today

#VITA YZ® SOLUTIONS

Swedental • Gothenburg, 14–16 November 2018

Editorial

In his new book, Dr Bertil Marklund advises on how good oral health, among other aspects, has a positive impact on our general health.

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Dental products in focus

The new Planmeca CALM algorithm for correcting patient movement in CBCT images is "the real deal".

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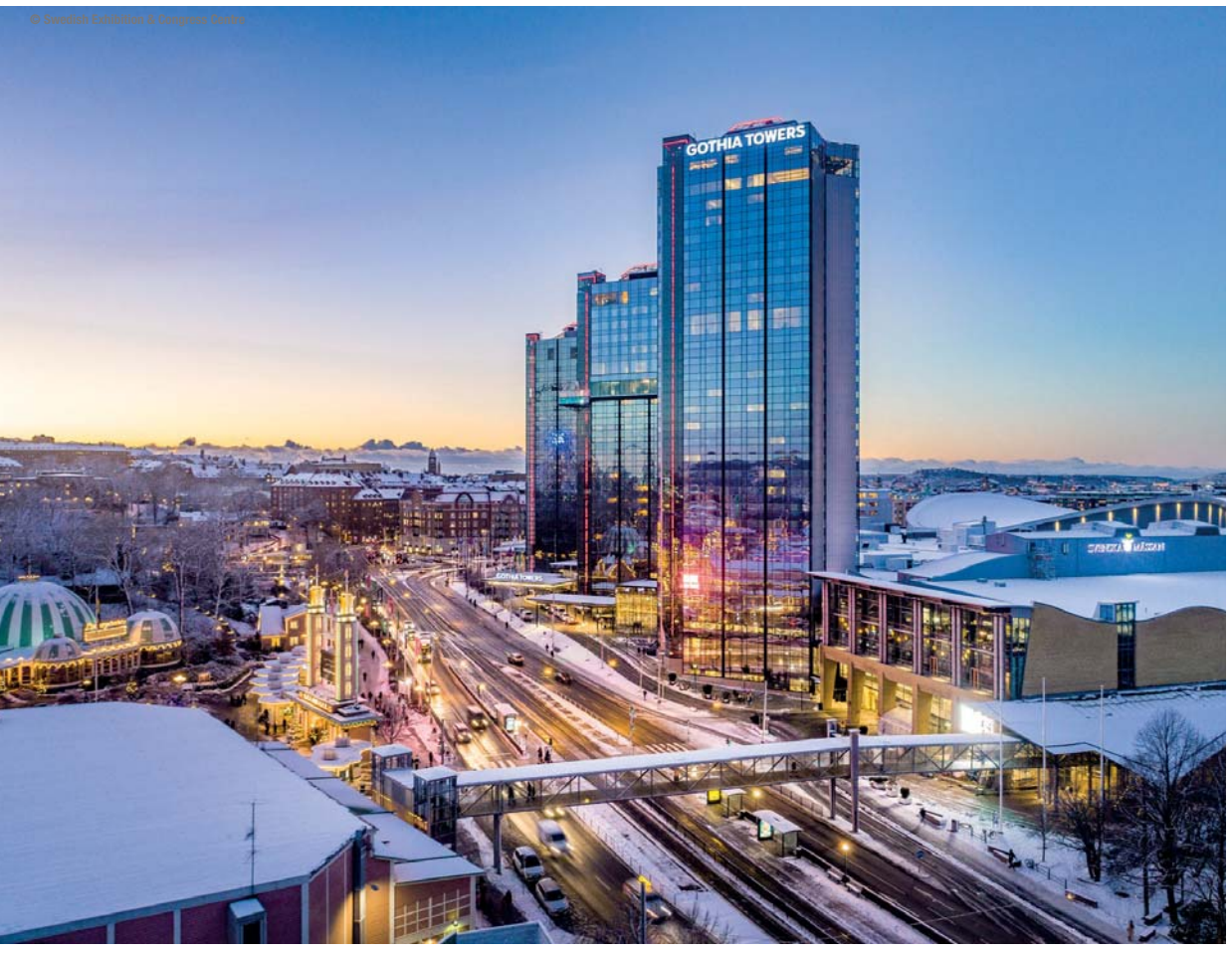
Swedental 2018 immerses dental professionals in digital dentistry

Largest dental and oral care event in Scandinavia taking place in Gothenburg



■ At the 2018 Annual Swedish Dental Congress and Swedental exhibition, dental professionals can learn about the newest products and innovative treatment methods, as well as have the opportunity to advance their skills. From 14 to 16 November, visitors are gathering at the Swedish Exhibition and Congress Centre in Gothenburg, the second largest city of Sweden.

Swedental was established in 1973 and is now the leading trade fair in Scandinavia for the dental industry. The fair annually attracts some 180 exhibiting companies from about ten countries. It has around 11,000 visitors every year, including those attending the Annual Dental Congress. This year's venue offers a total exhibition space of 41,000 m^2 and boasts 100 years of event organisation excellence.

The Annual Dental Congress offers accredited further education for the entire dental team. Combined with Swedental, participants can enjoy an immersive experience of the newest research and envisioned future developments in all fields of dentistry. The exhibition and the congress focus on the latest dental advances and innovative solutions, presented by inspiring speakers, and seek to foster meaningful business and networking time with peers.

With dental professionals under greater time pressure and public scrutiny than ever, this exhibition and congress present a unique opportunity to catch up with advancements and gain a glimpse of the future. For that reason, this year's event places special emphasis on digitalisation in the various fields of dental care.

For the first time, the exhibition features a whole new area: Future Lab. This walk-through experience transports participants into the future to explore new technologies and how these innovations could be used in dentistry in the near future. Visitors to the Future Lab can try out artificial intelligence and mixed reality solutions and new training technologies. Future Lab is furthermore aimed at generating ideas for future innovations and practical tools through dialogue, discussion panels and other interaction.

On Thursday evening, participants are once again invited to join the After Dent event, this year being held at the Twentyfourseven café in the Gothia Towers (17:00–19:00). Attendees can exchange ideas and experiences with old friends and make new ones while enjoying the live music offering.

All presentations are in Swedish, with only a few in English. There is no simultaneous interpreting of the lectures. Additional information about the meeting, scientific sessions and social events is available at *en.swedental.se*. ◂◂

Swedental 2018, 14–16 November

- Opening hours:
  Wednesday, 14 November: 10:00–19:00
  Thursday, 15 November: 9:00–17:00
  Friday, 16 November: 9:00–17:00
- Venue:
  Svenska Mässan—Swedish Exhibition and Congress Centre
  Mässans Gata/Korsvägen
  412 94 Gothenburg
  Sweden
- Organisers:
  Swedental is organised by Svenska Mässan in association with the Swedish Dental Association and Swedish Dental Trade Association.

More information on the trade fair: *en.swedental.se*

More information about the venue: *en.svenskamassan.se*

Dentistry in Sweden

Currently, the Swedish Dental Association has 7,500 members, of whom 4,200 practise in the public dental service and 1,700 are private practitioners. Approximately 250 lecturers teach at the four dental faculties, and 1,300 dental students are also members of the association. According to 2015 figures, around 14,500 dentists work in Sweden, yielding a dentist-to-population ratio of one to 1,273.

To live a healthy life, you do not have to go to extremes

Good oral health facilitates overall health
By Dr Bertil Marklund, Sweden

You can greatly influence your lifespan

Thanks to the astonishing state of knowledge today, we know that we can greatly influence our lifespans and health through the lifestyles we adopt. Our genes determine at most 25 per cent, while our lifestyle defines 75 per cent or even more. We also know that the appearance of major diseases and ageing is caused by one and the same: inflammation, which occurs in our body in different ways.

As a general practitioner and researcher, I became interested in identifying the crucial factors of our lifestyles, which can strengthen the immune system and both slow down and prevent inflammation. I then found ten areas that had the potential to extend our lives for ten healthy years. These findings I compiled in my book *The Nordic Guide to Living 10 Years Longer*.

Significance of oral health to general health and longevity

One field that plays a role in inflammation and general health is oral health. As we know, there is a strong correlation between the two, and research has shown that people with healthy oral cavities live about six years longer than those with oral inflammation. Bleeding gingivae, periodontitis and oral lesions that last for weeks, months or years constitute an inflammatory strain for the entire body, resulting in damage to blood vessels and thus causing an increased risk of heart attacks, strokes and premature death.

Therefore, in addition to brushing, it is important to keep interdental spaces clean to reduce the risk of periodontitis. Dental floss or other tools have been recommended worldwide, for example in the US since 1979.

However, a few years ago, a debate on dental floss arose. US authorities considered the research showing the effect of dental floss on periodontitis insufficient. Nevertheless, dental floss is recommended by the country's two leading dental associations, the American Dental Association and the American Academy of Periodontology. The associations relied on studies other than those included in the federal government's review, claiming that flossing helps to prevent plaque, gingivitis and dental caries. Prof. Björn Klinge of Karolinska Institutet, a medical university in Sweden, said that there are generally very few reliable scientific studies in medicine and dentistry that demonstrate convincing value of different methods of interdental cleaning. However, according to Klinge, proven experience shows that dental floss and other similar tools help against periodontitis and dental caries.

Simple tips for a longer and healthier life

Another important tip that may result in a long and healthy life is regular exercise. It has been found that the major effect on health already occurs at 30 minutes of fast walking per day. It is just as beneficial to do housecleaning or gardening—in this way, you combine benefit with pleasure. You do not have to run a marathon; on the contrary, there are studies that indicate risks for this. Another important and new understanding of physical activity is to avoid a sedentary lifestyle. Sitting still is as harmful as smoking! Therefore, stand up and move around for a few minutes after 30–45 minutes of sitting.

Of course, diet also plays a major role in both dental and general health. The phrase "you are what you eat" is absolutely true. You can eat in a way that ages you quickly or slowly; it is up to you! My book includes many simple tips on how to choose a good diet, which ideally contains antioxidants, omega-3 fatty acid and fibre. The book gives suggestions for diets that suppress inflammation and strengthen the immune system. In addition to food, beverages have to be considered. Coffee, for example, though this is not widely known, contains beneficial antioxidants and has been shown to reduce the risk of diabetes, cardiovascular disease and Alzheimer's disease.

Other interesting tips are that optimists live seven years longer than pessimists, social contacts are important to maintain a good health and you should not forget to sunbathe for 15–20 minutes each day during the summer to absorb the vital vitamin D. Additionally, during the winter months, a vitamin D supplement may be of great value.

Changing your lifestyle is not the easiest thing to do because we tend to fall back into our habits. The most important and, perhaps, the most difficult thing is, therefore, to take the first step. This action will come more naturally if you begin with a habit that is easy to change. Therefore, the book is filled with simple tips that can be applied right away. The transition to a healthy lifestyle should not be a torment, but should be perceived as something positive and meaningful. This way, the new resolutions can be adhered to long term. Make sure you eat healthily, brush and floss on a daily basis—and experience how fresh your mouth feels—sit in the sun and have a cup of coffee and look ahead positively. As a result, the chances of your new choices becoming habits will increase.

Dr Bertil Marklund

is a general medical practitioner and an adjunct professor in general medicine and public health at the University of Gothenburg in Sweden.

Information about the book:
Marklund's book titled *The Nordic Guide to Living 10 Years Longer: 10 Easy Tips to Live a Healthier, Happier Life* was published in 2017 by Piatkus and has been translated into 27 languages.

University of Iceland may apply controversial method of dental age assessment

The University of Iceland (HÍ) and the Directorate of Immigration are currently finalising a work agreement on determining the age of asylum seekers based on dental examinations. The assessment method has been heavily criticised as being imprecise.

■ HÍ Rector Prof. Jón Atli Benediktsson has confirmed the agreement. Up until now, the university has been conducting these dental age determinations informally, in particular of asylum seeking children who arrived without an accompanying adult in order to determine whether these applicants are over the age of 18.

The student council at HÍ was both surprised and disappointed to learn the news. "My personal opinion is that the university should not have anything to do with this," said Elísabet Brynjarsdóttir, president of the university student council. "I believe dental age determination is in conflict with the university's science ethics regulations, and the procedure is very controversial in academic circles due to inexact results and from an ethical point of view," she added.

In the UK, the Home Office has abandoned the practice altogether upon the recommendation of the British Dental Association (BDA).

The University of Iceland may soon perform dental radiographs in order to assess the age of young asylum seekers, even though this method is highly disputed.

The association clearly opposes the use of dental radiographs for assessing the age of asylum seekers because it is an inaccurate method. Furthermore, the BDA believes it is inappropriate and unethical to take radiographs of people without them gaining any health benefit therefrom. According to the association, radiographs taken for a purpose other than a clinical reason should not be used without the patients' consent and they should be fully informed about how and by whom the radiographs are going to be used.

The Royal College of Paediatrics and Child Health produced a publication titled *Refugee and Unaccompanied Asylum-Seeking Children and Young People* in April 2018 to support paediatricians in the assessment of children with a refugee background. The document states that the use of radiological assessment is very imprecise and can only determine an estimated age within a range of two years in either direction. Same as the BDA, the college regards the use of radiographs for this purpose as inappropriate. Therefore, it is important for paediatricians to inform social workers that dental radiographs will currently not contribute to the age assessment process.

Further, the science ethics regulations of the University of Iceland stipulate that participants in any study at the university cannot have been pressured to take part, nor can the results of the study have any negative impacts on the participants' lives.

While asylum seekers may refuse to undergo a dental examination for this purpose if they wish, they must do so with the understanding that this may affect whether their application is accepted or not, although it is stipulated that their application will not be rejected solely for refusing a dental examination.

Since the European refugee crisis began in 2015, an increased number of people have come to Europe via the Mediterranean Sea or south-east Europe in order to apply for asylum. Most of them have come from Syria, Afghanistan and Iraq and have been forced to flee because of persecution, war and violence. ◂◂

“It is fantastic to have implants as a treatment option”

An interview with Prof. Ann Wennerberg, Sweden

‣ At the Messe Wien Exhibition and Congress Center, Prof. Ann Wennerberg answered questions regarding her recent research findings on implant surfaces.

■ A world-leading authority on dental implant surfaces, Prof. Ann Wennerberg, from the University of Gothenburg in Sweden, recently led a systematic review of 62 clinical studies in which she analysed a total of over 17,000 implants with at least ten years of follow-up. The study compared the long-term clinical outcomes of treatment with implants with different surfaces, including sandblasted, titanium plasma-sprayed, turned, sandblasted and acid-etched, and anodised. At the 2018 EAO congress in Vienna, Dental Tribune International met with Prof. Wennerberg to discuss her research and its findings.

Prof. Wennerberg, in your study you compared five implant surfaces, including the TiUnite implant surface by Nobel Biocare. Could you please explain what TiUnite is exactly?

TiUnite is an anodised surface. An electrolytic bath is used to create those pores and those very typical structures on the implant surface. It is very easy on an image to detect that it is an anodised surface and not a blasted or etched one.

What do you think are the main advantages of implants with the TiUnite surface and were any of these investigated in the study?

Since the well-known company Nobel Biocare produces it, I think the fact itself is an advantage. There are a number of moderately rough surfaces that function well, but to assess their safety and so on, as also stated in the paper, it is helpful and important to work with companies that have collected clinical data. TiUnite has been followed for many years now, so it is quite safe to say that it has been proven to be safe to use. That is an advantage.

Nobel Biocare implants with a turned surface have been very well documented over the years. In this study, we were particularly interested in how TiUnite, which is relatively new, performs in the oral cavity. There had been some concerns that, because this surface has so many undercuts, that it may be difficult to clean and thus may harbour bacteria that may cause bone resorption over time.

What are the limitations of the TiUnite surface?

I do not know if there are any limitations. We do not have any proof that it causes more bone resorption or other problems, but I cannot say that it is absolutely impossible that it does. I have no idea how the implant would perform over the course of 25 or more years. As of now, we have not been able to confirm this concern though.

As for the financial aspect, of course, a lot of the major companies, which have spent a great deal on the development of these surfaces, expect some form of profit. Therefore, some implant systems are more expensive, but you quite often get more documented data on these systems compared with cheaper ones. Therefore, you know what you are buying. It may not be the case for every product, but generally speaking I think it is true.

During the Nobel Biocare symposium, which took place at the EAO congress on 12 October, you spoke about the next steps in surface technology. Where do you see innovation heading?

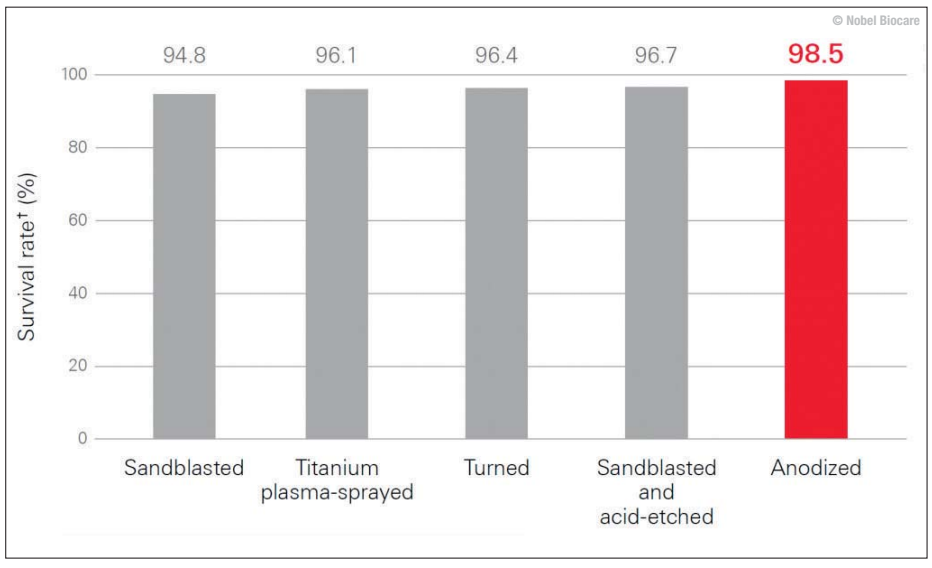
We are not at the point yet, where we can talk about innovations, but from a research point of view, it might be possible that, at some point, you would be able to load surfaces with different substances when you want to treat a certain disease for example. For infections, you might load a surface with antibiotics or something else that the tissue would respond to in one way or another. There are some developments in this area already. I also think that in terms of topography we have come to a really good state of the art. Of course other areas, such as implant design, have not yet been investigated well enough and might also be of interest in the future.

In your opinion, what has been the biggest development in dental implantology throughout the decades?

That is a difficult question for me to answer [smiles] because there have been many developments. From a material standpoint, we now have better mechanical properties and better prosthetic solutions, and we are able to better compensate for misalignment. And then there are some things that have really improved over the last 30 years, but I would not say it happened in one big leap or anything; more like a step-by-step approach, which has been influenced by many players in the field that have provided us with very good clinical results. Overall, I think it is fantastic to have implants as a treatment option for patients.

Thank you very much for the interview. ◂◂

Editorial note: The study, titled “Long-term clinical outcome of implants with different surface modifications”, is due to appear in an upcoming issue of the European Journal of Oral Implantology.



New findings on chronic pain syndrome in the mouth

Mainly middle-aged and elderly women are affected by BMS

■ The picture is becoming clearer regarding the chronic oral pain condition known as burning mouth syndrome (BMS), which mainly affects women who are middle-aged and older. A scientist at Sahlgrenska Academy at the University of Gothenburg has reported results on dissertation work that is part of a larger research project aimed at finding a model for BMS that can facilitate diagnosis and treatment in the future.

BMS affects approximately 4 per cent of the Swedish population. The condition is characterised by a burning sensation of the oral mucosa in a person with otherwise apparently normal oral health. The tongue is most often afflicted, but the palate, lips and gingivae may also be affected. Other common symptoms include xerostomia and altered taste perception, such as a bitter or metallic flavour in the mouth.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In her doctoral dissertation on oral microbiology and immunology at the Institute of Odontology, Dr Shikha Acharya connected clinical findings and self-reported findings from questionnaires from patients with BMS about their symptoms and background (other diseases, use of medications, etc.) along with saliva-related factors. These were compared with a sex- and age-matched control group.

The researcher found that 45 per cent of the BMS patients had altered taste perception and 73 per cent experienced burning or stinging or a combination of the two, but stinging and numbness also occurred. In addition to BMS, the examination of the study participants showed a higher incidence of other types of diseases, use of more medications, proneness to bruxism and more allergies than the control group. However, more advanced analyses showed that BMS was strongly associated with self-reported skin disease and subjective oral dryness.

That the BMS patients reported that they suffered considerably more from skin disease and skin problems, compared with the control group, is a new finding. The study also found that mucin proteins in BMS patients' saliva were altered and contained lower amounts of carbohydrate structures that affect the oral cavity's immune system, constituting another novel finding.

"Our hope is that the new findings will contribute to the development of objective diagnostic criteria and effective individualised treatment that are both currently lacking. It's important because the afflicted patients often feel that their surroundings and healthcare professionals doubt their ailment," explained Acharya.

Acharya's doctoral thesis, titled "On Characteristics of Burning Mouth Syndrome Patients", appears in the doctoral theses from Sahlgrenska Academy collection. ◂◂

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Dental health inequalities most apparent in young children

Preschoolers from socio-economically disadvantaged families are at higher risk of developing caries

■ Despite the fact that the Swedish government has provided free dental care to children and young people for decades, research has shown that large discrepancies in dental health exist. According to the results of a recent Swedish study at the Sahlgrenska Academy at the University of Gothenburg, inequalities in dental health are most evident in 3- to 6-year-old children. Especially preschoolers from socio-economically disadvantaged families showed a higher risk of dental caries compared with age cohorts with better living conditions.

The study formed part of the thesis of Dr Ann-Catrin André Kramer, who works for the Public Dental Service in Västra Götaland County. Her research investigated the dental health of 300,988 individuals aged 3–19 years in the Västra Götaland County.

Swedish researchers have investigated the correlation between children's socio-economic background and their dental health.

The research showed that children who already had cavities when they were 3 years old had developed considerably more caries by the time they turned 6, compared with children who were cavity-free at the start of the study. Only half of the children included in the study showed no signs of caries in their primary teeth by the time they reached 6 years of age.

Ten per cent of the 7- to 9-year-olds included in the research exhibited caries in their permanent teeth, and two-thirds of the older teenagers had cavities or fillings. The results of the thesis indicate that children in families with limited socio-economic resources were most at risk of developing caries. This was especially true of preschool-aged children.

"This situation is very demanding for both patients and dentists, and we need to consider how we can reach the groups who are most in need of dental care. Perhaps we can further develop inter-professional efforts and work with other healthcare professionals and schools to remedy this problem. Children should be taught that brushing their teeth is every bit as important as washing their hands, which is something they learn to do at a young age," said André Kramer.

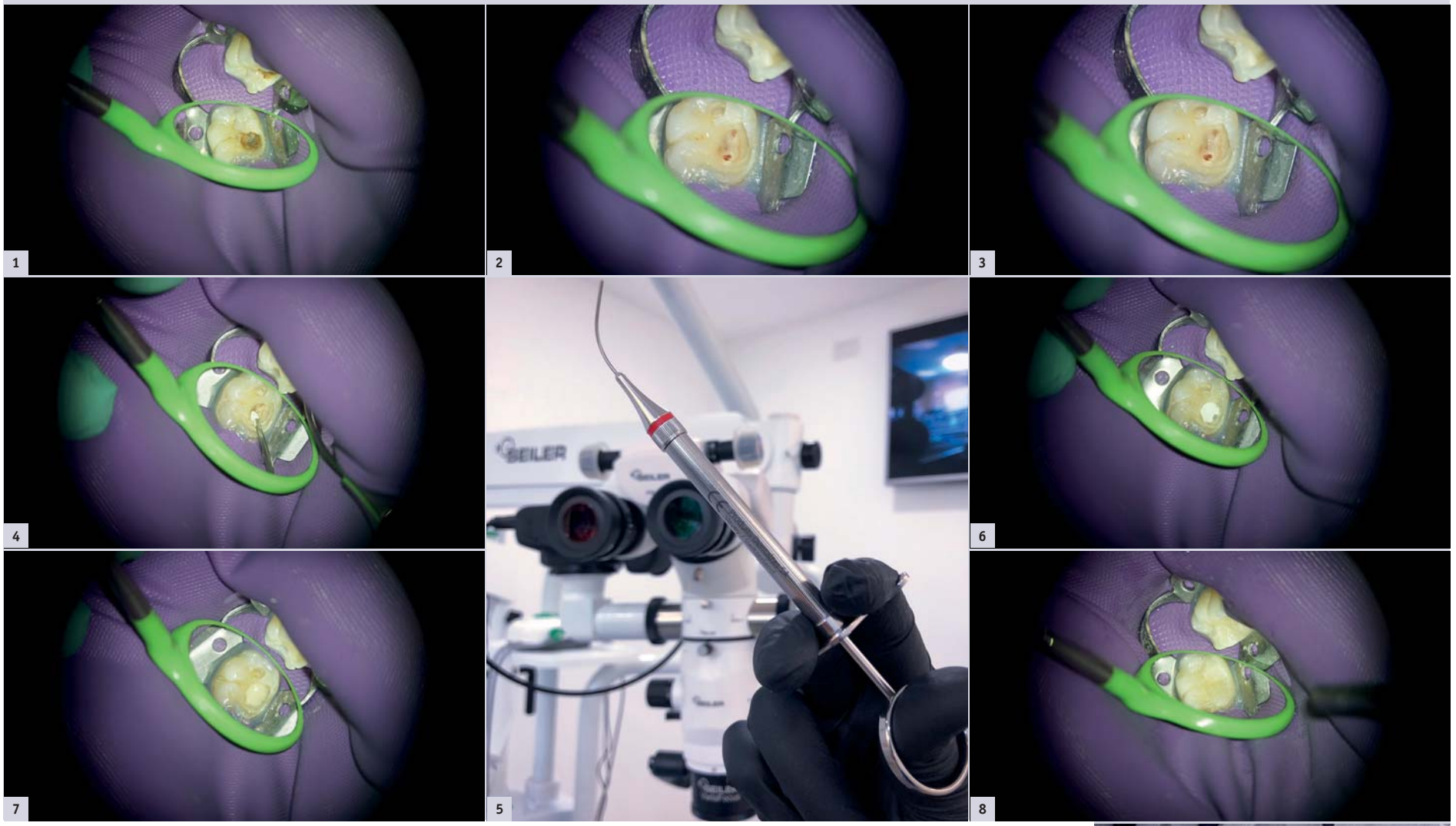
The doctoral thesis is titled "On Dental Caries and Socioeconomy in Swedish Children and Adolescents—Clinical and Register-Based Studies" and appears in the doctoral theses from Sahlgrenska Academy collection.

Ann-Catrin André Kramer, doctor of dental medicine and a registered dental hygienist.

Direct pulp capping as a conservative procedure to maintain pulp vitality

By Dr Jenner Argueta, Guatemala

Clinical Case 1

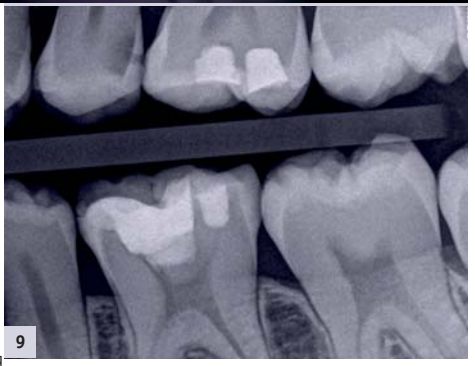


■ From a completely optimistic point of view, the ultimate goal for every dentist performing a restorative and/or endodontic procedure should be to maintain the pulp vitality and functionality of the tooth without any discomfort for the patient. The pulp tissue is needed to provide nutrition, innervation and immunocompetence, with these acting as a defence mechanism and alerting to the presence of any external aggression.[1]

The pulp tissue may be exposed to the oral environment as a result of dental caries or by mechanical means when performing restorative or prosthetic procedures. Two possible treatment options in these types of cases are root canal therapy and tooth extraction; the former procedure is a good choice, whereas the latter should be avoided at all costs in order to maintain the patient's oral health and natural function.[2–4]

A third alternative in the case of pulp exposure is to use conservative vital pulp therapy procedures, which include direct pulp capping, indirect pulp capping where the pulp is not fully exposed, and partial or total pulpotomies; this way, it is possible to maintain the vitality of the tooth, the nociceptive function and the body's self-defence system. Thanks to the points mentioned previously, among others, it has been shown that teeth with no root canal therapy survive longer than those that have been treated endodontically.[2, 5, 6]

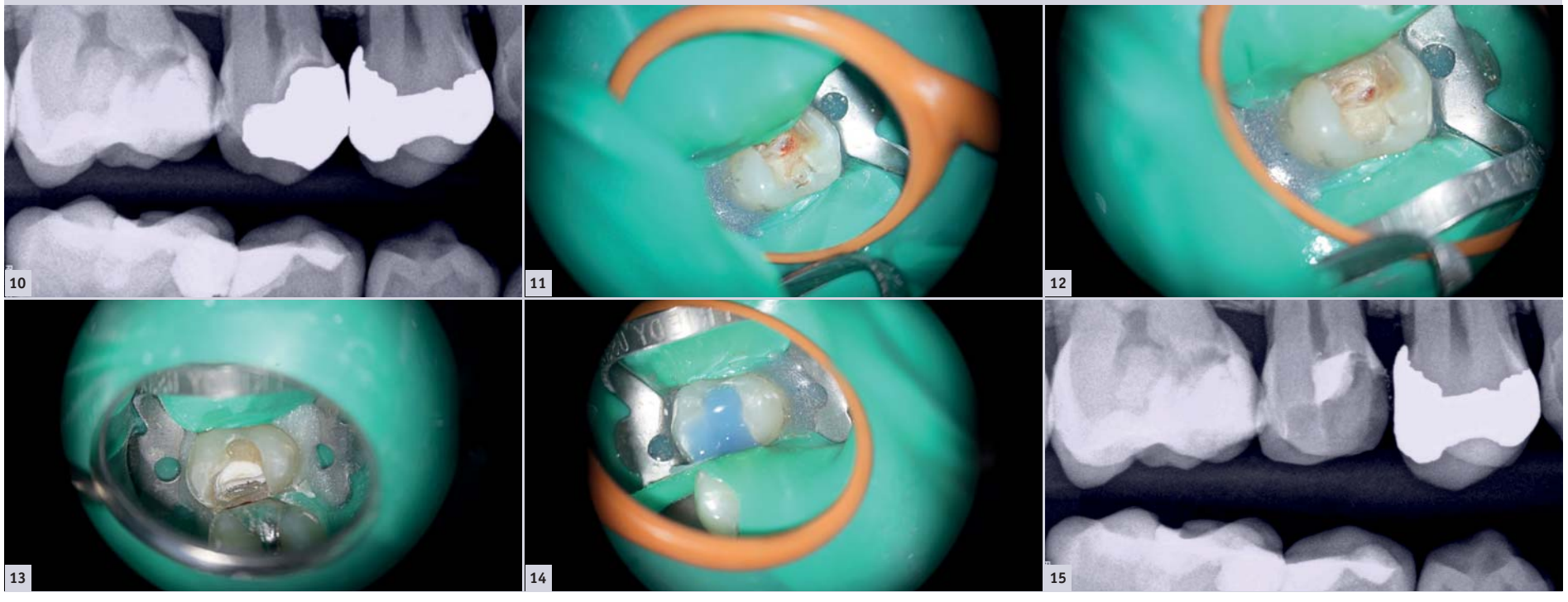
Next, we present two clinical cases in which the pulp tissue was exposed mechanically when carious tissue was removed. In both cases, it was managed to maintain the pulp vitality of the affected teeth by means of direct pulp capping. The vital pulp capping protocol suggested in this article is presented in the first case. The second case describes a treatment performed with long-term follow-up, where full formation of calcified tissue below the capping material could be observed by means of radiography. The treatment protocol was similar in both cases.



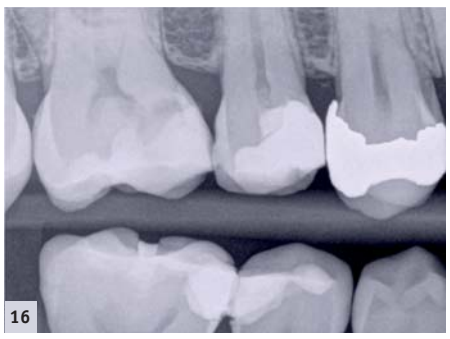
Clinical Case 1

The 24-year-old patient attended the dental clinic with transient pro-

Clinical Case 2



voked pain in tooth #19 (Fig. 1). The diagnosis was reversible pulpitis. The carious tissue was removed under complete isolation, producing two incidences of pulp exposure, with minimal bleeding (Fig. 2). Bleeding was stopped by applying pressure for 10 seconds using a cotton swab dampened with a sterile saline solution. The cavity was disinfected with 2.5% sodium hypochlorite (Fig. 3), and then white mineral trioxide aggregate (MTA, Produits Dentaires) was placed as a direct pulp capping material (Fig. 4). To ensure that the MTA was placed accurately, the MAP System micro-applicator for dental materials (Produits Dentaires) was used. This system allows the clinician to place the material exactly on the exposure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site, and this avoids staining the dentinal walls, which could over time show pigmentation due to the material used (Figs. 5 & 6). Once the MTA was placed on the sites of pulp exposure and the deep parts of the pulp chamber roof, a light-curing calcium hydroxide paste was applied. This was used to protect the material (Fig. 7) and to be able to proceed to the bonding procedure, to put the final restoration of the tooth in place during the same session (Figs. 8 & 9). Seven days after the procedure, the patient was completely asymptomatic and the tooth responded normally to sensitivity tests. In clinical situations like this, it is expected that there will be radiographic evidence of mineralised tissue formation below the cap between six and nine months after the procedure.[7]

Clinical Case 2

The 35-year-old patient attended the dental clinic with transient provoked pain in tooth #4. The diagnosis was reversible pulpitis. The same vital pulp therapy protocol described in the first case (Figs. 10–12) was followed, except that in this case, the permanent restoration was not put in place during the same session. In its place, a temporary non-radiopaque restorative material was placed.

This made it possible to ascertain the suitable thickness of the pulp capping material and its precise positioning at perforation level, while keeping the dental margin clear for a good bonding protocol (Figs. 13–15). It has been reported that the success rate of vital pulp therapy procedures may drop when the final restoration is put in place two days after the initial procedure.[8] The MAP System is very useful for precise and stable placement of the capping material in direct procedures, indirect procedures, and partial and total pulpotomies. Here, the final restoration was placed 15 days after the initial procedure and the patient was completely asymptomatic. Nine months later, full formation of calcified tissue could be seen at the level of the pulp capping, the tooth remained vital and the patient was completely asymptomatic (Fig. 16).

Obtaining the right diagnosis is key to the success of conservative pulp therapy. An ideal case is a diagnosis of reversible pulpitis with no previous history of spontaneous or prolonged dental pain.[9] It is generally accepted that a history of spontaneous pain or pain at night is associated with the existence of an irreversible pulp inflammation process.[10,11] In these cases, the success of direct pulp capping may be questionable,[12] although there are studies indicating that vital pulp therapy can be successful even in these situations.[2, 13–15]

When it comes to the long-term success of conservative pulp procedures, it is extremely important to provide a final permanent restoration for the tooth that ensures a suitable marginal seal. The reason is that this last factor, in conjunction with the absence of bacterial contamination during the procedure, is among the most important factors to consider in order to avoid subsequent pulp inflammation.[4,16] The success rate reported for vital pulp therapy procedures using MTA with a follow-up period of up to ten years is greater than 80%[17]—a fairly high percentage for a dental procedure within that functional period.

Produits Dentaires, Switzerland
www.pdsa.ch

Editorial note: A list of references is available from the publisher. This article was published in the 3/2018 issue of roots—international magazine of endodontics.