soft and malleable. Breastfeeding is the best way to promote healthy and physiologically correct jaw development. Latching on to the breast supports the natural development of healthy facial and mouth tone by training the cheeks, lips and tongue muscles. This helps to bring the skull plates into their correct physiological form after birth, which then has an effect on the jaw and mouth. This is only one of the reasons that breastfeeding should always be first choice. The jaw develops naturally as the baby grows, through the nutrition that the baby takes in through feeding.

It all comes down to proper breathing
There is a difference between mouth breathing and nasal breathing. Nasal breathing—and the related correct position of the tongue on the palate—pushes the top jaw outwards, promoting the healthy development of the palate and tooth positioning. Many children need something in addition to breastfeeding to satisfy their urge to suckle. In most cases, this is a dummy. However, it is often unfortunately a thumb. Standard dummies do not take into account the movements involved in sucking and the relationship between different spaces in the mouth. Around 70 per cent of children who use...
incorrectly shaped dummies or suck their thumbs end up with jaw misalignment and improper tooth positioning. In many children, this results in mouth breathing, which can have massive consequences for their health.

What is mouth breathing and why does it happen?
When we talk about mouth breathing, we are referring to breathing in which air reaches our lungs through the mouth or oral cavity. Generally, one only breathes through one’s mouth if the nose is unable to take in enough oxygen. For example, this happens at times of physical or mental stress; it also often happens during sleep. There are several possible reasons for mouth breathing: jaw misalignment, such as a high palate and the resulting improper tooth positioning, for example.
ADVERTORIAL: A NEW PERSPECTIVE

About the author

Dayo Oliver studied midwifery at St Gallen in Switzerland. She has been a midwife at the See-Spital Horgen hospital in Switzerland since 2006. For two years, Oliver also worked at a doctor’s surgery specialising in fertility problems and in vitro fertilisation. At the See-Spital hospital, she works in the delivery room and the women’s clinic, provides postnatal care and training, and performs acupuncture. Since starting her training, she has brought around 300 children into the world. Oliver is very passionate about her career as a midwife. She has been living with her partner for 19 years and has two sons and a daughter.

Dummies that have not been designed to take the mouth and jaw position into account, as well as thumb-sucking, cause unnatural pressure points in a child’s mouth. This can lead to several pathologies. First, the shapes of standard dummies and thumbs cause the wrong kind of pressure, which leads to misalignments. Owing to the shape of the dummy, these children move their tongues to an unnaturally low position. The child becomes used to this incorrect tongue position and begins to hold it there even when not sucking on a dummy or its thumb. This in turn results in the dental arch not being stretched upwards by the pressure of the tongue, so the teeth and tongue do not have enough space on the palate. Owing to the lack of space on the palate, the child breathes through its mouth.

In some children, the size of the tonsils is to blame. They can be so swollen that they cause an obstruction, meaning that the child cannot take in enough air through the nose. The body then automatically switches to mouth breathing to ensure a sufficient supply of all-important oxygen.

Problems caused by mouth breathing

In normal cases, a baby or toddler breathes through its nose. This is enormously important for many functions in our bodies, especially the unhindered growth of the oral cavity. There is a mucus membrane inside the nose that is covered with small hairs. Breathing through the nose cleanses and moistens, warms or cools the air. This natural effect prevents, among other things, dirt particles from the air, germs and other pathogens from entering our bodies. It works like a filter. When we breathe through our mouths, this filter is bypassed.

Mouth breathing also dries out the mucus membrane in the mouth, especially at night. The dryness reduces the saliva’s natural protective effect against dental caries and allows inflammation of the mucus membrane and gingivae, which can be very painful. This makes the child more susceptible to infections. This drying of the mouth can lead to problems swallowing, respiratory infections, tonsillitis and inflammation of the oral and pharyngeal mucus membranes. Mouth breathing also impairs the environment that important bacteria and digestive enzymes in the saliva need to thrive. This then has a negative effect on digestion and oral health.
One of the greatest problems caused by mouth breathing is the decreased absorption of oxygen. Nasal breathing leads to approximately 10–15 per cent more oxygen in the bloodstream compared with mouth breathing — this is a deciding factor for the growing child’s well-being and health.

Nitric oxide is a colourless gas that builds up in our sinuses. When we breathe through our noses, this nitric oxide is transported into our lungs. There, it causes vasodilation—an expansion of the blood vessels—and promotes better circulation within the pulmonary alveoli. This means that the body can absorb more oxygen and improve its supply to cells. This effect does not happen with mouth breathing, which explains the lower oxygen saturation.

Furthermore, babies and children who breathe through their mouths at night often snore and may also suffer from sleep apnoea. This means they experience pauses in breathing, which has a negative effect on their absorption of oxygen. These abnormal breathing patterns have several negative effects. The child does not reach deep sleep, as it often wakes up struggling for breath. This can increase its sleep requirement by several hours. The lack of deep sleep also has a negative effect on the child’s overall growth, since growth hormones are mostly released during deep sleep. If a child cannot reach deep sleep owing to loud snoring and regular sleep apnoea, not enough of these hormones are released—this negatively affects normal growth. The decreased intake of oxygen also leaves the child exhausted. This can lead to lack of concentration, decreased performance, disruptions in growth and development, and behavioural problems.

Designed to suit the mouth’s anatomy

Babies have a natural urge to suckle. Breastfeeding satisfies this urge for the most part. However, breastfeeding is sometimes not possible or not enough to satisfy the child’s urge to suckle. In order to limit the negative effect on the child’s jaw growth as much as possible, it is extremely important to choose the right tools. Standard dummies are unfortunately very poorly designed when it comes to the physiological needs of babies’ mouths. This can — as I have already said — have grave consequences.
Dummies that are designed to suit the mouth’s anatomy can have a great preventative effect. Healthy breathing is especially important for babies and small children. It is scary just how many negative effects pathological breathing, especially mouth breathing, can have. If we miss something in childhood, it could have a negative effect on the child for the rest of its life. If we are able to have such a positive effect on our baby’s health just by using the right dummy, we should start as soon as possible.

To sum it up, it is very clear to me how important proper breathing is for all of us. As a midwife, I seek to ensure that this topic is given the attention it deserves both in the hospital and at my postnatal home visits. We owe it to our children.
Periodontal health and systemic conditions

A correlation between periodontal disease, heart disease, infertility and diabetes has been established in various studies. Prevention provides an overview of recent evidence and hypotheses.

1 Breast cancer
A 2015 study published in the Cancer Epidemiology, Biomarkers and Prevention journal found that postmenopausal women with periodontal disease are at a significantly increased risk of developing breast cancer. One possibility is that systemic inflammation may arise due to periodontal disease and may then affect the breast tissue. Another possible explanation is that oral bacteria may enter the circulatory system and thereby affect breast tissue.

2 Stroke
Given that tooth loss and other oral health conditions are considered to be risk factors for stroke, Dr George S. Sfyroeras and a team of researchers investigated the relationship between periodontal disease and stroke. Published in the April 2012 issue of the Journal of Vascular Surgery, their statistical analysis of several studies on this topic found that the risk of stroke in periodontal patients was higher than in those without this condition.

3 Pneumonia
A study presented at IDWeek 2016 in New Orleans in the US found that regular (twice a year) visits to the dentist could lower the risk of contracting pneumonia from certain forms of oral bacteria. The study, conducted by researchers at Virginia Commonwealth University in the US, found that there was an 86 per cent increase in the risk of contracting pneumonia for people who never had dental check-ups in comparison with those with regular appointments.

4 Diabetes
A recent Perio-Diabetes Workshop jointly held by the European Federation of Periodontology and the International Diabetes Federation highlighted that periodontal patients are more likely to develop prediabetes and Type 2 diabetes and that research has demonstrated an association between an altered glucose metabolism in diabetics and changes in the periodontal microbiome. However, improving control of a patient’s diabetes might be beneficial to his or her periodontal health and vice versa.

5 Liver disease
In a study presented at the 2017 International Liver Congress in Amsterdam in the Netherlands, Danish researchers found that severe periodontitis is linked to a higher mortality rate in patients with cirrhosis. Previous studies have suggested that periodontitis is involved in the progression of liver disease and that it negatively affects the outcome of liver transplantation.

6 Infertility/premature birth
A 2012 study published in the Human Reproduction journal found that women with periodontal disease took, on average, two months longer to conceive than those without the disease. The researchers added that, even if a periodontal patient does become pregnant, there might be a greater risk of premature birth.
7 **Alzheimer's disease**
In a 2017 study published in the Neuroepidemiology journal, Leira et al. sought to clarify whether a link between periodontal disease and Alzheimer’s had been established by the previous decade’s research. Their systematic review revealed that a significant association between these two conditions had been observed.

8 **Depression**
Researchers from Australia’s Deakin University analysed this relationship on a large scale, drawing on data from an American health survey of more than 10,000 people. They demonstrated that not only does a link between depression and oral health exist, but also the severity of patients’ depression correlates with the severity of their oral health issues.

9 **Cardiovascular disease**
A recent meta-review conducted by University of Portsmouth researchers in the UK confirmed that there is a strong body of evidence that shows that individuals with chronic periodontitis have a higher risk of developing atherosclerotic vascular disease, regardless of other risk factors.

10 **Pancreatic cancer**
Presented at the 2016 annual meeting of the American Association for Cancer Research, a US study found that men and women whose oral microbiomes included Porphyromonas gingivalis had a 59 per cent greater risk of developing pancreatic cancer than those whose microbiomes did not contain the bacterium.

11 **Rheumatoid arthritis**
In a 2016 study published in the Science Translational Medicine journal, researchers at the Johns Hopkins Arthritis Center studied the rate of periodontal disease in rheumatoid arthritis sufferers and found that they were twice as likely as the population norm to have periodontal disease and six times as likely to suffer from severe periodontal disease.

12 **Osteoporosis**
A 2012 study published in the Journal of Dentistry of Tehran University of Medical Sciences analysed the existing research on the relationship between periodontal disease and osteoporosis. The authors found that there was a higher likelihood of alveolar bone loss in patients suffering from osteoporosis, particularly those with periodontitis.

13 **Mortality**
A study published in the April 2017 issue of the Journal of the American Heart Association suggests that overall mortality in the general population, and older women in particular, could be reduced by improving oral health. Based on analysis of data from over 57,000 postmenopausal women, researchers at the University at Buffalo in the US found that presence of periodontitis and tooth loss was associated with a significantly higher mortality rate.
The oral microbiome and overall health

Dr Michel Angelo Sciotti seems to be living the dream of any person interested in science. Michel is not only a Swiss biologist employed at the University of Applied Sciences and Arts Northwestern Switzerland. He’s also been an innovation scientist since 2004, who is dedicated to creating new products in the fields of molecular biology and bioanalytics. Whenever a company approaches him with a new idea, he’ll find a way to make it happen. For his doctoral thesis, he looked at oral streptococcal antigens.

What does he like about dentistry? “Certainly the interaction,” says Michel, standing in the middle of his laboratory on a warm July afternoon. “Biologists understand the wider scope of a biochemical reaction while dentists have the practical experience and data. If a new toothpaste with an enzymatic system such as lactoperoxidase is supposed to rebalance the oral microbiome, dentists need to understand and recognise this mechanism.” Enzymes? Lactoperoxidase? Well, let’s start at the beginning.

For decades, even centuries, dental and medical professionals have regarded all bacteria as the enemy and something to be removed from the human body. However, dentistry has started changing this view. Modern research and technology have helped reveal that the human microbiome is an intricate and complex system consisting of over 1,000 different bacteria that need to exist in a symbiotic balance with our bodies—for that reason, not all bacteria should be eliminated. "The perception of bacteria has changed: bacteria are a part of our lives, they exist on our skin and are needed to protect us from opportunistic pathogens," says Michel. "An aseptic mouth could have devastating effects on microbiome. At the same time, certain bacteria remain unknown, as do their interactions," he explains.

**Light in the oral cavity**

In the oral cavity alone, there are several different and distinct bacterial species present in the various ecosystems on the surfaces of the mucosal membranes, tongue, palate and other areas. Some of these bacteria are beneficial to our health, some are detrimental, but they nevertheless have co-existed for thousands, if not millions, of years. “Nature does not think in concepts of bad or good bacte-
ria. It was probably not the sense of evolution that we’ve had healthy teeth for a hundred years. However, it was the sense of nature to keep people away from diseases through a balanced microbiome,” says Michel. People now need to keep the natural oral microbiome intact if they want to keep their teeth as long as they live and, a huge part of doing that, involves a healthy diet with low sugar consumption.

This understanding of the oral microbiome has brought to light an appreciation of its importance in regulating our systemic health. Only a balanced microbiome can reduce inflammation, help regulate the cardiovascular system, assist in metabolic functioning and provide many other benefits to overall health. An oral microbiome that is not in equilibrium—i.e. dysbiosis—allows disease-producing bacteria to proliferate and can lead to oral diseases. If these oral diseases are left untreated, they can in turn have adverse effects on systemic health. It becomes clear then that maintaining a balanced oral microbiome has a positive effect, not only on oral health, but also on the overall health of the entire body.

We are enzymes
No human would be alive without enzymes. Enzymes are biological catalysts—they naturally accelerate the speed at which chemical reactions occur in the body without being used up. "We are made of enzymes. We are made by enzymes. Enzymes translate the genetic code and produce more enzymes and proteins that will perform all activities and functions that happen in and between the cells. It is likely that most biological problems may have an enzymatic-based solution," argues Michel. Made up mostly of proteins, enzymes are essential to the human body’s proper functioning. Without them, almost all of the processes that occur in our bodies would happen at a rate that would be too slow for us to exist. From the absorption of oxygen and the production of energy to the reduction of systemic inflammation, the plethora of biological activities in our cells would be unable to continue effectively without enzymes.

It makes sense then that enzymes are important for maintaining good oral health. When we eat, our food needs to be broken down so that the nutrients can be released and absorbed. Digestive enzymes facilitate this by reducing food
to its constituents like amino acids (from proteins), sugars (from carbohydrates), cholesterol and fatty acids (from fats) and an assortment of vitamins, minerals and other compounds. Though found in the pancreas and small intestine, the first digestive enzymes that are produced when eating are actually present in the saliva where they act as a lubricant and initiator of the digestive process. As they also possess antibacterial properties, these enzymes that are naturally present in saliva, protect and maintain oral health by reducing plaque build-up and promoting natural remineralisation. By doing so, they keep the immune system in balance and improve systemic health.

Enzymes for oral health

Dr Christoph Fiolka, on the other hand, seems to be living the dream of any person interested in transforming science into solutions. A chemist from the Cologne area, he is head of product development of Curaden AG, where he also oversees the Swiss company’s range of toothpastes, all of which contain a certain enzymatic system. "We use three types of enzymes: amyloglucosidase, glucose oxidase and lactoperoxidase," starts Christoph. "Amyloglucosidase, otherwise known as glucoamylase or AMG, works by breaking down the starches in food to glucose. This is why foods rich in starch, like potatoes, may begin to have a slightly sweet taste when chewed—the AMG enzymes in saliva are already breaking the starch down into sugar at this point."

The artificial adding of glucose oxidase helps with digestion by catalysing the breakdown of glucose into antimicrobial hydrogen peroxide and gluconolactone. When amyloglucosidase and glucose oxidase are combined with lactoperoxidase, a natural, yet potent, method of antibacterial protection is created in the enamel pellicle, destroying the bacteria, inhibiting dental plaque acid production and reducing oxidative stress.

The lactoperoxidase enzyme belongs to an antimicrobial system that relies on the lactoperoxidase-mediated oxidation of thiocyanate into hypothiocyanite. Hypothiocyanite is known
for its active antibacterial effects on cariogenic bacteria and certain periodontal pathogens. In fact, hypotiocyanite is part of the endogenous defence system and is present in all mucous membranes of the human organism, as well as in saliva. Researchers at University of Greifswald, Germany have been working on the lactoperoxidase system to help patients with limited oral hygiene.

A balanced oral microbiome

Christoph raves over the university’s recent findings. “We both agree that we need to maintain an effective endogenous antimicrobial defence system for the prevention of caries and periodontal diseases. Such a system could be the lactoperoxidase-thiocyanate-hydrogen peroxide-system (LPO-system). In their quantitative suspension test, raising the thiocyanate and hydrogen peroxide concentration over the physiological level alone showed a relatively low antimicrobial effect. However, the antimicrobial efficacy of the LPO-system was very high after adding lactoperoxidase. In other words, the LPO-system reduced cariogenic bacteria within 15 minutes, effectively,” he explains. Thus, the LPO-system can help regulate the necessary balance in the oral microbiome.

Michel and Christoph agree that if these enzymes are present in toothpaste as well, their protective effect can be intensified, reducing the build-up of plaque and tartar and encouraging remineralisation. “A higher concentration of peroxides helps with the natural antibacterial effect of saliva. We know that epithelial cells provide a physical barrier against pathogenic microbes and they produce peroxide at low doses.

Dr Michel Angelo Sciotti and Dr Christoph Fiolka wonder what else enzymes can do in terms of their antibacterial activity. How can they contribute to improving colds, influenza and a myriad of other illnesses and conditions? How effective are they for the prevention of xerostomia, halitosis and oral cancer—all of which have been suggested by previous studies. “We are only at the beginning,” both say simultaneously.
Why interdental brushes are essential for good oral health

Prof. Denis Bourgeois is not only the Dean of the University of Lyon’s dental faculty in France—he is a pioneer in research on oral prophylaxis, interdental biofilm management and interdental brushing techniques. Bourgeois was the first dental researcher to identify the 19 major pathogens in the interdental biofilm known to be involved in periodontitis in young healthy adults. Furthermore, he has pushed for proper tools like interdental brushes to be used to prevent interdental biofilm accumulation and the development of periodontal disease. “An interdental brush can remove around 16 billion bacteria from each interdental space,” said Bourgeois during his presentation at the 2016 FDI Annual World Dental Congress in Poznań in Poland.

Despite advances in oral health care, many patients and dental professionals remain uncertain about oral physiopathology and the concept of biofilm disruption. Although patients may have bought more oral care products and become more interested in their dental hygiene, many still do not know how to use them correctly. Various toothbrushing techniques have been developed for maximum cleaning efficacy, but brushing alone is not sufficient to reach and maintain a high level of oral hygiene in the long term. “Most of the current dental cleaning techniques are outdated: the main brushing techniques that most consumers use today were established around 1946,” said Bourgeois.

While dentistry has advanced, these outmoded techniques have continued to be used among the general population. “A classical manual toothbrush with 800–1,200 bristles is not sufficient to disturb the biofilm,” asserted Bourgeois. “To do so, a toothbrush should be soft, efficient and atraumatic. When used in combination with the Bass technique, a soft-bristled toothbrush with 5,000–6,000 filaments is the only option for effectively preventing biofilm development.”

But what about the biofilm between the teeth? The anatomy of the interdental space does not allow for an efficient salivary self-cleaning mechanism and makes cleaning this area difficult. Though useful otherwise, conventional toothbrushing is not effective in removing interproximal plaque. Recommendations for oral hygiene practices from dental practitioners have now begun
to incorporate interdental brushes for these spaces. However, many individuals object to using these tools, as uncertainty about interdental spaces and the importance of cleaning them daily persists.

**Sixteen billion bacteria in one interdental site**

So, why does interdental cleaning actually matter? As the average adult has 30 interdental spaces, should more than just toothbrushing be done in order to prevent gingivitis, periodontitis and related diseases? Are there any scientific studies that describe the composition of the interdental microbiota among generally healthy patients and explain the importance of disrupting this biofilm?

Bourgeois wanted answers to these questions. To understand the mechanism of periodontal pathologies, he took a unique approach, using real-time polymerase chain reaction to quantify and qualify the interdental biofilm in healthy adults. By using interdental brushes to collect the interdental biofilm effectively, he contributed significantly to establishing the role of interdental biofilm management in preventative oral health.

In his study, approximately 16 billion bacteria were collected on average from each interdental site, an astounding figure. To identify these interdental bacteria, Bourgeois and his colleagues used Socransky complexes, which reflect microbial succession events in developing dental biofilms. While the blue, yellow, green and purple complexes are correlated with periodontal health, orange and red complexes reflect periodontal disease.

Of the 19 major periodontal pathogens quantified in the study, bacteria of red and yellow complexes constituted the majority of interdental bacteria. In particular, red complexes such as *Porphyromonas gingivalis*, *Tannerella forsythia* and *Treponema denticola* were recognised as the most important pathogens in adult periodontal disease, representing around 8 per cent of the 19 pathogens analysed. *P. gingivalis* was detected in 19 per cent of healthy subjects and represented 0.02 per cent of the interdental biofilm. As much previous dental research has confirmed, *P. gingivalis* alone can induce alveolar bone loss, and in combination with *T. denticola* and *T. forsythia*, is likely to lead to periodontal disease. Bourgeois’s findings mean that even the interdental biofilm of healthy patients is composed...
Bleeding as a clinical reference
Dental professionals agree that, despite clinical evidence in its favour, effective daily cleaning of interdental spaces remains a challenge among their patients. So what happens if patients do not use interdental cleaning tools? Despite otherwise good oral hygiene habits, many patients experience interdental bleeding. According to the latest research, 41 per cent of young adults without periodontal disease or clinical gingivitis have experienced interdental bleeding at least once. This information is crucial for daily oral hygiene, particularly regarding interdental cleaning. “There is a need to use interdental cleaning tools,” reasoned Bourgeois. “If you do not use them, you could essentially stop using a toothbrush, as bleeding will occur anyway in the future.”

The access widths of interdental spaces are relevant to the use of interdental cleaning tools as part of individual oral prophylaxis. As the access widths of interdental spaces were mostly unknown in young adults, Bourgeois and his colleagues assessed their distribution in “Access to interdental brushing in periodontal healthy young adults: A cross-sectional study”. Importantly, 40 per cent of the sites studied showed bleeding upon passage of an interdental brush. However, this was not significantly affected by the width of the interdental space.

Interdental brushes prove to be superior
The CPS prime series of interdental brushes by oral health care brand CURAPROX were selected for the study. The researchers concluded that the latest generation of brushes was able to access 94 per cent of all interdental spaces, with participants able to easily use the brushes following instructions. As a result, the study concluded that most interdental sites could be cleaned using interdental brushes after their accessibility is established in the dental practice.

Conventionally, interdental brushes were only recommended for patients with large interdental spaces, with dental floss used for narrow spaces. As the technology has progressed, interdental brushes can now be used in very small interdental spaces effectively. “Dental floss is no longer a priority, as its use is not supported by scientific evidence. For interdental brushes, we have scientific evidence. Clearly, interdental brushes have now become the best tool for cleaning interdental spaces,” said Bourgeois.

“The majority of studies have reported a positive significant difference in the plaque index when using an interdental brush compared with floss,” continued Bourgeois. “Indeed, interdental brushes were found to be more effective in removing plaque compared with brushing alone or the combined use of toothbrushing and dental floss.”
this in mind, establishing the accessibility and widths of interdental spaces should clearly be a routine part of patient examinations.

The colorimetric probe: Key to success
An important message from the aforementioned study is that the size of the interdental brush matters. As interdental brushes have an access diameter defined by the thickness of their wire core, an efficient cleaning diameter needs to be taken into consideration. Another study by Bourgeois et al. emphasised the need for choosing the right diameter so that the interdental brush can fit comfortably into the interdental space. Apart from an individual’s anatomy, interproximal spaces differ and change due to age, periodontal health or dental treatment. While under-sizing of the interdental brush will affect its efficiency, oversizing might reduce acceptability and efficiency while increasing gingival trauma.

Essentially, Bourgeois and his colleagues suggested that the use of a colorimetric probe and interdental brushes is more beneficial than interdental brushes alone. By using the IAP CURAPROX calibrating colorimetric probe, patients were able to measure the interdental space and choose a suitably sized interdental brush, whereas over half of them had previously chosen brushes with a suboptimal diameter. According to the study, the colorimetric interdental probe is the only predictable way in which the interdental space can be measured by the dental professional and the patient.

A properly sized interdental brush will help individuals achieve optimal biofilm disruption through safe and thorough interdental cleaning. Concerns regarding the difficulty of penetrating the interdental space and identifying and recommending interdental brushes of the correct size to patients are now resolved, and interdental cleaning is now easier than ever. The comparison of efficiency with dental floss is, generally speaking, no longer valid.

Individual instruction important for good interdental health
Despite the clinical evidence, availability and selection of tools, and development of appropriate techniques, the main problem with interdental cleaning is patient ability and motivation. Damage to the interdental papilla often result from a lack of training. Furthermore, bleeding may deter patients from using interdental brushes even though it will cease after several uses of an appropriately sized brush.

“From a clinical point of view, the oral prophylactic goal of achieving thorough cleaning with minimal damage is important,” said Bourgeois. “Only the right technique, repetition and training can reduce the risk of bleeding, harm to soft or hard tissue, and presence of oral bacteria while attaining a high level of cleanliness.”
How chairside molecular saliva diagnostics boosts oral and systemic health

BY DIRK-ROLF GIESELMANN, INSTITUTE FOR MOLECULAR DIAGNOSTICS (IMOD)

D igital implantology, digital orthodontics and now, digital prophylaxis? Successful prevention can now be accomplished sooner with new digital technology for chairside diagnosis. A breakthrough tool for digital prophylaxis, the ORALyzer, a novel molecular diagnostics reader, is capable of precisely quantifying the concentration of certain enzymes in the saliva, gingival crevicular fluid and peri-implant sulcus fluid, which can indicate subgingival tissue destruction and therefore identify the need for additional preventive treatments.

The enzyme can be found everywhere in the body and is easily detectable in the crevicular fluid. An international research team has demonstrated the effectiveness and accuracy of oral saliva analysis with more than 200 studies using aMMP-8 as the gold standard for oral prevention analysis. These studies have confirmed that the level of the acute collagenolytic destruction process can indicate the level of gingival, periodontal or peri-implant soft and hard tissue destruction.

Thanks to the ORALyzer, aMMP-8 can be directly quantified chairside in ng/ml—a revolution for chairside diagnostics. In addition, the oral microbiome can be professionally analysed in seconds. “This development is a huge step forward for in-office diagnostics. The aMMP-8 ORALyzer increases diagnostic competence significantly. For dental hygiene, it is as important as an x-ray is for surgery,” stated Prof. Timo Sorsa, one of the leading European oral microbiology experts at the Karolinska Institute in Stockholm.

Studies show that an increasing number of patients are actually in a state of “pre-perio” or active periodontal degeneration. In fact, more than 40 per cent of all German patients already suffer from so-called “active periodontal degenerative processes”—one of the early stages of periodontal disease. As a rule, the initial destruction of the periodontium is overlooked, as this is not yet measurable. The average dental practice therefore loses more than a quarter of a million euros per year by not supplying the necessary preventive measures.

A step forward for digital prophylaxis

With the ORALyzer, the dental team can now identify this group of patients, who are in the early stages of periodontal disease, and treat them more effectively. The ORALyzer analyses, within minutes, the invisible collagen destruction process that is taking place in the patient’s mouth. One of the key features of the ORALyzer is its ability to take quantitative measurement of the concentration of aMMP-8 (ng/ml). The ORALyzer is easy to use and is delegable to the hygienist or dental assistant, while it allows for a non-invasive and pain-free experience for the patients. Furthermore, the time required for administering the test is even less than three minutes. Afterwards, dental professionals can then print out the results chairside, allowing the patient to immediately observe their personalised oral health report.

80 per cent of patients invest in additional prevention treatment

The prophylaxis team can now predict the subclinical tissue destruction of periodontal or peri-implant collagen and stop it by means of targeted, individual preventive measures. The result? Increased patient awareness and motivation for prevention, in-
creased patient compliance and increased dental hygiene revenue. The ORALyzer allows the dentist to halt the tissue destruction process with secondary prevention through advanced prophylaxis. Dentists confirm that 80 per cent of the patients who are tested positively, actively request more dental hygiene services and agree to two to six professional teeth cleanings per year. Dentists will not only gain more revenue with periodontally-healthy patients, but more time can be devoted to those patients who are in need of further treatment, restorative work and other elective aesthetic procedures.

Peri-implantitis protection
Peri-implantitis continues to pose a risk for implant failure. Since approximately 50 per cent of all dental implants placed worldwide are threatened with peri-implant inflammation and about one third of patients develop peri-implantitis within ten years, the solution to the greatest challenge in implantology can only lie in prevention and early detection. With the ORALyzer, a clinician now has the ability to assess the subgingival inflammation status around any individual implant. This knowledge is the key to preventing the tissue around the implant from developing peri-implant mucositis and, ultimately, peri-implantitis. Every patient with implants needs to come in at least once every six months, especially if they show early signs of inflammatory tissue destruction. If elevated levels of aMMP-8 are detected in the peri-implant sulcus fluid, oral hygiene treatment can be started at the pivot-point of destruction—right in time to prevent the progress and the manifestation of the disease. For an implant clinic, the ORALyzer opens the door to a significant increase in post-implant services.

The radar system for professional perio monitoring
More importantly, 10–20 per cent of successfully treated patients return with even more advanced periodontitis than what was observed before the initial treatment. With the ORALyzer, clinicians can test patients six to eight weeks after their perio treatment to find out if the patient is suffering from periodontal deterioration. Using the ORALyzer aMMP-8 testing system for perio treatment monitoring, a clinician can identify patients who need further treatment and can therefore effectively treat their patients and increase their profits at the same time.

aMMP-8: The connection between oral and systemic health
Interdisciplinary cooperation is a “high class of dentistry”. Every day, more and more research is published on the bidirectional relationship between periodontal disease and systemic health issues. Due to the high sensitivity of oral salivary diagnostics with aMMP-8, an increasing number of medical professionals are using the procedure for the detection of health risks in patients. Periodontitis, which is by far the largest of all the known silent inflammation processes, can only be addressed through an interdisciplinary approach. By identifying elevated levels of aMMP-8 in their patients with the ORALyzer, medical specialists can refer their patients to a PerioPrevention Center®, where they can receive hygiene care. PerioPrevention Centers® welcome new patients and get to do what they do best, while the patients receive the most comprehensive care possible for both their oral and overall health.

Become a Perio Prevention Center®
500 specialised dental practices throughout Europe will get access to the new ORALYZer digital diagnostics technology in 2017/18 and will be able to associate themselves with the growing network of physicians and dentists who use the technology.

Please register at: www.perioprevention.de for more information or to apply for access to the technology.
Digital diagnostics in practice: Leading Perio Prevention Centers® in Europe

Prevention visited KU64 in Berlin, one of the first dental practices to integrate the ORALyzer, a new device capable of precisely quantifying the concentration of aMMP-8 in the saliva, into its prophylaxis concept. With 120 employees, it will soon become Europe’s largest dental clinic. KU64 offers the entire spectrum of dental care. KU64 is also the German flagship of the Perio Prevention Network. We talked to practice owner Dr Stephan Ziegler and Michaela Kunkel, head of the dental hygiene and prophylaxis department.

How important is prophylaxis in your clinic?

Ziegler: There is no alternative to prophylaxis. Our approach goes far beyond the mouth, as we recognise that oral disorders and those of the body as a whole are closely connected. All dentists must integrate prophylaxis into their practice. Without it, all our work would be for nothing. Every patient and dentist must understand that professional tooth cleaning is the foundation of any treatment. Prophylaxis now takes up the major focus of our practice. We have 17 employees working only in prophylaxis, among them four specialists in paediatric dentistry.

Many of your peers say that focusing on prophylaxis is biting the hand that feeds one. What do you say to that?

Ziegler: I would say that it is not fun destroying and repairing your own work over and over again, with fewer teeth or larger cavities each time. Repairing is not the aim: we want to treat healthy patients. And if we do have to repair something, KU64 stands for sustainable restoration. That is a win-win for both patient and dentist. However, if neither the patient nor the dentist changes anything, they both lose. A lost tooth is the worst result for a dentist as well. The goal must be causal therapy, that is prophylaxis.

Moreover, we always take an interdisciplinary approach to prophylaxis. Together with diabetes specialists, gynaecologists and cardiologists, we work on the early detection and effective treatment of periodontitis. That is why we decided to become part of the Perio Prevention Network. I am impressed by the vast network of medical professionals who have integrated aMMP-8 testing into their daily practice routine. We work together on changing the relationship between dentistry and medicine.

Recent studies have affirmed the need for advanced prevention in this regard. Have you seen an increase in soft-tissue prophylaxis in your practice?

Ziegler: We definitely spend more time on periodontal prophylaxis and are able to diagnose periodontal disease earlier than a few years ago. We have even gone a step further and now use the PerioSafe test, which allows us to identify the probability of periodontal disease in periodontally healthy patients. I would say this is something revolutionary, enhancing periodontal treatment completely. In the end, complete healing of periodontits in the sense of restitutio ad integrum cannot be achieved. We should aim to detect and prevent the disease instead.

You are a full-service practice with all of the instruments available for the
best possible prophylactic treatment. While did you decide to integrate the ORALyzer in your practice?

**Kunkel:** The PerioSafe test does not simply analyse periodontitis, but within minutes tells us the risk of the patient developing periodontitis. On the one hand, we consider this as a great tool for motivating and communicating with the patient. On the other hand, blood and saliva testing methods are quite common in other medical disciplines and every doctor can and should use PerioSafe. We see PerioSafe and ImplantSafe in the case of probable peri-implantitis as another step towards a fully integrated approach to medicine. The new digital reader ORALyzer gives us exact information about the aMMP-8 concentration, lets us print the result immediately and send it to the referring doctor in certain cases. Digital prophylaxis used to be a thing of the future, but I definitely see the aMMP-8 reader as an effective tool for collecting data, motivating patients and helping them achieve sustainable health.
Implement digital saliva diagnostics in your office now and analyze additional prevention needs within seconds!

Become a European PerioPrevention® Center ...now!

→ Triple your dental hygiene revenues
→ Use aMMP-8 diagnostics to build the bridge to interdisciplinary collaboration with physicians
→ Protect implants: discover hidden peri-implant disease with ImplantSafe®
→ Print a patient take-home report in seconds
→ Create an individual PerioSafe® treatment plan
→ Get instant immunological results

"The ORALyzer is the biggest breakthrough for periimplantitis protection and periodontal disease prevention,"
-Dan Lazzara, Founder 3i, Periodontist, WestPalmBeach, Florida

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DIGITAL PROPHYLAXIS

Register here: www.perioprevention.de

FROM MEDICINE FOR DENTISTRY

Healthy Mouth. Healthy Body.
In October last year, I had the honour of speaking in front of a medical and dental audience to explain my approach to prevention. In my lecture, I talked about our new "peri-profiling" approach using saliva and aMMP-8 diagnostic methods.

Certainly, everyone can get periodontitis, but my younger patients visit my dental practice less frequently, which means they are at a higher risk of developing periodontal diseases. Interestingly, we have always had difficulty achieving the necessary compliance from patients in this younger age group to obtain good dental hygiene in order to prevent periodontitis.

Predictive analysis vs. measuring disease

Also, we have found that well-known diagnostic methods, such as PSI or BOP, do not necessarily “look ahead”; nor are they predictive—which is what we need to ensure so that we are not always too late with our treatment. Now, finally, we have found a way to do this.

The well-documented collagen destruction indicator, aMMP-8 can be measured in the saliva (with PerioSafe) and is, for us, the new gold standard for predictive analysis in preventive dentistry. It helps us identify the patients with the greatest need for preventive treatment and at the right point in time, which is when the sub-clinical collagen destruction of periodontal tissue has started, but it is not yet visible.

Fortunately, the Dutch public health insurance system NZA has recognized the ‘predictive value’ and solid scientific data of aMMP-8 diagnostic methods and is going to fully reimburse the cost of the diagnostic treatment for every patient by 2018. This decision is a breakthrough for targeted healthcare in dentistry.

aMMP-8: A proven concept

There are over 200 aMMP-8 studies in dentistry and more than 900 studies in medicine. We ran our own study with over 200 periodontally-healthy patients, between the ages of 20 and 40 years old. Each patient received a free PerioSafe test. Interestingly, 40 per cent of these participants tested positive for the presence of aMMP-8. All of these patients wanted to stay at our practice for an oral hygiene treatment. Of the other 60 per cent who had a negative result, around ten per cent still asked for an oral hygiene treatment. This means that only one test is necessary to triple the number of dental hygiene procedures for 40 per cent of the patients in your practice.

The peri-implantitis protection concept

I have done over 30,000 implants in my life and about ten per cent of those have failed. The overwhelming majority of failures were due to patients developing peri-implantitis. For patients who would like to have implants, we first have to determine what has gone wrong with their natural dentition. Which is why, prior to implant placement, we use the PerioSafe test to evaluate whether there is silent inflammation that might need attention. After the implant surgery, we use the ImplantSafe test for regular monitoring to prevent peri-implantitis. The patient has to test negative for aMMP-8 to guarantee tissue stability and since our strategy is sustainability, aMMP-8 is the most effective diagnostic tool available to date. Owing to the tool, we know that 80 per cent of our implant patients need more prevention to keep the implants safe.

ORALyzer: The digital future of prevention

Looking forward, we now have to step into the world of digital saliva diagnostics that is performed as a chair-side, aMMP-8 quantification with the ORALyzer, which is one of the biggest inventions in dentistry, because it allows us to precisely look at the patient’s immune response system and print out an analysis report within a couple of seconds. This tool is exactly what we need to fight peri-implantitis and periodontitis. The ORALyzer can even measure the success of our treatment by seeing a reduction of aMMP-8 concentration in the saliva, measured in ng/ml.

I want every dentist to understand that 40–50 per cent of all patients will need two to four dental hygiene procedures per year to prevent deterioration. aMMP-8 saliva diagnostics open the door to much needed “patient targeting” and “compliance” and there is nothing else available that can compare to it at this point in time. It is a prevention-need-indicator and a patient motivator.
The importance of saliva testing for prevention

Visiting different countries gives us a global perspective of the issues concerning oral health and health care. We continue to establish partnerships and a deeper understanding of prevention worldwide. That is why the mission of the Global Oral Health program at Arizona School of Dentistry and Oral Health in the US is simple: creating oral health solutions through leadership development, innovation, education and technologies while promoting care to underserved populations. Prevention should matter to everyone; this mission is more important than ever.

All around the world, we are focusing on the costs of and access to dental care. From my experience over the last 20 years, the value of oral health and oral health literacy have been common problems in many areas. In the US alone, about 100 million people do not visit the dentist. Among the results of this are that the costs of dental care are a great deal higher when the person ends up in hospital. In many areas, despite access to care and proper insurance, people still do not go to the dentist. As dentists, we have done a great job elevating our expertise as medical professionals. Despite these efforts, the average person holds the perceptions that dentistry is expensive and painful.

Historically, the idea of preserving one’s teeth was different. On the one-dollar bill, George Washington is not smiling because he suffered from dental problems from an early age due to poor oral hygiene. Obviously, little was known about means of maintaining dentition at that time because science and technology were not yet sufficiently advanced. Hundreds of years ago, however, dental status affected the price of a slave: the more teeth, the healthier the slave. In today’s dentistry, prevention has to become a major part of the conversation. Prevention increases education and patients’ value of their oral health. It is our job to engage the population.

How to help patients brush and floss better
These are our goals: we have to figure out how to engage our patients cleverly, how to take the time to educate and train them so they can be healthy and successful for life. Our most important challenge in achieving these goals remains the improvement of oral health care at home. While we have focused a great deal on treatment, we should spend more time on home care measures such as toothbrushing and interdental cleaning. Prevention entails substantial health management and we need to find good solutions to engage our patients.

This starts with a toothbrush. The modern message from dental professionals has been to use a soft toothbrush. In retail stores, one can still choose between hard, medium and soft toothbrushes. Even some of my colleagues continue to say that soft toothbrushes do not remove plaque completely. Using a plaque indicator will show the effective results of using a soft toothbrush and massaging one’s gingivae.

Of course, brushing alone will not do the job; technique and interdental cleaning matter too. Regarding interdental cleaners, it is important to choose the right size. Obviously, whatever interdental cleaning tool dentists use, it sends...
a message to patients that interdental cleaning matters. The average patient sitting in my chair does not know how to floss properly; this needs to change.

**A smartphone to measure, monitor and educate for prevention**

That is why education and motivation are our primary goals. In the US and many European countries with a good percentage of dental hygienists, we have a tremendous opportunity to educate patients together. During treatment, a great deal of conversation takes place between the hygienist and the patient. If 10 or 15 minutes of this conversation is dedicated to education in a fun way, we are able to become very powerful promoters of oral health.

As smartphone use continues to increase, oral health promotion via texting has the potential to be a great tool to improve oral health in the global community. Text messaging should become the most common and effective way to educate patients about their oral and overall health. We have developed a free app to promote overall health for patients, dental students and dentists. We named it Text2Floss to focus on the importance of flossing, brushing and rinsing. We also started the oral health PH2OH initiative to deliver new technology for pH saliva testing. Why saliva?

Salivary pH testing can play a significant role in helping to improve oral health by assessing pH as a risk factor for dental caries and dental erosion. It can also be used as an educational tool to engage patients in monitoring and maintaining their self-care. Saliva testing, through tools such as the PH2OH app, can be introduced to patients as a follow-up to discussions about oral hygiene and preventative recommendations and as a way to help remind them and motivate them about maintaining their oral care at home.

In the US, saliva-testing and examination tools are used by the dental team to educate patients, assist in preventative treatment planning and properly select dental materials to initiate changes in the patient’s oral health and hygiene. Dental professionals can measure salivary pH with a pH level test strip or litmus paper. Placed in a saliva sample, the paper turns a different colour depending upon the pH of the saliva. This colour changes from red (indicating a strong acidic state; pH < 3) to dark blue or purple (indicating a strong alkaline state; pH > 11).

**Inform the patient right where he or she shops**

Despite the technological advancements, there is still a major gap between dental care received at the practice and that practised at home. In the US, the average person purchases oral health care products from retail shops and pharmacies; however, there is no interaction with a health care professional. One may ask a pharmacist at Walmart, but he or she is more likely to merely read the instruction leaflet, not provide advice.

That is why I founded Smile Health. The Smile Health centre was created as an inviting environment with a boutique setting for consumers who are not patients yet. Those consumers can ask all sorts of questions at the centre. We also have a clinic behind the glass. We are open six days a week in a more affluent area with heavy traffic. I think that the location is key to success: I wanted the centre to be outside of a mall, but still close to it. The centre only provides state-of-the-art products, such as from Swiss brand CURAPROX.

The notion of the Smile Health centre reflects the simple idea of a healthy mouth. Good oral health is not just a lack of pain; it is functionality. I tell my teenage patients that they have to keep their teeth healthy for at least another 60–70 years. Think about the house you live in, the car you drive and all those things that you use on a daily basis. The idea of prevention is to engage individuals about total care. We have to be the leaders in moving consumers toward a healthy lifestyle.
Have you ever sent letters to your patients telling them about oral health facts, new possibilities in dental medicine or how to improve overall health? A personalised letter containing interesting information about oral hygiene, written and signed by you or someone on your team is not something a patient would generally expect. However, this can change with minimum effort on your part.

Think about how your patients’ attitudes will change once they know they have an oral healthcare provider who personally cares about them. One from whom they receive support all year round—not only in the form of a letter, but also with a lovely box delivered directly to their home containing all the necessary oral health care tools, information on oral health and a reminder for their next appointment. Your patients would eagerly await the arrival of this box since they read your personalised newsletters. What if patients could even engage in a continuous dialogue with your practice through a website and an app?

Most dentists care about, and like to read about, prevention. However, what matters in the end, is to have a tested concept or approach where prophylaxis at least pays your rent, equipment and salaries. New business models and concepts for prevention and oral care in dentistry require five things to succeed:

1. High-quality oral care products that are demonstrated in the practice to explain the reasons and necessity for daily oral care.
2. A high level of communication to increase involvement with existing and potential patients, ideally through digital media such as a website, app or social media.
3. An advanced marketing concept including easy-to-handle software, which supports recall management, patient communication and process optimisation.
4. Continuous education and motivation of one’s own practice team, who can then pass this new knowledge and motivation on to their patients.
5. A look and feel of the practice with consistent marketing material and practice interior.

Prevention One (P1) fulfils this purpose. It represents a holistic business model for the dental practice to activate, reactivate and motivate existing and new patients. Every dental practice has hundreds of inactive patients in their database, with no means to reactivate them. P1 unlocks this hidden potential and uses a full range of marketing services aimed at bringing the patient back to the practice. At the core of this practice concept are products and services for comprehensive home care for healthy patients.

A new business model
P1 is suitable for any dental practice and all its employees (the dentist, dental hygienist or assistant). It provides a preventive-oriented concept for dentists determined to add new services, pursue entrepreneurial success and increase their overall communication with patients. The entire team receives advanced training to provide better oral healthcare instructions to patients. By doing this, the entire team essentially helps build a base of more loyal patients.

P1 is designed to integrate easily into the practice, as it interacts with all existing dental and prophylaxis offers and therapies in the practice. No additional dental chairs or rooms are needed. The patient and the dental professional sit comfortably together at a specially designed table where both work on improving or maintaining the patient’s overall health. In order to get those patients to the table, P1 combines treatment programmes, oral care products, software, marketing and communication material and an educational programme for the entire practice team. Essentially, it covers all the important aspects of an oral health strategy for each day of the
Dentist Thomas Gasser and prophylaxis assistant Birgit Toffol, standing near Rathaus Street in Liestal close to their dental practice. They will soon be introducing P1 to their patients: “Our practice stands out from the competition and is prepared for future challenges, as is every clinic within our practice group,” said Gasser.
year, in other words, it provides a 360° degree approach to oral health.

A tailored dental fitness programme

Curaden developed P1 in partnership with other experts in oral health prevention, including the University of Zurich. “Many patients do not know what they should pay attention to and how important oral health is for their overall well-being. They do not know what tools and instruments they should use, what quality they should be looking for and how they should apply them,” explains Clifford zur Nieden, a member of the Curaden board of directors. “We will guide and coach them and provide continuous education and support. The patient—now called the client—does the actual training himself or herself, but they receive the proper introduction, guidance, information and motivation to stay on track. That is why we like to call P1 a dental fitness programme. A fitness programme tailored to the needs of each individual by the dental practice.”

The trainer, or P1 coach, is a dental hygienist or dental assistant in the dental practice. The P1 coach designs a specific training programme based on the individual patient’s requirements using a special P1 scoring tool, which forms the basis of an individual oral health strategy and becomes a means of measuring oral health. Based on the patient’s P1 score, the coach can develop an individual strategy for each patient to achieve the best possible result. Once this baseline is established, all improvements are made manageable and visible by achieving a higher score. Similar to a golf handicap, the patient is given one number, which is easy to remember and easy to work with.

A score to revolutionise oral health

The place? London. There are 8.7 million inhabitants and we’re close to the busy Oxford Street. Theodora Little prepares herself for her next patient at Holford Partners Curaden dental clinic. One can instantly recognise her red hair, radiant smile and motivational attitude. Every sentence she speaks conveys the feeling that dental schools should change the name of dental hygienists to oral healthcare specialists. Theodora is a dental hygienist, who graduated from King’s College in London in 2013 with a diploma in dental hygiene and therapy.

During her time at university, oral hygiene training was very theory-based, with a few representatives visiting to demonstrate and provide different products. Shamefully, she did not receive any interactive practical training on brushing from an instructor. As soon as she started practicing, she wanted to empower patients to maintain or improve their oral health. Unfortunately, owing to time constraints that the United Kingdom has implemented, she was not able to carry out an effective and thorough oral hygiene strategies by means of dedicating time to individual patients’ education and coaching.

In the UK, most dental hygienists have 20 to 30 minute appointments. Theodora has worked to this pressured sched-
ule in the past, so she understands how difficult it can be to carry out thorough oral hygiene and answer any questions the patient may have. Like many of her peers, she was left feeling empty at the end of each day and questioned whether she was really helping and making a difference to her patients’ lives. Since 2015, she has been fortunate to work in a clinic with hourly appointments. Last year, she went a step further.

Depending on the patient, the length of time between appointments varies. Some patients require more frequent appointments, such as every three to four months, whereas others may see her every six months. Now, as soon as Theodora welcomes a new patient, she prefers to start with P1—the development of a personalised oral health strategy. The result is that after the first session, patients usually request a recall after one, four or six weeks. How does that happen?

Professional cleaning, coaching and home care

In combination with individual coaching and dental care, Theodora has started using the scoring system. The score guides her patient through a multiple-choice questionnaire, beginning with oral hygiene aids and questions about how often they are used. It continues with the frequency of visits to a dentist and/or oral hygienist. The second part includes a health and lifestyle questionnaire and the third part includes the oral examination, which quantifies their plaque and bleeding index. At the end of these sections, the patient receives a score as a percentage. The patient and the coach look at the data together and discuss where and how they can improve the patient’s score.

At the end of the appointment, the patient receives a general score—the P1 score, which can then be compared to past and future scores to show the overall improvement in a patient’s health. The score helps her measure the patient’s individual oral health and gives her a modern instrument to communicate failures and suggest improvements easily. Theodora is convinced that the score works. “This method motivates my patients to carry out effective oral hygiene at home, because they want an improvement in their score at our next appointment,” she explains. “Even if a score only shows a small improvement, the patient feels happy and empowered by his or her own efforts. It really gets them involved. And I will smile, too, and be proud of them.” The positive information from the P1 score encourages the patient and the dental hygienist to progress further and put forth a greater effort on improving the patient’s general health. It helps that every patient wants to see Theodora smile.

The next step in prophylaxis

Liestal is a small, charming Swiss city close to Basel, with 14,000 inhabitants. In the centre of the city is Rathaus Street where three dental practices compete for patients from Monday morning until Friday afternoon. One of them is the newly designed practice “Die Zahnärzte” (German for “The Dentists”), part of a practice group with ten clinics in the Basel area. Open
365 days a year, with emergency services and multilingual medical and dental specialists for all disciplines, Die Zahnärzte invested a lot of time and effort into attracting new patients while keeping their existing ones. As of September 1st, 2017, Liestal will be home to the first P1 practice in Switzerland.

Thomas Gasser welcomes us at the practice with his assistant, Birgit Toffol. He has just come from one of the other practices in the centre of Basel. Thomas took the lead at the Liestal practice this year and spent a lot of time on the practice’s interior and equipment. He speaks with confidence and pride about the latest addition to the Swiss dental practice group. The practice currently offers three dental units, a separate playroom and treatment room for children and the latest equipment. In fact, the practice can also be extended to six rooms, one of which will be dedicated to the treatment of physically handicapped and geriatric patients from September onwards. “Our practice stands out from the competition and is prepared for future challenges, as does every clinic within our group,” says Gasser.

One can sense Gasser’s passion for dentistry right away. He is determined to provide the best treatment for the lifelong preservation of teeth. A graduate in 2013 at the University of Basel, this tall, young man has been working on his PhD in endodontics. “Endodontics fascinates me as does dentistry in general. Our practice soon expects the delivery of the latest endo microscope and endo motor,” he says, smiling. “However, my work can only last if my patients improve their oral hygiene before and after our restorative treatments through continuous recall appointments. Prophylaxis is a prerequisite, should always be adapted to the individual situation and has to be presented to the patient together with a mirror. The value of prophylaxis for long-lasting restorations is undeniable.” For sustainable dentistry, dentists, dental hygienists and patients must work together as partners at Die Zahnärzte.

Gasser first came into contact with individually trained oral prophylaxis when dental hygienist Edith Maurer Bussink visited his class to present new interdental studies. “It was captivating to hear her explain oral health care instructions to the patient. In school, we were required to measure the plaque index and BOP index. Only then could we start the treatment,” he says. In 2012, he volunteered to work in Cambodia where a team of dentists also provided oral hygiene instructions to approximately 900 children in eight orphanages. Around 400 kilograms of dental supplies, among them CURAPROX products, were donated to dental students at a Cambodian dental school. “It was a great time that taught me a lot, both as a dentist and an advocate of prophylaxis worldwide.”

An increase in quality

When he first learned about P1, it reminded him of his time at university. “We use the plaque index, BOP, basically all of the parameters where we can measure the patients and help them improve their oral health. Communication with the patient has to be visual and we need to use digital health scores that are easily understandable for the patient instead of printed clinical records today.” This professional training in prophylaxis and first-hand contact with patients convinced him to see prophylaxis as a priority.

Die Zahnärzte have decided to test P1 as a way to remain up-to-date, use the latest scientific studies and cleaning methods, increase their service portfolio and simply stand out in Rathaus Street. Gasser adds that even a large group like Die Zahnärzte cannot afford advertising in print and digital media to attract new patients. At the same time, practices need to be visible online in order to gain a certain reputation. P1 takes over the patient promotion, leaving marketing in the hands of industry experts while giving Thomas and Theodora more time to focus on their patients. Essentially, the concept increases the quality of the practice’s work, by allowing more time to focus on patients and increasing the practice’s capacity.

Today, dentists need to adjust their practice concepts according to the patient and not the patient according to the concept. As a way to reactivate and get new patients, the dental practice needs to provide new concepts that suit the trend towards prevention. For these concepts, industry and academia have to work together. P1 gives the dental practice a tool for long-term patient satisfaction and recognition, measurable oral health and professionally educated employees. Just like software, it will be updated and upgraded regularly to address new market requirements. Practices will not only benefit from the latest insights and concepts in prophylaxis, but they will also profit from healthy and happy clients. London and Liestal are only the first examples. P1 will launch in Germany and other European countries later this year.
Adam had Eve
Batman had Robin
Bonnie had Clyde

Every hero has a helper.

Our toothbrush, clearly, what a hero! But what about the 30% of the tooth surface that even this toothbrush cannot reach - between the teeth? This is where a hero’s helper enters the scene in the shape of a Curaprox ultrafine interdental brush. It is easier, more enjoyable and even more effective than dental floss.

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SWISS PREMIUM ORAL CARE
Imagine that, in a world that knows the causes of paralysis, a major effort would still be expended in developing the perfect wheelchair instead of addressing the causes. In a world where patients strive for the healthiest smile, the dental profession still focuses on designing the perfect implant. How does one return to the basics of prophylaxis in dentistry? Success in prophylaxis can only be accomplished if practitioners teach and motivate themselves, their teams, their families and their patients about it. That is the vision of the iTOP programme, short for individually trained oral prophylaxis. This programme and concept have convinced thousands of dentists globally to rethink biofilm management, prophylaxis and oral health. How does iTOP work?

AUTHOR: DENTAL TRIBUNE INTERNATIONAL
Visitors to IDS 2017 at the Curaden booth: iTOP provides dental professionals with the skills to speak in simple, interesting and effective language about oral hygiene. This fun and engaging language helps with repeating the same messages every time.
practical prevention | individually trained oral prophylaxis

programme facilitates individual training with regular check-ups and corrections to the prophylactic techniques learnt. While iTOP started as a one-day training programme with 15 people in 2006, it now boasts 200 courses in 44 countries with 15,000 participants.

Yes, 15,000 general practitioners, periodontists, oral surgeons or dental hygienists who relearn for up to five days how to manage optimal oral health for their patients. The theoretical part includes an introduction to biofilm management, patient motivation, cleaning techniques and tools. Today, the courses range from introductory to advanced and teacher levels. The higher the level, the smaller the group will be. A yearly recall course ensures the maintenance of one’s individual skills and own oral health, just as at least twice-yearly recalls should occur in the dental practice. In all courses, a great deal of time is spent on the exchange of ideas and discussions surrounding the most effective, atraumatic and acceptable prophylaxis possible for patients. Ideas, theories and practical concepts from all over the world have been collected to advance the patient experience, another unique feature of the educational programme.

The iTOP philosophy envisions a world of motivated and educated patients and professionals, both of whom understand the need to use soft toothbrushes and interdental brushes daily. How can a dental professional get started then?

Change requires motivation

Essentially, iTOP starts with changing the dental professional, helping him or her see the patient’s perspective. Let us take interdental cleaning as an example. The dental office experiences two major problems with interdental cleaning every day: patient ability and motivation. An individual’s ability to clean interdentally can be taught easily. An interdental brush that is sized correctly for each interdental space is easy to handle and atraumatic, but effective and acceptable. The iTOP programme follows this principle: participants first learn the theory and then determine the accessibility and widths of their own interdental spaces. They identify the largest diameter that can pass between the teeth without causing discomfort or trauma. Once they have been equipped with a cleaning tool that is effective, atraumatic and acceptable, they can pass this knowledge on to their patients through a mandatory routine examination of each interdental site.

Establishing a patient’s ability is one part of a routine examination. Improving a patient’s motivation, however, is not as easy to achieve. Damage to the interdental papilla and abrasive trauma to the dental surface essentially result from a lack of motivation and training. Furthermore, bleeding may stop patients from using interdental brushes even though this bleeding will stop after several uses. At the same time, every dental professional knows that oral and periodontal diseases largely result from a lack of motivation to brush twice daily. All iTOP seminars devote a major part to individual instruction and motivation. By correcting and repeating the correct cleaning techniques as much as possible, everyone can achieve oral health for a lifetime.

However, the road to lifelong oral health requires change. Change requires motivation. And motivation requires repetition of education and training. The conclusion: lifelong oral health without education is impossible. So, who will be willing to lead this change?

Prevent, not repair what could have been prevented

Prague, Czech Republic, 20 °C on a late spring day: the second theoretical part of the iTOP for students seminar has just ended. Every six months, students and recent graduates of dental schools are invited to attend an exciting weekend in the Czech capital of Prague. They learn more about cleaning techniques, motivation and ways to implement the preventative mindset in their future practice. And, yes, they have a few beers because this is what the Czech Republic is also famous for. We sit at the table with the head instructor and father of iTOP, a true pioneer in prophylaxis. Born in 1946 in Prague, Dr. Jiri Sedelmayer speaks in a calm, yet vibrant, voice recalling the tales of old your grandfather told. Last year, he celebrated 30 years as a dentist, an occasion on which he could not resist a glass of wine and a few cigarettes. In a world of perfect smiles, every dentist continues to be human. In a world of constant change, human beings remain creatures of habit.

Sedelmayer has spent most of his professional career repairing teeth. When he started working at the emergency room at the University of Hamburg in the 1980s, he realised that something was wrong. Every night, Sedelmayer witnessed so much suffering, severe periodontal disease and carries among educated businessmen, some of them crying from pain. Those businessmen expected Sedelmayer to fix what could have been prevented in the first place. “Most of the time, the only reason for this pain was a lack of mechanical plaque control. Hundreds of people that I treated simply did not brush their teeth properly. It was not taught to them—and it was not taught to me when I was studying.” About 30 years ago, ten of his peers would have shown him ten different Bass techniques. Most of these colleagues also started to bleed as soon Sedelmayer applied a new instrument called an interdental brush. Within two weeks, the inflammation had stopped and so had the bleeding. They were thankful for his advice—only to discover the rising potential of titanium implant systems and computer applications for the treatment of more patients.

No doubt, dentists disagreed on the concept of prophylaxis back in the 1980s. Very few textbooks or guidelines existed, and opinions ranged from calculus removal to flossing and medium-hard brushing once a day. Sedelmayer understood that the concept of preventative dentistry could only be founded on proper tooth-brushing. As a consequence, he started to change not only the way dentistry was taught at the University of Hamburg, but also the hierarchy of dentistry itself. “Why
Touch2Teach is the unique practical part of the iTOP approach. To teach correct brushing to patients, the dental professional has to start with improving his or her own brushing.
don’t we have mandatory exams in oral hygiene? Why are dental professionals able to graduate when they are bleeding interdentally? And why don’t we have practical, proper, sophisticated training in oral hygiene?” In contrast to other medical disciplines, prevention in dentistry is easy to achieve, continued Sedelmayer. The oral cavity is easy to access and most major causes of oral disease have been identified. In fact, proper devices and techniques have been developed only to be applied by everyone individually. Today, individual training is easier than ever.

Change is just one generation away

Although today’s dental professionals usually have improved oral hygiene, Sedelmayer seems to be right in saying that iTOP should be mandatory in dental schools. While the dentist of today might be difficult to convince, the future of preventative dentistry lies in the hands of those students who have experienced the patient perspective themselves. Those students will be able to carry on the virtue of prevention in schools and practices. In the end, change requires not only repetition and motivation, but also people willing to integrate prophylaxis in the current curricula of dental schools. This is a long-term goal with generations necessary to achieve it, but it is a goal only achievable through individual training and a motivated dental workforce.

Marios Domesthenous might be part of that generation willing to change the hierarchy of dentistry. He is a first-year dental student from Cyprus, currently studying in Greece. With an outgoing personality, he loves to travel and experience new things. His vision as a future dentist is to inspire patients and teach them how to achieve lifelong oral health. He heard about iTOP from a friend who attended the Curaden Student Camp in Portugal. Within two days, the iTOP philosophy had convinced him completely. “In medical sciences, we should always seek to prevent diseases and not cure them. We are so focused on treating the damage that we stop thinking about how to prevent it. We should not leave the iTOP philosophy behind, but teach it to our future colleagues and lecturers. From first-year students to older dental professionals, the iTOP philosophy is intuitive to everyone.”

In the classroom, Domesthenous sits right next to Volodymyr Tovarnytskyi, another first-year student, from Ukraine. At first, he was more excited to come to Prague, spend two nights in the Czech capital and meet dental students from all over the world. However, his enthusiasm for oral hygiene grew tremendously after he felt the interdental brush moving easily through his narrow anterior teeth. Back home, his university lecturers had taught him that medium-hard toothbrushes and dental floss should be used. Now, he feels overwhelmed after having experienced soft toothbrushes and interdental brushes. “I will be a dentist in the future. I need to know what pressure to apply and how to clean teeth.”

Change needs to happen

Back to Cologne. Just like Sedelmayer, Claudia Berki is a true pioneer in prophylaxis. She has been working at the University Medical Center Hamburg-Eppendorf at the Department of Preventive and Restorative Dentistry since 1984. Sedelmayer and Berki met in Hamburg and became close friends. While enjoying a short break, she is quick to summarise her impressions after the first few hours at IDS: “We are at a trade fair, so we are basically only speaking to dental professionals. And alarmingly, we found that some visitors do not clean their interdental spaces. We saw bleeding gingivae. As soon as we showed them interdental brushes and explained the benefits, the response was incredible.” Like her fellow iTOP instructors, Berki has decades of experience. Still, she has learnt that change continues to be necessary. First, one’s own behaviour needs to be modified, then the practice behaviour needs to adapt, and finally patient behaviour needs to change. All three steps are equally important. Lifelong oral health without education is impossible.

According to Berki, from a human perspective, it is difficult to say that someone has made a mistake—especially in front of patients. Five years ago, there were other approaches to hygiene that were regarded as the best methods at the time, but science develops and knowledge too. Biofilm management alone has come a long way in the past few years.

Cologne or Prague, in the dental office or at a coffee table: the dentist can choose between two approaches to oral hygiene today. He or she can show the patient prophylactic techniques using the Touch2Teach method and demonstrate how he or she can maintain his or her oral health for a lifetime, removing a bit of calculus in the process and giving the teeth a polish and so forth; or he or she can spend an hour simply removing calculus, polishing, applying fluoride treatments and so on. In the latter option, oral hygiene instructions are given through a nicely designed brochure or video in the waiting room. Which way will produce more successful results? iTOP automatically enhances patient satisfaction. Patients are grateful that having their teeth cleaned individually is a painless experience. In a world full of creatures of habit, a motivated and educated dental professional can change everyone.

The road to lifelong oral health requires change. Change requires motivation. And motivation requires repetition of education and training. Lifelong oral health without education is impossible.
Everyone is different—and so should his or her prophylaxis be. Dental professionals should recommend special toothbrushes for implants or bridges, for example.
One of the most common frustrations for dental professionals is the lack of desire shown by some patients when it comes to changing their oral care routine. Though many clinicians prefer a prescriptive approach, various studies have shown that its efficacy can be somewhat mixed. Alternative strategies for engendering change in patients, such as motivational interviewing, have been shown to be able to more accurately address a patient’s unique attitudes and needs, allowing him or her to take a more active role in his or her own oral health management.

“It is time to stop simply telling patients what to do and to start asking them questions about their dental habits,” according to Dr Christoph Ramseier, one of Switzerland’s leading educators in the field of periodontology. “We need to meet as individuals on the same level. This way, we can communicate with patients and build a relationship with them, motivating them to improve.”

Cooperation and communication

Ramseier’s advice is supported by evidence from a plethora of studies on the subject of patient motivation. A 2012 study published in the British Dental Journal investigated the relative success of different strategies for motivating disagreeable patients. It found that patient motivation is generally more successful when a patient-centred approach that empowers them in the process of decision-making is used. The study recommended that a cooperative approach should supersede the act of simply giving advice, as it is the responsibility of both the dentist and the patient to ensure that the patient adopts good oral health habits.

The cooperative approach, sometimes known as a therapeutic alliance or co-therapy, can be applied to specific fields of dentistry, such as periodontology. In a presentation on periodontal patient motivation, periodontics specialist Dr Mary Gibson highlighted that engaging a patient in the treatment and post-treatment process is crucial to achieving positive behavioural change. This process of engagement, however, needs to be tailored to patients depending on their specific situation. For example, for sufferers of chronic inflammatory periodontitis, according to Gibson, encouraging good oral health and regular check-ups may suffice, whereas those with aggressive periodontitis will need to understand that periodontal therapy takes time and will be maximally beneficial if they cooperate.

Periodontal patients are a frequent focus in motivational literature, as this form of treatment can require patients to make considerable changes and adaptations in their approach to oral health care and other factors. A 2014 cross-sectional study by Oruba et al. showed that periodontal patients with higher levels of motivation have better oral health outcomes, suggesting that it influences the quality of their self-treatment and self-management. This emphasis on compliance is echoed in the findings of Renz and Newton, whose 2009 study categorically affirmed its importance in long-term periodontal health. Renz and Newton were also adamant that distinguishing between patients who are simply unmotivated to change their behavioural habits and patients who are motivated, but may need some support in effectively adopting good behavioural habits is crucial to achieving optimal results.

Recall frequency: What should it be based on?

A popular and widely applied recall management has been to recommend twice-yearly check-ups. While this interval-based style is an easy and beneficial guideline to follow, many recent studies have suggested that a risk-based approach to recall management may be more suitable. A 2013 study published in the Journal of Dental Research investigated the relationship between tooth loss and the frequency of dental visits among adult patients with and without certain risk factors for periodontal disease. The findings demonstrated that an appropriate recall schedule should be based on an assessment of the patient’s oral hygiene and his or her associated risk factors and not a predetermined schedule. Encouraging patient compliance with an individualised recall plan is essential for its success.
Centuries ago, dentistry identified mineral deposits, such as tartar or calculus, as the main cause of dental disease. Further research then recognised bacterial infections in the roots and the periodontium as the cause of periodontitis. So, what was the logical conclusion? Calculus (tartar) was removed completely. Today, we know that calculus has a porous surface that provides a niche environment for bacteria and endotoxins. Endotoxins are not absorbed into the calculus, so it can be easily removed. However, extensive removal of calculus is contraindicated and counterproductive.

When I started out as a dentist over 40 years ago, prophylaxis was still in its infancy. At my university, there was minimal literature on everyday oral hygiene. An eye-opening moment for me was during a visit to see Prof. Jan Lindhe in Gothenburg. There, we studied cases of periodontitis that caused almost everyone to cry out: full dentures! We then saw images of the same patients ten years later—they still had their natural teeth, solely thanks to prophylaxis. The thing that made me opt for prophylaxis in dentistry was the birth of my first daughter. I would never have been able to forgive myself if she developed a dental disease. This private passion for preventive dentistry and the vision of Prof. Axelsson and Prof. Lindhe have stayed with me to this day. Although my children and grandchildren's teeth are healthy, I do see a lot of unhealthy teeth in people in my own generation.

40 years ago, there was a limited understanding of biofilm, individual diagnostics and individual prophylaxis. We removed calculus twice a year, but only introduced individual diagnostics and treatment in 1994. Today, we know the value of prophylaxis. One major reason is that we have a greater understanding of the causes of the most prevalent dental illnesses. The trigger for cavities, gingivitis, periodontitis, peri-implant mucositis and peri-implantitis is always biofilm and not calculus. However, the amount of biofilm is not the determining factor; rather, it is the biofilm's ecological make-up, type and balance.

Biofilm is a microbial, "organised" collection of microorganisms. The microorganisms are embedded in a matrix of extracellular polymer substances that the microorganisms produce themselves. Microorganisms in biofilm show a different phenotype regarding growth rate and gene expression compared to suspended living cells. Dental plaque is a kind of biofilm and since biofilm forms an adhesive layer, special attention is required to destroy and/or remove it.

Classic...
Currently, there are two technologies available for the manual destruction of oral biofilm, everyday manual biofilm management and professional manual...
biofilm management. In professional manual biofilm management, we have a range of tools available, including manual debridement with handheld instruments and classic surface polishing, as well as debridement with sonic and ultrasound instruments, such as air polishing systems.

Most dental practices still clean the surface of the teeth with manual tools. In initial therapy, after the use of Piezon, we sometimes still use manual tools, though never for maintenance therapy. The correct use of these manual tools is technically challenging and requires a good tactile feel and extensive training. The treatment itself is very time-consuming and tiring for the practitioner, but indispensable for deep pockets of periodontitis that are not being treated surgically. The procedure often leads to oversensitive roots and aesthetically displeasing and noticeable recessions. Manual tools are not well received by patients either and often cause dental practitioners’ hand and arm ligaments to tire. These reasons have led to the need for new tools to be used at regular intervals.

Or modern?

Axelsson and Lindhe have begun to use ultrasound tools in their maintenance therapy. This technology broke through in the 1980s as bulky ultrasound tips were replaced with fine tips based on periodontal probes. I can still remember the introduction of gentler piezo-ceramic ultrasound devices—a real scientific and technological innovation.

Only this ultrasound technology allowed linear, low-pain movements. A consensus paper on this topic, published during the EuroPerio 2012 Congress in Vienna, can be summarised as follows:

- Piezo-ceramic technologies have proven effective for manually removing build-up
- They can be used universally (both sub- and supragingival) to remove mineralised build-up and bacterial biofilm
- They are gentle on soft tissue
- They allow for shorter treatment times
- They cause less pain for the patient
- They can be used after a short training period

Today, we know even more. Powder jet devices can be used to clean sub- and supragingival biofilm and staining more efficiently and quickly. Low-abrasion powder based on glycine or erythritol and new subgingival nozzles perform exceptionally well. The literature on powder and water jet technology with low-abrasion powders in biofilm management, compared with manual and ultrasound tools, highlights the benefits of this new technology. Furthermore, air polishing with low-abrasion powder removes more bacteria than manual and ultrasound tools. Many studies have shown that air polishing can remove supragingival build-up and stains much more effectively than classic polishing methods. This applies to soft tissue, hard tissue or restorative materials. Therefore, subgingival air polishing with low-abrasion powder is gentle enough and therefore suitable for use on all dental tissue.

A short guide to powder

The most commonly used powders are sodium bicarbonate, glycine and erythritol. Sodium bicarbonate is a white, crystalline
powder with a range of applications in food and medicine and it breaks down at temperatures above 56 degrees Celsius. In wet conditions, sodium bicarbonate, a hydrogen carbonate anion, can neutralise acids. This property explains its central role as the most important blood buffer, since it can regulate the acid-alkali balance in the human body.

Glycine is the simplest stable amino acid that can be made by the human body, where it acts as a radical catcher and neurotransmitter. Glycine is found in almost all foods that contain protein as it is a common building block of almost all types of protein. Glycine is also found in collagen, an important component of tendons, bone, skin and teeth. Glycine is an approved dietary supplement with no maximum dose as it supports various bodily functions. In the food industry, it is often used as a flavour enhancer or humectant. Studies from 2008 onwards have shown that air polishing with glycine powder does not irritate the gingivae.

Now, we come to erythritol. Since 2012, we have almost exclusively used this white, crystalline powder with a pleasantly sweet taste. Erythritol is found in small amounts in nature, for example, in honey, wine grapes, melons and mushrooms and it is produced by the fermentation of natural sugar. Due to its sweet taste, erythritol is used as a sweetener to replace sugar. It has almost no calories when absorbed by the human body and is suitable for diabetics. Oral bacteria are also not able to metabolise erythritol, so it is tooth-friendly and not cariogenic. Various studies have shown that only glycine and erythritol powders do not change the surface structure of composite fillings, while erythritol powder showed no changes on glass ionomer surfaces.

**Guided Biofilm Therapy—GBT**

GBT perfectly combines air polishing devices and low-abrasion powders. Developed in collaboration with universities and dental practices, GBT is a concept designed for contemporary prophylaxis. Based on decades of scientific knowledge and evidence, GBT is the next step in prophylaxis. The eight steps that comprise GBT can be adapted to suit the treatment and patient, including patients in initial therapy to patients in maintenance therapy, healthy patients, patients with dental caries (especially in the initial stadium), patients with gingivitis, patients with periodontitis, patients with peri-implantitis.

The GBT concept ensures a systematic, quality-orientated approach, from greeting the patient to collecting diagnostic data, everyday oral hygiene advice, professional teeth cleaning, the dentist’s final diagnosis and check-ups as well as recalls. Alongside the dyeing of the supragingival biofilm, the process of professional teeth cleaning has changed considerably. The modern approach begins with sub- and supragingival biofilm removal using air-polishing technology with Air-Flow Plus Powder®. This erythritol-based powder guarantees a targeted, gentle, risk-orientated removal of the biofilm to support the initial diagnosis. This is followed by the targeted and minimally invasive removal of mineralised build-up with Piezon No Pain®. This approach has many additional benefits, including short treatment times and maximum comfort for both the technician and the patient.

Finally, we can carry out professional biofilm management effectively, gently, safely, quickly and without pain.

Going forward, it is especially important to use the correct devices and tools, such as GBT. Currently, there are a few new products on the powder market. However, in addition to the powders’ properties and scientific evidence that these powders are biocompatible and do not cause damage, it has become more and more important for powders to be compatible with dental devices. This is a strength exhibited by Switzerland-based EMS, who have not only significantly contributed to the development of GBT, but have also provided suitable devices and tools (AIRFLOW® PROPHYKLAXIS MASTER, AIR-FLOW® POWDER PLUS, AIR-FLOW® handpiece, PERIO-FLOW® handpiece, PERIO-FLOW® nozzle, Piezon No Pain®).

The scientific knowledge and technological progress for a paradigm change in professional prophylaxis has now been established. Now comes the time to integrate these developments into our everyday practice for the well-being of our patients and ourselves.
One of the primary ways in which oral health can impact the quality of life is through its economic burden. In Europe, traditional curative treatment accounts for 5–10 per cent of total public health expenditure. The Platform for Better Oral Health in Europe forecasts that the total cost will rise from €54 billion in 2000 to €93 billion in 2020. Oral diseases are the fourth most expensive to treat, according to the World Health Organization, and this financial aspect can hinder people of lower socio-economic standing in receiving appropriate care.

The prevalence of caries and other oral diseases is a worrying trend, especially given the increased knowledge of how oral health can be maintained through twice-daily brushing with a fluoridated toothpaste, a healthy diet and regular dental check-ups. In the Netherlands, for example, a commonly implemented programme to prevent caries among children involves twice-yearly check-ups that are often accompanied by an application of fluoride and the sealing of all visible fissures. This programme is covered by the country’s health insurance and is thus free for all children up to 18 years of age, ensuring that there is no financial disincentive. In spite of this progressive and egalitarian approach, the proportion of Dutch youths without any caries experience has not dropped over the last 30 years and has remained stable.

It was clear from this that an alternative approach to caries prevention needed to be tested. Working from the basis of a study conducted in Denmark, a group of dental researchers in the Netherlands tested a non-operative caries treatment and prevention (NOCTP) programme with a pool of 6-year-old children. This programme, which promoted recall intervals based on individual risk assessment, resulted in a 40–70 per cent reduction in caries for the group subjected to the NOCTP method.

Prevention spoke with Corrie Jongbloed-Zoet, President-elect of the International Federation of Dental Hygienists (IFDH), about how the principles of these scientific studies are applied to a programme implemented by Dutch society for the promotion of oral health ‘Ivoren Kruis’ (Ivory Cross) and the impact these studies may have on approaches to caries prevention throughout Europe.

Could you please take us through the protocol of the Ivoren Kruis’s Gewoon Gaaf programme?

The first appointment is made with a dentist or a dental hygienist and is followed by a demonstration of visible plaque and education and training in plaque removal by the patient and motivational interviewing. After professional plaque removal, a diagnosis may be made and the treatment continued. In the case of no

Corrie Jongbloed-Zoet

Corrie Jongbloed-Zoet: “The prevalence of caries and other oral diseases is a worrying trend”

AUTHOR: DENTAL TRIBUNE INTERNATIONAL / CORRIE JONGBLOED-ZOET
When it comes to the prevention of caries in children, what role do parents’ attitudes play?
The programme focuses on behavioural change: the patient and/or his or her parents are encouraged to take responsibility for his or her oral health. In the study, the parents’ attitude turned out to be a decisive factor. There are parents who are conscious and responsible, but there also parents who are trivialising and fatalistic, appearance-driven and open-minded, knowledgeable but defensive, or conscious and concerned. The health care providers are trained over several days to be familiar with these differences and to consider them in their approach towards the patient’s parents. After informed consent has been obtained, parents are asked to fill in a questionnaire to provide information on socio-economic circumstances, oral hygiene habits, oral health history, dietary habits, self-care routines and knowledge on dental topics.

What role does the IFDH play in the promotion of oral health in Europe?
The IFDH is an international non-governmental organisation registered in the US. It unites dental hygienist associations from around the world (32 countries) in their common goal of promoting oral health and preventing oral disease. The federation represents approximately 85,000 dental hygienists. All European countries where dental hygienist associations exist are members of the IFDH and of the European Dental Hygienists Federation (EDHF). The IFDH and EDHF work together towards their common goal of improving oral health worldwide with partners like the Alliance for a Cavity-Free Future, the Global Child Dental Fund and the Platform for Better Oral Health in Europe.

References:
How to put prevention into practice

When patients meet Sirid Kulka, their lives will be changed completely. They will find out how strong the link between a strong immune system and oral health really is. They will also discover that most health problems can be avoided if dentistry, medicine and natural therapies worked together better. What’s more, they will learn about a new process that could considerably minimise the accumulation of plaque.

Prevention was invited by Andreas Teichmann, the developer of the Dentcoat technology, to speak with Sirid Kulka, an advocate of preventive dentistry who gives the patient just as much ownership as the dentists who are in charge of their treatment. She believes that patients who sit in the chair and expect to be cured immediately will become unwell in the future.

Mrs Kulka, tell us a bit about your interdisciplinary network and meetups.

Kulka: Medicine is in my blood. Both my parents and my brother are also in medicine. I’ve always been interested in the links between different disciplines. At some point, the idea of a meetup arose and now it takes place several times a year. I’m also a member of an interdisciplinary network that meets regularly. Both groups welcome medical doctors, dentists, natural practitioners and therapists. We all see the prevention of illness as the most important aspect of our jobs. For example, I can often see in the patient’s oral tissue if he or she is coming down with something, or if they’ve been ill. Based on this, I can make certain treatment recommendations. In turn, my colleagues see other things that can help me with my treatments.

At the same time—and I’m very happy about this—I’ve learned so much more about holistic correlations thanks to these meetups. We work in a complementary way, which often lets us establish the patient’s root problem. This could be physical, immunological or even osteopathic. Classic dentistry would often have met its limits in these cases.

Dental medicine is constantly developing and many dentists are hardly keeping up with new technologies and practices. Should they be interested in interdisciplinary approaches despite of this, or because of this?

Teichmann: Doctors must ask themselves, what will lead to long-lasting results? It is absolutely correct that a patient with a systemic illness does not expect their dentist to approach their treatment from an interdisciplinary perspective. And not every doctor likes to share the healing process with his or her colleagues. However, an internist for example should consult a periodontist when dealing with intestinal absorption to assess the periodontal status. Interdisciplinary approaches are indispensable nowadays.

Kulka: We did not really learn about interdisciplinary approaches when we were studying dentistry. Dental training is comprehensive, but you can, and should, be able to identify important correlations in your practice. We have to question existing therapies and always evaluate them considering new scientific knowledge. The key is interdisciplinary...
nary and complementary collaboration between dentists, doctors, natural practitioners and therapists.

Why did you opt for preventive dentistry? And did you know from the start that your practice would focus on prevention?

Kulka: For me, it was a gradual process, since prevention reflects a lot of experience. It all began with periodontitis and treatment methods that did not really convince me. After all those years, the results of treating periodontitis were disappointing for me—and I can hardly even call them results. So, I asked, what is the alternative if I am not able to completely cure periodontitis? I prevent it. This approach works well when it comes to tooth decay, but we still need to work on periodontitis prophylaxis.

What does prevention mean to you personally?

Kulka: For me personally, there are three approaches to prevention. Firstly, I want to primarily avoid illnesses and their causes. Treatment is better when the patient is healthy. The second approach is stabilisation. For example, after we have achieved a satisfying therapeutic result, whether the problem is completely cured or not, we have to maintain the health status of the patient. The third approach is about preventing recurrence when we see the patient again. Prevention is applicable to patients of all age groups from the age of three. However, prevention in younger children involves also training the parent, establishing or developing an awareness of health and creating the foundations for well-informed children. Prophylaxis training can work well in a group setting, but long-lasting success and motivation are only derived from individual training and education.

Teichmann: I believe prevention would greatly unburden the healthcare system. It allows us to treat the people who really need help and require intensive therapy.

Why are some dentists shying away from comprehensive perio-prophylaxis?

Kulka: If you want to understand peri-prophylaxis, you have to understand the immune system. A perfect immune system masters attacks and tolerance. Dentistry has to compare periodontitis, as an invisible chronic illness, with coronary heart disease, diabetes and Chron's disease. Then the question arises: Can we even treat periodontitis locally, or is it more of a systemic problem? Well, I would say it is a systemic problem. I need partners from microbiology and medicine in order to treat periodontitis holistically. I believe therapy and prevention can only be successful together.

Teichmann: Understanding oral microbiology is more important than ever. We have to pay much more attention to our internal flora. Bacteria live in us and we are alive thanks to these bacteria. Therefore, we have to check that our oral flora and intestinal flora are balanced. When our oral flora is out of balance, it has an effect on the rest of the body. So, we have to stabilise the oral flora.

The prevention trend benefits the patient most of all. Many patients want to keep their teeth and have become more aware of their own health. However, a lack of motivation is often the problem.

Kulka: That’s exactly why I take the patient seriously. In my team, the patient is the boss—they decide when they need a break. They also decide if they are ready to give up smoking, for example. Together, we come up with specific tasks for the patient to do at home. If you give your patient the ability to make decisions, you are also motivating and involving them. That is what prevention is all about: motivation, training and constant support. For example, I offer smokers a tailored prevention programme with a check-up session every two months.

Prevention takes time, but not every dentist gives him- or herself, and the patient, enough time for diagnosis. And,
periodontitis can easily be diagnosed nowadays.

Kulka: When I see inflammation or bone loss, I have two options: I can either treat according to the old method or I can find out why it happened in the first place. I have a basic diagnostic schematic that involves taking a holistic patient history. Then the patient is informed about which tests they need or whether a biopsy is necessary. The financial side of things, however, is not taken into account, to be honest. However, we do have a step-by-step plan with a range of options. I spend almost an hour with the patient for diagnostics and therapy suggestions. In order to strengthen communication, we also colour code everything, both before and after the biofilm treatment!

So now we have come to biofilm management, a central factor in prophylaxis. This approach relies on a long-lasting treatment strategy with Dentcoat, a SiO2 complex. Dentcoat reduces the pathogenic biofilm so that almost no germs are able to settle. How does that work exactly?

Teichmann: Biofilm can be affected by the metabolism—if I can support the good bacteria, I have already achieved a lot. For example, a patient with exposed tooth roots has a very rough surface. Dentcoat is then used as a bio-repulsive structure. “Bio-repulsive” is a term from molecular medicine, meaning that the silica complex is diffused into the deep layers of the dental enamel. This creates a protective layer and reduces the enamel’s acid solubility.

This remineralisation requires a plaque-free surface, therefore, the procedure requires a professional cleaning. Remineralisation is only possible when I keep the surface free from plaque, so that bacteria cannot settle on the surface. The results are clear: no cavities and no periodontal illness, because it removes the microbiome’s ability to change. This means that we have further expanded Dentcoat’s indication spectrum. Today, we can use the complex for dental protection, periodontal illness and tooth decay, sensitive teeth or even white spots. And with Implantcoat, we now have a reliable preventive measure for peri-implantitis.

Kulka: I’ve been working with Dentcoat for a few years now and I am very happy to have this treatment option in my practice. Dentcoat has both therapeutic and preventive qualities. After a professional teeth cleaning, we use Dentcoat to reduce the affected area of the tooth. When used regularly, we can also balance oral flora and whiten the affected tooth. At first, you just see biofilm everywhere, then after a while there is just about 30 per cent and then, at some point, you only see minimal plaque accumulation. Dentcoat helps with prophylaxis and PA therapy, so it is part of a treatment system.

I ask patients to come to the practice every two months if they have heavy staining, so I can clean their teeth and apply Dentcoat. Prophylaxis is not just about having a professional teeth cleaning twice or four times a year, it is rather about the level of plaque accumulation. When I apply Dentcoat, I see long-lasting results and plaque returns slowly. Dentcoat does not just stabilise periodontal results, but also decreases the risk of tooth decay. Plaque reduction also allows teeth to remineralise. With Dentcoat, I can inhibit and reduce inflammation and it also keeps the oral health status stable.
The simplicity of natural tooth protection

Dentcoat is the World’s first bioactive crystallization for an Ultimate Tooth Protection. Dentcoat creates a long lasting crystalline protective shield against discoloration, reduces plaque and tartar. It will also eliminate tooth sensitivity.

Dentcoat is based on SiO2-Complex technology which uses the bioactive principle of self-assembled mono- and multilayers and makes use of this ability of molecules to self-assemble. Dentcoat fills up the enamel capillary through solidification subcrystallization.

Through this mechanism, the SiO2-Complex (liquid crystals) bonds firmly to enamel/dentin structures to at least coat the enamel. The result is an extremely smooth bio-repulsive surface, which leads to greatly reduced protein and microorganism adhesion. Plaque accumulation is reduced by up to 95%, and inflammation of periodontal tissues is therefore reduced.

www.dentcoat.com
Interview: "We can only achieve good oral hygiene together"

Dr Karl Wolfgang Geiwitz’s passion for dental prophylaxis is immediately apparent. The dentist and dental technician has specialised in prophylaxis since establishing his practice over 20 years ago, and now offers professional teeth cleaning, as well as nutritional advice and an in-house prophylaxis shop. Individual prevention takes up so much space in his practice in southern Germany that his prophylaxis lounge, opened in 2012, is almost completely full. In this interview, he talks about prophylaxis as being part of ensuring overall health and the importance of good patient communication to lifelong oral health.

Your practice focuses on individual professional prophylaxis. How do you implement this approach?

It is very important to me that my dental hygienist allow sufficient time for the patient. A detailed medical history shows us the most important problems and causes. The greatest problem is often that the patient has not found anyone who will listen to him or her properly and take them seriously. That is why we place so much importance on comprehensive diagnostics and oral hygiene deficits. Most patients brush regularly, but not properly. Using only a toothbrush means only around 60 per cent of the surfaces of the teeth are cleaned.

Owing to the oral situation of our youth, we are looking at a very different oral hygiene situation than we would have seen 30 or 40 years ago. If a patient implements good prophylaxis and brushes properly at home, he or she will have hardly any dental problems. That is one part of it. Above all, we have to make patients aware of the link between oral health and the overall health of their whole body.

How do you address prophylaxis with your patients?

By talking to them about prophylaxis! It is very important to me that we explain to patients the causes of their problems and how to prevent them, and not just address problems temporarily. At every visit, we document their current status and use earlier notes to show their progress or even their regression. Take dental caries as an example: we explain to patients about the acids responsible and how important it is to clean the spaces between the teeth. Once we have developed this awareness of good oral hygiene, it is even more fun to work with the
patient and to celebrate with him or her when, for instance, his or her gingival problems have cleared up. Therefore, the most important question in my practice is always: how can I reach the patient and what materials do I need to motivate and spur him or her on?

For me personally, it is always about patient satisfaction. Many patients go to the doctor to obtain an opinion about a medication or a treatment—and generally follow the recommendations provided by their doctor. This should also be the case for dentists. Today’s patient does not just sit in the chair to be treated. We explain in advance why we are undertaking the planned treatment; then, he or she is ready to invest in his or her health.

To what extent is the patient’s oral hygiene the dentist’s responsibility?
We can only achieve good oral hygiene together. The practice achieves this by carrying out prophylactic measures based on the patient’s individual situation at least every six months. The patient needs good tools and techniques and plenty of motivation at home. Some do not want recall appointments and would rather get in touch themselves, but others are pleased about the recall and appreciate the reminder. Continued thorough monitoring promotes lifelong oral health. We use a recall system that reminds the patient of his or her appointment one week in advance.

You place great importance on training and educating your team and patients in your practice. What exactly do you do?
It is important to me that the team be on the same level and have the same knowledge. That is the only way I can offer consistent prophylaxis. We talk to each other in regular meetings, and the team regularly takes part in training sessions. Internally and with patients, we work very visually and use up-to-date image and video material. We also let the patients handle the products, and they can often feel the difference. Each patient is given recommendations based on his or her individual oral health and the best professional cleaning for him or her. Prophylaxis for expectant mothers is different from prophylaxis aimed at patients with prostheses or those undergoing orthodontic treatment. We have to learn this ourselves as a team in order to pass it on to our patients.

You offer oral hygiene products in your own shop, and have been working with the Curaden’s toothbrushes and interdental brushes for around 15 years. Why have you continued to use its products?
I need a company that supports and educates my practice and provides face-to-face contact. The Curaden team instructs my practice team so that our practice can go on to instruct our patients. One example is interdental care. In my experience, only around a tenth of patients clean between their teeth. It is the practice team’s job to explain the theory behind interdental care. And it is not just about cleaning the teeth; it is about the person. Just like Curaden, I follow a systematic approach in my practice, as many factors, such as age, medications or underlying illnesses, have an influence on the mouth and teeth. We must recognise the contribution of oral health to our overall health, and then the patient’s awareness of and motivation to perform prophylaxis will increase. If we underpin this with high-quality products such as CURAPROX interdental brushes, then the patient will be happy for a long time to come.
Do you still remember from dental school that muscles constantly vibrate by tensing and relaxing in a specific rhythm? This micro activity activates the musculoskeletal system’s metabolism and prevents illness. If this harmonic and rhythmic metabolism is no longer in balance, it may result in a number of different symptoms. Successful prevention involves an understanding of oral microbiology and the musculoskeletal system—a concept that Dr Ulrich Randoll has combined into a revolutionary new therapy.

Healing by relieving muscular congestion

The area of liquid around our cells and organs, the extracellular matrix, is a component of the body’s connective tissue, which makes up a large part of our body. That is where collagen fibres are found. Connective tissue is full of nerve pathways, which direct nerve signals. To keep cells healthy, the extracellular liquid depends on the permeability and transportability of this transit space. Illnesses are errors in cell logistics. Cells that have become biologically unbalanced experience congestion and a deceleration in their extracellular matrix. This means that the affected areas of these cells no longer have a sufficient supply. These illnesses or disruptions to the body’s processes lead back to cellular regulation level. Essentially, the well-being of each cell depends on its environment.

"Pain and loss of mobility ultimately result from problems in cell logistics. This is the tissue crying out for oxygen," explained doctor and dentist Dr Ulrich Randoll. The cell does not have enough oxygen to create energy. The musculature suffers from a lack of oxygen, meaning it can no longer relax, so it stays constricted and becomes gradually harder. This results in a lack of elasticity and the pressure on the vessels...
Matrix Rhythm Therapy is based on the oscillation behaviour of skeletal muscles. It affects the cells of the body and their metabolism from the outside.
inside the muscles increases. Randoll is the Chief Scientific Officer of the Dr. Randoll Institute, a non-profit organization for research and education, and the medical director of a private clinic. He views biological systems as regulated complex systems constructed by three interacting areas: information, process and structure.

Matrix Rhythm Therapy (MaRhyThe) is a systemic biological approach to getting the body back on track, developed by Randoll. It rebalances the tissue and cells by simulating physiological muscle vibrations with a therapeutic device, the patented Matrixmobil, which is a handheld applicator with a swivel head. It moves to and fro at 8–12 Hz, which is the frequency at which muscle cells vibrate. Based on coherent muscle rhythms, it targets the musculoskeletal system using the physiological frequency and amplitude spectrum. This vibration window functions as a pacemaker for the body, as the musculoskeletal system has a major role in transporting liquids in the body and in microcirculation. The entrainment effect is used to gently reactivate cellular processes, flush the cells and readjust the whole system. The oxygen content of tissue and the exchange of nutrients and metabolites are both increased so that cellular supplies are optimised.

These magnetic and mechanical vibrations have a variety of uses. They promote circulation, relieve pain, improve oedema, and have become a regular feature in regenerative medicine, including plastic surgery. With MaRhyThe, the therapist can gently target deep tissue painlessly. “Employees and employers are equally relieved, as 70 per cent less backache and considerably fewer absences have been realised thanks to the preventative use of MaRhyThe,” Randoll stated.

What dentists should know

When it comes to craniofacial orthopaedics, musculoskeletal, fascial and nerve systems, and the relationship between muscles, occlusion and pain become therapeutic focal points. “With this holistic approach to dentistry, we see the masticatory apparatus integrated into the complex interplay of body, mind and soul. We pay special attention to musculoskeletal burdens in connection with the occlusion,” said Randoll. “Symptoms affecting the masticatory apparatus can influence the body as a whole, and vice versa.”

Randoll previously worked in oral and maxillofacial surgery and trauma surgery at the University of Erlangen-Nürnberg in Germany. Sometimes, the usual clinical therapies would not
work for some patients and there were simply no further options for therapy. This encouraged him to develop a new holistic therapeutic method. The result was MaRhyThe, a practice-relevant, systemic biological therapeutic method that has a direct influence on cellular processes: "MaRhyThe achieves deeply effective relaxation, almost a resetting of neuromuscular systems, and should be used as a preventative measure by staff and dentists themselves," stated Randoll.

MaRhyThe has been tried and tested in dental medicine for many years now. "We use the masticatory apparatus to process stress. Preventative changes to the inner structure can be triggered to help relieve stress. MaRhyThe helps tense muscles reset to zero. They can relax again once congestion has been cleared," explained Dr Hans-Christian May, a dentist and health practitioner in Munich in Germany. MaRhyThe is, therefore, perfect for preventing the development of illnesses, as it counteracts chronic degenerative processes and inflammation and promotes healing. This pleasant and painless treatment does not result in any reactive responses that could cause new tension. Healing is improved, as cellular conditions have been optimised.

**An interdisciplinary understanding of muscular function**

One example of this systemic biological tendency is patients with temporomandibular joint dysfunction syndrome. Success has been achieved in such patients by releasing muscular tension around the cervicothoracic transition at a cellular micro level using MaRhyThe. This inter-organ and interdisciplinary understanding of muscular function is central to treating the syndrome as it explains the relationship between cellular neuromuscular micro functions and macro movements.

In his Munich-based community practice, May uses MaRhyThe in preparation for splint adjustments and as a complementary treatment during splint therapy, among other things. To establish the static and dynamic positions of the temporomandibular joint, the muscles are relaxed before measurements are taken. "The muscles have to relax to allow for reliable tissue so we can take exact and reproducible measurements," he said. The splint position should represent the relaxed muscle position from the very beginning. It then works as a kind of reminder. Many patients think that their tension, neck pain and shoulder pain are normal, according to May. By involving osteopathy and manual techniques, even long-term painful cramps and muscle tension can be rapidly improved. This muscle-relaxing therapy is accompanied by sessions based on hypnotherapy in the spirit of a holistic systemic biological concept.

MaRhyThe is not just a contribution to physical therapy, but also combines dentistry and medicine to offer a preventative and curative approach for systemic biological disorders.
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