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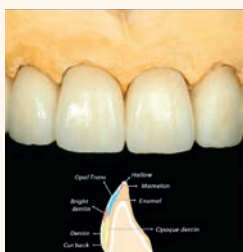
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Dr Claudio P. Fernandes about sustainability principles in dentistry, the preservation of natural resources and the economic dynamics of going green.

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Oral health education by itself ineffective

By DTI

MELBOURNE, Australia: Evaluating the effectiveness of oral health promotion strategies for preventing dental caries and periodontal disease among children, researchers from the Cochrane Public Health Group have found that oral health education alone, such as classroom lessons, videos, comics and brochures, was ineffective.

alone measure, had no significant impact on caries in permanent or primary teeth and surfaces. Nonetheless, some of the studies reported improvements in gingival health, oral hygiene behaviours and oral cleanliness, the review showed.

"There is a general perception that oral health education will change oral health risk behaviours and promote good

Cochrane Public Health Group, on the findings in an article on *DrBicuspid.com*. "However, this thinking is fundamentally flawed, as knowledge gained alone will not lead to sustained changes in oral health," Hegde emphasised.

When coupled with other measures, such as supervised toothbrushing with fluoridated toothpaste, oral health promotion interventions were generally found to be effective in reducing caries in children's primary teeth. Moreover, oral health education provided in an educational setting, combined with professional preventative oral care in a dental clinic, was effective in reducing caries in children's permanent teeth, the researchers found.

Another most promising intervention approach for reducing caries in children—although additional research is needed—appears to be improving access to fluoride in its various forms and reducing sugar consumption, Hegde told *Dental Tribune*. Generally, the findings of this review will have global implications in the area of models of oral health care delivery and oral health promotion, research, policy and practice, Hegde concluded.

The review, which was the first of its kind at an international level, included data on 119,789 children in 21 countries from studies conducted between January 1996 and April 2014. All of the studies reviewed focused on community-based oral health promotion interventions for preventing caries and periodontal

disease among children from birth to 18 years of age.

The review, titled "Community-based population-level interventions for promoting child oral health", was published online on 15 September in the Cochrane Database of Systematic Reviews.

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International researchers from the Cochrane Public Health Group have aimed to determine which promotion strategies are most effective and equitable in preventing poor oral health.

From analysis of the results of 38 international studies, the Cochrane researchers found that oral health education as a stand-

alone measure, had no significant impact on caries in permanent or primary teeth and surfaces. Nonetheless, some of the studies reported improvements in gingival health, oral hygiene behaviours and oral cleanliness, the review showed.

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First Indonesia Dental Exhibition and Congress to be held in 2017

By DTI

JAKARTA, Indonesia/COLOGNE, Germany: Exclusively catering to the needs of the Indonesian dental industry and dental professionals, the country's first comprehensive dental exhibition and congress will take place next year from 15 to 17 September at the Jakarta Convention Center. The event is being jointly organised by the Indonesian dental association (Persatuan Dokter Gigi Indonesia) and trade show organisers Koelnmesse and PT. Traya Eksibisi Internasional. It will be held in alternate years to the established IDEM Singapore, the leading dental exhibition and conference in the Asia-Pacific region.

Alongside IDEM, the Indonesia Dental Exhibition and Conference will be positioned as a designated regional event, the organisers said in a press release. It will consist of a two-day scientific conference featuring localised educational con-



tent and a three-day exhibition that will offer a platform for over 200 manufacturers to meet and do business in the emerging Indonesian dental market, which is one of the fastest growing in Asia.

"Although every edition of IDEM Singapore has enjoyed strong

support from Indonesian dental professionals we have come to recognise that there is still unrealised potential in the Indonesian market. Its healthcare industry is expected to grow by up to 20 per cent yearly, which points to an emerging need for a platform for dental professionals to learn

more about well-established and effective technologies, research and skills," Koelnmesse Managing Director Mathias Kuepper remarked.

Commenting on the decision to stage the new dental event, Dr Farichah Hanum, president of the Indonesian dental association, said that, by collaborating with two established exhibition organisers, dentistry in the country will hopefully be taken to new heights. "Indonesia has over 27,000 dentists nationwide, who face unique challenges in their daily practice," Hanum said. The city of Jakarta—representing over 5,000 dentists alone—was chosen to host the event because it is the country's central business and travel hub, he explained.

More information about the exhibition and the scientific programme will soon be available at www.indonesiadentalexpo.com.

Accuracy of optical scans and conventional silicone impressions

By DTI

IWATE, Japan: Aiming to evaluate the accuracy of digital impres-

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sions for use in implant placement, researchers from Iwate Medical University in Japan have compared optical impression

scans from an intraoral scanner with conventional silicone impressions. The analysis showed that the distance error of the optical impressions was slightly greater than that of the conventional method.

For many dental practitioners, digital technology has become vital in daily practice. Others, however, still rely on conventional methods used in the profession long before the introduction of digital alternatives. However, the question that arises in this connection is whether—apart from benefits such as being faster and often more convenient—digital methods are verifiably more accurate than traditional techniques.

Aiming to shed light on this issue, the Japanese researchers compared a virtual model created from a scan by an intraoral scanner to a working cast fabricated based on a conventional silicone impression technique. The evaluation was limited to the use of optical impressions for implant placement. For this purpose, the researchers placed two implant abutments (Nobel Biocare), one 5 mm and one 7 mm in height, in a master model.

To evaluate the error of the intra-oral scanner, the master model was scanned ten times with the Lava Chairside Oral Scanner

(Lava COS; 3M ESPE). To evaluate the error of conventional impressions, ten working casts were scanned with a computer numerical control coordinate measuring machine (Zeiss).

From comparison of the distance between two ball abutments that were connected to the implants, the researchers found that the trueness of distance error was 64.5 µm for the scanner and 22.5 µm for the working casts, making the conventional impression more accurate than the scanner.

For the 5 mm healing abutment, the mean angulation error of the Lava COS was greater than that of the working cast, indicating significant differences in trueness and precision, the researchers wrote. However, this was not observed for the 7 mm abutment.

As distance errors of the optical impression were slightly greater than that of the conventional impression, the researchers concluded that currently digital impressions are not equivalent replacements of conventional impressions for restorative procedures. However, they predicted that the development of information technology would most likely lead to improvement in the accuracy of optical impressions in the near future.

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Dental fillings may contribute to increased levels of mercury in the body

By DTI

ATHENS, USA: Although the potential adverse health effects of mercury have been the subject of debate for a long time, the extent to which dental fillings affect mercury levels in the body was still unclear. New research has now found that people with multiple dental fillings exhibited significantly elevated levels of mercury in their blood compared with people who did not have dental surface restorations.

The study, which analysed data from nearly 15,000 individuals, is the first to demonstrate a link between dental fillings and mercury exposure in a nationally representative population. The researchers found that patients with more than eight fillings had about 150 per cent more mercury in their blood than those with none.

They further analysed exposure by specific types of mercury and found a significant increase in methylmercury, the most toxic form of mercury, associated with dental fillings, suggesting that the human gut microbiota, a collection of microorganisms living in the intestines, may transform different types of mercury.

Mercury exposure from dental fillings is not a new concern, but previous studies were inconsistent and limited, according to Dr Xiaozhong Yu, co-author and Assistant Professor of Environmental Health Science at the University of Georgia's College of Public Health.

"This study is trying to provide the most accurate levels of exposure, which will form the scientific basis to make future risk assessment," Yu said.

In response to the study, the American Dental Association (ADA) issued a press statement at the end of September that clarified that the association's position on dental amalgam remains unchanged. "The mercury levels cited in the study did not exceed a level that according to the National Academy of Sciences would be known to cause adverse health effects. Thus no conclusions about the safety of dental amalgam should be drawn from this study. In addition, the study used data that included two different types of dental materials: composite, which does not contain mercury and dental amalgam, made from a combination of metals including silver, copper, tin and mercury. It is important to note that since the study does not differentiate between the two filling materials, the study's findings may be prone to over-interpretation," the ADA stated.

The ADA and the US Food and Drug Administration consider dental amalgam fillings safe for adults. However, they advise against its use in pregnant

women and children under the age of 6.

The study, titled "Associations of blood mercury, inorganic mer-

cury, methyl mercury and bisphenol A with dental surface restorations in the US population, NHANES 2003-2004 and 2010-2012," will be published in the De-

cember issue of the *Ecotoxicology and Environmental Safety* journal. It was conducted by researchers at the University of Georgia and the University of Washington.

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Convenient and reliable instrument reprocessing

An interview with Dr Diego Vezzoli, Italy, about the new Lisa steriliser from W&H

By DTI

Hygiene is of top priority for many dental practices. In addition to increased safety for both the practice team and the patients, the efficient structuring of workflows with state-of-the-art reprocessing technologies plays a particularly important role. Dr Diego Vezzoli, a dentist at the Studio Dentistico Eurodent in Palazzolo sull'Oglio in Italy has been using the new Lisa from W&H for several months. The W&H sterilizer provides support in the form of rapid, reliable instrument reprocessing for practice to cope with an average daily treatment volume of 20–40 patients. The 8-member practice team truly values the advantages offered by the new Lisa. In a recent interview, Dr Vezzoli spoke about the advantages of the new W&H sterilizer.

Particular attention was paid to a user-friendly menu design when developing the new Lisa. The four main menu points are intended to allow simple cycle selection. How do you rate the quality of the navigation concept? Does it make work easier for your practice team?

In my opinion, operation has been simplified even further and adapted to the requirements in the practice. Apart from the simple navigation, our assistants also appreciate the ergonomics of Lisa in their day-to-day work. These are two considerable advantages compared with the sterilizers that we used before. We're satisfied on all fronts.

Efficient, time-saving work is a focus of every modern dental practice. How would you assess Lisa's



Dr Diego Vezzoli is clearly delighted with the new Lisa. In addition to the simple integration in the hygiene process, the sterilizer also supports rapid and reliable reprocessing of instruments.

Nowadays, comprehensive quality management is a fundamental standard in every dental practice. At the same time, patient safety is always

afforded top priority. As such, complete documentation of sterilization cycles is indispensable. How does the new Lisa support you in this task?

The simplicity of the system is a considerable advantage. For example, you have the option of creating a label for the sealed sterile goods to confirm that they are sterile. The cycle is completed when the sealed instruments are opened in the patient's presence and the label is added to the patient's file. In addition to the professional hygiene processes, the patient is also aware of the safety and the high priority afforded to sterilization in our practice. The traceability offers the patient security and is also an important quality criterion in our practice.

Do you also use the new Lisa mobile app in your practice?

Our practice team loves the new tool! In my opinion, the Lisa Mobile App can offer valuable support in times with high work volumes and it helps with the optimization of workflows.

What do you think of the design of the new Lisa? Would you describe the dimensions as "practical"?

I think that Lisa fits into rooms well. The compact dimensions and flexible front feet make it easy to integrate the sterilizer in our hygiene workflows.

To finish off, could we ask for your personal evaluation of the new Lisa?

I'm very satisfied with my investment. And it's not just me, my practice colleagues are also very happy with the new Lisa.

Thank you for your time!

“The simplicity of the system is a considerable advantage.”

What role does the new Lisa play in the hygiene cycle in your practice?

Dr Vezzoli: It is very important. The new Lisa sterilizer from W&H boasts optimized cycle times and thus speeds up our day-to-day work. The reprocessing time between patient treatments is now very short, so the instruments are rapidly available for the next use.

accelerated type B cycle (patented Eco Dry technology)?

In addition to a rapid sterilization cycle and low energy consumption, the processing time is also noticeably shorter. What's more, the shorter sterilization cycle takes less of a toll on the instruments and they therefore enjoy a longer service life.

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“Going green is our business, not somebody else’s, but everybody’s responsibility”

An interview with Dr Claudio Pinheiro Fernandes, Brazil

By Kristin Hübner, DTI

Measures to reduce waste and pollution and to conserve natural resources such as water and energy already play a major role in many aspects of daily life. Likewise, acting in an environmentally friendly manner is becoming increasingly important in dentistry as well. *Dental Tribune* spoke with Dr Claudio Pinheiro Fernandes, head of the Sustainable Dentistry Center at Fluminense Federal University in Nova Friburgo in Brazil and consultant to the FDI World Dental Federation’s Science Committee, about sustainability principles in dentistry, the preservation of natural resources and the economic dynamics of going green.

Dental Tribune: Being environmentally friendly is becoming increasingly important in everyday life. When did this topic first gain momentum in dentistry?

Dr Claudio Pinheiro Fernandes: Sustainability is relevant to everyone and we face this challenge every day. Every single newspaper that one opens includes some-

thing about climate change or sustainable development. It is the responsibility of dentistry too to become involved as a profession to pursue sustainability in the field of oral health for the good of society.

The dental profession is being challenged by the increasing demand for better oral health care for more people in more countries than ever. At the same time, we have the challenge of needing to do so using less resources. In this context, the question of how exactly we are to do that arises.

What can dentists do and what defines a sustainable practice?

As dentists, we have to realise that there are certain aspects and areas of our work that can be organised better. From a procedural point of view and concerning the equipment used, there are certain sustainability principles to consider. Take a simple example: when one buys a refrigerator or an air conditioner today, one looks for energy efficiency labels that indicate



Dr Claudio Pinheiro Fernandes

the most efficient device in terms of its energy use. This means that it is good both for one’s pocket, being

cheaper to run, and for the environment, since it needs less energy. Why do we not have this kind of

labelling on dental equipment? We could introduce energy-efficient dental equipment, with labels indicating the device’s energy use. That would be one way of going green.

Another thing to keep in mind is how much water we use. That is an extremely important issue in dentistry. A dentist uses eight times more water than the average person does—a large volume! Usually the equipment used in daily practice causes this high consumption. For example, some brands of suction equipment use clean water to drive the suction mechanism. On average, they use 200 litres per hour and this water goes from the pumps directly to the drain. Of course, suction is important, but could we not apply different technologies to achieve the same results? Do we have to waste clean water for this?

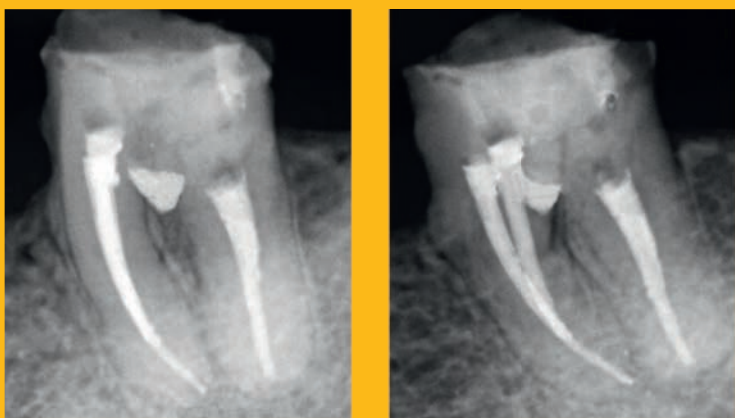
In many respects, dentists cannot implement a shift themselves alone; awareness of the importance of sustainability is important on the company side as well.

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That is why the FDI is taking a stand on the sustainability issue right now. The whole thing started back in 2012 during the Rio+20 meeting, the United Nations Conference on Sustainable Development, in which the FDI had decided to participate. Back then, we had already begun collecting information and thinking about what we could do in dentistry. I represented the FDI in those meetings and I was able to see how much we could do even without going to a great deal of trouble. For example, the most sustainable thing to do is to focus on prevention. If we act on prevention of oral disease, this would reduce the need for extensive treatment and the related use of products and, in particular, the associated generation of a large volume of waste, as well as the substantial amount of water and energy required, and the large carbon footprint that all of this creates.

Speaking of waste management, what should dentists consider?

A great deal of waste is generated in dentistry and some of it very toxic. Another issue that the FDI has pursued is the Minamata Convention on Mercury, which includes the phase-down of dental amalgam. We have to face our responsibility of dealing with amalgam waste, for example. Nordic countries are a good example in this regard, having implemented well-established amalgam management practices for many years.

One area in which we could do a great deal more is the management of recyclable materials. All the disposable materials that we use in dentistry generate hundreds of kilograms of waste every day. What can we do to address recycling of those materials? A considerable amount of waste is generated with disposable barriers, gloves and masks. Much of this could be safely recycled with current technologies.

How open is the dental community regarding this? When it comes to change, such as going digital, there are early adopters and some that find it difficult to adjust to something new.

That is a good point. Digital dentistry represents a different mindset on production. The primary objective is to have more control and to be more efficient in production; however, a third point is that digital technology generates less emissions, since there is less transportation and less product waste. This is just one example that serves to demonstrate that there are many more efficient means of manufacture. Certainly, digital dentistry is one of those areas of increasing technology use that results in greater sustainability. Science, technology and innovation play a key role in most areas of business. Improvements in efficiency, accessibility and cost-effectiveness of products and processes may allow fulfilment of global need in a more sustainable way. Furthermore, dental research

“By utilising the environment in an intelligent, sustainable manner, we allow society to develop in a healthy way.”

needs to be directed towards improving sustainability in dentistry.

Dentistry may be considered a very conservative profession. How difficult is it to change the predominant mindset?

We are doing that already. One way or another, people are coming to realise that going green is our business, not somebody else's, but everybody's responsibility. We as dentists have to play our part as well. In addition to efficient equipment and waste management, we should consider the topic of recycling, particularly in light of all the products that we use in daily practice.

I think that the most important thing is education. We need to include education on sustainable development in undergraduate programmes and in continuing education programmes. That way, new and experienced dentists alike will learn how to actually practise environmentally friendly dentistry. The national dental associations too can do a great deal to increase awareness and promote sustainable development. A good example is the Norwegian Dental Association, which has decided to include sustainability aspects of dentistry in its agenda.

What is the situation right now? Is the topic covered in the curriculum at all?

There is a great deal going on right now. I would say that we are in the moment of great activity. For example, the International Organization for Standardization has developed very good materials for action. There is also a United Nations Educational, Scientific and Cultural Organization platform for integrating education on sustainable development. It is called Education for Sustainable Development. In addition, it should be noted that many universities are already going green today. So, there is progress.

Behind it all, there is one driving force, the United Nations' 2030 Agenda for Sustainable Development. This agenda has defined 17 sustainable development goals that were adopted by all member states in September 2015. This is very recent, but we are on a schedule of looking into the reduction of poverty, the reduction of hunger, better health for more people and more educational opportunities—a number of issues that will improve the environment on the one hand, as well as social and economic development on the other. By utilising the environment in an intelligent, sustainable manner, we

allow society to develop in a healthy way. We need to have jobs, we need to produce, but we can all do that in a responsible manner and at the same time sustain a good economy.

When it comes to food and clothing, an eco-friendly lifestyle is often more expensive than the alternative. For dentists, is there an economic barrier to going green as well?

Yes, there are challenges regarding entry, and investment is required because everything must be reoriented to the future. As with everything, it is very difficult to start all over again, but when attitudes change, when den-

tists actively decide to pursue sustainability, then they will start reviewing their own procedures and little by little implement change. The good news is that, once one actually starts to implement a sustainable approach, it becomes evident that energy and resources were wasted before—which is not a good business strategy. There will be a return on investment. One's patients, one's clients and the public will recognise one as an active member of a responsible society. It will take time and effort, but the dental profession will achieve this.

So in the future it could be a selling point for companies to identify themselves as “green”.

Yes, this is already happening in many business areas, because the public is driving sustainability awareness by seeking more sustainable alternatives. As always, there may be some companies that already say that about themselves even if they have not achieved that yet. However, standards have already been established to determine whether certain things have been applied. Based on these indicators of sustainability, auditors and reviewers are able to evaluate objectively whether sustainability is being achieved by the company.

Of course, investment is required in the beginning. However, some business reports indicate that going green can save as much as 40 per cent of costs on water, energy and unnecessary product waste, which is a great deal of money. Many companies, big and small, are already considering it their corporate responsibility to act for the social and environmental good.

Thank you very much for the interview.

AD

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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 but also a pioneer in research on oral prophylaxis, interdental biofilm management and interdental brushing techniques. He was the first to test for 19 major pathogens in the interdental biofilm known to be involved in periodontitis in young healthy adults. Furthermore, he has suggested interdental brushes to prevent interdental biofilm accumulation as well as to decrease the development of periodontal diseases and even systemic diseases. "An interdental brush can remove around 16 billion bacteria from each interdental space," said Bourgeois during his presentation at the FDI Annual World Dental Congress in Poznań, Poland.

Despite advances in good oral health care, many patients and dental professionals remain uncertain about oral physiopathology and the concept of disruption of biofilm instead of elimination of dental plaque. According to various studies, conventional toothbrushing is not effective in removing interproximal plaque successfully. Recommendations on oral hygiene practices from dental practitioners have focused on the methods of daily toothbrushing and interdental cleaning instruments as standard for achieving and maintaining good oral health. However, uncertainty has remained about oral physiopathology and the concept of disruption of interdental biofilm.

Sixteen billion bacteria in one interdental site

So why does interdental cleaning actually matter? The anatomy of the interdental space does not allow for an efficient salivary self-cleaning mechanism and makes cleaning this area difficult. As a means of further understanding the mechanism of periodontal pathologies, Bourgeois was the first to use real-time polymerase chain reaction to quantify and qualify the interdental biofilm in healthy adults and explain the role of interdental biofilm management in preventative oral health.

In his study, an astounding approximately 16 billion bacteria were collected on average from each interdental site. 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. *P. gingivalis* was detected in 19 per cent of healthy subjects and represented 0.02 per cent of the interdental biofilm. As dental research has confirmed, *P. gingivalis* alone can induce alveolar bone loss, and in combination with *T. denticola* and *T. forsythia*, periodontal disease is likely to occur. This means that the inter-

ease or clinical gingivitis have experienced interdental bleeding at least once. This information should be considered critical for daily oral hygiene and interdental cleaning in particular. "There is a need to use interdental cleaning tools in order to achieve optimum oral health. If you do not use them, you could essentially stop using a toothbrush, as bleeding

week and 71 per cent after three months. Bourgeois and his team concluded that interdental cleaning can be considered as "an effective means to help individuals maintain and/or achieve optimal oral health."

As the general access widths of interdental spaces were mostly unknown in young adults, Bour-

CPS Prime series. As a result, the study concluded that most interdental sites can be cleaned using interdental brushes, but accessibility of interdental spaces would need to be established in the dental practice by the dental professional.

Interdental brushes prove to be superior

Conventionally, interdental brushes were only recommended for patients with large interdental spaces, while dental floss was recommended for narrow spaces. As technology advanced, so did the innovation with interdental brushes, and as a result, interdental brushes can now be used for very small interdental spaces to clean the space between teeth effectively. "Dental floss used to be the common tool for narrow spaces. However, dental floss is no longer preferred, as its use is not supported by conclusive scientific evidence. For interdental brushes, we have scientific evidence. Interdental brushes have now become the best tool for cleaning interdental spaces," said Bourgeois.

As Bourgeois concluded at the end of his presentation, "The interdental brush currently represents the primary and most effective method available for interproximal cleaning. Interdental brushes are specifically designed to clean between the teeth in accordance with the interdental space access diameter. The method of choice for interdental cleaning when brush space permits is to select the largest size that can penetrate into the interdental space and then to fill this space completely without causing discomfort or trauma." By using a calibrating Curaprox IAP colorimetric probe, a suitably sized interdental brush will help individuals achieve optimal biofilm disruption through thorough interdental cleaning with minimal trauma.

For all studies, Bourgeois and his team selected the CPS prime series of interdental brushes of the Swiss oral care brand CURAPROX.

More information can be found at www.curaprox.com.

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Prof. Denis Bourgeois spoke about the efficacy of CURAPROX interdental brushes during his presentation at the FDI congress in Poland this year.

dental biofilm of even healthy individuals is composed of bacteria that could lead to periodontitis. "The effective presence of these periodontal pathogens is a strong indicator of the need to develop

will occur otherwise anyway in the future."

In a study titled "Efficacy of interdental calibrated brushes on bleeding reduction in adults: a

geois and his colleagues also assessed the distribution of these widths in this group in a study titled "Access to interdental brushing in periodontal healthy young adults: A cross-sectional study".

"There is a need to use interdental cleaning tools in order to achieve optimum oral health."

new methods for disrupting interdental biofilm in daily oral hygiene," concluded Bourgeois.

Bleeding as a clinical reference

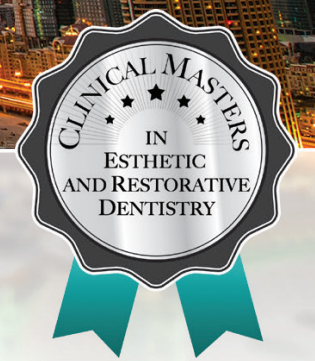
Despite good oral hygiene habits, many patients experience interdental bleeding. "As we have seen, the interdental space is a source of bacterial contamination and has an effect on overall health," said Bourgeois in his presentation. According to the latest research, 41 per cent of young adults without periodontal dis-

3-month randomized controlled clinical trial", a test group was asked to use a standard manual toothbrush twice daily and an interdental brush daily. Based on the hypothesis that interdental brushes reduce interproximal bleeding, Bourgeois and his team instructed periodontally healthy and young individuals how to use interdental brushes daily and correctly. In addition, a calibrated colorimetric probe helped to effectively determine the interdental space and right brush size. As the study suggests, the overall interproximal bleeding was reduced by 47 per cent after one

Importantly, 40 per cent of the sites studied showed bleeding upon passage of an interdental brush. An unexpected finding was the high number of adults (69.9 per cent) with greater than 30 per cent of bleeding sites. It was observed that this did not have a significant effect on the width of the interdental space. By measuring the interproximal space, the researchers concluded that the latest generation of interdental brushes was able to access 94 per cent of interdental spaces. Over 80 per cent of the sites required a small-diameter interdental brush (0.6–0.7 mm) from the Curaprox



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