Nobel Biocare has continually led innovation in full-arch solutions for over 50 years. Now, the company has achieved another breakthrough in the efficient treatment of the edentulous mandible. The launch of the new Trefoil system has made the passive fit of a pre-manufactured bar possible for the very first time, using a revolutionary, self-adjusting fixation mechanism and just three implants. An innovation that drives efficiency at every step, from manufacture to definitive restoration, the Trefoil system makes a fixed full-arch implant solution a real possibility for more patients.

More patients benefit from a fixed solution

The benefits of fixed solutions far outweigh the costs of fixed-removable solutions for many patients when considering implant-supported solutions. While a removable implant rehabilitation may offer a lower price and faster treatment than typical fixed alternatives, many patients desire the comfort and ease of a fixed prosthesis, which has been proven to significantly improve quality of life. Fixed solutions also offer enhanced function with a higher bite force and better retention and stability, and avoid some of the disadvantages of removable solutions, such as more mucosal problems and the wear of components.

Developed with the needs of the many in mind, the efficiency of the Trefoil system empowers clinicians to provide many patients who are held back by time or finances with the premium-quality fixed solution they deserve.

The next full-arch revolution

With Trefoil, Nobel Biocare presents a definitive fixed solution to treat more patients better.

- Fig. 1: The Trefoil system offers a precision-milled bar with self-adjusting joints for a passive fit.
- Fig. 2: The mechanism allows screws to self-adjust in compensation for inherent deviations from each implant’s ideal height, angulation and position.

The Trefoil system offers a precision-milled bar with self-adjusting joints for a passive fit.
Implant community gathers in Madrid for EAO 2017

While most of the presentations will be in English, the organisers have announced that there will be simultaneous interpreting into Spanish for some of the sessions. Furthermore, a record number of 139 manufacturers and dealers (as of 21 September), including international heavyweights like Nobel Biocare, Straumann and Dentistry have registered for the accommodating trade exhibition, which will showcase the latest innovations. Attendees will also be able to learn about the new products and clinical solutions in detail at industry symposia that will run concurrently with the main programme.

In 1991 by leading dentists interested in osseointegration, the EAO is now a worldwide authority in the fields of reconstructive surgery and prosthetic rehabilitation. In addition to its large annual event, the association holds master clinical courses throughout the year. It furthermore offers members and non-members the opportunity to obtain a postgraduate diploma in implant dentistry.

The Trefoil system, combining a pre-manufactured titanium bar, three implants, a simplified restorative workflow, acrylic prosthesis and minimised restorative componentry, enables shorter time to teeth and reduced chair time compared with conventional treatments that use provisional restorations. With no need for CAD/CAM or temporary prostheses, the ability to place definitive teeth on the day of surgery* using a prefabricated bar and wrap-around acrylic technique for the prosthesis saves substantial time for the restorative clinician, the laboratory and ultimately the patient.

First pre-manufactured bar with a passive fit

Before the Trefoil system, pre-manufactured bars could be cost-efficient, but none could enable the passive fit that is so crucial to long-term treatment success. In challenging this limitation, Nobel Biocare engineers developed the first pre-manufactured bar with a passive fit, enabled by a unique fixation mechanism with self-adjusting joints. This mechanism provides passive fit by compensating for horizontal, vertical and angular deviations from the ideal placement of the three implants. Accurate drilling with standardized drill guides enables precise parallel implant positioning and placement for passive fit.

Proven implant design with conical connection

A special component of the Trefoil system is the Trefoil Implant. It combines the proven parallel-wall implant design, a machined soft-tissue collar—which allows easy access to the implant while leaving the soft tissue undisturbed after the surgery—and a conical connection. The TiUnite surface is proven to maintain implant stability during the critical healing phase through rapid bone formation* and it promotes long-term success.

Treatment success

Results from an ongoing five-year multicentre study across four continents are already being reported for implant and prosthetic survival rates.* This important study has been expanded to include 110 patients at the request of clinicians, to meet the needs of their patients.

Implant specialists from over the globe will attend the congress of Feria de Madrid. (Photograph: IFEMA, Spain)

After the FDI World Dental Congress in August, the Feria de Madrid fairgrounds will open its doors again today for dental professionals from around the world. From 5 to 7 October, thousands will be able to learn everything there is to know about dental implantology and oral rehabilitation at the 26th annual congress of the European Association for Osseointegration (EAO).

Organised in partnership with the Spanish society of prosthetic and aesthetic dentistry (Sociedad Española de Prostesis Estomatológica y Estética), an association with a membership of 4500, the conference is poised to attract thousands of specialists from all over the globe to Madrid. Spanning three days, the meeting will offer a number of high-class clinical lectures, hands-on sessions and industry symposia under the theme of “Twenty-five years of implant dentistry. What have we learned?”. According to the organisers, it will furthermore provide interactive opportunities for audience involvement, such as surgical video sessions.

Overall, more than 50 clinical experts from all over the world will be speaking at this year’s event. Among them are prominent figures in dentistry, such as Prof. Mariano Sanz from Spain, Dr Christian Coachman from Switzerland. In the guest country Spain, Dr Christian Coachman from the Spanish society of prosthodontics, such as Prof. Mariano Sanz from the Spanish society of prosthodontics (ASPE), an association with a membership of 11000, the conference is poised to attract thousands of specialists from all over the globe to Madrid. Spanning three days, the meeting will offer a number of high-class clinical lectures, hands-on sessions and industry symposia under the theme of “Twenty-five years of implant dentistry. What have we learned?”. According to the organisers, it will furthermore provide interactive opportunities for audience involvement, such as surgical video sessions.

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The next MIS Global Conference will take place from 8 to 11 February next year in the beautiful Atlantis Resort in the Bahamas. Based on the success of last year’s event in Barcelona in Spain, with its fascinating scientific programme, high-level lectures and amazing entertainment, the next edition promises to deliver an intense and unforgettable experience in every respect.

The scientific committee, headed by Prof. Lior Shapira, Chairman of the Department of Periodontics at the Hebrew University–Hadassah Faculty of Dental Medicine in Jerusalem in Israel, has undertaken all efforts to make the next conference even better than the one before. In addition to contemporary treatment possibilities, insight will be provided into the present and future of dental implants as part of clinical dentistry.

“The podium will be occupied by high-quality clinicians, researchers, and educators, who will share with you their extraordinary experience and clinical excellence,” Shapira said.

With the launch of the V3 Implant System currently underway in the US market, MIS Implants Technologies is devoted to equipping the dental community with the latest innovations and helping clinicians improve patient care. The two-day main programme will feature world-prominent speakers presenting their expertise, which could be implemented in everyday dental practice and optimize dentists’ skills for the benefit of their patients. Some of the key topics of the conference are evolution and horizons in implant therapy, biological principles and predictable aesthetics, the long-term forecast for implant therapy and going digital (where, when and how).

A number of workshops will provide an opportunity for meaningful learning in an intimate environment, with accomplished experts in their specific fields of interest.

As part of its commitment to promoting young clinicians, MIS is continuing the tradition of holding a clinical case competition during its conference. With the focus on modern technologies and techniques in clinical practice this year, 15 top clinical cases will be presented as posters at the conference venue, and the best three will also be awarded.

In the spirit of “ideas worth spreading” and its commitment to innovation, MIS has further proudly announced a new partnership with TEDx. An independently organised TED event, TEDxMIS will be held on 10 February and feature some of the world’s leading thinkers and achievers in the field of implant dentistry. The goal is to give conference guests the opportunity to experience a unique series of fast-paced, eye-opening talks that will inspire them and provoke meaningful engagements with their peers.

Similar to past events, the Bahamas conference is expected to provide an extraordinary environment for knowledge sharing and the opportunity to meet with peers in the international dental community. In 2018, conference guests will also enjoy one of the most beautiful and exotic locations in the Atlantic Ocean; the Atlantis Resort on Paradise Island. When not engaged in the workshops and lectures, they will be able to explore this extraordinary marine habitat, participate in sports activities, and experience the culture and colours of the Bahamas. Full of impressive and fun events, the MIS Global Conference entertainment programme will leave guests with fond memories and looking forward to the next meeting.

More information about the conference can be found at bahamas.misimplants.com or at Booth P1 in the exhibition hall at EAO 2017.

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Reliable Experience Original Forever
Nano-coating effective in reducing peri-implantitis risk

Combination of silver, titanium dioxide and hydroxyapatite shows promising results in UK study

Investigating the effect of a new approach using a combination of silver, titanium dioxide and hydroxyapatite (HA) nano-coatings on the surface of titanium alloy implants, researchers from Plymouth in the UK have found that the method was successful in inhibiting bacterial growth and reducing the formation of bacterial biofilm. In addition, the coating created a surface with antibiofilm properties, thus supporting successful integration of the implants into surrounding bone and accelerating bone healing.

One of the main reasons for dental implant failure is peri-implantitis, an inflammatory process affecting the soft and hard tissue surrounding dental implants caused by pathogenic microbes that develop into biofilms. Current approaches to managing the development of biofilms include application of antimicrobial coatings loaded with antibiotics or chlorhexidine. However, these are usually only short-term measures. In addition, chlorhexidine has been reported to be potentially toxic to human cells.

Investigating a new approach to the prevention of biofilm, researchers from the School of Biological Sciences, Peninsula Schools of Medicine and Dentistry, and School of Engineering at the University of Plymouth tested the effectiveness of a dual-layered silver–HA nano-coating on titanium alloy medical implants. The antibacterial performance of the coating was quantitatively assessed by measuring the growth of Streptococcus gordonii, the proportion of live and dead cells, and lactate production by the microbes over 24 hours. The results showed that the combination successfully inhibited bacterial growth and reduced the formation of bacterial biofilm on the surface of the implants by 97.5 per cent. Uncoated controls and titanium dioxide nano-coatings showed no antibacterial effect.

According to the researchers, no dissolution was detected for the HA nano-coatings. Thus, application of a dual-layered silver–HA nano-coating on titanium alloy implants further created a surface with antibiofilm properties without compromising the HA biocompatibility required for successful osseointegration and accelerated bone healing.

“In this cross-faculty study we have identified the means to protect dental implants against the most common cause of their failure. The potential of our work for increased patient comfort and satisfaction, and reduced costs, is great and we look forward to translating our findings into clinical practice,” commented Prof. Christopher Tredwin, Head of the Peninsula School of Dentistry.

In the next step, the effectiveness of the approach needs to be tested in vivo, according to the researchers.
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To learn more about the conference visit: www.mis-implants.com/bahamas
In 2010, Dr Pär Johansson received his dentistry degree at Malmö University in Sweden, where he submitted a master thesis on implant universality in Sweden, where he submitted his dentistry degree at Malmö University in Sweden. In an interview with today international, Dr. Pär Johansson spoke about the advantages and challenges of PEEK implants and what the new material could mean for the future of implantology. PEEK is not optimal as a load-bearing implant. It has been argued that implantable PEEK polymers are a next-generation biomaterial in several spinal critical fields. Today, PEEK is the standard material in several spinal procedures and ongoing research has introduced new applications. In dentistry, the introduction of PEEK has been slow, but the material may well be functional in healing abutments, temporary cylinders, and dental frameworks. Introduction of new biomaterials is a slow process which requires a comprehensive evaluation by the U.S. Food and Drug Administration before it can be implemented for clinical trials. PEEK-OPTIMA (Invibio) is currently the only commercial PEEK polymer approved by the FDA as a medical device.

What are the main advantages of PEEK in comparison with conventional implant materials like titanium? What are its limitations? The main advantage in spine and trauma surgery is its superior biomechanical properties compared with metals. PEEK has an elastic modulus similar to that of human bone, while that of titanium is almost eightfold higher. Differences in elastic modulus between the implant and the surrounding tissue may promote stress shielding and inhibit bone growth or lead to bone resorption. Furthermore, titanium and metal alloys have, in some documented cases, caused signs of hypersensitivity and allergy. Three days, there is also an increasing demand for non-metallic restorations and biomaterials. PEEK, bio-inert, has a non-reactive surface and, according to current literature, has never shown any signs of provoking hypersensitivity. The colour of PEEK is more natural, and this enables the manufacturing of aesthetic implants for thin biotypes and diverse dental components. Finally, PEEK is transparent to X-rays, which is a feature highly useful after spine surgery, allowing the postoperative radiographs to be viewed and analysed without any disturbing artefacts.

Dr Johansson is examining histological sections of the implant in rabbit bone before looking at this in the microscope. This is a histological image from a PEEK implant with a hydroxyapatite coating. This one is implanted into rabbit bone and retrieved after three weeks of healing. At the bottom of the implant you can see the osteoconductive properties of hydroxyapatite on PEEK as the bone bends and grows along the implant surface.

The results of a study in rabbit bone you conducted in 2016 proved that the addition of a nanosized hydroxyapatite-coating to PEEK surfaces improved the bone-implant contact and demonstrated strong osteoconductive properties at the perforation. How important are these findings to advancing research on PEEK implants? This aforementioned study is the third by our research group on PEEK. There were two main areas of investigation regarding the material used in this study, the use of PEEK as a biomaterial and the innovative coating technique by which a nanosized hydroxyapatite coating is applied to the implant surface. Further, this study...
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evaluated a PEEK implant with a unique design: the implant is manufactured with an apical perforation to enable evaluation of the bone fusion. The design is mainly aimed to be correlated to spinal applications where PEEK implants are currently used as cages between the vertebrae to facilitate bone fusion. The results of this study show the significant effect of surface modification using nano-hydroxyapatite. These outcomes are important in inspiring and facilitating future research on PEEK and nano-hydroxyapatite. This coating technique can further be applied to PEEK implants with other design and surface properties of the core material.

Do PEEK implants have a good success rate in human patient cases that would allow them to be used in all clinical situations?

PEEK implants used in spinal surgery have in retrospective studies showed equal or more successful outcomes in terms of treatment success and bone formation compared with titanium. Recently, the FDA has given clearance for hydroxyapatite-coated and -impregnated PEEK implants. However, the approval only applies to PEEK as an inter-body spine implant. It is difficult to relate the outcomes as a spine implant to other applications, since the design, loading and surrounding tissue are different. However, if hydroxyapatite-modified PEEK can reach comparable levels of osseointegration to titanium, there will be a manifold increase in applications.

How likely do you think it is that PEEK dental implants will replace conventional ones in the near future?

Replacing titanium in oral implantology will require more research including experimental studies and clinical trials. According to the current literature on PEEK and its various bioactive improvements, the level of osseointegration does not seem sufficient to withstand the load from masticatory forces. However, an introduction into the dental field could be as an orthodontic implant implanted for a relatively short period of function and with less and more controlled applied force.

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About 15 years ago, some of the implant companies began to change their focus. While previously it was all about proving that the respective implant system did function, a new era began once it had been established that implants do really work. In this era, the emphasis became selling more implants.

My first big international presentation was at the EAO conference in Paris in France in 2004. I remember that I was excited and well prepared. I thought I killed it, as people loved it. It felt great. However, fellow lecturers and representatives of the industry suggested that I should change the topic. But change to what? I was told that regeneration was over. Flapless surgery had arrived and there was no longer any need to use bone grafts and membranes, especially non-resorbable ones. They asked me to use this and that new implant with a new design and maybe a new surface and just put it in without a flap. They said they would invite me to be their speaker. I thought, well, I would not be a speaker then. My patients needed bone despite the trend.

I love to take care of my patients and will keep doing what is best for them by choosing implants that I think are best for a particular case and not what the industry tells me to use. Years have passed and I became deeply involved with regeneration. I loved it and did not care how the flapless business was doing until there was no way to avoid the results arising from it. We encountered problems. Lost implants, peri-implant disease and bone loss around implants became a public health issue. I started to see more and more patients who needed regeneration of defects created by failed implant treatments.

In the meantime, I studied and developed evidence-based research on vertical and horizontal ridge augmentation. This resulted in the Sausage Technique, which is now widely recognised and used. I enjoy teaching and it feels great to see peers using my techniques successfully. It is fascinating to see how many patients around the globe are helped by using these techniques.

Regeneration is now less invasive and more predictable. As an enthusiast, I love regeneration so much that I would never want to do anything else. I really think it has a bright future. I recommend to all my colleagues to find a field of this exciting profession that they can be passionate about. We should keep acting in consideration of the best interests of our patients.

Regeneration is needed more than ever
By EAO 2017 presenter Dr István Urbán, Hungary

Optimize bone and tissue regeneration with GUIDOR®

• OPTIMIZED WOUND STABILITY
• SYNTHETIC ADVANTAGE
• EASY HANDLING
• IMPROVED CLINICAL PLANNING

*Dr István Urban maintains a private practice in Budapest in Hungary. This afternoon, he is presenting a paper titled “Use of bone substitutes and barrier devices” in Room Madrid as part of this year’s EAO congress programme.
Digitising your implant practice

By Dr Ross Cutts, UK

— Undoubtedly, digital dentistry is the current topic. Over the last five years, the entire digital workflow has progressed in leaps and bounds. There are so many different digital applications that it is sometimes difficult to keep up with all the advances. Many dentists are excited about the advantages of new technologies, but there are an equal number who doubt that the improved clinical workflow justifies the expense.

I have many times heard the argument that there is no need to try to fix something that is not broken. It is so true that impressions have their place and there are certainly limitations to the digital workflow that anyone using the technology should be aware of. For me, however, the benefits of digital far outweigh the disadvantages. In fact, the disadvantages are the same as with conventional techniques.

Chairside CAD/CAM single-visit restorations have been possible for over 20 years, but it was only recently that we became able to mill chairside implant crown restorations after the release of Variobase (Straumann) and similar abutments. I made my first CEREC crown (Straumann) and similar abutments. It was back in 2003 with a powdered scanner, and the difference from what I remember then to how we can make IPS e.max stained and glazed restorations (Ivoclar Vivadent) now is amazing.

An investment not an expense

The results of a survey regarding the use of CAD/CAM technology were published online in the British Dental Journal on 18 November 2016. Over a thousand dentists were approached online to take part in the survey and the 385 who replied gave very interesting responses. The majority did not use CAD/CAM technology, and the main barriers were initial cost and a lack of perceived advantage over conventional methods. Thirty per cent of the respondents reported being concerned about the quality of the chairside CAD/CAM restorations. This is a valid point. We must not let ourselves lose focus that our aim should always be to provide the best level of dentistry possible. For me, digital dentistry is not about a quick fix; it is about raising our performance and improving predictability levels by reducing human error.

In the survey, 89 per cent also said they believed CAD/CAM technology had a major role to play in the future of dentistry. I really cannot imagine that once a dentist has begun using digital processes that he or she would revert to conventional techniques.

What is digital implant dentistry?

Many implant clinicians have probably been using CAD/CAM workflows without even realising it, as many laboratories were early adopters, substituting the lost-wax technique and the expense of gold for fully customised cobalt-chromium milled abutments (Fig. 1).

One of my most important goals in seeking to be a successful implantologist is to provide a dental implant solution that is durable. We have seen a massive rise in the incidence of peri-implantitis and have found that a large proportion of these cases can be attributed to cement inclusion from poorly designed cement-retained restorations (Fig. 2). Even well-designed fully customised abutments and crowns can have cement inclusion if the restoration is not carefully fitted (Fig. 3). This has led to a massive rise in the retrievability of implant restorations, with screw-retained crowns and bridges now being the goal. However, making screw-retained prostheses places even greater emphasis on treatment planning and correct implant angulation.

With laboratories as early adopters, we have been milling titanium or zirconia customised abutments for over ten years (Fig. 4). What has changed recently in the digital revolution is the rise of the intraoral scanner. We now have a workflow in which we can take a preoperative intraoral scan and combine this with a CT scan using colDiagnostix (Dental Wings) in order to plan an implant placement accurately and safely. We can also create a surgical guide to aid in accurate implant placement, have a temporary crown prefabricated for the planned implant position and then take a final scan of the precise implant position for the final prosthesis.

Accuracy of intraoral scanners

Figures 4 to 13 show the workflow for preoperative scanning, which includes the implant design, guide fabrication and surgical placement of two fixtures. Intraoral scanners have improved over the last few years, and their accuracy and speed provide a viable alternative to conventional impression taking. The digital scan image comes up in real time and you can evaluate your preparation and quality of the scan on the screen immediately, stopping the preparation blown up in size no doubt improves the technical quality of your tooth preparations. The scan can then be sent directly to the laboratory for processing.

While we do not think of intraoral scanners as being any more accurate than good-quality conventional impressions, there are many benefits of scanning, such as no more postage to be paid for impressions, vastly reduced cost of impression materials, almost zero re-impression rates and absolute predictability.

Of course, there are steep learning curves with the techniques, but once a clinician has learnt the workflow, there really is no looking back.

We have three different scanners in the practice: the Tera (Align Technology), the CEREC Omnicam (Dentsply Sirona) and the Straumann CARRIS Intraoral Scanner (Dental Wings; Fig. 14). The CEREC Omnicam is fantastic for simple chairside CAD/CAM restorations, such as IPS e.max all-ceramic.
restorations on Variobase abutments. For truly aesthetic results, we, of course, still have a very close working relationship with our laboratory, but, undoubtedly, patients love the option of restoration in a day. Being able to scan an implant abutment and then an hour later (to allow for staining and glazing) fitting the definitive restoration is a game changer. Patients also love watching the production process as they see their tooth being milled from an IPS e.max block.

Figures 15 to 19 show the production process, including the exposure of the implant, the abutment seating, the scan flag on top of the abutment, the healing abutment during fabrication and the delivery of the final prosthesis. However, for more than single units or aesthetic single-unit cases, we use the iTero and Straumann scanners. The latter we have only had at our disposal since February. While it is a powered system at the moment, this is due to change this month. Particularly with implant restorations, the need to apply a scanning powder is a limitation, owing to a lack of moisture control contaminating the powder. The technology, however, is superb, as it is the openness of the system, which provides the advantage of being able to export files into planning software. A colleague of mine even uses it for his orthodontic cases now instead of wet impressions.

We invested in the iTero scanner five years ago and have used it for everything, from simple conventional crowns and bridges to scanning for full-mouth rehabilitations. When fabricating definitive bridge work, we use Createch Medical frameworks for screw-retained CAD/CAM-milled titanium and cobalt-chromium frameworks. Even though intraoral scanning appears extremely reproducible and accurate, I still use verification jigs where needed to ensure our frameworks are as accurate as possible. There are many intricacies that we consider and tips and techniques that we employ to make the scans more accurate that we have developed over time. The closer the scanbodies are together, the more accurately the scan is. Also, the more anatomical detail, such as palatal rugae or mucosal folds, the better the scans can be stitched together.

Figure 20 shows a CBCT volume to aid in planning for mandibular implant placement and realising the implant placement (Fig. 21). We exposed the fixtures and placed Straumann Mono Scanbodies (Fig. 22). Then, we took an iTero scan of the fixtures in situ (Fig. 23) and made a verification jig from this (Fig. 24) to ensure passive implant positioning. The iTero models were made (Fig. 25) and a Createch titanium framework was used to support porcelain in a screw-retained design (Fig. 26). The last two figures show the excellent outcome and accurate framework seating (Figs. 27 and 28).

Choosing your workflow
There are many different systems on the market now, each offering a one-stop shop. If you are considering investing in a digital scanner, then take some advice from colleagues. One of the most important things is to ensure the system you opt for is an open one that allows you to extract the digital impression data into different software. We extract our files into CT planning software, model production software, chairside milling software, and now orthodontic planning software. I am convinced there will be yet more advances with time. The size of the camera is critical–some can be very cumbersome–and it is worth asking the salesperson what developments are underway.

Some companies are more on the cutting edge than others. My favourite at the moment is the Straumann scanner. Its design is light and user-friendly and it synchronises perfectly with coDiagnostiX implant planning software. Furthermore, while it offers a chairside milling unit, it also synchronises perfectly with my laboratory for larger cases.

To conclude, digital implant dentistry is the future and so why not take advantage of it and help improve your clinical outcomes?
First-ever robot-led dental surgery performed in China

For the first time ever, a robot has independently placed two 3-D-printed implants into a patient’s mouth without human involvement. The successful procedure raises hopes of lessening Asia’s dentist shortage, especially prevalent in metropolises such as Hong Kong and Singapore, and of avoiding risks posed by poor-quality surgeries performed by unqualified dentists.

After taking a CT scan to acquire data on the female patient’s skull and jaw, the medical staff fitted position orientation equipment to the woman and determined the movements, angle and depth needed to fit the implants in her mouth so that the robot could be programmed to move into the correct position to carry out the operation. According to Prof. Zhao Yimin, a surgeon from the Fourth Military Medical University (FMMU) in Xi’an, the procedure went very smoothly and the implants were placed with high precision.

Although human staff were present at all times during the 1-hour surgery, they did not play an active role. The robot, which was jointly developed by the Beihang University in Beijing in China and FMMU’s Stomatological Hospital over the last four years, is designed to follow a set of preprogrammed commands, but is able to make adjustments during surgery, the South China Morning Post reported.

According to a recent survey, about 400 million patients are in need of dental implants in China. However, the number of qualified dentists in the country is insufficient to meet the increasing demand. Through a continuing implementation of robot technology, this shortage may be eased.

In the future, robot-assisted and -led technology could increasingly facilitate dental surgeons’ work, experts have predicted. Robotic technology has already been introduced in recent years to assist in dental procedures such as root canal therapy, orthodontic operations and implant placement. In March this year, a pioneering robotic guidance system, Yomi, received clearance from the U.S. Food and Drug Administration. The computerised navigational system delivers physical guidance through the use of haptic robotic technology, which provides sensory feedback and constrains the drill in position, orientation and depth, the device’s manufacturer, Neocis, stated. 

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The role of prevention in implantology

By Dr Peter van der Schoor, The Netherlands

In October last year, I had the honour of speaking in front of a medical and dental audience to explain my approach to prevention. In my lecture, I talked about our new “peri-profiling” approach using saliva and aMMP-8 diagnostic methods. The thing is, we need to treat patients between the ages of 20 and 40 differently to those who are 40 years and older. Certainly, everyone can get periodontitis, but my younger patients visit my dental practice less frequently, which means they are at a higher risk of developing periodontal diseases. Interestingly, we have always had difficulty achieving the necessary compliance from patients in this younger age group to obtain good dental hygiene in order to prevent periodontitis.

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

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

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

A proven concept

At my practice, we ran a study with over 200 periodontal healthy patients, between the ages of 20 and 40 years. Each patient received a free PerioSafe test. Interestingly, 40 per cent of these participants tested positive for the presence of aMMP-8. All of these patients wanted to stay at our practice for an oral hygiene treatment. Of the other 60 per cent who had a negative result, around ten per cent still asked for the treatment. Of the other 60 per cent who had a positive test, around forty per cent wanted to receive a free PerioSafe test. Interestingly, 40 per cent of these participants wanted to have oral hygiene treatment. All of these patients wanted to stay at our practice for an oral hygiene treatment. Of the other 60 per cent who had a negative test, around ten per cent still asked for oral hygiene treatment. This means that only one test is necessary to triple the number of dental hygiene procedures for 40 per cent of the patients in your practice.

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

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

Some dentists think they cannot earn money with prevention, but I want every dentist to understand that 40–50 per cent of all patients will need two to four dental hygiene procedures per year to prevent deterioration. aMMP-8 saliva diagnostics open the door to much needed “patient targeting” and “compliance” and there is nothing else available that can compare to it at this point in time. It is a prevention-needed indicator and a patient motivator. Simply do the calculation for yourself, it is a win-win for the dentist and the patient.

Editorial note: This article was originally published in Prevention – International Magazine for Oral Health 1/2017.

Author

Dr Peter van der Schoor
is director of Implacademy in Gardecon, in the Netherlands.
The Trefoil system is a breakthrough in efficiency for treating the mandible. Previously, pre-manufactured bars could be cost efficient, but passive fit posed a challenge. Now, Trefoil has overcome this with a unique fixation mechanism, which can adjust to compensate for inherent deviations from the ideal implant position. This feat of engineering has enabled a new fixed solution that makes it possible for clinicians to offer patients fixed and definitive teeth in one day.²

More patients benefit from a fixed solution

Several studies confirm implant-assisted complete prostheses are more advantageous than conventional dentures.¹ The benefits of fixed solutions can outweigh the cost of a fixed-removable for many patients when considering implant-supported solutions. As an elective surgery, clinicians must take into account many patient preferences and circumstances. Developed with the needs of the many in mind, the efficiency of the Trefoil system empowers clinicians to provide many patients who are held back by time or by finances with the premium-quality, fixed solution they deserve.

Even before launch, the patient benefits of the Trefoil system have been experienced. A global, five-year multi-center study using the solution began in 2015 and has already yielded positive results.² The hope is that, with the Trefoil system now widely available, patients around the world will soon experience changes in their daily life that this innovative new solution was designed to deliver.

¹Depending on clinician preference and close cooperation with the laboratory.

Booth D3 and Hospitality suite H2. Visit us to experience the new system

Leading in immediate solutions

By challenging existing treatment methods we aim to drive efficiency and make high-quality treatment a viable choice for more patients.

THE FIRST PRE-MANUFACTURED BAR WITH PASSIVE FIT

The ingenious fixation mechanism is a breakthrough in treating the edentulous mandible.

Anatomically designed for the natural arch of the lower jaw, the standardized bar contains adaptive joints that adjust to compensate for horizontal, vertical and angular deviations from the ideal implant position.

Angular deviation ±4.0°
Horizontal deviation ±0.4 mm
Vertical deviation ±0.5 mm

PATENT PENDING FOR FIXATION MECHANISM

Each mechanism has five self-adjusting joints that help correct the position of the pre-manufactured bar, enabling the passive fit of the definitive prosthesis.

PROVEN STRENGTH WHEN PUSHED TO THE LIMIT

The Trefoil system maintains its strength when pushed to the extreme of its compensation capability. In fact, tests² prove almost no difference in fatigue limit between the maximum compensation configuration and the configuration without compensation.

No compensation (n=6)
Maximum compensation (n=6)

FIND OUT MORE

Discover the detail behind this revolutionary full arch solution: nobelbiocare.com/trefoil

**STRAIGHTFORWARD PROSTHETIC WORKFLOW**

Substantial time savings for the restorative clinician and the lab.

The restorative workflow is simplified thanks to the use of the pre-manufactured bar. An experienced clinician and lab will require approximately six hours of active working time to do the treatment.**

**already backed by clinical research**

The Trefoil system is the focus of an ongoing five-year, multi-center study, taking place across four continents, that began in 2015. Positive results are already being reported for implant and prosthetic survival rates.

**Live on stage**

Learn more about the Trefoil system from Dr. Kenji Higuchi, one of the innovators behind the concept, and Dr. José Navarro Sr., one of its very first users.

Corporate Forum on October 5, 9:30pm

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**Conventional treatment**

**Implant placement and fixed definitive restoration in one visit***.

- **1 DAY**
  - Implant placement: implant and provisional denture are placed.
  - Fixed and definitive restoration is placed.

**Trefoil™**

**1 DAY**

- Implant placement and fixed definitive restoration in one visit***.

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**Definitive teeth in one day***

The Trefoil system is a cost-efficient solution that allows immediate function and makes fixed and definitive teeth on the day of implant surgery an option for more patients.

Shorter time-to-tooth:

The Trefoil system enables a fixed and definitive prosthesis to be placed up to six months earlier than conventional treatments with provisional prosthetics.

**5 YEARS**

**4 CONTINENTS**

**110 PATIENTS**

Dr. Kenji Higuchi, United States

Dr. Rubén Rosenberg, Chile

Dr. Glen Liddelow, Australia

Dr. Rubén Davo, Spain

Prof. Dr. Massimo Albanese, Italy
This floor plan is a reproduction of the floor plan by the EAO. Changes or modification can occur. Last update was 22 September 2017.
<table>
<thead>
<tr>
<th>Company</th>
<th>Booth</th>
</tr>
</thead>
<tbody>
<tr>
<td>CASA SCHMIDT</td>
<td>B88</td>
</tr>
<tr>
<td>CENTRES + METAUX</td>
<td>B37</td>
</tr>
<tr>
<td>CHIMD DENTAL</td>
<td>B57</td>
</tr>
<tr>
<td>CLAIRONAV</td>
<td>S31</td>
</tr>
<tr>
<td>CORTEX DENTAL IMPLANTS</td>
<td>G9</td>
</tr>
<tr>
<td>CURAPROX</td>
<td>S37</td>
</tr>
<tr>
<td>DATUM DENTAL</td>
<td>B58</td>
</tr>
<tr>
<td>DENTAL</td>
<td>S48</td>
</tr>
<tr>
<td>DENTAL RATIO</td>
<td>B30</td>
</tr>
<tr>
<td>DENTAL STUDIO</td>
<td>B42</td>
</tr>
<tr>
<td>DENTIUM</td>
<td>G5</td>
</tr>
<tr>
<td>DENTSPLY SHIONA</td>
<td>D5</td>
</tr>
<tr>
<td>DM-EL DENTISTA MODERNO</td>
<td>B44</td>
</tr>
<tr>
<td>DR-KIM</td>
<td>B33</td>
</tr>
<tr>
<td>DYNAMIC ABUTMENT SOLUTIONS</td>
<td>B46</td>
</tr>
<tr>
<td>ECKERMAANN LABORATORIUM</td>
<td>B49</td>
</tr>
<tr>
<td>EMS ELECTRO MEDICAL SYSTEM</td>
<td>B15</td>
</tr>
<tr>
<td>EXAKTUSS / ORIG</td>
<td>B67</td>
</tr>
<tr>
<td>FOTOLANDIA</td>
<td>B72</td>
</tr>
<tr>
<td>FOTODIA</td>
<td>S36</td>
</tr>
<tr>
<td>GACETA DENTAL</td>
<td>B52</td>
</tr>
<tr>
<td>GC</td>
<td>B118</td>
</tr>
<tr>
<td>GEISTLICH BIOMATERIALS</td>
<td>D4</td>
</tr>
<tr>
<td>GLOBAL D</td>
<td>S30</td>
</tr>
<tr>
<td>GIOLO</td>
<td>B1</td>
</tr>
<tr>
<td>Greater New York Dental Meeting</td>
<td>B48</td>
</tr>
<tr>
<td>GSX</td>
<td>B66</td>
</tr>
<tr>
<td>HAGER &amp; MEISSINGER</td>
<td>B18</td>
</tr>
<tr>
<td>HELMUT ZEPF MEDIZINTECHNIK</td>
<td>B53</td>
</tr>
<tr>
<td>HENRY SCHEIN</td>
<td>G8</td>
</tr>
<tr>
<td>HU-FREDDY</td>
<td>B3</td>
</tr>
<tr>
<td>IBIS IMPLANT</td>
<td>S35</td>
</tr>
<tr>
<td>IMPLANTAGE - AGS MEDIKAL</td>
<td>S39</td>
</tr>
<tr>
<td>IMPLANT DIRECT</td>
<td>G15</td>
</tr>
<tr>
<td>ImplantaSwiss</td>
<td>S14</td>
</tr>
<tr>
<td>INIBA DENTAL</td>
<td>B7</td>
</tr>
<tr>
<td>INTRALOCK INTERNATIONAL</td>
<td>S25</td>
</tr>
<tr>
<td>INVIRIO BIOMATERIAL SOLUTIONS</td>
<td>S32</td>
</tr>
<tr>
<td>IRIS</td>
<td>S26</td>
</tr>
<tr>
<td>ITI</td>
<td>B47</td>
</tr>
<tr>
<td>FIOCLAR VIVADENT</td>
<td>S40</td>
</tr>
<tr>
<td>JODENTALCARE</td>
<td>B27</td>
</tr>
<tr>
<td>KLOCKNER IMPLANT SYSTEM</td>
<td>S11</td>
</tr>
<tr>
<td>KORNE ITALIA</td>
<td>B13</td>
</tr>
<tr>
<td>LEOHE</td>
<td>B40</td>
</tr>
<tr>
<td>LIFENET HEALTH</td>
<td>B28</td>
</tr>
<tr>
<td>MAXILLARIS</td>
<td>B73</td>
</tr>
<tr>
<td>MAXILLENT</td>
<td>B29</td>
</tr>
<tr>
<td>MECTRON</td>
<td>S21A</td>
</tr>
<tr>
<td>MEDITIS</td>
<td>B56</td>
</tr>
<tr>
<td>MEDIDENT ITALIA</td>
<td>B26</td>
</tr>
<tr>
<td>META</td>
<td>B19</td>
</tr>
<tr>
<td>MRCODENT IMPLANT SYSTEM</td>
<td>B20</td>
</tr>
<tr>
<td>MICRO-RX</td>
<td>B2</td>
</tr>
<tr>
<td>MINIMAVIDENT</td>
<td>B9A</td>
</tr>
<tr>
<td>MWS IMPLANTS</td>
<td>P1</td>
</tr>
<tr>
<td>NEDDENT</td>
<td>G7</td>
</tr>
<tr>
<td>NEDSS</td>
<td>B16</td>
</tr>
<tr>
<td>NIBECCOL</td>
<td>S28</td>
</tr>
<tr>
<td>NOBEL BIOCARE</td>
<td>D3</td>
</tr>
<tr>
<td>NOBIL BID RICERCHE</td>
<td>B68</td>
</tr>
<tr>
<td>NSK</td>
<td>S17</td>
</tr>
<tr>
<td>NUCLEOSS</td>
<td>S2</td>
</tr>
<tr>
<td>OMANA SPA</td>
<td>S38</td>
</tr>
<tr>
<td>OSSTELL</td>
<td>S5</td>
</tr>
<tr>
<td>OSSTEM</td>
<td>P2</td>
</tr>
<tr>
<td>OSTEODIR BY TECNOSS</td>
<td>S20</td>
</tr>
<tr>
<td>OSTEGENICIS BIOMEDICAL</td>
<td>S18</td>
</tr>
<tr>
<td>OSTEODENT FOUNDATION</td>
<td>B63</td>
</tr>
<tr>
<td>PENGUNIFRA</td>
<td>B12</td>
</tr>
<tr>
<td>PERIOSYSTEM</td>
<td>S23</td>
</tr>
<tr>
<td>PLANNECA</td>
<td>S21</td>
</tr>
<tr>
<td>PROCESS FOR PRF</td>
<td>S41</td>
</tr>
<tr>
<td>PROCLINIC</td>
<td>B45</td>
</tr>
<tr>
<td>PROCTECH</td>
<td>B24</td>
</tr>
<tr>
<td>QUINTESSENCE</td>
<td>E1</td>
</tr>
<tr>
<td>REGEDENT</td>
<td>B54</td>
</tr>
<tr>
<td>RHEIN R&quot;3</td>
<td>B34</td>
</tr>
<tr>
<td>SANSHIGA</td>
<td>B38</td>
</tr>
<tr>
<td>SEPA</td>
<td>B14A</td>
</tr>
<tr>
<td>SEPIA</td>
<td>S27</td>
</tr>
<tr>
<td>SHINHUNG CO</td>
<td>S12</td>
</tr>
</tbody>
</table>

Dental Tribune International

**ESSENTIAL DENTAL MEDIA**

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Europe has some of the most highly penetrated markets for dental implants in the world, including Italy, Germany and Spain, but it also contains regions with considerably under-developed markets, such as France and the UK. A shift in consumer preferences will be a key characteristic of the European market in the future, in both the dental implant fixture market and final abutment market. Although the shifts will contrast one another, they will both have a significant impact on the market in terms of overall pricing, the competitive landscape and technological innovation.

Historically, premium dental implant companies have dominated in Europe, but have recently faced increased competition from the value and discount brands. A growing prevalence of local manufacturers and an increasingly cost-sensitive consumer demographic will contribute to overall price depreciation and the declining presence of premium implants in the future.

Region-specific growth of the premium segment is highly reliant on the prevalence of domestic, lower-cost dental implant brands. In countries such as Italy, Germany and Spain, there is a plethora of local value and discount dental implant companies that have emerged to cater to the growing cost sensitivity expressed by dentists. Within these regions, the premium segment of the market has lost significant market share and is exhibiting far lower growth relative to the past. It is expected that this trend will continue to spread throughout Europe, as consumer preferences shift towards lower-cost products. Several competitive strengths cement product portfolio and maintain a competitive position in both the premium and value segments. Straumann has also invested in a number of value and discount brands that cater to the European market, including Biodentica, Medentika, MegaGen and Anthogyr. These investments are supplemented by Instradent, Straumann’s business platform established in 2014, which currently provides distribution for Neodent and Medentika through an online store and worldwide network.

In June 2016, Dentsply Sirona continued its expansion by announcing a definitive agreement to acquire MIS Implants Technologies, an Israeli-based company that has a leading position in the value implant segment. Large conglomerates too have taken note of the changing structure of the market, with Henry Schein making strategic investments in BioHorizons and CAMLOG, while Danaher Corporation has invested in Nobel Biocare and Implant Direct.

Rapidly growing CAD/CAM segment in the final abutment market

Similar to the dominant position of the premium segment in the implant market, the market for final abutments has traditionally been controlled by the stock abutment or prefabricated abutment segment. Although the majority of stock abutments lack many benefits associated with patient-individualized solutions found within the custom-cast abutment and CAD/CAM abutment segments, they still provide a relatively simple and cost-efficient solution in implant procedures. The segment is expected to continue experiencing strong growth, as new products and innovation have made CAD/CAM abutments a hybrid abutment and a monolithic crown. The presence of Ti-base abutments has grown rapidly across most regions in Europe and it is expected to become the predominant stock abutment type in the near future. The cost-effective nature and flexibility of options offered with Ti-base abutments will help maintain the position of the total stock abutment segment in the overall market. Stock abutments currently represent over 50 per cent of the total final abutment volume in the majority of markets across Europe, but this share is expected to steadily decrease.

Recent improvements in production capability and technological innovation have made CAD/CAM abutments more affordable than in the past. CAD/CAM abutments are now relatively comparable in price to custom-cast abutments and are more easily accessible, especially in regions where milling laboratories with CAD/CAM production are in greater abundance. Further, CAD/CAM zirconia abutments are primarily required in cases in which aesthetic outcomes are of higher priority, such as the anterior region of the mouth. CAD/CAM abutments are expected to continue to experience double-digit growth, and the expanding market share of the segment will limit ASP of the overall abutment market, since it carries a price premium relative to stock abutments and custom-cast abutments.

Consolidation and emerging players in the competitive landscape

In addition to investments in value and discount companies, the market for dental implants has been distinguished by consolidation among the top competitors. Most recently, Dentsply Sirona was established after the merger of DENTSPLY International and Sirona Dental Systems in February 2016, combining the strengths of each company in dental consumables and innovative technology, respectively. The premium implant company acquired Astra Tech in 2011 and announced the acquisition of MIS in June 2016. In June 2015, Zimmer Biomet was formed through the merger of Zimmer and Biomet, combining the dental divisions of each company, Zimmer Dental and BIOMET 3i. Although the premium implant companies still collectively maintain over 60 per cent of the European market, they are expected to face competitive challenges from emerging players in the value and discount segments. Competitors that have been able to secure a notable market share from the premium companies include BioHorizons, CAMELOD, Global D, medentis medical, Sweden & Martina and regional manufacturers.

Other notable developments in the European market for dental implants include the increased uptake of ceramic materials, growing presence of implant companies in the biomaterials space and rising demand for modern surgical protocols, such as immediate loading and full-arch restorations. Overall, growth within each segment will be highly dependent on the aforementioned factors and region-specific characteristics.

Authors

Dr Kamran Zamanian is President, CEO and founding partner of iData Research. He has spent over 20 years working in the market research industry.

Artur Kim is a research analyst at iData Research in Canada and lead researcher for the 2017 Europe Dental Implant Report Suite. His current work includes the 2017 Europe Dental Bone Graft Substitute Suite and the 2017 Europe Orthopedic Soft Tissue Repair Suite.

Shifting consumer preferences and positive uptake of CAD/CAM technology

Artur Kim and Dr Kamran Zamanian, iData Research, discuss current developments in the European dental implant market.
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Professionalism in dentistry

By Tim Bradstock-Smith, UK

Professionalism has been defined as the conduct, aims or qualities that characterise or mark a profession or a professional person. Literature pertaining to healthcare suggests that professionalism is a competency that can be taught, developed, measured and assessed. Nevertheless, it can be argued that professionalism extends beyond the scope of clinical knowledge and skills and is most certainly multifaceted.

Professionalism includes working within a regulatory framework with adherence to ethical practice; situational judgement and awareness; the ability to interact and communicate with patients as well as inter-professionally; and the commitment to continually enhance and improve the knowledge, values, skills and understanding required to provide consistently high-quality dental care.

As every dental professional is aware, continual development and progression are essential in every part of the industry. However, with the rapid advancements we are seeing year on year, it may not be possible to keep abreast of everything. As such, practitioners should at least make the effort to be familiar with clinical and technical innovations that may potentially affect their practice. While this may seem like a perpetual student, it is the personal responsibility of every dental professional to remain up to date with all the relevant skills and experience they need to maintain clinical competency, as well as gain confidence in those acquisitions in order to strengthen their professional judgements.

Continual development and progression also enable practitioners to build on their abilities and capabilities to pursue a particular area of interest or to strengthen their treatment portfolio. For example, the demographic of a practice may reveal high periodontal disease rates, which would mean that enhancing skills in this area would be advantageous for both the clinician and the dental practice. Alternatively, with the rising demand for areas of dentistry such as short-term orthodontics and aesthetic solutions, some practitioners may wish to extend their expertise into these areas. Nevertheless, learning how to apply skills, knowledge and experience to treatment with sound judgement is critical to the provision of professional dental healthcare.

Judgement, at its simplest, is forming an opinion. Yet, when applied to dental care, it becomes part of a process that involves weighing up all the clinical facts and treatment options with their advantages and risks, as well as interaction between the practitioner and the patient, to come to the most appropriate method for treatment.

Most would agree that well-informed, engaged patients are in a stronger position to decide between treatment options and are more likely to take ownership of the final treatment decision and results. Research suggests that patients seek to prefer this collaborative approach, with the patient and the dentist equally sharing responsibility for decision-making. Consequently, practitioners require interpersonal competency to communicate with and relate to patients by listening, understanding, and providing complete and honest information. For instance, discussing a treatment plan step by step can help the patient to understand and appreciate the reasons for and the health benefits of each procedure. Fundamentally, this enables the patient to make an informed decision before consent and, by developing a plan of action together, the patient-practitioner relationship is enhanced with trust and confidence, and this is more likely to result in patient satisfaction.

This does not necessarily mean that one practitioner should be able to perform all areas of treatment. Part of acting with professionalism is the ability to recognise our individual capabilities and acknowledge that there will always be cases that are beyond our skills or the technological parameters of a practice. This could be due to the particular needs of the patient or the complexity of the treatment required. Yet, whatever the reason, having the professional judgement to refer a patient to another dental professional with the relevant skills and facilities is essential. By requesting the skills and services of clinicians that perhaps specialise in a specific area of dentistry or by utilising the advanced technology of another practice, it is possible to add value in terms of accuracy and outcome, but it also extends the scope and professionalism of the practice.

When it comes to referring patients, it is of course imperative to work with dental professionals that can be trusted to deliver first-class dentistry. It is a good idea to look around. The London Smile Clinic, for example, is a dedicated referral practice with a team of highly qualified dentists that strive to provide a five-star dental service to referring dentists and their patients. As a centre of excellence in dentistry, the clinic offers an efficient and streamlined pathway for all types of complex treatment, including endodontics, orthodontics, prosthodontics and implants. Above all, the London Smile Clinic recognises how important it is to work with professionalism as part of the referring dentist’s team.

Developing the trust of patients is one of the most important attributes of professionalism. As all practitioners know, patients’ well-being should always be put ahead of costs or any other considerations. When patients trust a practitioner’s professionalism, competency and judgement, they are more likely to seek dental services, comply with treatment and recommendations, and return for further appointments. Furthermore, referring strengthens the professionalism of the practice and team.

*Developing the trust of patients is one of the most important attributes of professionalism, according to Bradstock-Smith.

Learning how to apply skills, knowledge and experience to treatment with sound judgement is critical to the provision of professional dental healthcare.
Swiss solutions provider TRI Dental Implants (Booth S16A) has expanded its digital offering with an innovative range of products that help clinicians provide superior digital dentistry. One of its highlights is the TRI Base, a titanium base that is unparalleled in terms of flexibility and performance. TRI+ Digital Solutions is an open interface to all CAD/CAM and guided surgery workflows and technology platforms. Furthermore, the unique TRI 2in1 Impression Abutment is now also available for TRI Narrow and Tissue-Level Implants. TRI+ Digital Solutions provides a universal open implant interface to leading technology partners in digital dentistry. In contrast to numerous closed digital systems, it provides better transparency and helps eliminate all barriers for their respective treatments. TRI+ Digital Solutions allows a wide range of indications through 3-D planning, guided surgery, CAD abutments, CAD/CAM screw- and cement-retained restorations, and modern treatments such as rehabilitation on four implants. Combined with TRI’s lean and intelligent digital implant system, choosing treatment options, from simple to complex without limits, has never been easier. The new TRI+ Digital portfolio contains the new TRI Bases, both in engaging and non-engaging versions; milling blanks, including the proprietary TRI Friction, multi-unit Ti Bases; and the new digital implant analogue. To meet all specific aesthetic requirements, all TRI Bases can be customised for use with the new angulated screwdriver.

**TRI-Base** Customisation options for available Ti Bases are limited. For this reason, the existing TRI Ti Base has been refined and technologically improved to a unique digital abutment with extraordinary features, offering a new level of performance and simplicity. The newly patented TRI Base is the first such base that can be customised in length and angulation, both physically by the technician and virtually in the respective CAD software, and even for angulated screw channels in aesthetic cases. Owing to the defined machined surface roughness, the bonding connection between the TiBase and the restoration has been perfected and strengthened. TRI Bases are anodised in pink to guarantee a long-lasting natural aesthetic result. They are available in an engaging version for single-tooth restoration and a non-engaging version for multi-unit restorations. The engaging version features the proprietary TRI Friction fit, and both versions include the consistent and proven TRI Soft Tissue Concept.

**Digital implant analogue** TRI has recognised the increasing importance of 3-D printing and has launched a new analogue for digital and conventional production of the master model. Special features allow click retention in the 3-D printed master model. The analogue can additionally be fixed in the model with a basal screw for maximum predictability and precision.

**TRI 2in1 Impression Abutment** TRI has expanded its product portfolio also with the unique, innovative TRI 2in1 Impression Abutment available now for Narrow and Tissue-Level Implants. The patented, instrument-free and simple handling concept enables a new, fast and safe closed-tray impression. The impression post can then be used as a final abutment. The new TRI 2in1 Impression Abutment is unparalleled in terms of simplicity, quality and price. TRI+ Digital Solutions and the TRI 2in1 Impression Abutment reflect the company’s main objectives to make practitioners’ work as simple and high-performance as possible, while offering 100 per cent Swiss quality. 

**DENTAL TRIBUNE’S NEW ONLINE LEARNING SERIES SET TO LAUNCH IN 2018**

In 2018, Dental Tribune International (DTI) is launching its online educational platform, Dental Tribune Online Shows. Consisting of a series of educational lectures on all dental specialties, including aesthetic dentistry, digital dentistry, endodontics, implantology, laser dentistry, orthodontics, periodontics and preventive dentistry, the shows are designed to be of immense value for dental professionals around the globe and are free to attend.

The unique concept will allow dental professionals insights into the latest studies and case reports as well as gaining first-hand experiences from top international experts. Lectures are designed to be convenient in style and use and participants will be able to access them from anywhere in the world, free of charge. Additionally, interaction with the dedicated experts via the questions-and-answer sessions at the end of each presentation offers a chance to dig deeper into an area of interest—entirely while receiving credits from an ADA CERP-recognised provider.

Lectures will be presented on a dedicated website and cover two full consecutive days (Friday and Saturday, 9.00 to 20.30) with ten 60-minute presentations per day. Each lecture will be recorded, edited and archived on the respective show’s website to allow for later access.

DTI Online Shows calendar and corresponding websites are as follows:
- 16 & 17 February 2018: Ortho Show [www.OrthoShow.com]
- 14 & 15 September 2018: Endo Show [www.EndoShow.com]
- 16 & 17 November 2018: Aesthetic Dentistry Show [www.AestheticDentistryShow.com]
Preventing peri-implantitis

Despite major advancements in implant placement and increasing success rates, peri-implantitis continues to pose the risk of implant failure. This inflammatory disease arises as a result of the formation of dental plaque on the implant surface. While peri-implant mucositis is reversible, peri-implantitis might lead to implant failure. Both surgical and non-surgical mechanical debridement, antimicrobial therapy, or the combination of chemical bridge ment, antimicrobial therapy, and surgical methods help to manage peri-implantitis. Only regular implant care maintains the conditions necessary to prevent such diseases and ensures long-term success of the treatment and implant health. Swiss oral healthcare provider Curaden, through its CURAPROX, get to know their patients and adapt the treatment to the specific needs of each of them, especially in or generation and augmentation procedures, and periodontal and peri-implant operations. The chlorhexidine concentration of 0.2 per cent is highly effective in the management of plaque and bacteria and protects the surgically treated areas from superinfection. The combination of chlorhexidine with polyvinylpyrrolidone-vinyl acetate (PVP-VA) and hyaluronic acid (HA) offers further benefits both for patients and for dental professionals: it promotes healing and tissue regeneration, reduces pain as well as plaque accumulation, and serves as an important adjunct in the treatment of peri-implantitis and mucositis.

In order to address chlorhexidine’s side effect of staining the teeth—which often lowers patient compliance and interrupts the treatment and healing process, Curaden’s chlorhexidine mouthwash contains ADS (anti-discoloration system). The benefits of chlorhexidine are not affected by this addition and several studies have shown that Curaden’s 0.2 per cent chlorhexidine mouthwash containing ADS has the same beneficial effect as other 0.2 per cent chlorhexidine mouthwashes, but without discoloration of the teeth. The company’s portfolio of chlorhexidine products includes CURASEPT ADS 250 (Curaprox), ADS 350 (Periodontal Gel) with 0.5 per cent chlorhexidine for topical application. The product can be used weekly in treating difficult periodontal cases and peri-implantitis.

The right kit used according to the right technique

As an all-in-one solution to implant care, the CURAPROX implant kit contains a CS 5460 ultra soft toothbrush, a CS 1009 angle toothbrush, the CPS prime and CPS soft implant interdental brushes, an interdental access probe and a brochure to explain the right techniques to your patient. No matter what tools you use for implant care, implant specialists need to determine the individual periodontal situation of each patient. "When recommending this kit to your patients, it is helpful to use the brochure to explain the right techniques to your patient. No matter what tools you use for implant care, implant specialists need to determine the individual periodontal situation of each patient," said Ventimiglia. "Following a simple, non-traumatic oral hygiene routine for implant patients should be standard in implant treatment."
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“The RFA technique must be accurate and reliable”

An interview with Prof. Lars Sennerby, Sweden

Prof. Sennerby, what is your experience of the RFA technique?

Prof. Neil Meredith showed me a prototype of his invention already in 1992 and we have since then used RFA for implant stability measurements in numerous experimental and clinical studies. I supervised, and then as a clinical routine diagnostic instrument. I find it to give valuable information about implant stability at any time point during implant treatment and follow-up.

What is the background to the ISQ unit?

The whole purpose of introducing the ISQ (Implant Stabilty Quotient) was to give clinicians a unique and easy quantity that different pegs for different implant designs give the same ISQ value if they have the same implant stability. This is a known problem when calibrating transducer pegs for different implant designs. It has not been so easy to solve, since implant stability per se has not been defined using any other quantity, and a reference had to be created. The reference can then be used when transducers are designed and developed. To explain the problem, think of two different implant designs that are placed in identical material and two different ISQ values are obtained. It is impossible to know if the difference depends on the fact that the two pegs are different or if it is because the stability is actually different, or a combination of the two. So a reference is indeed necessary.

How do we then know that implants with the same stability have the same ISQ?

It is of course desirable that different pegs for different implant designs give the same ISQ value if they have the same implant stability. This is a known problem when calibrating transducer pegs for different implant designs. It has not been so easy to solve, since implant stability per se has not been defined using any other quantity, and a reference had to be created. The reference can then be used when transducers are designed and developed. To explain the problem, think of two different implant designs that are placed in identical material and two different ISQ values are obtained. It is impossible to know if the difference depends on the fact that the two pegs are different or if it is because the stability is actually different, or a combination of the two. So a reference is indeed necessary.

How do you define the ISQ unit?

ISQ is calculated from the underlying RF of the transducer peg using a mathematical formula. The ISQ unit has not yet been defined using any other general or specific unit, simply because there is no such unit available. Instead, empirical data from more than 800 scientific publications has guided clinicians how to use the ISQ scale clinically.

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The ISQ measurement in the FullScope unit has not yet been defined using any other general or specific unit, simply because there is no such unit available. Instead, empirical data from more than 800 scientific publications has guided clinicians how to use the ISQ scale clinically.

So how did you solve this problem?

Studies have shown that bone density at the implant site determines the ISQ value and that it correlates with the implant’s micro-stability. This reflects the clamping ability of the bone, which in turn defines the micro-stability. The problem is that different implant designs behave differently also in the same bone density, depending on surgical technique, design and self-tapping properties. So when calibrating pegs for different implant types, we embodied the different implant types in a dense material in an identical way. In addition, we gave all implants an identical outer geometry by moulding each implant type into identical cylinders. The stability of each implant/cylinder can then be varied with a clamping device in a standardised manner. This also gave us the possibility to calibrate the pegs over the full ISQ scale and not only for a single value.

How do you use this calibration methodology?

With the method described above, a reference ISQ/stability relationship has been established, which is used when manufacturing MultiPegs for different implant designs. Each type of MultiPeg is designed to follow the standard ISQ/stability curve to ensure that different types of implants show the same ISQ value for the same stability. It is also an excellent method to assure that the peg has an optimal fit to the implant.

Why is the above important?

RFA is a great clinical tool, however, it is absolutely necessary that the technique is accurate, reliable and is based on a standard reference so that the stability of different implant types can be compared. This is particularly important if the academic and scientific community is going to agree on different clinical protocols based on ISQ values, for instance, when it is safe to apply immediate/early loading protocols.

Thank you for the interview.

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www.penguinrfa.com

PREMIUM PRODUCTS AND TRENDSETTING SOLUTIONS BY CAMLOG

- CAMLOG is cordially inviting visitors to EAO 2017 to take a closer look at the full range of its products at Booth G11. There, they can experience how the innovative CAMLOG products and implant systems can be used in the digital workflow and what possibilities they offer to improve work efficiency. CAMLOG provides the expertise to expand the digital process chain in the field of oral implantology and in the network between surgeons, prosthodontists and dental technicians.

One highlight being presented at EAO is the CERAMLOG System, which is very efficient owing to its new and innovative product components. The perfectly adapted workflow with the One Click, One Scan, One Shift concept will guide clinicians into the future of digital dentistry. Tailored to the individual needs of modern dental practices, CERAMLOG allows for a highly efficient workflow and optimised value chain. It also benefits patients, requiring less surgery, offering shorter treatment times and a competitive cost-benefit ratio together with CAMLOG quality and thus making implant restorations possible for more people.

During a lunch symposium on Saturday, October 7, Dr Carlos Repullo from Spain will be providing a detailed overview of iby’s possibilities when used in combination with the CEREGO system. The presentation will be held in English and take place at 13:00 in Room 113.

Another highlight presented by CAMLOG is the new CERALOG ceramic implant system, which offers highly aesthetic restoration options, according to the company. Made of yttria-stabilised zirconia, it is said to possess good mechanical properties, comparable to those of titanium. The zirconia implant portfolio includes two different types of implants. The two-piece CERALOG Hexalobe implant is a true two-piece design with reversible screw-retained abutments made of the high-performance polymer PEKK. The abutment can optionally be attached to the implant with a titanium or gold screw. Alternatively, the one-piece CERALOG Monobloc implant can be used for purely ceramic solutions.

The CAMLOG implant systems offer easy and efficient handling. The Tube-In-Tube implant-abutment connection of CAMLOG with its distinctive three cams has become well established, with millions of implants placed. The implant design allows quick and easy insertion, as well as alignment of the abutment. Accurate transfer and economic handling are only a few of the many benefits of the CAMLOG Tube-In-Tube connection. CAMLOG has also followed these principles with the CONELOG Implant System, featuring a coaxial implant-abutment connection. Both systems have the same outer geometry (SCREEN LINE), which only requires one surgical set for both systems.

A new package design for CAMLOG and CONELOG undertakes the efficiency in handling during the surgical workflow. The ergonomic blister pack allows easy handling and safe transport of the implant to the sterile area. The heart of the new packaging concept is the innovative implant holder that secures both the implant and the locking screw with a click mechanism. The new insertion post has a narrow head diameter and is ideal for reduced interdental spaces. It can be picked up directly with a manual insertion device or angle piece and inserted accordingly. The transition to the new packaging concept is gradual. In addition to the wide range of aesthetic possibilities provided by the CAMLOG and CONELOG systems, the multi-option COMP4UR abutment system, a precise guide system and the customised manufacturing services of DEDICAM, CAMLOG has a comprehensive product offering. **
WHITE TEETH
FRESH BREATH
PURE SMILE

WHITE TEETH DUE TO
HYDROXYLAPATITE

BLACK IS WHITE
CHEW FOR WHITE
WITH ACTIVATED CHARCOAL

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ABUTMENTS4LIFE: IMPLANTOLOGY HAS NEVER BEEN EASIER

With this new hybrid abutment range, Swiss company Cendres+Métaux is about to set new benchmarks in the field of implant prosthodontics. Abutments4life are fully anatomical prosthetic solutions for implants. The basic idea behind the development was to follow natural morphology and simplify aesthetic challenges and design processes for maximum efficiency for both the clinician and the patient.

The hybrid abutment consists of a prefabricated anatomical abutment with an angled screw channel and a bonded zirconium cap. According to the company, it can be inserted directly after implantation and ground intranorally. Owing to the biologically optimised NCW (nano-coated wave) surface, the soft tissue can attach quickly and easily. The final crown is placed after impression taking after only three sessions.

Abutments4life complements the existing range of prosthetic dental implant solutions for dentists and dental technicians.

"I am convinced that this additional product offering will help to make the cooperation between dental laboratories and dentists even more efficient," stated Dr Arne-Christian Faust, CEO of the Cendres+Métaux Medtech division. "For me, the patient benefits are impressive. Abutments4life supports the vision of Cendres+Métaux Medtech to become one of the leading providers of dental solutions.”

Cendres+Métaux has a long history of manufacturing implants and dental prostheses. For over 100 years, its customers have relied on the company’s skills to turn precious materials into high-quality products with the utmost precision. The combination of experience and innovation has led to a number of successful solutions.

Guided surgery without a guide

Excellence in dental implantology needs careful restoration-driven planning based on a virtual patient 3D model which is created by using CBCT and digital impression data. In the past, accurately executing that plan in the patient’s mouth required the design and custom production of drilling guides. New dynamic navigation products now enable freehand execution, without the need for such guides.

While it is an initial investment in purchasing a navigation system and learning a new way of performing implantation surgery, dynamic navigation offers a number of significant advantages over static guides. These include simplified planning, no delay from scan to surgery as well as the evaluation of the accuracy and change of plan in real time. Clinicians further benefit from lower per procedure costs, easier access to drilling sites, better irrigation as well as better tactile feedback.

Dynamic navigation combines the advantages of performing highly accurate and minimally invasive surgery with the flexibility to make changes to the digital plan at any time during that surgery. Independent of any implant specific surgical kit, it offers the promise of a simple workflow, easily adapted to the free-hand surgical techniques that clinicians currently employ.

The Dynamic Navigation Society (DNS) was recently founded to enable implantologists to learn how to perform restoration-driven planning on virtual patient models and use dynamic navigation to accurately implement their plan. DNS members, which currently includes over 40 leading implantologists, offer one- or two-day courses in planning and navigated implantation, providing CE credits and certification. The society also certifies a number of third party educational courses. By cooperating with existing courses, more clinicians in more languages can be reached. Moving forward, the morning session will be lead by Prof. Josep Arnabat and Dr Eduard Valls from the University of Barcelone followed by Dr Hadi Antoun, who has his own clinic and training institute in Paris, France. Attendees who are interested in the workshop and have registered for the EAO-SEPS meeting, can sign up for the workshop in their profile.

CeraNav has also announced a new partnership with the Clinic of Fixed and Removable Prosthodontics and Dental Material Science from the University of Zurich. Having started in September, the clinic will utilise the company’s Navident system in the field of dynamic navigation for dental implantation. The research will leverage Zurich University’s expertise in the area of 3D diagnostics and implant dentistry with Navident’s easy to perform, minimal invasive treatments.

To learn more about the Dynamic Navigation Society, visitors are invited to visit Booth S31. Information are also available at dncarolinas.com.
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WHAT’S ON in Madrid, 5–7 October

**Madrid Oktoberfest 2017**
- Date: 5–7 October
- Starting time: Thursday: 20:00 | Friday: 20:00 | Saturday: 13:00 and 20:00
- Venue: WiZink Center, Av. Felipe II
- [www.madridoktoberfest.es](http://www.madridoktoberfest.es)

The Madrid Oktoberfest brings Munich’s trademark beer festival to the Spanish capital. This year’s celebration at the fourth event will include all the main German traditions, such as the opening of the barrel, characteristic Bavarian clothing, traditional live music, sausages, pork knuckles, pretzels and beer. In fact, the original beer of the Munich Oktoberfest, the König Ludwig—served at the wedding of Ludwig I, King of Bavaria, and Princess Teresa in 1810—will be available at the event for the first time. This beer gave rise to the tradition of Oktoberfest and laid the foundation for a traditional Bavarian toast: Prost!

**El Rey León [The Lion King] at Teatro Lope de Vega**
- Dates: 5 October, 20:30
- 6–7 October, 18:00 and 22:00
- Venue: Teatro Lope de Vega, Gran Vía, 57
- [www.elreyleon.es](http://www.elreyleon.es)

The Lope de Vega theatre was built between 1946 and 1947 and opened in August 1950. With its beautifully crafted ornate decorations and grandiose seating at orchestra level and two levels of balconies, it quickly became one of Madrid’s most popular showplace theatres. After serving as a cinema and venue for other events, the building was converted back to a showplace theatre with 1,496 seats in 1997. Shows performed there since include Man of La Mancha, Beauty and the Beast, Phantom of the Opera, Mamma Mia! and The Lion King.

**Villamanuela Festival 2017**
- Date: 6 & 7 October
- Starting time: 19:30
- Venue: Teatro Barceló, Calle Barceló, 11
- [www.wegow.com/festivales/villamanuela](http://www.wegow.com/festivales/villamanuela)

Five years ago, the Villamanuela Festival was born to unite the two districts of Conde-Duque and Malasaña with music, art and food. This lively event—a festival with personality”, as the locals like to call it—seeks to showcase the character and vitality of these two neighbourhoods. Its fifth edition will be held this October with the aim of maintaining the artistic quality of previous years. Each day will begin with concerts at the Barceló Stage (at the Barceló theatre) and...
Baroque Party at Plaza Mayor de Madrid

- Date: 7 October
- Starting time: 18.30
- Venue: Plaza Mayor

Recalling the great street theatre it was from its beginnings, when it was site of parties of the city and the kingdom, the Plaza Mayor will regain its essence with a great event: the Baroque Party that reflects the history of Madrid. As part of the celebrations for the fourth centenary of the square, this playful affair will relive the mythological comedies that were performed in the era of the Habsburgs. A festive caravan of actors, musicians, dancers and horse riders will bring a parade of floats to life, presided over by the allegoric of the Fame of Madrid, accompanied by Titan, bearing the Earth, the Petades and the zodiac signs on his shoulders. They will be followed by Cybele and her entourage of fertility, and then Neptune with his court of nymphs, mermaids and nereids, all dancing to the rhythm of the minstrels’ live music. This lavish procession of gods of ancient times will end in the square with a jovial party.

Carmen de Bizet (opera)

- Date: 6 & 7 October
- Starting time: 19.00

The passionate character of Carmen, which was created by Georges Bizet at the end of the nineteenth century, embodies the features of a perfect woman who knows how to twist men around her little finger. In the ballet performance, Carmen seduces Don José, an inexperienced soldier. Infatuated with Carmen, he abandons his former love, mutinies against his superior officer and, eventually, joins a group of smugglers. But when Carmen falls in love with bullfighter Escamillo, her unfaithfulness provokes a dark side in Don José that she has never experienced before.
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*Depending on clinician preference and close cooperation with the laboratory.

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