Study finds DNA vaccine to inhibit caries formation

Daniel Zimmermann

HONG KONG/LEIPZIG, Germany: A research group from the Chinese Academy of Sciences in Beijing has taken another step towards development of a caries vaccine. (DTI/Photo Diego Cervo)

Researchers from China have taken another step forwards development of a caries vaccine. Researchers from China have taken another step forwards development of a caries vaccine. Researchers from China have taken another step forwards development of a caries vaccine. Researchers from China have taken another step forwards development of a caries vaccine. Researchers from China have taken another step forwards development of a caries vaccine.

The admitted that low immunogenecity which is the ability to provoke an immune response is still relatively low in the vaccine. "Animal experimentation with this vaccine and route of administration have been reported over the past several years, "explains Dr Daniel Smith, an immunology specialist and member of the Forsyth Institute in the US, to DT Asia Pacific. "The new feature here is the use of flagellin as an adjuvant which seems to give a modest improvement in antibody levels."

Other substances currently in preclinical experimentation for use as a caries vaccine are other recombinant proteins and glucan-protein conjugates. According to Smith, human trials however cannot be expected to be realised anytime soon.

Better oral health for Vietnam

The Vietnamese government is doing well in its efforts to improve the oral health of schoolchildren. Minister of Health Nguyen Thi Kim Tien has said. Speaking at the Sixth Asian Conference on Oral Health Promotion for School Children last month in Hanoi, she revealed that 10 million school children are now receiving regular dental care through the country's national oral health programme.

According to results of the last National Oral Health Survey conducted in 2001, more than 85 per cent of six-year-olds in the country suffer from tooth decay. Tien said that although the programme has achieved good results, still only 55 per cent of hospitals nationwide offer dental services.

Most dental professionals are also based in cities, making it difficult for people living in rural areas to get any dental treatment at all, she said.

Dental implants receive recognition

Dental implant maker Hung Chun Bio-S from Southern Taiwan has been given a product award for its T-one 101 implants by the Institute for Biotechnology and Medicine Industry at the recent National Innovation Awards in Taipei.

Operating from Taiwan's major port city Kaohsiung, Hung Chun Bio-S has been active in the national and international implant markets since early 2011. Director of Research and Development Lui Chich Chen told reporters in his company, which invested US$10 million in its implant portfolio, has gained a five per cent market share within the last 11 months.

Taiwan's US$50 million dental implant market is still dominated by companies from Europe, Korea and the US. In 2008, for example, Nobel Biocare entered the market with the acquisition of its Taipei-based distributor Implant Master. National industry sources estimate that the number of implants placed is growing by almost 20 per cent each year.

Besides Hung Chun Bio-S, local competition includes bio-ceramics manufacturer Cauho Technology in Taichung. The Vietnamese government is doing well in its efforts to improve the oral health of schoolchildren. Minister of Health Nguyen Thi Kim Tien has said. Speaking at the Sixth Asian Conference on Oral Health Promotion for School Children last month in Hanoi, she revealed that 10 million school children are now receiving regular dental care through the country's national oral health programme.

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Human jaw shrinks with age

The size of the human jaw decreases with age, research conducted at the Malmi University Faculty of Dentistry in Sweden has found. According to study, which followed 50 participants over a timespan of 40 years, less room was available for teeth in the jaw of each individual with increasing age.

Fortis buys Singapore unit

India's largest provider of health care clinics and services has agreed to pay more than half a billion US Dollar to buy Singapore-based Fortis Healthcare International PTE from RHC in Mauritius. The record deal is expected to be completed by mid-December depending on regulatory approval.

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Disagreement brews over use of botox in Australian dentistry

From news reports

MELBOURNE, Australia: The use of botulinum toxin (botox) in dentistry is causing debate amongst the dental community in Australia. The discussion came to a head recently after the Australian Academy of Dento-Facial Aesthetics (AADFA) issued a letter to the Dental Board of Australia (DBA), the government-­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­‐­¬
Students of Medicine and Dentistry are not the ones to blame for the hundreds of millions of loans overdue under the Student Loan Scheme, New Zealand’s Tertiary Education Minister Steven Joyce said on Monday. In its 2011 report, released in October, the Ministry of Education found that there are over 2,600 students with piling debts of more than NZ$100,000 (US$81,300) each, with pilots and serial students being the worst payers.

Although in the group with the highest loans, medical and dental graduates are usually the ones who are able to pay back their loans quickly, Joyce commented. He said that almost one million students have received money from the government since the implementation of the scheme in 1992. The total amount of debt currently exceeds NZ$600 million (US$488 million), almost 0.5 per cent of the country’s gross domestic product.

Joyce announced initiatives to amend the scheme in order to reduce the amount of debt of groups who owe the ministry the most, especially those living overseas. The loan amount of borrowers there has increased by 27 per cent within the last 12 months. Legal action will be also taken against some borrowers living in Australia and the UK who have not made any effort to pay back their dues, he said.

With NZ$80,000 (US$65,000), dentistry tops the list of occupations with the highest average starting salaries, according to latest figures from Careers New Zealand, a government agency based in Wellington. This amount can almost double within five years of practice to NZ$150,000 (US$121,900).
Dear reader,

Daniel Zimmermann

Last year one of these pages I already talked much about Asia’s prospects in dentistry. Looking back at the last 12 months, nothing could be more relevant today. With debts soaring and markets plunging in almost all developed markets, established systems of social and health care are getting under increasing financial stress. This development will have an effect not only on many people but also on the industry, which is already looking at the Far East for profits.

With the majority being only at the beginning of their development cycle, however, Asian countries should carefully watch which is already looking at the market. Established systems of development in the West in order to avoid repeating the same mistakes. There is no doubt that growth is important for the survival of every society but it also has become quite clear that uncontrolled distribution of resources and welfare only leads to turmoil. Asians should be aware that all our future will depend much on how seriously they are willing to take these principles.

With this in mind, the Asia Pacific editorial team wishes you a happy and successful year 2012.

Yours sincerely,
Daniel Zimmermann
Group Editor
Dental Tribune International

Use of botox is a medical procedure

Prof. Laurence J. Walsh

The use of botox for treating TMJ dysfunction and spasms in the muscles of mastication is a well-accepted part of clinical practice, particularly for oral and maxillo-facial surgeons, with a growing evidence base supporting safety and efficacy. Severe bruxism or jaw-closing dystonia unresponsive to other treatments can be treated by injecting Botox-A into the masseter muscles.

The Dental Board of Australia’s interim policy on the use of botox permits the use of botulinium toxin by registered dentists with the necessary education, training and competence for the treatment of TMJ disorder or dysfunction. A general dentist is not sufficiently conversant with the indications for using Botox-A to treat wrinkles as opposed to other skin treatments such as laser resurfacing, dermabrasion or Retin-A therapy.

The arguments against allowing use of botox for wrinkle reduction and other cosmetic treatments are threefold. Firstly, the principles of pharmacology that underpin the use of botox are covered in dentistry programmes at a very basic level, which is not a sufficient foundation for clinical use because of the lack of detailed pharmacology and therapeutics (dosages, side-effects, etc.). Secondly, the detailed anatomy of the mid-face, orbit, upper face and neck is not covered in dental training at a level sufficient for the safe use of botox. The fact that we as dentists are experienced at administering injections of local anaesthetic solutions into the oral and peri-oral regions does not mean it is appropriate for dentists to inject botox across the neck and face. Finally, the use of botox for cosmetic purposes is part of cosmetic medicine (or beauty therapy) and does not form part of the practice of dentistry. Its use for cosmetic purposes should be confined to appropriately trained medical practitioners, and should be considered a medical procedure.
New study targets dental drills for hearing loss

Daniel Zimmermann

NEW YORK CITY, USA/LEIPZIG, Germany: An audiology student who is investigating the effects of noise from dental drills on dentists has won a National Hearing Conservation Association 2011/2012 research award. In her study, Krisztina Busci Johnson from the East Tennessee State University in Johnson City seeks to determine whether rotating instruments used in dentistry take their toll on dentists’ hearing function.

Johnson is not the first scientist to look into a possible connection between dental drills and hearing loss in dental professionals. Research on this topic dates back to the early 1980s, when a study published by the “American Journal of Public Health” found a cause and effect relationship between hearing loss and the use of the high-speed dental handpieces.

Results, however, remain inconclusive, as a recent study conducted by the Institute for Evaluation in Cologne in Germany found that noise from rotating instruments did not go beyond 85 to 90 decibels, the limit commonly associated with permanent inner ear damage. This level of noise is typically created by subway trains driving at high speeds or heavy traffic.

Being a dental assistant for eight years herself, Johnson intends to measure and compare data on the hearing threshold of dentists drilling without hearing protection over a period of a working day. She is currently seeking participants in the Johnston City area, who will also receive a free clinical hearing evaluation during the process. If successful, she hopes to be able to persuade dentists to use better hearing protection and to widen the study to include dental assistants or hygienists.

“Another possibility is that the data could persuade dental drill manufacturers to produce drills that are safer for the human ear,” she said.

Manufacturers of modern dental drills usually do not recommend using ear protection during operations, saying that the technology has become quieter over the years and their running time has significantly decreased. According to the NHCA, a second research award went to a University of Florida research assistant who is investigating hearing threshold changes induced by digital audio players.

The annual trophy comes with prize money of $5,000.

2012 WDF to be held in Hong Kong

From news reports

BELLEVUE, Wash., USA: Modern Dental Laboratories has announced that registration for its second World Dental Forum in Hong Kong in 2012 is now open to dentists in the United States. The event will be held in conjunction with the centennial anniversary of the University of Hong Kong and feature educational offerings in English ranging from subjects like dental restorations to endodontics, implant dentistry or sleep medicine.

With its Shenzhen dental lab north of Hong Kong, Modern Dental Laboratory says to be one of the largest global providers of ISO 13485:2003 certified dental work. It also maintains one of the largest dental technology school worldwide with a staff of 3,000.

The company’s first congress was held in fall 2009 and saw more than 200 dentists from Europe, North America and Asia learning and discussing new trends in the global dental industry. Next year’s event has confirmed presentations from US dental researchers Drs John Burgess and Jack Ferracane and will be held at the Grand Hyatt hotel from 31 May to 3 June.

Participants will be also able to earn up to 16 AGD approved CE credit hours, the company said.

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New study targets dental drills for hearing loss

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New study targets dental drills for hearing loss

Tetric® N-Collection
A complete nano-optimized restorative system
A durian a day keeps caries away, research from Asia suggests

From news reports

LAS VEGAS, Nev., USA: A sugary gel covering the thorn-covered husks of the durian fruit is currently being investigated by researchers for its potential as a mouth disinfectant. Students from the Faculty of Dentistry at Chulalongkorn University in Bangkok, Thailand, recently presented their initial findings at the Annual Meeting of the American Dental Association in Las Vegas, the website drbiscus.com has reported.

They found that the substance made of polysaccharides was able to reduce the number of Streptococcus mutans bacteria in lab rats hours after use, which would make it as effective as 0.2 % chlorhexidine, a common formula used in mouth rinses. Studies on human subjects also showed a reduction of hydrogen sulphide, methyl mercaptan, and dimethyl sulphide, compounds responsible for halitosis or bad breath. No evidence of treatment-related gross toxicity or deaths caused by exposure to mouth rinsing with durian polysaccharide gel was observed, the researchers stated.

Durian is popular in many Southeast Asian countries, including Thailand and Malaysia, which are the world’s largest importers of the fruit. Its roots and leaves are often used in traditional medicine.

Earlier research conducted on durian polysaccharide gel confirmed the antibacterial properties of the gel.

Caries investigated by nanotech

From news reports

BASEL/VILLIGEN, Switzerland: Researchers at the University of Basel and the Paul Scherrer Institute, the largest research centre for natural and engineering sciences within Switzerland, have successfully demonstrated how caries affects human teeth at a nano-level. Their study offers new possibilities for the treatment of tooth damage.

Dentine consists mainly of inorganic elements but a fifth is composed of organic material. It was previously hypothesised that these organic components—especially certain endogenous structural proteins (collagen)—were unaffected by damage to the dentine and that their structure could offer a basis for remineralisation. To test this hypothesis, the research team, led by Prof. Bert Müller at the Biomatериалs Science Center at the University of Basel, used X-ray scattering to compare the density of collagen in healthy and carious tooth spots.

The researchers cut both healthy and carious teeth into thin slices of 0.2 to 0.5 mm and examined them using small-angle X-ray scattering, a technique used for the structural characterisation of solid and fluid materials in the nanometre range.

They observed that carious bacteria initially destroy the ceramic components of the outer enamel and the subjacent dentine. In contrast, in the early to mid-carious state, a significant part of the dentinal collagen network remains practically unaffected.

Hence, the researchers suggest that in the future their method will allow the development of biometric dental fillings and cavity treatments that are based on an undamaged dentinal collagen network, and allow the remineralisation of damaged dentine, for example, with nanoparticles.
Forsyth starts commercialization of blue light gum treatment technology

From news reports

BOSTON, Mass., USA: The Forsyth Institute in Boston has signed an exclusive licensing agreement with a US-based start-up for the commercialisation of a recently patented blue-light based technology for use in dentistry. Under the terms of the contract, Lexington-based PhotOral will be allowed to support the development and marketing of an intraoral cleaning system working against bacteria that cause gingivitis.

The promising technology was developed and first documented by Forsyth researchers Nikos Soukos and Max Goodson. They found that light with a particular wavelength, typically used in teeth whitening procedures, did also eradicate so-called “black-pigmented bacteria” that are responsible for the inflammation of gum tissue. In addition, their study showed that the proportion of other healthy bacteria increased.

“This suggests that it might one day be feasible to use light to restore a healthy bacterial balance in the mouth,” Soukos told the university paper Harvard Gazette in 2005.

According to PhotOral CEO Stamatis Astra, a Boston University business graduate and radio talk show host, a prototype of the device is expected to be available within the next 12 to 18 months. He said that it will be targeted at the consumer market and be priced at US$90 dollars. His company would now be in the process of raising a sum of US$10 million for financing first clinical trials, production and marketing.

Astra told the New England technology journal Mass High Tech that the technology could also be used in the future to disinfecting wounds.

Birth after oral cancer treatment

Lisa Townshend
DT UK

LEAMINGTON SPA, UK: A British mother has made medical history after successfully giving birth having had chemotherapy cancer treatment during her pregnancy. Thirty-year-old mum-to-be Sarah Best from Leamington Spa was diagnosed with mouth cancer when she was four months pregnant and was told that if she did not opt to have radiotherapy the cancer was sure to spread.

As Best underwent radiotherapy and chemotherapy treatment to treat the mouth cancer, two five-cm thick lead shields were used to protect baby Jake from the radio waves. Best unexpectedly gave birth to a healthy baby boy just hours after receiving her last course of radiotherapy.

“I was devastated when I was told I had cancer,” Best, who had an operation to remove a tumour from her tongue, was quoted saying in The Telegraph. “The surgeons managed to remove most of it but they said they saw specks of cancer cells on my lymph nodes. I thought pregnancy was supposed to be the happiest time. You are supposed to feel wonderful. I was really worried about the effect the radiotherapy could have on the baby but the doctors said the lead shield would protect him.”

Best said she was expecting to have Jake at least a month after her treatment ended but suddenly went into labour on the last day of her treatment.

Meanwhile, she has been given the all clear from cancer. Consultant oncoloigist Lydia Fresco, who helped design and build the lead guard for Sarah, said in The Telegraph: “Sarah’s case was extremely rare. As far as published cases go she was the only woman with mouth cancer in the world to have this combination of chemotherapy and radiotherapy while pregnant.”
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The 2011 FDI Annual World Dental Congress in figures

With entry free-of-charge, just under 5,500 square metres of exhibition space, some 27,000 visitors, 200 exhibitors and nearly 1,000 exhibition staff, 2011 proved to be the largest FDI World Dental Exhibition in recent years. Jointly organized by FDI and the Mexican Dental Industry (AMIC), it was held alongside the 2011 FDI Annual World Dental Congress at the Centro Banamex Convention Centre, Mexico City, from 14–17 September 2011.

Over 5,000 individuals, principally dental practitioners, but also hygienists and students, participated in the sessions and meetings scheduled in and around the event. The four-day Scientific Programme, held under the theme ‘New horizons in oral health care’, featured 112 scientific sessions facilitated by more than 128 speakers from 29 different countries.

Sessions covered a wide range of issues, from oral health and noncommunicable diseases to caries management, from patient safety to salivary diagnostics and from to oral and maxillofacial surgery to orthodontics—in fact full coverage of the today’s key areas of interest and discussion in dental art, science and practice.

In addition, 121 scientific posters were on display and 59 free communications were presented. The three winners of the 2011 FDI Poster Award Competition were announced during the VIP reception on 14 September. They are Assoc. Prof. Josimert Hebling from Brazil, Assoc. Prof. Azzia Eldar-Rat from the United Arab Emirates and Prof. Hyun-Duck Kim from South Korea.

In all, 98 nationalities were represented at the 2011 FDI Annual World Dental Congress.

FDI Hong Kong 2012 briefing

FDI recently held a site visit and briefing in Hong Kong for an audience comprising members of the dental industry, representatives from the Hong Kong Dental Association, and key providers. The aim was to detail the numerous opportunities at the 2012 Annual World Dental Congress as well as respond to questions.

Those present included sponsors from 19 companies, of which 8 are current FDI corporate partners—in all some 80 industry representatives, mainly from China but also from Australia, France and Singapore. The briefing, which took place on 17 October, also allowed all parties to familiarize themselves with the venue.

“FDI recently held a site visit and briefing in Hong Kong for an audience comprising members of the dental industry, representatives from the Hong Kong Dental Association, and key providers. The aim was to detail the numerous opportunities at the 2012 Annual World Dental Congress as well as respond to questions.”

Meanwhile, the Congress website will soon be open, with a preliminary programme online by the end of November.

FDI President: high-level meetings on India visit

On his first official visit—at the invitation of one of FDI’s members and valued partner in ‘Leading the world to optimal oral health, the Indian Dental Association (IDA)—FDI President Orlando Monteiro da Silva addressed local events, consolidated links with regional branches of IDA and held high-level meetings with government officials.

The trip took in three of the country’s major cities. His first stop, 25 September, was in Chennai, where he addressed a vast audience of dentists and dental students at the opening ceremony of a ‘Dental-medical interaction Symposium’, organized by IDA’s Greater Chennai Branch and the Sri Ramachandra University.

IDA President Dr. George Thomas was present as guest of honour. Other dignitaries present included Dr Gunaseelan Rajan and Dr S. Murugakun, respectively President and Hon. Secretary of the IDA-Greater Chennai Branch, and Dr R. Suresh, Dean of the Dental Faculty Sri Ramachandra University. The visit included a view of the university’s medical, pharmaceutical and nurse training facilities.

The following day, Dr da Silva was in Kolkata, where he briefed a highly receptive audience, among them Mr Sudip Bandhopadhyay, Minister of State (Health), on FDI advocacy and activities in the field of noncommunicable diseases. As well as IDA representatives, the audience comprised government officials from all over India, members of the Indian Dental Council, notably IDC President Dr Dhyendu Marumbar and Vice-president Dr Mahesh Verma, and faculty from a number of universities.

Mumbai, 25 September, was Dr da Silva’s last port of call. There he once again had the opportunity of carrying out a presentation of FDI and outlining its vision and activities to members of the local chapter of IDA, officials from the regional government, and dental from local universities.

During the course of Dr da Silva’s visit, IDA officials expressed their keen support for FDI to launch a Continuing Education Accreditation System and outlined their intention of presenting a specific proposal.

Commented Dr da Silva, “I was genuinely moved by the warm reception I received everywhere travelled and by the enthusiasm of IDA, local politicians and academia on FDI’s work and what it is trying to achieve.”

“More specifically, I received very clear signals from a major FDI contributor: we really need to move forward on continuing education.”
Oral diseases are obstacles to development, says UNDP

The Administrator of the United Nations Development Programme, Helen Clark, has called oral diseases “obstacles to development”.

In her address, “Intersectoral Collaboration to Advance Social Economic Development and Achievement of the Millennium Development Goals”, she highlighted the development impact of oral diseases.

“Low and middle income countries face variably alarmingly high and/or rapidly increasing rates of oral diseases, including tooth decay, cancers, and Noma. These challenges can be exacerbated by weak health system capacity, and by a lack of focus on oral health, despite its importance for sustaining overall health.”

The result, said Ms Clark, “is unnecessary death and disability on a large scale from oral diseases.”

Deep concern

The 19 September UN Summit side event was sponsored by the United Republic of Tanzania and co-sponsored by Australia and Sweden. In his keynote address, Tanzanian President Jakaya M. Kikwete expressed his deep concern over the burden of oral diseases in his country and other resource-constrained countries.

The event was moderated by Ali Veshli, Anchor and Chief Business Correspondent for CNN and included discussion of the “Global Burden of Oral Diseases: Common Risk Factors”, “Connecting Oral Diseases to Non-Communicable Diseases” and “Integrating Oral Health into Primary Health Care—Practical Solutions”. Present at the event, FDI President Orlando Monteiro da Silva, said “We were very impressed by the debate and discussions and learned a lot about the impact of oral diseases on developing countries. I certainly came away with a much better sense of the extent of the problem and possible solutions.”

Also present, FDI Executive Director, Jean-Luc Eiselé, added: “FDI is clear that FDI very much needs to have at its fingertips. It will inform and advise our current strategy on Africa.”

FDI omnipresent during United Nations Summit

FDI was omnipresent in New York during the two-day United Nations Summit on noncommunicable diseases both to attend the Summit and to promote and disseminate the newly-published World Health Professions Alliance WHPA Action Toolkit.

FDI President Dr Orlando Monteiro da Silva and Executive Director Jean-Luc Eiselé attended the Summit to hear presentations from ministers of health and a number of international dignitaries, including WHO Director General Dr Margaret Chan.

She called the Summit “a wake-up call for governments” and cautioned that NCDs “are the diseases that break the bank”. She added, “These challenges can be exacerbated by weak health system capacity, and by a lack of focus on oral health, despite its importance for sustaining overall health.”

FDI followed this up on 10 August with a direct appeal to UN General Assembly Chair, H.E. Joseph Deiss, with copy to Sir George Alleyne, former PAHO Director General and chairman of the drafting committee for the outcome document, indicating specific changes FDI was requesting.

Commenting FIDI’s successful campaign, FDI President Orlando Monteiro da Silva said “We could never have achieved our goals without the timely action of some NDA’s who took our advice and alerted their health authorities to the problem.”

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FDI + NDAs = success at UN Summit

This reflects a view that FDI has long expressed. Yet, in early July, FDI had to admit in a letter to its NDAs that the feedback received indicated that, at this point, oral health still has little support and is unlikely to figure in the Final Declaration unless at the specific request of member governments.

This was despite two interventions, the first at the World Health Assembly in Geneva on 21 May, the second at Executive Director Jean-Luc Eiselé, at a UN Civil Society Hearing on NCDs held in New York on 16 June.

In the wake of this, FDI sent its landmark “Write to your Minister” email to its NDAs on 5 July, encouraging them, first, to make sure their head of government or state would be attending the Summit and, second, to make contact with their Health Minister, Chief Dental Officer and, possibly, public health authorities “to alert them to the fact that oral health is not included in the ‘Draft outcome document’.”

It attached a special advisory document on the main points to raise as well as a template letter, based on a model from the American Dental Association, to provide an opener for face-to-face dialogues.

In her address, “Intersectoral Collaboration to Advance Social Economic Development and Achievement of the Millennium Development Goals”, she highlighted the development impact of oral diseases.

“Low and middle income countries face variably alarmingly high and/or rapidly increasing rates of oral diseases, including tooth decay, cancers, and Noma. These challenges can be exacerbated by weak health system capacity, and by a lack of focus on oral health, despite its importance for sustaining overall health.”

The result, said Ms Clark, “is unnecessary death and disability on a large scale from oral diseases.”

FDI’s bid for oral diseases to be mentioned specifically in the Declaration from the United Nations NCD Summit on Non-communicable Diseases has been crowned with success.

Thanks to its own lobbying and direct action by FDI member national dental associations (NDAs), as well as to the sustained efforts of a number of other governmental and non-governmental stakeholders, the Declaration’s Article 19 now recognizes that “renal, oral and eye diseases pose a major health burden for many countries and that these diseases share common risk factors and can benefit from common responses to non-communicable diseases.”

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This whole NCD campaign illustrates the very real strengths of FDI as an international Federation working directly through its member associations to advocate health policy and getting the results it wants.”

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Implants for a neglected clinical situation
An interview with Dr Anders Holmén, Astra Tech

The Swedish implant manufacturer Astra Tech AB recently presented OsseoSpeed TX Profile, an implant for sloped ridge situations, at the annual congress of the European Association for Osseointegration in Athens, Greece. Dental Tribune Asia Pacific spoke with former dentist and Astra Tech Head of Product & Therapy Management Dr Anders Holmén, about its indications, clinical benefits and why it is mainly targeted at experienced users.

DT Asia Pacific: After the Academy of Osseointegration congress in Washington, DC, in May, you presented the OsseoSpeed TX Profile implant at a major European implantology meeting for the first time. What has the feedback been from specialists so far?

Dr Anders Holmén: The EAO congress has always been a positive forum for Astra Tech AB to present new products with related concepts and the scientific background that is behind it. By exhibiting at congresses like the EAO you as a company also establish your presence and demonstrate your level of expertise. This year, we again have had an extremely good response from congress participants, including those who visited our EAO satellite symposium where they had the opportunity to discuss aspects of the new profile implant with various clinicians from the Europe and the US.

The new implant was designed for a specific clinical situation. How common is this problem in dental implantology?

I would say that sloped ridges are not so much a problematic but rather neglected clinical situation. We have noticed that implant cases where the alveolar ridge has a slope are quite frequent, and that regular implants with a flat profile do not offer good adaptation to this bone contour. When a flat implant is placed in line with the buccal aspect in such a case, then the lingual/palatal and proximal bone have no support and will eventually resorb and disappear. The risk for soft tissue dehiscence and compromised aesthetic results is a reality.

Another way to place a flat implant that supports all surrounding bone is to position it level with the lingual/palatal aspect of the bone. The disadvantage with this is the risk for discoloration of the buccal soft tissue owing to the implant sticking out of the buccal aspect of the bone. What we have done with the OsseoSpeed TX Profile implant is a very simple thing from a conceptual point of view. By giving the implant a sloped profile, in harmony with the bone profile, we are able to maintain the bone around the implant and provide support for long-term aesthetic results.

How many cases do you estimate could be treated with this kind of implant?

Initial calculations indicated that 5 to 10 per cent of clinical situations will be suitable for treatment with this implant. However, after the launch in March and looking at the experienced from our clinical research programme, we see the need becoming more frequent. Clinicians are also communicating that this is something they will use more often, so we foresee that in the future it will be...
Acteon cancels seminar over floods

French dental manufacturer said in a statement.

The seminar was to be held from 10 to 11 January at the Grand Millennium Sukhumvit, a five-star hotel located in Bangkok's central Watthana District. The company had invited a number of international speakers, including renowned oral surgeon Dr. Fred Bergmann from Germany and Prof. Fumihiko Watanabe from the Nippon Dental University in Japan, to hold lectures and hands-on courses.

“As the Thai government is still very concerned about inhabitants’ safety and of hygiene conditions, we do not want the attendees to take any risk,” International Marketing Director Robert P. Gregoire told Dental Tribune Asia Pacific. “Our priority is to support our Thai office and our personnel there to repair the damages and move on.”

According to the latest figures from the Department of Disaster Prevention and Mitigation in Thailand, more than 500 people have died since the flooding began in July. The catastrophe could also have a severe impact on the country’s already strained political and economic system, experts say.

Do you have clinical results available to back up the new profile implant?

First results from studies were presented and discussed at the AO and the EAO meetings. We have one-year data available from implants placed in healed ridges and are about to start another trial looking at implants placed in extraction sockets. The scientific basis however for the Profile implant is the well-documented Astra Tech BioManagement Complex which in total applies to this new evolution of our implant assortment.

The implant is mainly targeted at experienced users. What are the main challenges that come with this new-profile?

There is definitely a learning curve attached to this implant and clinicians who want to use it have to have good diagnostic experience and be knowledgeable in implant surgical procedures. The problems here are that beginners might miss implanting preferably and performing correct dimension and direction of the drilling which does not necessarily result in severe complications but could mean negative feedback from the patient. It is easy to understand the concept but we have installed a process where our customers have to do some actual hands-on training to make sure that they understand the critical and important parts of the handling before doing the first clinical case.

The TX Profile has already gained market approval in the US and the EU. When will it be available in the rest of the world?

This is a global launch, so distributors in countries where we have distributors or own subsidiaries should be able to obtain this implant depending on the local regulatory processes.

The OsseoSpeed TX Profile will probably be a topic at your next World Congress in Gothenburg in May 2012. Apart from this, are there more products that you are currently working on?

With our implant system, we already have a scientifically supported solution that offers predictable long-term results. What we constantly do, nevertheless, is to try to identify those situations where we can improve on products and make it easier to work with for our customers. The new profile implant is a perfect example for existing scientific documentation to meet a clinical situation through a minor product modification. We certainly have more things in the pipeline and some of them will be discussed at our World Congress next year in May.

Thank you very much for this interview.
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Laser in endodontics (Part I)

Prof. Giovanni Olivi et al.
Italy

One of the main goals of endodontic treatment is the effective cleaning of the root-canal system. Traditional endodontic techniques use mechanical instruments, as well as ultrasonic and chemical irrigation to shape, clean and completely decontaminate the endodontic system. Laser in endodontics

Laser technology was introduced to endodontics with the goal of improving the results obtained with traditional procedures through the use of light energy by increasing cleaning ability and the removal of debris and the smear layer from the root canals and thus improving the decontamination of the endodontic system. The action of the chelating substances facilitates the penetration of the reagent. In endodontics, they are used in endodontics for canal decontamination, owing to their ability to penetrate the dentinal walls up to 1 mm with the Nd:YAG (1,064 nm) laser and up to 3 mm. Their beam is selectively limited to the vaporisation and in-situ destroying them through photo-thermal effects on tissue. They interact primarily with soft tissue by diffusion (scattering), with respect to the point of interaction or diffusion, creates biological effects responsible for therapeutic aspects that can be summarised as:

- photo-thermal effects;
- photomechanical effects (this includes photoacoustic effects); and
- photochemical effects.

The diode laser (from 810 nm to 980 nm) and the Nd:YAG (1,064 nm) belong to the near infrared region of the electromagnetic spectrum of light. They interact primarily with soft tissue by diffusion (scattering). The Nd:YAG laser has a greater depth of penetration into hard tissues (up to 5 mm), while the diode laser is more superficial (up to 1 mm). The Nd:YAG laser is effectively absorbed by haemoglobin, oxy-haemoglobin and melanin, and has photo-thermal effects on tissue. Therefore, their use in dentistry is limited to the vapourisation and in-situ destroying of soft tissue. They are also used for dental whitening with a laser beam, by thermal activation of the reagent. In endodontics, they currently represent the best system for decontamination, owing to their ability to penetrate the dentinal walls (up to 750 µ with the 810 nm diode laser; up to 1 mm with the Nd:YAG) and for the affinity of these wavelengths with bacteria, destroying them through photo-thermal effects.

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cool (thermal relaxation time), allowing for better control of thermal effects (Fig. 4).

The Erbium lasers also work with an integrated water spray, which has the double function of both cleaning and cooling. In the pulse mode, a string of pulses is emitted with a different pulse repetition rate (improperly called ‘frequency’) referred to as the Hertz rate (generally from 2 to 50 pulses) per second. The higher emission repetition rate acts in a similar way to the CW mode, while the lower repetition rate allows for a longer time for thermal relaxation. The emission frequency (pulse repetition rate) influences the average power emitted, according to the formula shown in Table 1.

Another important parameter to consider is the ‘shape’ of the pulse, which describes the efficiency and the dispersion of the ablative energy in the form of thermal energy. The length of the pulse, from microseconds to milliseconds, is responsible for the principal thermal effects. Shorter pulses, from a few microseconds (<100) to nanoseconds, are responsible for photomechanical effects. The length of the pulse affects the peak power of each single pulse, according to the formula in Table 1. Dental lasers available on the market today are free-running pulsed lasers, the Nd:YAG with pulses of 100 to 200 µs and the Erbium lasers with pulses of 5 to 1,000 µs. Furthermore, diode lasers emit energy in CW that can be mechanically interrupted to allow the emission of energy with pulse duration of milliseconds or microseconds depending on the laser model.

Effects of laser light on bacteria and dentinal walls

In endodontics, lasers use the photo-thermal and photo-mechanical effects resulting from the interaction of different wavelengths and different parameters on the target tissues. These are dentine, the smear layer, debris, residual pulp and bacteria in all their various aggregate forms.

Using various strengths, all the wavelengths destroy the cell wall owing to their photo-thermal effect. Owing to the structural characteristics of the different cell walls, gram-negative bacteria are more easily destroyed with less energy and radiation than gram-positive bacteria. The near infrared lasers are not absorbed by hard dentinal tissue, having only a thermal effect and not an ablative effect. They penetrate deeper, allowing for a decontaminating effect on deeper dentine layers. The medium infrared lasers have an ablative effect on dentine walls but are also well absorbed by the dentinal walls and thus have an equally effective, although more superficial, decontaminating effect in this regard.6,10

The thermal effect of the lasers, utilised for its bactericidal effect, must be controlled to avoid damage to the dentinal walls. Laser irradiation at the correct parameters vaporises the smear layer and of the organic dentinal structure (collagen fibres) with characteristics of superficial fusion and melting. Only the Erbium lasers have a superficial ablative effect on the dentine, which appears more prevalent in the inter-tubular areas richer in water than in the more calcified peri-tubular areas. When incorrect parameters or modes of use are employed, thermal damage is evident in the extrusive areas of melting, recrystallisation of the mineral matrix (bubble), and superficial microfractures concurrent with internal and external radial carbonisation.

More options, same original body.

With a very short pulse length (less than 150 µs), the Erbium laser reaches peak power using very low energy (less than 50 mJ). The use of subablative energy minimises the undesirable thermal effects on dentinal walls while the peak power offers the advantage of the photomechanical and photoacoustic effects (shock waves) of the irrigant solutions introduced in the root canal on the dentinal walls. These effects are extremely efficient in decontamination, and will be discussed in Part II.6,11

Table 1: Laser light emission parameters

<table>
<thead>
<tr>
<th>Power (in W)</th>
<th>Energy (in J)</th>
<th>Pulse repetition rate (in Hz)</th>
<th>Power density or density of power (in W/cm²)</th>
<th>Fluence or density of energy (in J/cm²)</th>
<th>Peak power x E x L</th>
<th>Peak power x L</th>
</tr>
</thead>
</table>

Table I: Laser light emission parameters

Editorial note: A complete list of references is available from the publisher.

Contact Info

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Restoring severely discoloured anterior teeth

How to achieve an impressive outcome with minimally invasive procedures

Endodontically treated incisors present a challenge for the restorative team. Often, they entail serious aesthetic deficiencies in the form of severe discolouration. The objective of the treatment presented in this case was to reconstruct the biomechanical and optical properties of the affected teeth, while compromising as little natural dental tissue as possible.

By following a clearly coordinated procedure, the treatment team may achieve satisfactory results with an internal bleaching method, an adhesive post build-up and a preparation technique that suits the requirements of the restorative material. The invasiveness of this approach is considerably reduced compared with conventional restorative techniques.

This article discusses the rehabilitation of two upper central incisors by placing fibre-reinforced composite posts, using build-up materials and subsequently restoring the teeth with 500° veneers made from lithium-disilicate ceramic. A 28-year-old male patient presented at the practice with the wish to have his endodontically treated and severely discoloured upper central incisors restored. He said that he had not had any problems since the resection of the root was done years ago. However, he was dissatisfied with his impaired aesthetic appearance caused by the affected teeth (Figs. 1-3).

The clinical and radiological evaluations revealed tight and properly executed root-canal obstructions in teeth #11 and 21. There were no signs that indicated the presence of root-canal posts, but the extensive composite restorations in both teeth were leaking and showed secondary caries (Fig. 4). At the time of the clinical evaluation, five years had passed since the restorations. The specific challenges that the treatment team had to face were the patient’s wish to have the aesthetic appearance of his teeth restored in a timely fashion. The patient required that his natural tooth shade and position be restored and the remaining tooth structure be stabilised to the highest possible extent in the long term.

Treatment planning

Before we proceeded with the planning for the permanent restoration, the inadequate fillings of the anterior teeth and the secondary caries were removed. This allowed us to assess the extent of damage to the teeth. In addition, a possible contamination of the two root canals with micro-organisms, resulting from the inadequate fillings—which had been in place for years—had to be ruled out. Both root-canal fillings had been tightly sealed at the cemento-enamel junction with separate fillings and therefore the canals did not have to be reopened. Internal bleaching of the crown portions of both teeth using the walking bleach technique was planned. After an initial technical and clinical evaluation, the following treatment plan was determined. First, the tooth position and proportions were to be corrected by means of an analytic wax-up. The brightness of the affected teeth was then to be adjusted by internal bleaching to match the brightness of the neighbouring teeth during a preliminary treatment phase. Owing to the extensive lesion, we opted for a direct adhesive build-up following endodontic treatment with ceramic fibre-reinforced composite posts. For the final restoration of the severely discoloured anterior teeth, we decided to use 560° veneers based on a lithium-disilicate material. In order to achieve an optimum aesthetic outcome, the veneers were to be fabricated in the cut-back technique (Fig. 5).

Preliminary treatment and preparation

After the coronal pulp chamber of the two incisors had been cleaned, another seal was placed at the cemento-enamel junction using a small amount of phosphate cement. This procedure ensured that the bleaching agent that would be applied later did not diffuse into these sensitive areas (Fig. 6). For the internal bleaching, a mixture of sodium-perborate powder and distilled water was applied using the walking bleaching method. The palatal access to the coronal pulp chamber was sealed with cotton pellets soaked in holding agent (Helibond) and a low-viscosity composite (Tetric EvoFlow, Ivoclar Vivadent). The next appointment was scheduled for one week later. The desired tooth shade had not yet been achieved, and therefore fresh bleaching agent was applied. After another week with the bleaching agent in place, a satisfactory brightness value was observed on both abutment teeth (Fig. 7). A cam-oxide build-up preparation (CaliPure, Dughtech) was inserted into the pulp chamber and left in place for a week in order to neutralise the bleaching agent.

After the neutralisation phase, we proceeded to the post-endodontic build-up of the abutment teeth. For this purpose, the coronal sealing of the root-canal fillings was removed and standard...
ised holes for the fibre-reinforced composite posts were drilled. The posts were luted with Variolink II (dual-curing, low-viscosity, white-opaque shade) and a multifile adhesive (Syntac, Ivoclar Vivadent). After the posts had been covered with a low-viscosity composite (Tetric EvoFlow), a bright, highly filled viscous composite (Tetric Emove, Ivoclar Vivadent, with > 1,000 mW/cm²) was used for the final polymerisation of the cementation and build-up materials. A diagnostic pattern, fabricated on the basis of the wax-up, was employed for the minimally invasive preparation, containing all information relating to the correction of the tooth position and the outer contour of the final restoration.

**Temporisation and fabrication of the final veneers**

The diagnostic template was also used for creating the direct veneer temporaries. The temporary restorations could thus be fabricated in a fairly straightforward manner using a Bis-GMA-based temporary material (Telio C&B, A2, Ivoclar Vivadent). Hi-bond was applied to the finished, non-etched preparation surfaces and to the inner side of the temporaries and light-cured after removal of excess material.

After a four-week evaluation phase of the tooth shape and position, which both were determined by the wax-up and transferred to the temporaries, a precision impression of the prepared teeth and an impression of the antagonist jaw were taken. This information was sent to the laboratory together with the face bow, the registration of the jaw relation and an image of the prepared abutment teeth. The image of the preparations helped the laboratory to assess the required degree of opacity for the framework structure. Given the different levels of translucency and the different build-ups of the abutment teeth and to ensure an improved masking capability in case of a relapse of the discolouration, the treatment team chose to use press ceramic inlays with a medium opacity level in shade 0 (MO 0). The IPS e.max Press frameworks were veneered with the IPS e.max Ceram veneering ceramic in shade A2 (both Ivoclar Vivadent; Fig. 7).

**Try-in and seating**

After removal of the temporary restorations, residue of the bonding agent was removed with cleaning brushes and a fluoride-free cleaning paste. In order to check the shape and shade of the veneers in the patient’s mouth, the restorations were tried in with a shaded glycerine gel (Try-in Paste, Variolink II, white-opaque). A perfect masking of the abutment teeth had already been achieved at this stage and the resulting situation showed a harmonious appearance regardless of the substruc-

**Conclusion**

A light transmission that corresponded to that of natural teeth was achieved by using translucent build-up materials in conjunction with glass-ceramic lithium-disilicate veneers (Fig. 12). The final outcome with regard to functional and aesthetic parameters was found to be very satisfactory at the final evaluation. The tooth shade was in perfect harmony with the surrounding dentition. In addition to removing the severe discolouration of the hard and soft tissues, we were able to correct the tooth position and adjust the tooth proportions (Fig. 13). The patient was fully satisfied with the outcome and did not have any phonetic problems resulting from the correction of the tooth position (Fig. 14).
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The importance of implant-abutment connections

The long-term success of an implant depends on the proper seating of the prosthesis components. This is a key requirement for the best possible performance and to ensure that the connection is sealed, avoiding the creation of a micro-gap.13

Material biocompatibility: Not to be neglected
One aspect of implant-abutment connections is the geometry of the connection. Connecting surfaces (highlighted in green in Fig. 4) do not allow the abutment to rotate within the implant and can therefore only be assembled in its correct orientation. This feature provides precise orientation, precise repeated abutment placement and a stable connection of the prosthesis to the implant.

6. Biological aspects

Control of bone and soft tissue growth: The influence of the implant-abutment connection

Individual oral hygiene of the patient is a relevant biological aspect that can influence the successful outcome of restorations.10 How the implant-abutment interface influences bone growth and surrounding soft tissue growth is an important success factor in restorations.11 A gap between abutment and implant, caused for example by dimensions and tolerances that are not harmonized and matched, may cause bacterial infiltration and accumulation, and may subsequently impact on the success of treatment.12

Biological width: As big as possible
A smart design of the connection as described in an earlier section of this article reduces bacte rial infiltration into microgaps, the origin of bacterial contamination.13 In this regard, consideration of the biological width—the distance from the bone crest to the micro-gap (point on surface at implant-abutment connection)—plays a crucial role when designing abutments and implants.14 The biological width should be as big as possible.15 Therefore, the connection should be moved as far away from the bone as possible. This can be achieved with an implant design emerging at the level of soft tissue (cemental offset) or with an implant design emerging at the level of the bone crest with so-called platform switching (horizontal offset through internal connection). A design according to these requirements avoids the infiltration of bacteria, which is important as it avoids bacterial contamination and related inflammation and bone loss.16,17

Straumann designs abutments and implants with specific tolerances on the occlusal section (load bearing and sealing surfaces) to ensure that the abutment, screw and implant. Engaging parts made of different materials may trigger galvanic corrosion,18 a process that can be avoided through the exclusive use of original Straumann products with parts compatible with the respective Straumann dimensions and features.

Material compatibility is important for components which come into contact with each other, such as

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