By Dr. Shiamaa Al-Mashhadani, UAE

Introduction
Oral health has been a top priority in the Dubai Health Authority agenda for the strategy 2021. The main aim is to decrease the level of caries for children in Dubai. The latest data shows that the percentage of caries for children aged 5-6 years was 65%, which is considered higher than the average caries level in the region.1 The “MY SMILE” tooth-brushing program was introduced in 2017 under the direction and guidance of Dr. Hamda Al-Mesmar, the Director of Dental Services Department of Dubai.

Background
The aim of the tooth-brushing scheme was to introduce forms of preventive activities that would decrease the high levels of caries prevalence among the students in Dubai schools. The tooth-brushing in schools scheme is an evidence-based intervention, drawing on principles and learning from comparable programs in Scotland2 and other research which show that the application of fluoride toothpaste in a supervised school-based intervention can have a significant effect on children with high caries risk. The tooth brushing program was designed with the intention of improving the oral health of young children and with emphasis on the importance of daily good oral hygiene habits.

Project Outline “MY SMILE” tooth-brushing program
In 2017, “MY SMILE” program was introduced to 12 government and private schools in Dubai.

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By Dental Tribune MEA/CAPPmea

CAPP Events recently concluded the 9th edition of the Dental Facial Cosmetic International Conference and Exhibition. Over 3,000 dental practitioners, students, trade visitors and VIP’s from the MENA regions Americas, Asia, Australia and Europe gathered at the InterContinental Hotel Dubai Festival City, UAE on 3rd and 4th November. The event once again established itself as the region’s largest scientific dental conference (03-04 November). Featuring a thrilling and vibrant exhibition showcasing the latest novelties in aesthetic dentistry (03-04 November), Dental Hygienist Seminar (05 November), over 20 multidisciplinary pre- and post- hands-on training courses (03-05 November) and over 25 free CME trainings at specially dedicated training zones throughout the exhibition area.

The two-day scientific dental conference programme welcomed a total of 330 dental experts who discussed their research, innovative approach, advancements and best practical methods on a variety of topics including aesthetic dentistry, endodontics, restorative dentistry, orthodontics, prosthodontics, implantology and hygiene. A total of 3,027 international delegates made the trip to Dubai from over 47 countries to share ideas and network with dental experts, speakers, industry players as well as movers and shakers in the dental market.

The annual event provided an unparalleled platform for dental professionals to earn up to 35 continuing medical education (CME) credit hours over the course of five days played a key role in attracting a record number of delegates and visitors. This year’s significant event highlight was the “Free CME Trainings” which took place during the exhibition at dedicated training zones. The activity not only encouraged visitors to attend but created networking opportunities for sponsors, exhibitors and participants alike.

Dental Hygienists Seminar (DHS) once again took place in partnership with Colgate Oral Care Academy and supported by the International Federation of Dental Hygienists (IFDH) focussing entirely on the dental hygienist profession. A mix of international and regional speakers presented relevant hot topics aligned with the seminar theme “Exploring the possibilities in the arena of dental hygiene”. A total of 303 dental hygienists attended the dedicated programme and its sub hands-on training courses with topics such as enhanced biofilm management, working posture and periodontal instrumentation and sharpening. As part of CAPP’s commitment to further supporting the path for innovative research and advancements in the field of dentistry, dental professionals and dental students were invited to present their findings through the “Poster presentation” competition which was reviewed by academicians and industry experts.

Dr. Dobrina Mollova, founder and Managing Director of CAPP summarised, “Such events are of paramount importance to dental professionals as they encourage conversation, integration of best practice, adaptation of the latest advancements in technology and above all contribute positively to maintaining and improving patient health.”
Over 3000 delegates attended the two day event 9th Dental Facial Cosmetic Conference & Exhibition.

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Dr. Aisha Sultan - President of the Emirates Dental Society

Conference chairman - Dr. Munir Shewadi

Dr. Maria Batak lecturing on another dimension of composite restoration - new possibilities

Dr. Matthew Holyoak, BARD Faculty presented during the 9th Dental Facial Cosmetic Conference & Exhibition

Professor Louis Handan, Lebanon lectured on direct composite restorations

The event once again established itself as the region’s largest scientific dental conference.

In total 303 dental hygienists were educated during the Dental Hygienist Seminar.

Dr. Knut Hufschmidt, Austria explained the world of direct restorations.

Professor Louis Handan, Lebanon lectured on direct composite restorations.

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CEREC Software 4.5 – Made for Dentists

By Dentsply Sirona

Single-visit dentistry is an emerging expectation amongst patients today. Everything from a single source for safer, better and faster dentistry, and this is made possible by CEREC. Today, dentists can readily meet these expectations thanks to the CEREC SW 4.5 in which the workflow has been significantly improved and expanded to include a variety of features. The CEREC SW 4.5, with its intelligent tools, makes it even easier for newcomers to enter the world of digital dentistry.

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• Designed to ensure a perfect fit if the preparation happens to deviate from the specifications.
• Calculation of next work steps.

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• Improved biogeneric initial proposals that match the patient’s needs perfectly, even in difficult anatomical situations, based on the biojaw algorithm.
• Analysis of tooth shade with independent function, structures are engineered to be represented realistically and in true, natural colour. This gives you objective support and more certainty when selecting the suitable restoration shade.
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• More realistic visualisation of model and restoration.
• Optimised milling and grinding strategies for an improved fit.
• Reduction of required computing power.

CEREC SW 4.5 features user-friendliness, realistic visualisation, increased speed and top quality results, designed to contribute to faster, safer and better dentistry. To find out more about CEREC SW 4.5, please contact your local Dentsply Sirona representative.

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BEAUTIFIL II LS

By SHOFU

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FONA CLOSER TO YOU
Back in May 2017, we interviewed Julian Callanan, the Managing Director of Sinterex, and discussed how he and his business were applying metal 3D printing technology in dentistry. We caught up with him to find out his progress and the latest products.

DTMEA/CAPPmea: How have the last 6 months passed by?
Julian Callanan: The last 6 months have absolutely flown by. As a young business, we are on a constant roller-coaster ride with highs and lows combined with lots of learning. The summer in particular was quite tough, I know many clinics and laboratories found market conditions to be more quiet than usual, but things seem to be moving again now. Overall, we keep adding new customers, and once they convert from the traditional manual techniques to digital production, then they do not go back.

Are you working on any new products or technologies?
Our primary product line remains PFM crowns and bridges. However, since we last met, we have introduced two new products: Removable Partial Dentures and Metal Surgical Guides. The RPDs which we produce are a great solution for a partially edentulous patient who is not a candidate clinically or financially for implants. We use a metallurgical process called Solution Annealing which brings flexibility into our metal and helps with the fit for the patient. The second product is a metal 3D printed Surgical Guide. This is a really exciting innovation in Surgical Guides and we recently collaborated on a trial surgery to test the product in the Middle East region for the first time.

Who was involved and what did you do?
We worked with a broad team of dental experts. The design of the guide and the planning of the operation was led by 2INGIS, a Belgium based company who holds many patents in this area. The operation was led by Dr. Ahmad Aljazairi with support from Dr. Islam Samy and Dr. Khaled Al-Ekram. The role of Sinterex was to metal 3D print and then finish the guide.

What was the outcome?
The patient had two missing teeth and one broken tooth. During the operation the broken tooth was removed, and three implants immediately placed. We checked the results after the operation using a CBCT and the implant placement was perfect, more importantly, the patient was happy. The patient had needed the operation for a while but was avoiding as he was worried about the procedure. The patient works as a microelectronic technician and is very technically minded, when he heard that a surgical guide would be used, his confidence in the procedure increased.

What lies ahead for Sinterex?
We are focusing now on expanding our customer base and bringing our products to new markets. In parallel we are also looking at some really cool new 3D printing technologies which we feel could be beneficial to our existing customers.
NEW: Update Sirona Connect Software 4.5

By Dentsply Sirona

The latest version of Sirona Connect SW 4.5 offers additional software and portal features, which expand and improve both the digital impression process in the practice, as well as the possibilities for choosing individual laboratory services during the Sirona Connect ordering process.

These include:

General bug fixes and quality improvements
- More detail in the image.
- More realistic visualization of the model.
- Less computer power needed.

Shade Detection
- The ‘Shade Detection’ feature allows you to analyze the shade of any tooth based on the Omnicam scan. This gives you objective support and more certainty when selecting the suitable restoration shade.

Open Scan Export
- Exporting scan data in STL format is possible for CEREC Omnicam introral scans. This means that the data from the digital impression can now also be used in software products from other manufacturers. This allows new options for the digitalization of your practice.

Digital impressions of implants from Dentsply Sirona or third party implant systems
- Integration of “MIS” TiBases and “Thommen” scan posts.
- Selecting “other Scanbody” during implant treatments.
- Separate image catalogue for scan posts and TiBases as well as other scanbodies.

Create customized laboratory services in the Sirona Connect Portal
- With the release of Sirona Connect SW 4.5, the Sirona Connect Portal offers labs the opportunity to create individual profiles and order information that are shown during admin phase and order phase in Sirona Connect SW 4.5.

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Sirona Connect SW 4.5 is a full version which is supported by CEREC Omnicam, CEREC Bluecam and Apollo DI.

We highly recommend that all users install Sirona Connect SW 4.5. For more details please check the Sirona Connect SW 4.5 manual or ask your CAD/CAM specialist.

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Contact your Dentsply Sirona representative to request a demo and see for yourself why Calibra Ceram Cement is a mighty good choice for restorations that need more strength.

* Tack cure window equals five-second wave cure per surface. For excess cement cleanup, monowave output LED lights with a single peak output around 470nm are recommended. ML070013A (5/18/17)

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Essential communication: The use of technology for virtual patient records

By Dr. Les Kalman & Mariana Capretz, Canada

Introduction
Records are an essential and integral component of diagnosis and treatment planning. Moreover, the acquisition of records allows the required communication between the clinician, laboratory, patient, and other third party stakeholders. This is critical in all aspects of dentistry, but holds immense value in implant dentistry. Unfortunately, there is a growing epidemic in which clinicians are utilizing the minimal amount of records. This becomes a paramount issue in the delivery of predictable and successful dental implants. Dental records may take many forms, but they tend to originate from two different groups: concrete and virtual. Concrete records include impressions and models, while virtual records encompass modalities such as cone beam computed tomography (CBCT) and intraoral scans. Each group has its own strengths and weaknesses, yet the literature seems to suggest that CBCT provides an abundance of information, especially for implant dentistry.

Computed tomography
Computed tomography (CT) has revolutionized diagnostic radiology. Since its inception in the 1970’s, its use has increased rapidly, with the annual number of CT scans in the United States alone, now being over 70 million.1 By its nature, a CT unit involves larger radiation doses than the conventional X-ray imaging procedures. Consequently, a typical CT series results in radiation doses that are associated with a small, yet statistically significant increase in lifetime cancer risks.2 The quantity most relevant for assessing the risk of developing cancer from a CT procedure is the effective dose.3 A diagnostic CT procedure produces an effective dose in the range of 1 to 50 mSv, with a dose of 10 mSv possibly being associated with an increase in the likelihood of cancer of approximately 1 in 2000.4 The risk of radiation induced cancer is much smaller than the natural risk of cancer; however, this small increase in risk for an individual becomes a public health concern if large numbers of people undergo increased numbers of CT screening procedures unnecessarily.5 There is strong evidence suggesting too many CT studies are being performed in the United States and it has been speculated that one third could be replaced by alternative approaches, or not performed at all.6

Furthermore, in the dental office setting, the large size, high cost of the equipment and logistics makes it improbable for the clinician. Likewise, with a cost per scan ranging in the hundreds to thousands, the procedure can be challenging for patients. Thus although CT has numerous beneficial aspects, there are barriers to the technology from both the clinician’s and patient’s perspective. Subsequently, other records acquisition techniques have gained increasing popularity.

Cone beam computed tomography
Cone beam computed tomography (CBCT) is a variation of the traditional computed tomography (CT) system.7 With CBCT, an X-ray beam, in the shape of a cone, rotates around the patient to produce a 3-D reconstruction of the craniofacial area.8 Dental CBCT was developed so that dentists could have a small, less expensive machine still capable of producing 3D images.9 The equipment is used for various clinical applications, including dental implant planning, visualization of abnormal teeth, evaluation of the jaws and face, cleft palate assessment, diagnosis of dental caries, endodontic assessment and diagnosis of dental trauma.10 Thus, CBCT provides a fast, non-invasive method of addressing a number of clinical questions.11 Moreover, compared to the conventional CT, it has a limited X-ray beam, offers a shorter scan time, uses a lower radiation dose, and contains fewer imaging artifacts.12 Nevertheless, to accurately read a soft tissue phenomenon, a 24 bit contrast resolution is needed. The dynamic range of CT for contrast resolution can only reach 14 bit maximally and consequently, CBCT is not the best imaging modality to evaluate soft tissues.13 Additionally, it does not provide the full diagnostic information available with conventional CT. The aspect of cost, technology implementation, skills acquisition and radiation exposure also hinder the utilization and implementation of CBCT in the dental office.

Intra-Oral Scanner
Launched in the USA in October 2012, the True Definition Scanner (Fig. 1) is a relatively new digital intraoral scanner.14 Its 3D video capture technology allows the dentist to digitally capture images of the patient’s dentition.15 The scanner's technology instantaneously stitches...
the images together to generate an accurate replica of the patient's oral anatomy. Patients can therefore have a better understanding of their oral situation and the treatment procedures. Furthermore, the precision of the data provides the clinician the required records to design and fabricate prostheses, such as orthodontic appliances, crowns and bridges, all without the need for impressions or models.

This eliminates the time and cost associated with impressions, model fabrication, potential for material distortion and the issue of patient discomfort. In addition, the True Definition Scanner digital files can be used with any system that accepts STL files, a common file format used for storing three-dimensional objects. Dentists can easily share files and work with laboratories and other open source technologies to design and fabricate prostheses and delivery quality treatment to the patient.

However, there are limitations to the technology. Given the new technology, there is the period of skill acquisition for the clinician and, although the unit is mobile, it does require space (note: a compact, tablet-based unit has been recently released). Additionally, while the True Definition Scanner captures the dentition, there is a lack of reference to the patient. Once the scans have been compiled into an image, the image has the ability for rotation on three dimensions objects. Dentists can easily share files and work with laboratories and other open source technologies to design and fabricate prostheses and delivery quality treatment to the patient.

MaxAlign

MaxAlign is a mobile, tablet-based technology, many barriers to utilization are eliminated. For instance, as the technology is mobile, it does not require any office space consideration. It is also cost-effective, possesses negligible radiation concerns for the patient and has a gentle learning curve for the clinician and staff.

Merging virtual technologies

Recent research has investigated a new application utilizing MaxAlign with the True Definition Scanner by merging and correlating the intraoral images. MaxAlign provides the reference and frames the 3-D intraoral digital impression with the landmarks of the patient’s face, providing crucial information to the lab in an anterior aesthetic and complex prosthodontic cases. Additionally, early investigation has also merged images from digitized wax-up scans with the referenced patient image from MaxAlign. By applying the transparency control on MaxAlign, the patient and other third parties, can now have the ability to immediately try-on the proposed restorations and view a before and after effect within the context of the patient's face. This can aid in patient communication and understanding of planned treatment.

Conclusion

Records will continue to have a significant role in the diagnosis, treatment planning and delivery of predictable and successful prostheses. With the growing pressures on the dental profession, including economics, office space limitations, patient concerns and skill acquisition, it is crucial to develop accurate and informative technologies to maximize patient information acquisition and communication. Although CBCT and virtual planning remain the gold standard, there are real patient and clinician limitations to the technologies. The utilization of low-radiation, mobile, tablet-based technologies to merge patient information, has become an exciting avenue that will continue to have an increasingly important role in implantology and dentistry.


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Fig. 4: MaxAlign patient image indicating facial reference planes

Fig. 5: MaxAlign tablet software used for patient image acquisition

Fig. 6: MaxAlign patient image modification

Fig. 7: 3M digital wax-up scan merged and referenced with MaxAlign patient image
One patient, one doctor: 30 years of implant innovation

By Jack A. Hahn, DDS

Since placing my first dental implant 45 years ago, many implant systems have come and gone, several of which I designed myself. If there’s one thing I’ve learned from the thousands of implant cases I’ve completed during the course of my career, it’s that regardless of the implant system chosen, long-term success depends on following the basic principles of treatment planning, surgery and prosthetic design.

Innovations in implant design have streamlined and simplified treatment, making it easier to produce ideal outcomes. Key advancements, such as the screw-shaped implant body, the internal prosthetic connection and the tapered body design, have been crucial in making implantology the essential mode of tooth replacement today.

The following case illustrates more than three decades of implant evolution within the mouth of a single patient. Each implant patient received throughout the years represents a small but significant step forward, culminating in the placement of the Hahn™ Tapered Implant (Glidewell Direct, Irvine, Calif.), which I designed in order to make treatment simpler, more predictable and as accessible to as many patients as possible.

The patient

The patient, whom I’ve been treating for more than 30 years, has received implant therapy several times to treat tooth loss from fracture or decay. Because this treatment occurred episodically throughout many years, I’ve utilized several different implant systems to replace the patient’s teeth. As a result, the patient has implants with internal as well as external hex connections, ranging from an outdated blade-form design to the very latest tapered implant. The experience I’ve had both designing and placing these implants for this patient and thousands of others has given me the unique opportunity to observe my results and determine what designs and protocols work and what can be improved, as I’ve strived to advance implant design throughout the years.

The implants

- JAH 2000 Blade Implant (Fig. 3): first placed an implant for this patient in 1988. It was the JAH 2000, which I designed as a flat, two-piece implant with wings. The blade implant was indicated for thin ridges where a root-form implant could not be placed without bone grafting. Blade implants were typically connected to other implants or teeth, and could be cut, shortened and shaped to align with the anatomy of the bone, which was commonly required when placing blade-form implants at the time. For this patient, two teeth anterior to the implant were prepared, an incision was made, a trough was drilled in the patient’s very narrow ridge, the implant was placed and a five-unit bridge was delivered to replace three teeth in the posterior maxillae. Notice that I adjusted the distal inferior portion of the implant so as not to impinge on the mandibular nerve.

- JAH 3000™ Replacement Implant (Fig. 4): The JAH 3000™ implant in the area of tooth #26 is HA-coated and was placed immediately following extraction. The neck to extend lower than the tops of the wings, allowing more bone to integrate around the neck of the implant. Decades after implant placement, this blade design continues to serve many of my patients well.

- Steri-Oss HL (Fig. 4): The Steri-Oss HL implant in the area of tooth #26 is the most popular design in the No-Bleucone implant portfolio after the company acquired the brand in 1998. The thread pattern of the Replace Select was similar to that of the parallel-walled Steri-Oss implant, but I wanted to have a variant of aggressiveness in the pitch of the threads so it came up to the apex. I knew that another company was coming out with four different implants for the different qualities of bone, and I wanted to beat them to the punch. So I said, ‘Let’s put four different thread patterns in one implant,’ which really helped with the degree of taper and cutting into denser bone.

- Replace® Select Tapered (Fig. 5): I placed several Replace Select implants (Glidewell Direct, Yorba Linda, Calif.) for this patient throughout the years, and the tapered shape simplified positioning within the available bone, especially in the area of the premaxilla. Prior to the Replace Select, most implants were parallel-walled, and in 1993, I came up with the concept of a tapered design, although it didn’t come to market until 1997. The idea arose from my experience with single-tooth replacements in the anterior maxilla, where I’d often need to tilt parallel-walled implants to the facial to avoid perforating the subnasal fossa. The roots of natural teeth are tapered, so it occurred to me that implants should be tapered as well. The bone is not square; it’s a series of triangles that is best accommodated by a tapered shape.

A flat top with an internal connection offered an esthetic advantage because the implant could be placed at or slightly below the crest of the bone, without an external component causing metal to show through the crown. This led to the design of the tri-lobe internal connection of the Replace Select, which was first introduced by Steri-Oss and became the most popular design in the No-Bleucone implant portfolio after the company acquired the brand in 1998.

The tapered shape of the Replace Select was ideal for two-stage treatment, but the thread design wasn’t aggressive enough to provide the stability I needed for single-stage surgery. This left me wanting a thread design that was more sharp-edged — but not too aggressive — which was one of the formative ideas behind the Hahn Tapered Implant.

- Hahn Tapered Implant (Fig. 6): Like several of the implants I’ve placed for this patient, the two Hahn Tapered Implants shown in the panoramic radiograph (Fig. 2) were placed immediately following extraction. The patient is active socially and has always wanted an immediate temporary after having a tooth extracted. In both cases, I extracted the tooth, prepared the site and placed the implant.
The patient’s root-canal treated mandibular canine needed to be separated from the posterior bridge connected to the patient’s 5JH 2000 blade implant. Because both of the Hahn Tapered Implants achieved excellent initial stability, immediate provisional crowns were delivered. The patient’s other implants have performed well, but required more work to get the outcome I wanted. With the Hahn Tapered Implant, there are fewer steps.

The Hahn Tapered Implant’s ability to remain engaged with the palatal bone and attain maximum primary stability is the result of its deep, sharp threads, which I consider the implant’s most important design innovation. By the time I began developing the Hahn Tapered Implant, I had concluded that the thread patterns of the previous implant systems I designed weren’t aggressive enough. As a result, the implant could wander toward the thin cortical bone of the facial plate during placement. Other implant systems on the market that had a sharper-cutting thread designed were too aggressive and could cause microfractures in narrow bone or ridges.

So I designed a new tapered implant, including threads that were just aggressive enough, and brought it to Glidewell Laboratories. The engineers and business leaders at Glidewell, many of whom I’ve enjoyed working with in past endeavors, were happy to meet with me. I told them, “We need a tapered implant that doctors can easily place, stays right where you want it, and gets maximum primary stability.” They looked at my drawings, and their team of engineers helped me fine-tune the design until we got the thread pattern just right. We ended up with an implant that can be directed against the palatal bone, avoids the facial plate and fits within tight anatomical spaces. The Hahn Tapered Implant includes a 1 mm-machined collar. Because both hard and soft tissue is stable around a machined collar, this design affords doctors the flexibility in crestal positioning they need to meet the aesthetic demands of each case. We designed the implant with a conical connection to ensure a strong, stable seal.

The prosthetic connection also facilitates platform switching, which has been shown in numerous studies to preserve bone and gingival tissue around the implant-abutment interface.

“...To ensure an optimal restorative outcome, the Hahn Tapered Implant System features contoured healing abutments and matching transfer copings.”

Since we launched the Hahn Tapered Implant in 2015 and began working with experienced practitioners, we’ve received nothing but positive feedback. The comment that I hear repeatedly is, “Jack, I love your implant.” Looking back at this patient’s radiograph, I know that we’ve come a long way with implant design.

Conclusion

The various implants I’ve designed and placed in this patient through-out the years demonstrate that success is highly predictable as long as we adhere to the proper diagnostic, surgical and restorative principles. At the same time, advancements in implant design have simplified surgery and made it easier to establish the implant positioning and stability needed to achieve the best outcome possible. I’m proud to have contributed to this evolution and look forward to the innovations to come.

References available upon request from the publisher.

Dr. Jack A. Hahn
earned his DDS from The Ohio State University College of Dentistry and completed postgraduate coursework at Boston University, New York University, the University of Michigan and the University of Kentucky. A pioneer in the field of implant dentistry, Hahn has been placing and replacing implants for more than 45 years. Hahn developed the Nobel-Replace dental implant system for Nobel Biocare and oversaw the design of the Hahn Tapered implant. Recipient of the Aaron Gershkoff Lifetime Achievement Award and the Venue and LEAD magazine Healthcare Leadership Award, Hahn was honored with the Lifetime Achievement Award from the American Academy of Implant Dentistry in June 2015. Hahn is also editor-in-chief and clinical editor of Inclusive magazine. He lectures to dentists around the world and maintains a private practice in Cincinnati, Ohio. Contact him at replace7@mac.com.

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Dubai, covering 1500 students aged 4-6 years old. The implementation of the program required cooperation between the Ministry of Health and Prevention, the Knowledge and Human Development Authority, School health and Educational Institute Unit, the private companies and Dental Services Department, Dubai Health Authority. The program involved two forms of tooth brushing based on the facilities in school.

- Guidelines for tooth brushing in schools and infection control measures were adapted from the MyS-mile program (Scotland) and copies provided to the oral health coordinators.
- The program involved two forms of tooth brushing based on the facilities in school.

**Dry tooth brushing**

- School children were provided with free toothbrushes appropriate for their age, fluoridated toothpaste and customized tooth brushing charts to record their daily tooth brushing.
- A training workshop was conducted for the oral health coordinators (school nurses) that were assigned to supervise the daily tooth brushing after meals and provide guidance and support to the students.
- Guidelines for tooth brushing in schools and infection control measures were adapted from the My5-mile program (Scotland) and copies provided to the oral health coordinators.

**Wet tooth brushing**

- Schools that did not have the facility for children to go to washrooms to brush their teeth and spit excess toothpaste were given instructions to brush in their classrooms using appropriate amount of toothpaste and spit in cups or paper towels and were disposed of appropriately.

Toothpaste was placed on paper plates to help in infection control and enables the use of one toothpaste tube to be used for more than one student.

A dental team of two dentists and two dental hygienists visited each school and conducted dental check-ups using the visible plaque index (VPI) in a mobile dental van. Main concentration was to measure the plaque accumulation on the teeth surfaces for the students aged 4-6 years, as they were the age group with the highest caries prevalence based on the previous screening conducted in Dubai.

Results were recorded for each student on oral hygiene forms and were placed in the student’s medical file in the school with the supervision of the school nurse.

Follow up from the dental team was done from the dental team with oral health coordinator was done on a weekly and monthly basis. At the end of the three-month activity, a second dental checkup conducted on the students to record the dental plaque accumulation and compared with the previous results. An extensive interview was done with the oral health coordinator, school nurse and the feedback questionnaire from the parents were collected.

An additional activity that encouraged children to be more involved with oral health was a drawing contest of healthy smiles, winners were given one year supply of tooth brushes and tooth paste to take home.

**ANNUAL DENTAL HYGIENIST SYMPOSIUM**

**19TH JANUARY 2018**

- 08.45 – 09.00 Coffee and registration
- 09.00 – 09.15 Welcome remarks – Introduction to the EDHC Board
- 09.15 – 09.45 Rachael England – Public Health in a dental context
- 09.45 – 10.15 Mary Rose Pincelli Boglione – When is the best time to brush, and why?
- 10.15 – 10.30 Refreshments
- 10.30 – 11.30 Dr. Eleftherios Kaklamanos
- 11.30 – 12.00 Dr. Shiamaa Shihab Ahmed Al Mashhadani – (Dubai Health Authority) Dubai Smiles Healthy: An oral health prevention program Initiative from the Dental Services Department
- 12.00 – 13.00 Beverley Watson - Prophylaxis Masterclass – Theory
- 13.00 – 14.00 Lunch
- 14.00 – 15.00 Beverley Watson - Prophylaxis Masterclass – Practical
- 15.00 – 16.00 Dr. Hamzeh Awad - The Role of Tele-Health in Diabetes Management: Does the Cloud Based Smart Electronic Health Application (SEHA) provide the comprehensive approach for Diabetes Prevention and Management?
- 16.00 – 17.00 Dr. Jacob Smith - The introduction to oral probiotics and the implication in dentistry
Outcome
Data obtained from three resources, first dental surfaces that were free from plaque, secondly the interview with oral health coordinators in the schools and finally the feedback questionnaires from the parents.

Dental examinations for students involved in the brushing activity:
A total number of 1500 students were involved in the tooth brushing activity, parents consents for oral examination was obtained for the students aged 4-6 years only. Students were examined for plaque accumulation on teeth surfaces using The Visible Plaque Index (VPI). The index determines the frequency of tooth surfaces covered with clearly visible plaque, the outcome of which was dichotomized as “present” (at least one surface covered with visible dental plaque on the buccal region of the maxillary anterior teeth) or “absent” (dental plaque not visible on any surface of the buccal region of the maxillary anterior teeth). Scores were recorded on a screening sheet. The examination was done twice for the same students one before the first dental surfaces that were free from plaque, and the next one was after 90 days of the same students one before the examination was done twice for the students.

The examination was done twice for the same students one before the brushing activity started and the next one was after 90 days of continuous brushing in schools. Associations between self-reported tooth brushing frequency and The Visible Plaque Index (VPI) was assessed using the chi-square test. Statistical analyses was performed with the aid of the SPSS Statistics™ program (SPSS for Windows, version 20.0, SPSS Inc., Chicago, IL, USA).

Interviews with the school nurses (oral health coordinators) involved a half-hour interview with open-ended questionnaires related to:
- Commitment and support of the school administration in allowing students to do the tooth brushing at the assigned time on a daily basis.
- If the activity had fulfilled the learning objectives of the training they had completed before the activity took place.

Another question was about their professional opinion if this activity contributed to children’s acceptance for daily brushing and interest in oral health.

A set of questions were asked about the mechanism of the activity and the reactions of school staff in having students brush their teeth daily in the school.

Any barriers that effect implementation of the tooth brushing activity.

In regards to the commitment of schools, 71% of the oral health coordinators responded that if the school administration enforced the activity the compliance was high both from the teachers and students, others informed that allowing students to take a ten minute break to brush their teeth and return back to the class was considered as a disruption to the students daily schedule.

A high response was to the questions about students’ reaction to brushing in school and how they considered it as an enjoyable task and made the students interested in brushing their teeth more often, even in schools that did not enforce daily tooth brushing students requested from their teachers to be given permission to brush their teeth.

Many of the Oral health coordinators (68%) agreed that the main barrier students brushing was due to their support in the program.

Many students who were concerned about students’ reaction to brushing daily in school would help to establish a good oral hygiene routine (85%). They had increase interest to have more parents’ oral health sessions (73%). Most of the parents wanted their children to continue to brush at school (75%). There were 71% of parents who were concerned about students’ reaction to brushing in school.

Conclusion
The school-based oral disease preventive intervention comprised of oral hygiene instructions and supervised tooth brushing education was effective in imparting oral health knowledge and establishing good oral hygiene habits in school children and in improving their oral hygiene status and the attitudes of their parents. With these positive findings, it is recommended that similar programs be supported and implemented with a larger sample size to determine the long-term effect of such programs and to improve the poor oral health situation among school children. Furthermore policies for such preventive methods should be placed to emphasize the importance of its effect and govern their implementation.

Acknowledgements
The author would like to thank Dr. Hamda Almomani, Director of Dental Services Department, DEA for her kind support and guidance, Dr. Waleed AlHayyoud and Dr. Sara AlShaya from Ministry of Health and Prevention, UAE for facilitation of the program in the government schools, Dr. Nusabda Shaker from the School Health and Education Institutes unit for facilitation of private schools, Dental Services Department team of dentists (Dr. Dana Aboza, Initiative Leader of Oral Health Awareness) and the team of dental hygienists in dental services department, Dubai Health Authority for their dedication and hard work.

Materials distributed to the students (toothbrushes, tooth paste and tooth brushing charts) were funded by Jordan® and Philips®. There was no involvement of Jordan® and Philips® in the methodology and implementation of the study. We appreciate their support in the program.

References
Upper Arch Alignment with the ClearSmile Inman Aligner

By Inman Aligner

Treatment planning
In this case, the patient contacted the clinic because she was both unhappy with her upper anterior teeth and worried about the increasing crowding. At this time, she did not feel that crowding in the lower arch was a problem. She made it clear she was not motivated for fixed orthodontics and was interested to know if her upper anterior teeth could be aligned with the ClearSmile Inman Aligner. After an orthodontic assessment, UR2 was identified as the landmark.

Fig. 1: Pre treatment anterior to tooth, and the Spacewize™ crowded UR2 was identified as the landmark after an orthodontic assessment, with the ClearSmile Inman Aligner.

When the case was submitted to the IAS Academy’s online support along with clinical photographs and Spacewire™ analysis, the trainers confirmed that it was a suitable case for the ClearSmile Inman Aligner with a combined expander, and would help to unlock the overlapping central incisors. The trainer also said that it may not be possible to completely align the upper arch while the lower arch remained crowded, so a digital setup was requested from the laboratory to ascertain exactly what could be achieved.

Fig. 2: Pre treatment right lateral

Using the digital setup, I was able to discuss the final outcome with the patient, as well as explain the composite bonding process that would take place at the end. The treatment goal was to achieve straighter, more natural looking teeth and restore incisal wear in URs and ULs while preserving the enamel. Information about the bonded retainer was also given at this time and the importance of retention. After she consented to the treatment plan, impressions were made and the appliance was ordered from the laboratory.

Fig. 3: Pre treatment left lateral

Appointment
Stage
1. At the initial appointment, palatal anchors were placed, with interproximal reduction (IPR) and predictive proximal reduction (PPR) carried out using the guide issued from the laboratory. The patient was instructed on how to turn the expander in situ.
2. UR1 anchor removed, and IPR and PPR carried out using discs for canines and blue/red strips for anterior teeth.
3. Progress with crowding on target at this point thanks to use of expander. IPR strips used and space between URs and ULs polished.
4. Patient had turned the expander eight times by this point – instructed to stop. PPR carried out on central incisors, with space between URs and ULs polished again. Discs used distally on the canines, with a composite anchor placed on URs and composite anchor removed from ULs.
5. Impressions were taken for ClearSmile Aligners.
6. First ClearSmile Aligner fitted.
7. Second ClearSmile Aligner fitted and worn for two weeks solid before being used at night to aid retention. At this point there was a break in treatment, as the patient was breastfeeding her baby.
8. After a couple of months, treatment recommenced with bleaching and impressions were taken for a retainer.
9. Fixed retainer bonded followed by composite bonding of UR1 and UL1 using the reversed triangle technique. The benefits of this technique include:
   - Affordable
   - Ethical (preserves tooth structure)
   - Aesthetic
   - Simple
   - Complements alignment therapy
10. Afterwards, the restoration was polished with both felt disks and Mini FluffHuff with Emax finishing paste. At the end of this appointment, new impressions were taken for new bleaching trays and an Essix retainer. Composite re-polished and patient given bleaching tray and retainer to wear at night.

Table 1 – Assessment / Diagnosis

<table>
<thead>
<tr>
<th>Skeletal</th>
<th>Class I</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMPA</td>
<td>Average</td>
<td>No</td>
</tr>
<tr>
<td>Lower face height</td>
<td>Normal NL angle</td>
<td>Class I (crowded)</td>
</tr>
<tr>
<td>Facial asymmetry</td>
<td>4mm (at URs)</td>
<td>30 per cent overlap of incisors</td>
</tr>
<tr>
<td>Soft tissue</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Overjet</td>
<td>Class I</td>
<td></td>
</tr>
<tr>
<td>Overbite</td>
<td>All present</td>
<td></td>
</tr>
<tr>
<td>Displacement on closure</td>
<td>2mm deviated to the right in upper</td>
<td></td>
</tr>
<tr>
<td>Molar relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canine relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teeth present</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centrelines</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 – Treatment pathway

1. Don’t turn the expander too quickly focusing on the expansion.
2. Wait for the front teeth to unwind, focusing on the expansion.
3. Don’t turn the expander too quickly as it will induce unwanted tooth movement.
4. After the fourth appointment, I also received feedback from one of the trainers suggesting that I should have waited until the URs distal was a little further forward before adding the labial anchor, which in hindsight would have been a better approach.

Self-appraisal
The patient was very satisfied with the results, especially the fact I was able to improve her smile without affecting the integrity of the enamel. I sent before and after images to the patient at the end of her treatment pathway so that she could see the difference, and she was amazed at how much the aesthetics of her teeth had changed. I was also very happy about the outcome – with the help of the IAS Academy and digital planning tools, treatment was safe and predictable.

Dr Solveig Skar
Dr Solveig graduated from the University of Bergen in 1998 and purchased her own dental clinic in 2005. Now, she is a member of the Scandinavian Academy of Esthetic Dentistry and has been a certified user of the ClearSmile Inman Aligner since 2013 (she took the advanced course in 2014). Here, she details the case of a 28-year-old female patient who received upper alignment treatment using the ClearSmile Inman Aligner.
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The ClearSmile Inman Aligner course is part of the IAS Academy pathway of training for GDPs. The course is a continuum and two cases must be submitted and evaluated on completion for website listing.
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Lighting in dental surgeries—frequently neglected requirements of the standard on illumination

By Antonín Fuksa, Czech Republic

Proper illumination plays an important role in most of our activities, as we acquire more than 80 per cent of information by sight. Precious values such as health and wellbeing are intrinsic in health care.

Lighting in dental surgeries is governed by EN 12464-1:2001 standard specifying minimum lighting requirements for workplaces. National versions of this harmonized standard are made mandatory by country regulations in EU countries.

The current standard is effective as of 2011. Some of the illumination systems designed according to the previous edition (2002) are therefore no longer compliant. The requirements of the standard should be understood as the absolute hygiene minimum, as they are a compromise between average physiological needs and average economic potential. According to ergonomic research, most people prefer their workplaces to be illuminated to 1,000 lx or more, while the standard prescribed minimum is 500 lx. The standard prescribes the maintained illumination E, when the real average illumination falls under E, maintenance is to be performed; luminaires to be cleaned up, lamps to be replaced, walls to be repainted etc.

Adaptable illumination of the operating area is vital to perform surgical tasks. The standard for dental operating lights requires the operating field illumination to be in the range of 5,000 to 20,000 lux in ellipses of size 50 × 25 mm (visual task area), but only 60 mm up from the centre of the ellipse, a maximum of 1,200 lux is allowed to prevent the patient from being dazzled.

Constant readaptation of the eye between very bright and dark areas leads to eye fatigue and, finally, to overall fatigue for the dentist. A powerful luminaire above the chair meets or exceeds the minimum prescribed illumination of the patient, which is 1,000 lx (co-responds to immediate surrounding area of the visual task area; a stripe of at least 0.5 m around visual task area). Lower contrast means better visual comfort for the dentist.

Cold tones of light are preferred as peripheral vision is more sensitive to the blue component of light. This leads to a decrease of perceived contrast. The standard requires light with high colour rendering index Ra ≥ 80. Patients looking directly into the luminaire prefer matt luminous surfaces.

The model surgery has dimensions 5.6 m by 3.2 m and ceiling height of 2.8 m. The luminaire above the chair is suspended in the height of 2.2 m above the floor. Positions of the additional luminaires are a compromise between functionality and aesthetics. Besides the visual task in the mouth cavity, many other facets exist in the dental surgery that need to be illuminated in order to carry out tasks: instrument trays, controls and displays of diagnostic instruments, material preparation areas, PC table, filling cabinet etc. Illumination requirements have to be fulfilled at all these places, too. A minimum overall room illumination of 900 lx has to be maintained as well.

One of the principal items in the updated standard is background surrounding the dentist’s work space, which is a stripe aligned to the surrounding area of the dentist’s workplace, at least 3 m wide, within the size of the room. According to the standard, this has to be illuminated 1/3 of the illumination of the surrounding area. Installations according to the older standard rarely meet this requirement. A luminaire of 500 lx directed at the patient can be measured under a powerful luminaire. The background lighting in this case would be 1,600 lx, which is quite expensive to achieve. This requirement has not been met in any of the surgeries measured where a powerful directional pendant luminaire was placed above the chair. The updated standard helps us to understand the room as a whole, not just a set of task areas. Not only the illumination of the patient, but also the uniformity and acceptable contrast in the whole space is important.

The focused beam of the operating light provides illumination of about 3,500 lx, directed to the patient, which has both eye and overall fatigue implications.

The high-output directional/indirect luminaire above the chair provides illumination of the task background area of about 900 lx, providing a 4:1 contrast, which is already an acceptable level. Colder tones of light further improve the perceived contrast to about 1:4. Besides illuminating the patient, the high-output directional/indirect luminaire serves as an illuminated tool to assist the visually demanding task of the dentist.

Measurements carried out in dental surgeries across some Eastern European countries clearly show that even the very basic requirement of task illumination is often neglected. Also task background and overall illumination are often far too low, which has both eye and overall fatigue implications. As little as 30 lx have been repeatedly measured on the material preparation areas and computer desk.

Many surgeries installed in existing buildings kept the original (office) luminaires, not quite following the lighting project. These systems were often projected according to an old standard that required as little as 300 lx for office work. Savings on lighting tend to generate much larger expenses later. The need for light grows with age.

Other parameters of lighting like uniformity, glare, colour rendering or non-visual effects of light and lighting control will be discussed later in a dedicated article.

Lighting the surgery with office luminaires only is not sufficient to fulfill basic requirements. Lighting using a single powerful central luminaire provides enough light in the visual task area, but may easily fail to meet additional requirements. That is why additional luminaires are needed to provide background area illumination and uniformity.

Table 1: Comparison and evaluation of very basic parameters of illumination.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Fig. 1</th>
<th>Fig. 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctor’s desk illumination</td>
<td>300–500 lx</td>
<td>500–750 lx</td>
</tr>
<tr>
<td>Material preparation area</td>
<td>300–500 lx</td>
<td>500–750 lx</td>
</tr>
<tr>
<td>Instruments illumination</td>
<td>500–700 lx</td>
<td>700–800 lx</td>
</tr>
<tr>
<td>General colour rendering index</td>
<td>&gt; 90</td>
<td>&gt; 90</td>
</tr>
<tr>
<td>Contrast</td>
<td>1:4</td>
<td>1:6</td>
</tr>
<tr>
<td>Compliance with standard</td>
<td>NO</td>
<td>YES</td>
</tr>
</tbody>
</table>

Table 2: Requirements on lighting in dental surgeries, according to Table 5.48 of the standard.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>Maintained illumination (adjusted light)</td>
</tr>
<tr>
<td>U/L</td>
<td>Units of Lux (U/L)</td>
</tr>
<tr>
<td>U</td>
<td>Maximum illumination is uniform to acceptable contrast</td>
</tr>
<tr>
<td>L</td>
<td>Minimum illumination is uniform to acceptable contrast</td>
</tr>
<tr>
<td>H</td>
<td>Minimum general/indirect luminaire (indirect illumination)</td>
</tr>
<tr>
<td>R</td>
<td>Minimum general/indirect luminaire (indirect illumination of chair)</td>
</tr>
<tr>
<td>–</td>
<td>Special requirements: Adaptable task areas</td>
</tr>
<tr>
<td>–</td>
<td>Luminaires</td>
</tr>
<tr>
<td>–</td>
<td>Visual task areas</td>
</tr>
<tr>
<td>–</td>
<td>Task surrounding area</td>
</tr>
<tr>
<td>–</td>
<td>Task background area</td>
</tr>
</tbody>
</table>

Fig. 2a: 3-D visualisation of situation from Fig. 1a. Lighting is designed using requirements for office workplaces. The installation does not respect additional task areas.

Fig. 2b: Typical situation in dental surgeries in Eastern Europe. Lighting is designed using requirements for office workplaces. Most of the requirements are not met, see Table 1.

Fig. 2c: Balanced illumination of dental surgery employing a directional/indirect luminaire above the chair and using additional ceiling and furniture luminaires, see Table 2.
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Replacing a failing dentition with new technology

By Dr. Ara Nazarian, USA

Having the ability to take a patient from start to finish in a fewer amount of appointments within your practice allows you to position yourself as a provider that can fulfill your patient’s surgical and restorative needs. With the proper training, a dental provider may provide extraction, grafting, and implant placement within one appointment at one location. Not only does this allow you to reduce the amount of visits for the patient, but this type of service also helps maintain the cost to the patient since they are not seeing multiple dental providers. Most importantly, this enables the dental provider full control of the surgical and prosthetic outcome. Depending on the patient’s desires, the clinical conditions of the oral environment present and the skills of the provider, a dentist may choose to extract teeth, level bone, and graft with guided dental implant placement within his/her dental practice. A patient presented to my practice for a consultation wanting to restore her smile (Fig. 2). She complained of generalized discomfort in her entire dentition, probably due to the rampant caries and infection that was already present (Figs. 2–5). Having already visited several providers for an evaluation, she was very frustrated with conflicting treatment options offered. Either the suggested treatment would require multiple surgical and restorative visits that would extend for a very long time or dental treatment would require a team approach where little coordination by dentist and specialist was communicated to the patient. Since many of these options did not appeal to her, the patient decided to have me provide comprehensive treatment that would include extractions, bone leveling, grafting, dental implant placement, immediate provisionalization and prosthetic rehabilitation within my own practice.

When presenting cases like this to my patients, I will always use the Dine Digital Solutions (Fig. 3) to capture the patient’s existing dental condition and create a customized treatment plan based on the patient’s desires, the clinical conditions of the oral environment present and the skills of the provider. Aesthetics, function and comfort were the primary driving factors in planning this patient’s treatment.

Planning

A CBCT scan was taken to accurately treatment plan this case to estimate how much of the patient’s existing dentition could be saved and what additional treatment would be required. The plan was then discussed with the patient and her desires were noted. Once all the maxillary teeth were extracted and the patient was completely sedated, the alveolar crest was leveled 2–3 mm apically following the parameters set by the bone leveling guide with the AEU-7000 surgical motor/handpiece (Aseptico), so that the patient’s transection line from the ridge to the prosthesis would not be visible when the patient smiled. Once completed, the surgical drilling guide was inserted and the sites for the implants were initiated with the Hissem Osteon Guided Kit (Fig. 6). In the upper arch, six 4.0 mm diameter ET III SA dental implants were placed in the areas of teeth 84, 6, 8, 9, 11 and 13 to support an All-on-4 restorations. The most distal implants were angled in order to avoid the maxillary sinus cavities and any augmentation in that area.

Fig. 4: Preoperative maxillary occlusal view

In the lower arch, several different products, is used to keep her mouth open. LogiBlock’s unique design stabilizes and comfortably supports the jaw while allowing unrestricted visual and physical access to the working area for the provider. Once the patient was completely sedated and anesthetized, the teeth were extracted in a systematic manner, working in sections at a time starting from the anterior maxillary teeth. Acting like a modified class I lever, the Physics Forceps (Golden Dental Solutions) were used to atraumatically extract the teeth with the goal of trying not to disturb the underlying bone. The beak of the forceps was placed on the lingual cortical portion of each tooth, where the base of the implant was placed in the buccal alveolar ridge at the apophyseal location of the masticatory function. During the extraction process, the beak grasps the tooth and the bumper acts as the fulcrum. Extractions were accomplished with slight wrist action in a buccal direction taking about 40 to 60 sec- onds each depending on the tooth morphology and density of bone.

Biomedical Engage (OCO), Nobel Active (Nobel Biocare), Seven (MIS), 3 (All Dental USA), Conus 12 (Blue Sky Bio) and Any-Ridge (Megagen). Not only was the type and size of the implant selected because of CBCT planning, but also its relationship to the planned restoration and its proximity to vital structures determined before performing the surgery. Guided bone leveling, as well as immediate implant placement, would be accomplished at the surgical appointment by using CT-based bone leveling and implant drilling guides. Additionally, prefabricated screw-retained fixed provisional restorations would be directly picked up with acrylic over dental implants in the maxilla and mandible in the key implant positions if adequate fixation was acquired.

When performing this many procedures in one visit, it will utilize IV sedation to make the procedure more efficient and comfortable for the patient as well as for myself. Since the patient is sedated, a mouth prop, Logibloc’s (Common Sense Dental Products) is used to keep her mouth open. LogiBlock’s unique design stabilizes and comfortably supports the jaw while allowing unrestricted visual and physical access to the working area for the provider. Once the patient was completely sedated and anesthetized, the teeth were extracted in a systematic manner, working in sections at a time starting from the anterior maxillary teeth. Acting like a modified class I lever, the Physics Forceps (Golden Dental Solutions) were used to atraumatically extract the teeth with the goal of trying not to disturb the underlying bone. The beak of the forceps was placed on the lingual cortical portion of each tooth, where the soft tissue portion was placed on the buccal alveolar ridge at the apophyseal location of the masticatory function. During the extraction process, the beak grasps the tooth and the bumper acts as the fulcrum. Extractions were accomplished with slight wrist action in a buccal direction taking about 40 to 60 sec- onds each depending on the tooth morphology and density of bone.

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In the lower arch, several different implants were angled in order to avoid the maxillary sinus cavities and any augmentation in that area.
Fig. 12: Postoperative retracted view biting
Fig. 13: Postoperative retracted view
Fig. 14: Postoperative maxillary occlusal view
Fig. 15: Postoperative mandibular occlusal view
Fig. 16: Postoperative full face view.

Fig. 12: Postoperative retracted view
Fig. 13: Postoperative retracted view
Fig. 14: Postoperative maxillary occlusal view
Fig. 15: Postoperative mandibular occlusal view
Fig. 16: Postoperative full face view.

RESTORATIVE

The immediate provisional restoration was tried in to insure a passive fit over the temporary abutments (Fig. 7). Once confirmed, block-out material was placed to avoid the restoration from locking on and chairside hard denture mime material (Reheal II, Yokurama) placed within recesses around the temporary abutments to pick up the restoration. After the material completely set, the immediate provisional restoration was removed and any access material trimmed and polished with the Torque Plus (Aesport) lab handpiece and acrylic bur (Komet). A similar series of steps was utilised for the mandibular arch. In fact, the ISQ values were even higher due to the type and quality of bone present in the patient’s mandible. At this point, a Panorex was taken to confirm the placement and position of the dental implants with their corresponding multi-unit abutments and temporary cylinders.

Seven days postoperatively the patient returned with very little discomfort, swelling, or bruising. She was very pleased with her fixed provisional restorations (Fig. 8). Now that the patient was no longer anaesthetised, the occlusion was checked again to confirm there were no interferences in lateral and protrusive movements. The next step in her treatment would consist of impressions for the definitive upper and lower restorations approximately 4 to 5 months postoperatively.

Approximately 16 weeks after implant placement, the patient returned for the prosthetic phase of her treatment. The gingival tissue widths (3.5, 4.5, and 5.0 mm) of the ET III SA dental implants were used due to various widths of bone available in the remaining ridge. Here, the tooth areas that would have dental implant placement included 819, 22, 23, 25, 27 and 30.

A baseline ISQ reading was taken of these implants utilising the Osstell ISQ unit. Since the initial readings were all above 65 and the quality of bone after leveling was good, temporary cylinders (Hiossen) were placed on the multitruit abutments (Hiossen) for immediate provisionalisation. Any residual areas around the implants or in the sockets were grafted with a puffy blend of cortical mineralised and demineralised bone grafting material to optimise the area for regeneration. Primary closure was achieved by suturing the tissue with resorbable sutures.

Since all the dental implants were well integrated, impressions were taken for the definitive restorations. For both arches, impressions were taken using Instant Custom C&B Trays (Goodfit) with a heavy and light body vinylpolysiloxane impression material (Take 1 Advanced, Kerr).

Bite relations was accomplished by picking up clear duplicates of the provisional restorations (Fig. 9). Instructions for size shape and color for the definitive restorations was forwarded to the dental laboratory and any changes indicated easily communicated to the dental laboratory technician.

A PPF prosthesis would be fabricated for the patient’s upper and lower restorations. The pink gingival areas of this prosthesis type were needed to reconstitute the maxillary and mandibular tissue contours, as substantial bone leveling was required to even out the patient’s smile.

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Celtra Duo (ZLS) blocks
• Restoration longevity of Celtra Duo (ZLS) is ensured when used with Prime&Bond universal Adhesive and Calibra Ceram Cement
• Firing is optional; choose either fire and seat or polish and seat

Prime&Bond universal Adhesive
• No need to use a self cure activator when used with Calibra Ceram Cement
• Low film thickness to allow passive seating of the crown

Calibra Ceram Cement
• One-step curing when used with Prime&Bond universal Adhesive
• 10-second tack cure window and 45-second gel phase ensures an easy, no-stress cleanup
With improvements in materials and advancements in CAD/CAM technology (Fig. 10), full-arch prosthesis can now be precisely milled from monolithic zirconia, offering aesthetics and functionality with the added benefit of long-term durability. Exhibiting exceptional fracture toughness and flexural strength, Zenerostar has the ability to withstand the functional stresses that dental implant restorations are subject to over time.

Unlike hybrid dentures, the entire body of the Zenerostar Implant Prosthesis (Arrowhead Dental Lab) including the gingival and tooth areas is constructed from the same robust material. The strength and durability offered by Zenerostar is complemented by its esthetics and excellent translucency. The teeth of the prosthesis exhibit color that is both tooth-like and dentin, and advanced staining techniques are used to establish gingival areas that blend well with the patient’s soft tissue.

Within three weeks, the definitive maxillary and mandibular restorations were delivered from the dental lab (Fig. 10). Utilizing a night angle prophylactic driver, both provisional restorations were removed and the definitive restorations inserted (Figs. 12 & 13). Care was given to torque the retention screws according to the manufacturer’s recommendations. A Panorex X-ray was taken to verify the restorations were completely seated. Once confirmed, a piece of Teflux tape was placed followed by composite material (Figs. 14 & 15).

The occlusion was checked and verified with the T-Scan (Tekscan) to make sure that all the proper points of contact were in their ideal positions to ensure longevity of the reconstruction. The patient no longer experienced pain and was very pleased with her new enhanced ‘whiter’ smile (Fig. 16).

Conclusion

Computer generated 3D virtual treatment plans allow the dental provider or team to accurately place dental implants efficiently and effectively. With a variety of different software and associated surgical instrumentation available, dental implant diagnosis and treatment has become more simplified. This development has created an interdisciplinary environment in which better communication and precision execution leads to better patient care and outcomes.

Removal of leaking amalgam restorations and placement of ceramic CAD/CAM inlays in one-hour appointment

By Dr. Richard WH Pollock B.D.S.

Case characteristics

Age: 39-years-old
Gender: Female
Area of restoration: Upper and lower first molars
Teeth numbers: 16, 46
Reason for treatment: Patient wanted a long-lasting aesthetic restoration in one visit due to busy work schedule. (Fig. 1, 2)

Introduction

With the information now available to the general public through internet access, many patients often come to visit a dentist already armed with some facts they have researched. This also fuels the attitude of, “I’m too busy to keep coming to the dentist- I need it all done in one visit.” This study shows how to achieve high quality long-lasting aesthetically pleasing restorations by using MyCrown technology.

Patient first contact

A 39-year-old woman attended our clinic complaining of increased discomfort coming from her two first molar teeth when biting. This had been increasing in intensity over the last few months but her busy work schedule had caused her to continue putting it off. Although the pain she was experiencing was only a mild irritation over the last week she had reported noticing a slight metallic taste also, which spurred her on to make the appointment.

On examination, teeth 16 and 46 had amalgam restorations, with demineralization scores positively with electric pulp testing. This also fuels the attitude of, “I’m too busy to keep coming to the dentist- I need it all done in one visit.” This study shows how to achieve high quality long-lasting aesthetically pleasing restorations by using MyCrown technology.

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For age-appropriate esthetics: Natural effects with VITA VM materials

By Carolin Wehning, Germany

It becomes especially challenging for dental technicians to produce natural, age-appropriate reconstructions in the visible area of the mouth for older people. It is recommended to establish a very planned procedure based on the characteristics of the natural teeth for the individualization and characterization of such a restoration. This is the only way results can be achieved that fit harmoniously into the remaining tooth substance. Dental technician Carolin Wehning (Bocholt, Germany) shows how such a complex case can be solved with VITA VM 9 veneer ceramics and VITA INTERNO materials for internal characterization (all VITA Zahnfabrik, Bad Säckingen, Germany) in the following case study.

A 77-year-old patient entered the dental practice after a coronal transverse fracture at 21, which had already been treated with a direct composite structure. Clinically, the results were morphologically and esthetically inadequate. On the adjacent natural tooth 11, age-related discolorations, initial white and brown spot lesions in the cervical area, and a vestibular transverse dark brown crack were apparent. The dentist and patient decided to restore the tooth with a full ceramic crown for long-term stabilization, in which the color effect of the adjacent tooth 11 was to be reproduced in detail. In order to achieve a predictable result, the situation was modeled and a model was developed for a wax-up. Tooth 21 was prepared for a full crown and a master model was produced on a precision mould.

1. Assessment and planning

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2. CAD/CAM fabrication and veneering

The crown framework was made of CAD/CAM supported VITA YZ HT zirconium dioxide. For a deep initial fluorescence effect, a wash firing was performed with EFFECTLINER J (orange) and ELS (green-yellow). 'Layering with VITA VM 9 was the basis for reproducing the basic shade. The VITA INTERNO materials then enabled me to intensify the deeper individual shade nuances after the wash and dentine fittings," said Wehning, describing the key steps of ceramic reproduction. INT94 (orange) and INTs (gray-brown) were used in the cervical and interdental areas, INTs (terracotta) was used in the center. The inside areas were nuanced with INT1 (white), INT2 (sand), INT7 (anthracite); the incision tails with a fine diamond, the inside crack was pulled from the outside with a fissure bur to achieve a three-dimensional effect. The surface texture was kept as smooth as possible, in accordance with the patient’s age. After the glaze firing, only a goat-hair brush and diamond polishing paste were used to slightly reduce the gloss effect. After trying out the fully ceramic crown, the patient was very satisfied with the result, and a self-adhesive bond was applied. The shade and form of the restoration integrated harmoniously with the other teeth. The ceramic veneer in combination with two stain-colored fires made it possible to achieve an age-appropriate esthetic.

3. Finalization of the restorations

After working out the basic morphology with the stone and the details with a fine diamond, the inside crack was pulled from the outside with a fissure bur to achieve a three-dimensional effect. The surface texture was kept as smooth as possible, in accordance with the patient’s age. After the glaze firing, only a goat-hair brush and diamond polishing paste were used to slightly reduce the gloss effect. After trying out the fully ceramic crown, the patient was very satisfied with the result, and a self-adhesive bond was applied. The shade and form of the restoration integrated harmoniously with the other teeth. The ceramic veneer in combination with two stain-colored fires made it possible to achieve an age-appropriate esthetic.

Source: Dental Barometer. 6-2017, Barometer Verlagsgesellschaft mbH, Germany

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New research links oral health and weight issues

By DTI

GOTHENBURG, Sweden: Having children eat healthily can be a tricky task. However, having found an association between the prevalence of cariogenic bacteria and a high body mass index (BMI) in children, research by a doctoral student at the Sahlgrenska Academy of the University of Gothenburg has pointed to a possible new approach.

The thesis on children’s diet, BMI and well-being has suggested that discussions with parents and children about what foods are good or bad for the teeth may help to reduce the risk of obesity. “Weight can be a sensitive subject, but if you talk about eating behaviours alongside dental health, you’re looking at the issue from a different angle,” said the author of the thesis, Louise Arvidsson.

In one of her sub-studies, Arvidsson reviewed the eating behaviour, BMI and dental health of 271 preschool and primary school children in Sweden. She compared the children’s height, weight and food intake over one day with the prevalence of cariogenic bacteria in saliva and discovered a link. The children who had higher amounts of the bacteria also had a significantly higher BMI and less healthy eating habits, such as eating more frequently and consuming more food rich in sugar.

The researcher emphasised that more studies are needed to investigate the mechanism behind the association between BMI and cariogenic bacteria count. However, she suggested that improving children’s eating habits by reducing intake of sugar-rich foods and beverages and limiting intake frequency (specifically of unhealthy snacks) may provide multiple benefits in preventing both dental caries and the development of childhood obesity.

Furthermore, Arvidsson believes that, with the right collaboration between dentists, child health care specialists and schools, there is a good opportunity to help those most at risk, specifically in Sweden, where children visit the dentist from a young age.

Arvidsson also pointed to the link found in the study between healthy food and a higher self-esteem, better relationships with friends and fewer emotional problems.

“We know that adults with depression feel better if, in addition to other treatment, they also meet with a dietitian. The question is whether a healthy diet can have effect also in young children. There has been a lot of focus on physical activity and mental health in children, but diet is an increasingly recognised aspect,” said Arvidsson.

The thesis, titled Diets of European Children, with Focus on BMI, Well-Being, and Families: The IDEFICS/I. Family Cohort, was based on data from a European study aimed at identification and prevention of dietary- and lifestyle-induced health effects in children and infants.

A thesis has suggested using discussion of dental health as a way to combat obesity in children after finding a link between the two.

(Photograph: jarmoluk/Pixabay)
“Machines will never replace the human hand...”

An interview with Dr. Stavros Pelekanos, assistant professor at the School of Dentistry of the University of Athens, Greece, and faculty member of the Global Institute for Dental Education, Los Angeles, USA

By DTI

What is the role of aesthetics in dental implantology today?

Dr. Stavros Pelekanos: Implantology in the 1980s and 1990s was bone-driven. The Albrektsson criteria for a successful implantation back in 1986 did not even refer to esthetics and were followed for many years to come. Nowadays, prosthodontists start the treatment and perform backwards planning, always keeping in mind the correct positioning of the tooth or teeth to be replaced.

Patients’ expectations regarding aesthetic results are growing with the emergence of new technologies and materials. However, have these innovations truly arrived in every dental office?

Well, in continuation of my response to your first question, there are two major problems that the dental community has been facing in recent years, incorrect implant positioning and peri-implantitis both being difficult to resolve. As patients become more aware of these complications, they expect and demand more esthetics and predictable results. New technologies such as high-resolution CBCT, CAD/CAM abutment manufacture, abutments produced using new zirconia technologies, and digital planning are already widely in use in everyday dentistry, minimizing risks, as well as enhancing esthetics and treatment workflow.

Have digital solutions changed the way dental restorations and full-mouth rehabilitations in particular have been performed over the past several years?

Digital planning, intra-oral digital impressions and CAD/CAM tech-
nologies have really changed implantology today. First of all, preoperative planning is a helpful tool for ensuring correct implant placement, for both novice and experienced surgeons. Furthermore, more conservative (sometimes flapless) surgical approaches result in much less post-operative swelling, facilitating greater patient acceptance. The digital workflow in prosthodontics facilitates milled abutment constructions or even same-day teeth when immediate provisionalization is chosen in the treatment planning. CAD/CAM laboratory procedures reduce human error, providing more robust and accurate frameworks and final reconstructions.

In your experience, what is the best way to achieve a natural looking implant crown? Irrespective of the digital revolution, the hand skills of a talented dental technician are indispensable, especially in the case of a single implant crown next to natural teeth. Machines will never replace the human hand, as individual perception of every case, the knowledge of biology and the ability of the greatest importance. The factors that determine the success and natural appearance of an implant crown are accurate implant positioning, meticulous bone and soft-tissue handling, and a skilled dental technician.

The number of implants placed worldwide is expected to double over the next five to six years. Consequently, education efforts have to double too in order to ensure that dentists are adequately trained in implant placement. Do you agree with this statement?

Of course, however, and I say this all the time, I am a faculty member of the School of Dentistry of the University of Athens, which provides education at the highest level, students are still unfortunately not adequately trained in implants. Postgraduate studies in a university environment or very well-organized implant master programs are necessary for a dentist to be able to place or restore implants.

We have seen quite a few different concepts emerging over the last several years in aesthetic dentistry, such as bio-emulation and smile design. Which concepts will have the most impact in the future and change the way aesthetic dentistry is performed? Well, as a prosthodontist, I have to say that nothing is new in these concepts. Basic aesthetic rules are to be applied to every prosthodontic case, such as tooth positioning, proportion, occlusion, color, and design. However, digital technology is a very helpful tool, especially for the novice dentist, for implementing these rules and simplifying the treatment workflow: The same applies to bio-emulation. Biological concepts, improved materials and techniques are always there to simplify clinical dentistry and reduce potential errors and complications.

What is the position of aesthetic dentistry in the development of dental specialties in your opinion? Aesthetic dentistry is not a recognized specialty generally. Failing mainly under prosthodontics, I do not think aesthetic dentistry should be a stand-alone specialty. Being trained in a periodontic-prosthodontic environment (University of Freiburg, Germany, under Prof. J.R. Strauch), I believe that a modern restorative dentist should be adequately trained in more than one main area. Periodontics, prosthodontics and restorative dentistry all constitute what is considered aesthetic dentistry.

“...digital technology is a very helpful tool, especially for the novice dentist, for implementing these rules and simplifying the treatment workflow.”
Walking among giants
Marketing dentistry in the global connected economy

By Chris Barrow, UK

In an information rich world, the wealth of information means a dearth of something else: a scarcity of whatever it is that information consumes. What information consumes is rather obvious: it consumes the attention of its recipients. Hence information and its byproducts such as advertising is created to capture and hold attention. So we have a rich diversity of information and entertainment channels, and of increasing breadth of choice. But this diversity is drowned out by a sea of億元 every day alone, and 1.8 two million new books, 16,000 new grows by eight million new songs, last count and every year the Internet in population have created statistics The connected economy and growth prospered through convenience and time, the local ma-and-pa business television commercials. At the same newspaper advertisements and tel- gain our attention with billboards, a world in which advertisers tried to think that his words predate the Simon in 1971. It seems incredible ic lines were shared by Nobel laure- concludes is rather obvious: it consumes. What information con- of whatever it is that information dearth of something else: a scarcity wealth of information means a race to attract that poverty of at- ter to cover this. Are you happy with the customer service that the team delivered? Are you happy with the clinical outcome? I'd like to ask a couple of questions: So Mr Patient, now that we have arrived at the end of your course of treatment, Template for end-of-treatment protocol 1. Use good search engine optimisation (SEO) to optimise your position in Google’s organic search. SEO is a technical skill that has to be deliv-
ered by experts. Google changes its own goal posts regularly and the savvy SEO guru will know that and take appropriate action quickly.

2. Massively encourage the collection of Google reviews, user reviews via Facebook and critic reviews via proprietorial sites like WhatClinic.com, NHS Choices and Comparethetreatment.com in the UK. In September 2016, Google changed the rules twice; first by including external reviews alongside its own in searches and second by altering its own search criteria to favour businesses with in excess of 100 Google reviews. It is necessary that your marketing activity be adjusted to reflect such changes.

3. Connect to your patients through a well-maintained social media channel like Facebook or Twitter (and deliver daily human interest content). Remember that those 1.8 billion photograph uploads per day include the inevitable selfies. Many of my clients now take a patient selfie at the end of a course of aesthetic dental treatment. To quote again from Harari’s new book: “If you experience something—record it. If you record something—upload it. If you upload something—share it.”

4. Build a website that engages the visitor through video and visual testimonials. Your most powerful marketing collateral is the stories that your patients can tell about the difference that you have made to their lives.

5. Collect visitors’ e-mail addresses and consent to e-mail via white paper marketing. A coffee shop, hotel or airport exchanges free Wi-Fi access for an e-mail address and permission to keep one informed. You can do the same by exchanging useful information (free guides).

6. Nurture long-term relationships with patients and prospects by publishing a monthly human interest e-mail newsletter.

7. Deal with initial enquiries directed through the Internet, by telephone or in person in a polished manner.

8. Create a memorable new patient experience from initial consultation all the way through to treatment delivery.

9. Employ a strict end-of-treatment protocol to capture reviews, testimonials and social connections (as well as plan membership).

I have given you nine marketing actions designed especially for the smaller business. Actions that should be avoided by the independent dental practices are seeking to gain attention by paying through the nose for Google or Facebook advertising, broadcasting non-human interest material or selling services on price, discount or special offer. This is because every week I hear from dentists and their marketing teams that advertising to strangers, using jargon and cutting prices at best attract nobody and at worst attract bargain-hunters, price shoppers and messers.

“A wealth of information creates a poverty of attention.” We end where we began. The challenge is for the mouse to gain attention without competing with the bull elephants. You can only do that by stepping away from the herd of elephants and delivering your story in a different way and a different place. For me, that means human interest, personal service and recommendation, and so when I am working with clients on their marketing plans, we focus on and mobilise their most valuable asset: the goodwill of their existing patients.

Editorial note: This article first appeared in Dental Tribune United Kingdom Edition 8/16.

Chris Barrow is the founder of Coach Barrow consultancy practice. An active consultant, a trainer and a coach to the UK dental profession, he regularly contributes to the dental press, social media and online. Chris Barrow can be contacted at coachbarrow@me.com.
Certificate & Diploma in Clinical Endodontics

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DUBAI 2018-2019

Certificate  |  3 Modules  |  12 Days
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Module 1  |  22-25 February 2018  |  Fundamental of Endodontics
**Programme outline:** Introduction to contemporary endodontics. Understanding of instrument design and its effect on prevention of iatrogenic errors.
**Hands-on:** Hand filing and lateral compaction techniques.

Module 2  |  26-29 April 2018 (4 days)  |  Aetiology and Diagnosis of Endodontic Disease
**Programme outline:** Microbiology of endodontic disease and its relationship with the host immune response.
**Hands-on:** Rotary NiTi and advanced thermoplastic obturation techniques.

Module 3  |  16-19 August 2018 (4 days)  |  Traumatic Injury, Pain and Its Management
**Programme outline:** Emergency endodontics and diagnosis in depth. Odontogenic and non-odontogenic pain. Diagnosis and management.
**Hands-on:** Rotary NiTi and thermoplastic obturation techniques.

Diploma  |  3 Modules  |  12 Days
---|---|---
Module 4  |  November 2018 (4 days)  |  Dental Resorption and Pattern of Tooth Fracture
**Programme outline:** Understanding advanced endodontic problems.
**Hands-on:** Reciprocating NiTi and Carrier based thermoplastic obturation techniques.

Module 5  |  February 2019 (4 days)  |  Restoration of Endodontically Treated Teeth
**Programme outline:** Occlusion and whole patient care. The restorative endodontic interface. Plastic restoration, posts, intra and extra-coronal restorations, cuspal coverage amalgam vs composite.
**Hands-on:** Placement of core restorations and post retained restorations.

Module 6  |  May 2019 (4 days)  |  Management of Endodontic Failure
**Programme outline:** Endodontic retreatment, surgical endodontics.
**Hands-on:** Re-treatment of common endodontic obturation materials. Apical micro-surgery on cadavers (animal).

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From organic electronics to social robots: Digital pioneers illustrate the future

By DTI

LINKÖPING, Sweden: The digital future—what it could possibly look like—came alive in the present at the Knut and Alice Wallenberg Jubilee Symposium at Linköping University (LTH). Held earlier this autumn as one of six symposia to celebrate the Knut and Alice Wallenberg Foundation’s 100th anniversary in 2017, the event featured pioneering research and prototypes in the field of digital technology that are poised to shape and change people’s lives in the near future.

Among the novel achievements presented was a thin, pressure-sensitive material that aims to mimic human skin, in both appearance and functionality. “We are on the threshold of an era in which electronics will become part of our bodies. Wearable electronics will change our lives, and the relationship between us and the world around us,” said Prof. Zhenan Bao, who is from Stanford University in the US and part of the Stanford Wearable Electronics Initiative.

According to Bao, the research in this field, which she called elastonics, requires expertise from many different disciplines and could one day enable the creation of self-healing materials, among other innovations.

Breakthrough research was also presented by local scientists. LiU researchers Prof. Magnus Berggren and Dr Efstratios Stavrinidou described how they had been successful in connecting organic electronics and human nerve cells. As one of the many examples of how this technology could be used, they demonstrated a tiny ion pump used to disrupt pain signals. Further developed, the technology may find application in the relief of chronic pain, the researchers said.

Among the novel achievements presented was a thin, pressure-sensitive material that aims to mimic human skin, in both appearance and functionality. “We are on the threshold of an era in which electronics will become part of our bodies. Wearable electronics will change our lives, and the relationship between us and the world around us,” said Prof. Zhenan Bao, who is from Stanford University in the US and part of the Stanford Wearable Electronics Initiative.

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Presenting the latest in robotic technology was Prof. Nadia Thalmann, who works at the University of Geneva in Switzerland and the Nanyang Technological University in Singapore. Thalmann has developed an AI robot, Charlie.

In the future, robots with social functions such as Nadine could be used for looking after and stimulating elderly people and patients with dementia. In dentistry, the MEDi robot developed by US company RxRobots has already been successfully used in the paediatric dental setting since 2015. The robot helps distract children with initial anxiety and fear, thereby enabling the dental team to continue with their work with less interruption.

Celebrating its 100th anniversary this year, the Knut and Alice Wallenberg Foundation is one of Europe’s largest private research funders. The jubilee symposium in Linköping was received enthusiastically by both the audience and the organizers alike. “Today has given me a great deal of inspiration. It’s not often that I can sit and listen for a full day, but this has been truly interesting and exciting,” commented LiU Vice Chancellor Prof. Helen Dannetun on the successful event.

“I am impressed and fascinated by research that leads to discoveries that we didn’t even know that we were looking for,” said Peter Wallenberg Jr, Chairman of the Knut and Alice Wallenberg Foundation. “Some Swedish universities are exceptional, and Linköping is one of them. This is a relatively small university which focuses on a few areas, and is doing an excellent job with limited resources,” he added.
Ceremony awards fellowship in laser therapy in dentistry on 12th October recently held its awarding ceremony for the fellowship in laser therapy in College London’s Dental Institute.

The organisations first worked togethe for EuroPerio8, which was held in London in the UK in 2015. For 2018, DTI will again produce a special edition of its show newspaper title today international on each of the three days of the event. In addition, DTI editors will provide daily cover age on EuroPerio9 from the Amster dam RAI Exhibition and Convention Centre on its news website and social media channels.

With its congress newspaper, DTI already provides daily news on all significant global dental congresses and exhibitions, including the Inter national Dental Show in Germany, the FDI World Dental Congress and the Annual Scientific Meeting of the European Association for Osseointe gration.

First held in Paris in France in 1994, EuroPerio is organised every three years by the European Federation of Periodontology, a professional body representing over 30 organisations, with 14,000 members, worldwide. The last edition saw a record attendance of 10,000 visitors, including some of the most high-profile ex perts and scientists in the field.

For the upcoming edition in Am sterdam, the organisation is anticipat ing a similar number. Highlights will include a live surgery as part of the Master Clinician/Pedodontal Specialist Forum and a number of sessions aimed at the various mem bers of the dental team. The scientific programme will be accompanied by a large trade exhibition, which will feature the latest innovations from leaders in the field, such as CURAPROX, EMS and Philips.

"I think that the combination of the location, the scientific programme and our marketing strategies will create a very interesting meeting," congress chair Dr Michele Benessi commented. "Even with such a large attendance, everybody can have the benefit of and experience EuroPerio in a positive way."

More information about the event can be found on the official website. Anyone wishing to make advertise ment enquiries is invited to down load the today EuroPerio9 rate card or contact one of DTI’s media sales managers.

**EuroPerio and Dental Tribune International renew collaboration**

**Students help teach good oral health in South Africa**

By King’s College London

Final year dental students Karolyn and Jack McIverney spent three weeks teaching children about oral health in the villages surrounding Cape Town in South Africa as part of the dental elective programme at King’s College London’s Dental Institute.

The students helped teach oral health and hygiene on behalf of the Dental Wellness Trust, a charity that aims to promote general dental wellness to less fortunate communities around the world. They joined after-school programmes in small towns with the goal of teaching children the importance of brushing their teeth and washing their hands. The programmes are run by trained volunteers known as "Mamas" but there are never enough volunteers. Karolyn and Jack wanted to help spread messages to more children, and managed to reach out and recruit more volunteers, increasing the classes covered from 4 to 12.

"It was extremely challenging logistically to ensure there were enough toothbrushes for everyone. With about 500 children brushing at the same time, monitoring their technique was actually quite a task! However their abundant enthusiasm made the entire operation a thoroughly pleasant experience. ” Dental student, Karolyn John.

**Ceremony awards fellowship in laser therapy includes MEA delegate**

By Dental Tribune MEA / CAPPmea

AACHEN, Germany: The Rheinisch-Westfälische Technische Hochschule Aachen (RWTH) recently held its award ceremony in The Netherlands for the fellowship in laser therapy in dentistry on 12th October 2017.

The RWTH Aachen University recently held its awarding ceremony providing the fellowship in laser therapy in dentistry on 12th October 2017 in The Netherlands. Various groups of dental delegates gathered from countries across the world including Argentina, Lebanon as well as United Arab Emirates. Amongst the delegates was Dr Shalleen Verma, currently practicing in the UAE who was honored to receive the fellowship.

Dr Shalleen Verma is currently practicing in Dubai, UAE and is head of the dental department of Majid Al Futtaim group, City Center Clinics and has been in clinical practice for over 21 years.

The unique ceremony was held at the Bloemendal Vauls Hotel, The Netherlands where the event continued for over four hours including a presentation and certificate awarding by Prof. Norbert Gutknecht.
Oral Anatomy, Histology & Embryology
40th Anniversary

By King's College London

The latest edition of the now-classic Oral Anatomy, Histology and Embryology continues to provide readers with all the information required to ensure a full understanding of these essential subject areas as they relate to current dental practice.

Now entering its 40th anniversary, the fifth edition of Oral Anatomy, Histology and Embryology has been thoroughly overhauled, updated and augmented to meet the needs of dental students worldwide. Maintaining the clear writing style and popular atlas-style format that characterized the phenomenal success of earlier editions, the fifth edition is written by dentists for dentists – authors, including King’s College London’s Barry Berkovitz – who know exactly what students need for safe clinical practice.

The “Best book worldwide on oral anatomy” contains a wealth of new illustrations, many of them previously unpublished. Chapters now also come with helpful overviews to summarize the topic and place it into wide context while learning objectives help students focus on key areas.

Now available with new pedagogic features and an enhanced illustration program, Oral Anatomy, Histology and Embryology 5th edition also comes with a free online program containing a wide selection of MCQs and additional learning exercises to allow readers to test and reinforce their knowledge.

External Features
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• Includes sectional anatomy and functional anatomy (covering mastication, swallowing, speech, taste and olfaction, thermoreception)
• Many chapters include Clinical Considerations which explore associated pathological findings as well as other topics of consideration such as the use of local anaesthesia, temporomandibular joint disorders and malocclusion
• Explores bone structure and remodelling – including potential bone atrophy following tooth extraction, its relevance to orthodontic treatment and implantology, trauma and malignancy
• Rich with over 1300 images including schematic artworks, radiological images, electron-micrographs, cadaveric and clinical photographs, all specially selected to make learning and recall as easy as possible

Barry Berkovitz is Emeritus Reader in Dental Anatomy, King’s College London, United Kingdom. Oral Anatomy, Histology and Embryology is founded on knowledge acquired over 40 years of teaching and research experience.

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Help keep your patients on a journey to healthy gums
Blue light laser assisted crown lengthening in restorative dentistry

By Dr. Philipp Skora, Dr. Dominik Kraus, PD Dr. Jörg Meister & Prof. Matthias Frentzen, Germany

Abstract
Basic investigations of the laser-tissue interaction of a new type of laser device with a wavelength of 445 nm—the blue light spectrum—promise considerable advantages in comparison with infrared laser systems due to the known optical parameters of oral soft tissue. The procedure for a comprehensive laser-based gingivectomy before restorative treatment using this new type of laser is presented in the following case report. Due to the outstanding haemostasis with the blue light laser, both gingivectomy and adhesive filling treatment were possible in only one session.

The follow-up examination showed the rapid healing of the wound with no complications and with no post-operative gingival recession. The treatment led to a very good aesthetic result at a moderate effort.

Introduction
Blue light emitting diode lasers present an innovative alternative to the already established diode laser systems with wavelengths within the infrared spectrum. Due to the strong absorption of blue laser light in oral soft tissue, the cutting capacity is improved when comparable laser parameters are used. Blue light lasers have very powerful coagulation effects that enable blood-free work. In addition, the high antimicrobial effect of blue light has been demonstrated in many fundamental studies. Due to these specific characteristics, blue light lasers are extremely suitable for corrective periodontal surgery in terms of gingivectomies. In contrast to electrosurgery, laser assisted plastic-aesthetic periodontal surgical procedures do not cause problems of electro magnetic interactions that could in turn present a contra-indication in the case of patients with symptoms of cardiac disease. In the case of multi-morbid patients who are frequently prescribed anti-coagulants, the danger of secondary haemorrhage can be minimised. In addition, in these cases, a bloodless surgical field can be created ad hoc, so that moisture-sensitive restorative measures (adhesive dentistry) can be carried out. In general, for multi-morbid patients, it is important that restorative procedures can be carried out in a short time and that the use of anaesthetics should be reduced to a minimum. Excision wounds should heal in a short time period. A dry environment is advantageous, in particular when a dental rubber dam cannot be used.

In case of extended subgingival loss of dental hard tissue, e.g. as a result of carious defects, it is always necessary to enable a visual inspection of the preparation margin before the restoration can be placed. Furthermore, a bloodless, clean, and dry adhesive surface must be guaranteed before application of...
This case study presents a treatment protocol for restorative and endodontic treatment of patients with extensive subgingival carious lesions in the anterior tooth area.

Case report

A 72-year old patient visited the Dental School of the University of Bonn to obtain a dental consultation regarding prosthodontic aspects. The medical history was unremarkable. The patient did not suffer pain among other things, insufficient composite restoration in the anterior tooth region.

The medical history was unremarkable. The patient did not suffer pain.

Fig. 7a–c: X-rays documentation of the endodontic treatment of 11.

The treatment plan was explained thoroughly to the patient. In the first session, tooth 11 was trepanned and treated as part of an emergency procedure. After exposure of the root canal, it was rinsed with sodium hypochlorite and calcium hydroxide was applied. Ahead of this emergency endodontic procedure, the carious lesions on 11 and 21 were excavated incompletely and treated temporarily with glass ionomer cement.

The patient came for further treatment five days later. The fistula on 11 had closed, clinical symptoms were no longer present (Fig. 2). After an infiltration anaesthesia (1.8 ml UDS), the subgingival carious defects in teeth 11 and 21 were visualised in a gingivectomy (Fig. 3). For both teeth, approximately 4 mm of soft tissue had to be removed to expose the affected area. The gingivectomy was carried out using a 445 nm diode laser (Sirona K-Laser, Sirona) with a power output of 1.5 W in CW mode and an application tip with a diameter of 320 µm. This device is a pre-serial model equivalent to SIBOLaser Blue (Sirona). The resection was carried out in six minutes.

The surgical procedure was performed with no pain. After finishing the gingival excision, the surgical field was bloodless and dry (Fig. 5), so that the temporary fillings at 11 and 21 could be removed and the cavities completely excavated under visual control.

The defects were treated with adhesive restorations with a composite material in a multi-layer technique (Herculite® A3,5). Figure 4 shows the situation after the restorations had been completed, including finishing and polishing of the aesthetically complex restoration. After laser treatment, haemostatic measures were no longer necessary for all subsequent treatment steps. In the post operative recall after seven days (Fig. 5), the patient reported that there was no post operative pain. After the procedure, the patient did not find it necessary to use the anaesthetics that had been made available.

After 14 days (Fig. 6), the excision wounds had healed to a very extent. There was still slight redness in the marginal area. No swelling occurred in the entire post operative phase. At this time, endodontic treatment was also performed for the devitalised teeth 11 and 21. After preparation and sealing of the root canal, the trepanation cavity was closed using a composite material (Figs. 7a–c). Three months after the operative procedure, the endodontic treatment of tooth 11 resulted in no further clinical symptoms. In the treated area, the probing depth was 1.5 mm. No bleeding was found during probing. No further recession of the gingival margin was found after the primary healing, approximately two weeks after treatment or at the follow-up inspection after three months. Gingival colour and surface texture (gingival stripping) corresponded to a healthy appearance (Fig. 6). To ensure long-term good oral hygiene and to prevent approximal gingival recession at 11/21 in a further step a frenectomy (laser-assisted) should be performed.

Discussion

The presented treatment protocol for laser assisted gingivectomy enabled the badly destroyed teeth 11 and 21 to be restored in an aesthetically satisfactory manner.

Due to the safe procedure and the drying of the surgical field after laser assisted excision, adhesive fillings were placed in the same session and exhibited no discoloration in the marginal zone, even after three months. This indicates a good bonding between the restorative material and the dentin. There was only little discomfort for the 72-year-old patient which derived from this complex therapy. After an emergency treatment, definitive rehabilitation, including adhesive restorations and endodontics, was carried out in two sessions.

The patient did not report any discomfort related to the laser treatment. The patient’s aesthetic appearance in the anterior teeth of the upper jaw was restored with moderate means. This treatment procedure improves the patient’s compliance, because it allows the patient to partake in a systematic care and treatment concept, which enables the continuation of additional necessary treatment measures.

Editorial note: A list of references is available from the publisher. This article was first published in Laser Magazine 4/2016.

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Figs. 2a–e: X-rays of the upper jaw—Subgingival carious lesions at 11 and 21.

Fig. 3: OP plus after laser surgery (gingivectomy).

Fig. 4: Situation after adhesive composite restoration following laser surgery.

Fig. 5: Postoperative recall after seven days.

Fig. 6: Follow-up inspection after 14 days.

Fig. 7: Follow-up inspection after 14 days.

Fig. 8: Postoperative recall after three months—Healthy gums and aesthetic restoration of the carious lesions at 11 and 21.
Root canal repair with the MTA sandwich technology

A clinical case that explains the technique step by step

By Dr. Riccardo Tonini, Italy

Root perforation repair has historically been a treatment with a low success rate; however, recent techniques and materials utilized in root perforation repair have dramatically improved the prognosis of both surgical and non-surgical procedures. Root perforation is defined as an artificial communication between the root canal system to the supporting tissues of teeth often caused by using rotary burs inside root canals.

In my practice, I have found lot of perforations caused by an inappropriate post space preparation for permanent restoration of endodontically treated teeth. They are located in the middle part of the canal and, according to my personal statistic, 80 per cent of the cases involve the first lower molar: considering this tooth, 60 per cent of perforations are in the mesial root and 40 per cent in the distal root and they are always generated by an over preparation of post space that has not taken into consideration the geometry of the cross-sectional anatomy of the lower first molar. Another consideration is that large sized perforations may not respond to repair as well as smaller ones.

Diagnosis

Bacterial infection emanating either from the root canal or the periodontal tissues, or both, prevents healing and brings about inflammatory sequels where exposure of the supporting tissues is inflicted. Thus, painful conditions, suppurations resulting in tender teeth, abscesses, and fistulae including bone resorptive processes may follow (1). A narrow isolated periodontal defect is a possible sign of root perforation. To determine locally isolated vertical bone losses, periodontal probing should be carried out by walking the probe around the tooth while pressing gently on the floor of the sulcus (2).

Fig 1: In the first lower molar an X-ray can often show a bone loss between roots and diagnosis is easier than other teeth.

Fig 1: The MTA sandwich technique is the author’s personally recommended repair method for this kind of perforation and it has been well described by Fabio Gorni in this article.

But what’s the equipment?

1) MTA is my choice material for perforation repair and numerous case reports exist in the literature showing excellent healing results with MTA.
2) The MAP (Micro-Apical Placement) System, provides an efficient method for placing repair materials and is the only one device that lasts over time. It has lot of tips, steel and NiTi that can satisfy all the requirements. I love the NiTi tip because I can bend it as I want.
3) Paper points
4) One gutta cone
5) One plugger
6) One plastic carrier (usually 40 or 60)
7) One Endo Explorer (Dg16)

Fig 2: As accurate detection of root perforations and determination of location are crucial to the treatment outcome, a paper is enough. The appearance of blood in the middle part of it is the perfect sign for a right diagnosis, detection and location of a perforation.

Fig 3: The second step is represented by a conventional RCT, but obturation is done with last part of a gutta percha cone, starting with warm gutta percha condensation deeper than the perforation level avoiding any contamination of perforation area with sealer and GP. A plugger is used for GP condensation.

Fig 4: During the third step MTA is positioned with MAP system. The system consists of a stainless steel or NiTi applicator with a bayonet catch for several exchangeable applicator cannulas (needles). Inside the cannula there is a plunger made in polymer that is longer than cannula providing a complete extrusion of internal material. The MTA can be taken from a dispenser thrusting the tip into the repair material and placed inside the canal in a sharp way pressing syringe piston to expel the material. An Endo Micro Brush can be used to gently pack the MTA or a plastic carrier can be used for a stronger condensation.

Fig 5: The last step is represented by backfilling the coronal part with GP or composite material in a second visit.
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Base-metal bridges from small to large

By Dentsply Sirona

The CAD/CAM-based in-house production of crown and bridge frameworks made of non-precious metals (NPM) has opened up new possibilities in the dental laboratory for some time now, as it presents a faster, more economical, and more reliable alternative to conventional casting methods. The scope of this option is now further extended by the new inCoris CCB disc (Dentsply Sirona CAD/CAM) that allows the fabrication of wide-span NPM restorations using the inLab MC X5 5-axis milling unit. These two concrete cases document the digital process.

Case report 1: 4-unit bridge

The patient presented at the dental practitioner’s office has a failing bridge in her upper left quadrant (tooth 22 to 26). Due to agenesis of the canine, a four-unit bridge with one pontic at site 25 was required. As the patient wished to bring the cost down as low as possible, the dentist agreed to provide a veneered bridge with an NPM framework.

Fig. 1, 2: The bridge restoration was first defined in the software inLab CAD SW 16.0 (Fig. 1), choosing the new inCoris CCB disc for the framework (Fig. 2). The digital impression of the intraoral situation was taken at the dental office using the CEREC Bluecam intraoral camera and transferred to the dental laboratory’s inLab CAD SW 16.0 online via the Sirona Connect portal.

Fig. 3, 4: A virtual version of the master model, including segmentation and pinning, was created for subsequent mounting on the perforated plate.

Fig. 5: The model data were exported in STL format by way of the interface module of the inLab CAD software and used for in-house production of the physical model with a 3D printer.

Fig. 6: The model axis, the jaw ridge line, and the insertion axis were defined in the inLab CAD 16.0 software (Fig. 6).

Fig. 7-10: Thanks to its integrated biogeneric function, the CAD software supplied a design proposal. Only minor modifications were made: the contact points were individually adjusted and the thickness of the framework was reduced somewhat.

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Processing of NPM sintering metal with inLab MC X5. User Case

Base-metal bridges from small to large

By Dentsply Sirona

The CAD/CAM-based in-house production of crown and bridge frameworks made of non-precious metals (NPM) has opened up new possibilities in the dental laboratory for some time now, as it presents a faster, more economical, and more reliable alternative to conventional casting methods. The scope of this option is now further extended by the new inCoris CCB disc (Dentsply Sirona CAD/CAM) that allows the fabrication of wide-span NPM restorations using the inLab MC X5 5-axis milling unit. These two concrete cases document the digital process.

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Case report 2: 11-unit bridge

The second case involved a much more extensive restoration. Due to the extraction of a tooth that had previously served as an abutment tooth, several bridges had to be replaced by a large 11-unit bridge. The workflow and approach were similar to that described for case #1. Again, the impression was taken digitally by a CEREC Bluecam and transmitted to the laboratory’s own inLab CAD SW 16.0 unit via Sirona Connect.

Fig. 22-24: The virtual design of the master model (Figs. 23 to 24) was followed by its physical production using an STL data export and a 3D printer.

Fig. 25-27: For the production, the resulting job was transferred to the inLab CAM SW 16.0 (Fig. 25), where the restoration, the sprues, and the sinter support, required for the subsequent sintering process (Fig. 26) were positioned and the milling job initiated (Fig. 27).
Dental Technician Int’l Meeting
05 May 2018

By Dental Tribune MEA/CAPPmea

The Dental Technician International Meeting (DTIM) is the continuation and growth of CAPP’s Dental Technician Sessions during the last 10 years. These Dental Technician Sessions were accomplishments not only for dental laboratory owners and dental technicians but for the entire dental technology profession.

The DTIM will be held on the 5 May 2018 at the Madinat Jumierah Conference Centre. Over 200 dental technicians, clinical dental technicians (CDTs), lab owners, trade visitors and more are expected to attend.

The DTIM takes place in conjunctions with the 15th CAD/CAM & Digital Dentistry Conference which will be attended by over 2000 dental professionals.

Who Should Attend and Why?
- Dental technicians
- Clinical Dental Technicians (CDTs)
- Dental lab owners

Join the DTIM 2018 to ensure that you are at the very forefront of the industry.

Conclusion
The CAD/CAM-based processing of NPM provides various advantages over the traditional casting process. A quick and clean procedure reliably produces high-quality results. Complex workflows have become a thing of the past, as have porosities and voids, distortion, impurities or other problems associated with the casting process. With the new inCoris CCB disc, an even greater number of cases can benefit from these advantages. After all, in combination with the inLab MC 55 5 axis milling unit, it is suitable for smaller objects as well as large-span bridges, as the two cases described here have shown. Thus, the laboratory can resort to this simple and economic process in almost all situations where economic aspects play a significant role for patients. Moreover, the profits generated by the CAD/CAM-based process accrue to the laboratory itself.

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LAB TRIBUNE

Fig. 28-29: The milling job executed by the inLab MC X5 took 64 minutes to complete.

Fig. 30, 31: The bridge framework is then removed from the milling unit (Fig. 30) and separated for overnight drying (Fig. 31).

Fig. 32, 33: The final dimensions of the bridge framework were once again obtained by sintering in the inFire HTC speed (Figs. 32-33). Due to the large dimensions of the framework, sintering was performed with the aid of a sinter support—a procedure generally recommended for 6-unit and larger frameworks. The sintered framework was then veneered and finished.

Dental Technician Int’l Meeting
05 May 2018

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Fig: 28-29: The milling job executed by the inLab MC X5 took 64 minutes to complete.

Fig. 30, 31: The bridge framework is then removed from the milling unit (Fig. 30) and separated for overnight drying (Fig. 31).
Restorations at 35 minute intervals

By COLTENE

Whereas production times with zirconium of up to 14 hours are no exception, architecturally appealing composite crowns can today be created within 35 minutes and only require minimal post-polishing. The CAD/CAM experts of the renowned laboratory partner DT&Shop know all about the benefits of fast, high quality production and how to keep dental laboratories competitive in the long run. In this interview, Dr. Nicolas Rohde, Head of Digital & International Division, and dental technician Manfred Bildhäuser explain what is possible in the field of CAD/CAM with state-of-the-art materials research.

Dr. Nicolas Rohde is well acquainted with the notion of speedy delivery. The fast implementation of demanding customer orders is the daily agenda of the leading mail order company for dental laboratory equipment. Eight dental technicians produce highly aesthetic prosthetics for the company’s numerous customers in the in-house milling centre. No wonder the enthusiasm for the novel CAD/CAM composite blocks, for example the BRILLIANT Crios substructure hybrid composite from Swiss dental specialist COLTENE, knew no bounds. The flexible all-rounders make life considerably easier for CAD/CAM production and are notable for their rapid producibility among other things.

Dr. Rohde: It is difficult for dentists to bypass composites in classical filling therapy. Now this versatile material is also entering the arena of CAD/CAM technology. Is composite the new ceramic?

Dr. Rohde: This depends entirely on the indication! Indeed, the CAD/CAM composite blocks currently available on the market bring with them a number of excellent material properties. In many cases it is possible to create visually attractive results from this flexible material in virtually no time. Long sintering or crystallising of other dental materials can be eliminated completely. After roughly 35 minutes, the milling machine produces virtually finished crowns, partial crowns, inlays, onlays, or veneers. Due to the high intrinsic gloss of high performance composites such as BRILLIANT Crios, brief polishing is all that is required. This allows fabrication of a top quality restoration within one hour.

What can composite do which traditional CAD/CAM materials can’t?

M. Bildhäuser: Above all, the marginal stability of BRILLIANT Crios is extremely high. Compared with glass ceramics, the high performance composite is ideally suited for inlays or onlays requiring extremely thin walls. We also use the flexible all material in all cases where preparation was not so good. Dr. Rohde: From my days in implant dentistry, I know that removing part of the dental fibres for dentures with implants often leads to a lack of the natural damping effect of the ligament in the jaw. This makes it extremely pleasurable for patients, if the crown itself has a slight damping effect. Many users have reported on the high wear comfort of composite based restorations. The dentine-like modulus of elasticity provides for a natural chewing feeling and is gentle on the opposite tooth at the same time.

Where exactly is the specific advantage in processing Mr. Bildhäuser?

M. Bildhäuser: I was amazed at how easy the novel material could be smoothed and polished. There are no interfering inclusions of the polishing paste and post-processing takes next to no time, be it for monolithic crowns, onlays or veneers, whereby we use a compact wet grinding machine also used by many of our customers. This is not difficult to reproduce even for smaller laboratories. For example, the Finocam W is an inexpensive wet grinding machine which delivers better results than far more expensive chairside CNC machines.

What needs to be observed in general terms when processing CAD/CAM composite blocks?

M. Bildhäuser: Of course every technician has his own style. A somewhat slower speed is generally recommended for composite: it is important to apply only little pressure on the material. And as the processing time is short anyway, one can take a more relaxed approach. Of course, with a new material one always has to first try out the pressure effects of the grinding tools. After one to two units, processing is possible with comparatively little effort. The final finishing and polishing is separated from the carrier with a thin disc. Then smooth the surfaces with a soft rubber polisher. For further processing I use the D/AXTEX Shape-Guard from COLTENE, this adapts perfectly to the respective surfaces. This is followed by meticulous post-polishing with the margin polishing paste - and finished!

Which material is currently in particularly high demand in laboratories?

Dr. Rohde: Zirconium remains the gold standard in the industry, last but not least because of its favourable price structure. At approximately 25 units per blank, the circular blank is certainly in a different price category than the conventional blocks for chairside grinding systems. At the same time, zirconium has a convincing fl exural strength of over 1,000 megapascals. At approximately 600 megapascals the value is of course somewhat lower for highly translucent pieces. On the downside, zirconium needs to be sintered for a very long period to achieve an aesthetic solution. 14 hours for production is quite common. When using CAD/CAM composite blocks we can process orders from laboratory customers quicker as the firing process is eliminated. If we have the data by 3 pm, our milling centre can generally deliver on the same day.

Who benefits most from rapid processing?

Dr. Rohde: If the dentist has a CAD/CAM device in the practice, a crown can be produced within an hour and be fitted during the same session. The patient saves the need for a second session and is pleased by the immediate treatment. Also in the laboratory, production only takes one hour, in other words: the patient can have his dentures a few days later which is still considerably faster than in the past.

...does this mean there are no limits to patients’ demands?

M. Bildhäuser: Today, patients obtain extensive information via the Internet on various indications and the treatment methods available. This increases the wish for highly aesthetic restorations and patients do take a closer look. In view of the marked quality awareness of many customers, one is of course delighted to deliver work to laboratories distinguished by a fantastic gloss.

Dr. Rohde, how has the competition from the Far East changed the domestic laboratory market in your opinion?

Dr. Rohde: As leading mail order company we export to over 50 countries and monitor the development in Europe with mixed feelings. The pressure on margins is no doubt increasing if dentists outsource their laboratory work more and more to India or China. Investment into CAD/CAM technology is therefore a good approach for the individual dental laboratory: machine fabrication largely eliminates the intermediate labour-intensive steps, making production costs competitive again. Usually the unit labour costs are the deciding factor in the calculation.

M. Bildhäuser: Add to this that the starter models for CAD/CAM have meanwhile become affordable, togetherr with a manageable learning curve. In the past you more or less had to be an engineer to operate the devices, these days dental technicians attend one of our training courses at the beginning, the rest follows automatically.

And finally: what properties would you want the dental material of the future to have?

Dr. Rohde: (laughs) The all-in-one solution for every purpose would be a material with the fl exural strength of zirconium, the aesthetics of e max and the processing characteristics of composite, but we place our trust in the inventiveness of the manufacturers. The amazing development of modern high performance composites over the past years would suggest that it is not only processing time in the laboratory which will undergo rapid progress. And we would be pleased to actively support easing the work burden for dental technicians.
Stabilized Stannous Fluoride Dentifrices are toothpastes of choice: ME Dental Consensus

By Dental Tribune MEA / CAPPMea

DUBAI, UAE: On 02-03 November 2017, a selected panel of ME elite dental academicians gathered for a two-day scientific consensus to discuss recommendations for best choice of toothpaste. This unique assembly took place at The Address Hotel, Dubai Marina, UAE. The results were presented live on stage at the 9th Dental Facial Cosmetic International Conference which took place at KCH in Dubai Festival City on 03-04 November 2017.

The consensus was led by Professor Hien Chi Ngo, Dean of College of Dental Medicine, UAE. Dr. Elias Berdouses, Board Member of Emirates Pediatric Dentistry Club. The consensus was achieved by the Delphi methodology (A structured survey approach conducted in multiple rounds of questionnaires and answers. It is regarded as a systemic, interactive forecasting method relying on a group panel of experts), resulting in an unbiased evidence-based conclusion on the best type of toothpaste available. The panel of experts included:

**Introduction**

An ideal toothpaste should protect gums, teeth and the oral environment with minimal side effects and environmental impacts. In addition to the body of evidence supporting fluoride effectiveness, evidence suggests that Stabilized Stannous Fluoride, with verified bio-availability, has additional benefits in association with sustained patient compliance (daily use) and effective mechanical debridement; this group recommends the following.

**Gum Health**

There is emerging scientific evidence supporting the anti-inflammatory action of Stabilized Stannous Fluoride. In Patients with gingivitis, which can predispose to periodontitis, there is evidence that a toothpaste with Stabilized Stannous Fluoride has distinctive advantages in restoring and maintaining gingival health by reducing plaque and calculus deposition.

**Tooth Health**

There is strong evidence to support that Stabilized Stannous Fluoride is superior to other forms of fluoride in anti-bacterial efficacy and the reduction in aggressivity of plaque. Stabilized Stannous Fluoride based toothpaste has been found to be effective in managing dental caries. A Stabilized Stannous Fluoride based toothpaste, in addition to addressing all etiological factors helps reduce progression of erosive tooth wear.

**General**

Based on the recommendation of the European Academy of Paediatric Dentistry (2009), the dosage for toothpaste for children is twice daily. Up to 1 years of age: 500 ppm fluoride; 2 to 6 years of age: a pea size amount; 6 to 12 years of age: one half a spoonful of 1450ppm fluoride-1cm. Where higher concentrations of Fluoride toothpastes are not available, larger amounts and longer exposure to toothpaste may be recommended based on individual needs. It is recommended that patients with fixed orthodontic appliances may have an increased risk of gingival inflammation and dental caries. We recommend further scientific studies in the areas of peri-implantitis, root caries and dentine erosion. To increase compliance, oral health care providers should consider the effectiveness of products and patient specific needs regarding age, medical conditions, taste and texture. In conclusion, based on current literature we recommended that a Stabilized Stannous Fluoride based toothpaste is the toothpaste of choice.

Over the two days, the consensus culminated in the above recommendations which are agreed and signed off by the expert panel.

Prof. Hien Chi Ngo – Moderator, Dean of College of Dental Medicine, University of Sharjah, UAE

Dr. Elias Berdouses – Moderator, Board Member Emirates Pediatric Dental Club, UAE

Prof. Crawford Bain – Chairman Periodontics Department, Hamdan Bin Mohammed College of Dental Medicine, UAE

Dr. Arwa Al-Sayed – Chairman of the Saudi Fellowship Program in Implant Dentistry, Saudi Commission for Health Sciences, KSA

Dr. Nada Naaman – Honorary Dean, Professor Department of Periodontology, Saint-Joseph University, Lebanon

**Reference**


2. Further information on the evidence, references and methodologies used can be obtained from Prof. Hien Chi Ngo – Moderator of the Consensus. Please email dental-tribune.me with your enquiry.

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**Dental Hygienist Seminar 2017 educates over 300 dental hygienists from MEA region**

**By Dental Tribune MEA / CAPPMea**

DUBAI, UAE: Dental Hygienist Seminar 2017 once again took place as part of 9th Dental Facial Cosmetic International Conference on 03-04 November 2017 at InterContinental Hotel Dubai Festival City. The event which focuses on the dental hygiene profession was organized in collaboration between CAPP and Colgate Oral Care Academy with the support of the International Federation for Dental Hygienists (FDI) and the Emirates Dental Hygienist Club (EDHC). This year’s 9th edition of the Dental Facial Cosmetic International Conference welcomed over 3,000 dental professionals, establishing itself as Middle East & Africa’s largest scientific international dental programme incorporating several concurrent dental education events organized by Dental Tribune MEA / CAPPMea
by CAPP. Over 20 multidisciplinary hands-on training courses, a two-day conference & exhibition, dental toothpaste consensus, free CME training zones, poster presentations and the Dental Hygienist Seminar all took place at the InterContinental Hotel Dubai Festival City, UAE between on 06 November 2017. Conference delegates received continuing dental education points for their attendance from numerous accrediting bodies including Dubai Health Authority (DHA), Health Authority Abu Dhabi (HAAD) and CAPP as an ADA CERP recognized provider of continuing education credits.

This year’s Dental Hygienist Seminar educated over 300 dental hygienists from GCC, MENA, Asia and Europe. The gathering was enlightened by the positive energy of the dental experts who visited and presented hygienist relevant lectures throughout the day. Dedicated dental hygiene hands-on courses were further organized in partnership with Colgate Oral Care Academy and the IFDH. The scientific programme was designed to increase the level of enlightenment of all passionate dental hygiene professionals.

Dental hygiene virtuosos from around the world featured throughout the scientific line up including: Session Chairman Dr. Mohammad Kashfi – College of Dentistry Ajman University dental faculty, UAE; Dr. Mary Mowbray, RDH, IFDH, New Zealand; Dr. Mohammad Bin Huraib, King Saud University dental faculty, UAE; Dr. Maha Al-Ghouth, King Faisal Special Hospital dental faculty, KSA - The role of the dental hygienist in maintenance of aesthetic restorations and implant supported restorations.

The core element of the Oral Health and Pregnancy initiative is a newly created dedicated web portal. It provides scientific reports, guidelines for oral and other health professionals, brochures, practical recommendations for women, a bibliography, infographics, videos, news items, features, and other educational content—all of which can be accessed free.

"Women’s oral health during pregnancy is important, not only for its health risks during pregnancy and the publication of four fully referenced scientific papers specially written for the initiative. According to the EFP, the articles cover the importance of women’s oral health during pregnancy, the biological mechanisms between periodontal disease and pregnancy (a narrative review of studies and a systematic review and meta-analysis), and the importance of treating periodontal disease during pregnancy.

"By raising awareness about oral health risks during pregnancy and offering simple solutions, we hope to encourage more women to seek professional dental care and to improve their at-home oral health care while expecting," said Dr. Anja Rist, manager for oral care for Europe, the Middle East and Africa at Procter & Gamble, owner of the Oral-B brand.

New campaign focuses on oral health during pregnancy

The event further included 4 hands-on courses featuring two sessions of Enhanced Biofilm Management, Working Posture, and Periodontal Instrumentation and Sharpening trainings. The Dental Hygiene Seminar 2018 is already scheduled as part of the milestone 10th edition of the Dental Facial Cosmetic International Conference which will take place November 2018 once again in Dubai. All dental hygienist and dental professionals interested in the platform are welcome to attend.

By DTI

BRUSSELS, Belgium: The European Federation of Periodontology (EFP) and Oral-B have launched a campaign to highlight the importance of oral health for pregnant women and its possible impact on delivery. The Europe-wide Oral Health and Pregnancy initiative aims to help address the problem of pregnancy gingivitis and to bring awareness and advice based on the latest scientific evidence to health professionals and women.
HYPERSENSITIVITY DUE TO TOOTH EROSION CAN BE GONE WITHIN SECONDS* WITH COLGATE® SENSITIVE PRO-RELIEF™ TOOTHPASTE

The risks that carbonated soft drinks, alcoholic mixers and wine pose to your patients’ teeth are well-known – increased consumption of acidic food and drinks can lead to tooth erosion and hypersensitivity.

However, even your patients following a healthy lifestyle may be at risk due to the acidic nature of fruit juices and sports drinks. Hypersensitivity results when the tiny dentine channels directly linking to nerves in the tooth become exposed and is associated with pain and discomfort triggered by heat, cold or touch.

Addressing hypersensitivity is crucial for providing relief to your patients.

COLGATE® SENSITIVE PRO-RELIEF™ TOOTHPASTE TARGETS HYPERSENSITIVITY FOR FAST PAIN RELIEF**

The Pro-Argin™ Technology of Colgate® Sensitive Pro-Relief™ toothpaste physically seals dentine tubules with a plug that contains arginine, calcium carbonate and phosphate. The plug effectively reduces dentine fluid flow reducing sensitivity and relieving pain in seconds.*2,3

COLGATE® SENSITIVE PRO-RELIEF™ IS CLINICALLY PROVEN TO RELIEVE PAIN IN SECONDS**

In a double-blind, parallel group study, 120 patients directly applied either Colgate® Sensitive Pro-Relief™ toothpaste, a regular desensitising toothpaste† or a regular toothpaste‡ to sensitive teeth. Change in hypersensitivity was assessed using air blast sensitivity scores, where a lower score indicates better pain relief.

Not only did Colgate® Sensitive Pro-Relief™ provide instant relief of dentine hypersensitivity, both immediately after direct application and after 3 days of use, but it also provided superior pain relief when compared with the other toothpastes.

Recommend Colgate® Sensitive Pro-Relief™ to your patients suffering from hypersensitivity due to acidic tooth erosion – clinically proven to treat hypersensitivity and relieve pain fast.*2

* When toothpaste is directly applied to each sensitive tooth for 60 seconds.
† Containing 5% potassium nitrate and 1450 ppm fluoride as sodium fluoride.
‡ Containing 1450 ppm fluoride as MFP

References:

INSTANT AIR BLAST SENSITIVITY RELIEF IN VIVO

![Graph showing air blast sensitivity scores](Ayad et al. 2009b, Mississauga, Canada)

- Baseline
- Immediately
- 3 days

- Control with KNO₃ and NaF
- Control 2 with MFP
- Colgate® Sensitive Pro-Relief™ toothpaste

* p < 0.05 compared to baseline • p < 0.05 compared to control

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‡ Containing 1450 ppm fluoride as MFP

References:
This year Beverly Hills Formula focused on increasing their brand presence throughout the Middle East by attending several industry events, including the International Dental Conference and Arab Dental Exhibition (AEEDC) and BeautyWorld.

The Dubai International Convention and Exhibition Centre was the stage for Beverly Hills Formula's launch of their latest Professional White oral hygiene range which were showcased at AEEDC and have since been highly recognized as the premium professional products by leading industry figures. Dr. Eyass Jebrin, periodontist at the Dental Studio in Dubai an Clinica Joelle in Abu Dhabi met up with the Beverly Hills team at AEEDC where he got chance to try their latest Professional White range before it was launched on the market.

Dr. Jebrin, who personally uses and recommends Beverly Hills Formula products said: “I've been using the Black Pearl toothpaste and Fresh Pearl mouthwash on a daily basis and I love the clean and fresh feeling after each use with its mild fresh taste as I don't like strong flavors found in other brands.

“When I started using the Perfect White Black toothpaste and latterly the Black Pearl toothpaste I noticed that my teeth have less stains than before and it has reduced the need for polishing my teeth after time. The toothpaste ingredients are low in abrasives and I think that the activated charcoal plays an important role in removing the stains without harming the enamel.”

Beverly Hills Formula Professional White range includes, Black Pearl whitening toothpaste, Pink Pearl Sensitive whitening toothpaste and Fresh Pearl mouthwash. Another innovative product within the range includes Precious Pearl Enamel remineralizing serum which won the award for the Best New Oral Product in this year’s Pure Beauty Awards, London.

Beverly Hills Formula also launched the new Professional White whitening kits at the Dubai Beauty Show in May hosted by Enterprise Ireland. Attending the event, Chris Dodd, CEO of Beverly Hills Formula explained that the kits had been in development for over two years, ensuring only the highest quality ingredients were included to actively achieve a whiter, brighter, healthy smile. The main active ingredient is PAP - Phthalimido-Peroxy-Caproic Acid, a non-peroxide teeth whitening ingredient which breaks down discolorations on the teeth without affecting the tooth structure. Additionally, PAP supports dental hygiene and health by eradicating bacteria which can harm to teeth. Since PAP is only active on the tooth surface, no irritation is caused to the gums and mucous membranes in the mouth.

Chris Dodd added: “Our teeth whitening kits are something we are really excited about because it’s an expansion to our whitening toothpastes and mouthwash in to new devices. Our teeth whitening kits are designed to be used alongside our entire new range of Professional White products which offer a solution for every oral hygiene concern, be that teeth sensitivity, gingivitis, discoloration and enamel protection. We can’t wait to make these products available in the Middle East and were delighted to reveal them first at the Dubai Dental Show and then at the Dubai Beauty Show.”

Beverly Hills Formula were also present at the annual Summer Sale held at the Four Seasons Hotel in Amman, in September, an exhibition focused mainly on local fashion designers who display their latest trends. Here more than a 2,000 guests visited the event where Beverly Hills Formula presented Perfect White Gold as well as Perfect White Black toothpastes, two of their flagship products from their original Perfect White range. Also in July, Beverly Hills Formula took part in the Amman Street Fashion event in Jordan which exhibited a wide selection of fashion and beauty products and was attended by over 10,000 visitors.

So as 2017 comes to a close, Beverly Hills Formula have proved that they are not only thriving but driving a growing market in the Middle East.
Empower your patients to achieve complete care for a healthier mouth with the new Philips Sonicare DiamondClean Smart

By Philips Sonicare

DUBAI, U.A.E: Royal Philips (NYSE: PHG, AEX: PHIA) today announces the launch of the Philips Sonicare DiamondClean Smart toothbrush, offering patients complete care for a healthier mouth. The DiamondClean Smart is our best and most complete oral care solution, empowering dental professionals and patients to achieve superior results and multiple oral care goals from plaque control to gum health to whitening.

With personalized coaching and feedback, an intuitive brushing experience, to new high performance brush heads, the DiamondClean Smart helps eliminate any guesswork and guide them to improve their overall technique; giving patients more confidence they will achieve a complete clean every time. In fact, 95% of those surveyed agreed it’s the most effective product they’ve used for building healthy brushing habits.

“Connected technology is key to motivating patients to learn more about their oral health and how they can achieve better results. The new Philips Sonicare DiamondClean Smart is our best and most complete brushing solution ever, using industry leading smart sensor technology combined with the heritage of the DiamondClean range. For the first time it allows dental practitioners to help their patients’ achieve multiple oral health goals while monitoring their progress, ultimately to achieve better longer-term care.” (Rashed England President of Emirates Dental Hygienics Club)

The new DiamondClean Smart connects to the Philips Sonicare App, giving patients personalized feedback and coaching which they can choose to share with their dental professional. A suite of smart sensors built into the handle track location, Scrubbing and Pressure and syncs using Bluetooth technology. This allows patients to track brushing habits to identify trouble spots to help them achieve 100% coverage for a truly tailored clean. With the Touch Up and Focus Area features to guide patients to a better oral care routine, 87% of users surveyed claimed to be a better brusher after just one week of use.

Easier to use with a new intuitive brushing experience; the Philips Sonicare DiamondClean Smart does all the hard work, using Smart Brush Head Technology and a microchip in the brush head to prompt the handle to the right mode and intensity setting, and it even reminds patients when to change their brush heads.

To address all patients oral care needs for a healthier mouth, the DiamondClean Smart features three brush heads that promise a more precise and tailored clean.

The new brush heads include:

- **Premium Gum Care**: a small brush head that reaches the very back of your mouth to your molars and achieves up to seven times healthier gums (as compared to a manual toothbrush) in just two weeks.
- **Premium White**: densely packed stain removal bristles that whiten and polish teeth resulting in a five times whiter smile in three days.
- **Premium Gum Care and Clean**: a medium brush head that removes up to 5X more plaque for white teeth in just 1 day (in White+ Mode) vs a manual toothbrush using a leading Whitening toothpaste.

References

1. Improved oral health for/to support improved overall health. 2.95% of consumers surveyed agreed Sonicare DiamondClean Smart is the most effective product they have used for building healthier brushing habits. 3. In a survey of US patients 100% coverage of the time.

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By DTI

PITTSBURGH, U.S.: For a long time in dentistry, filling materials have been a topic of intense interest and now new research out of the U.S. and Brazil has added to the discussion. The study found that not only smoking and drinking but also a patient’s genetics can negatively affect the success of a filling, suggesting that personalized dental treatment could lead to improved outcomes.

The researchers, from the University of Pittsburgh School of Dental Medicine in the U.S. and the University of Pernambuco’s dental school in Brazil, investigated a large number of dental records from the Pittsburgh school’s Dental Registry and DNA Repository, which contains information on patient fillings and rates of failure up to five years after the restorative procedures. It also contains information on patient lifestyle, including smoking and drinking habits, and a DNA sample from each patient, allowing the team to investigate whether patient lifestyle and genetics can negatively affect the success of a filling. The findings suggest that personalized dental treatment could lead to improved outcomes.

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The team found that, within two years of the procedure, fillings failed more often in patients who drank alcohol, and the overall failure rate was higher in men who smoked. Furthermore, a difference in the gene for matrix metalloproteinase (MMP), an enzyme found in teeth, was linked to increased filling failure. The researchers then hypothesized that MMP’s might be able to degrade the bond between the filling and the tooth surface and potentially lead to failure. However, according to the researchers, more investigation needs to be done before any definitive conclusions can be drawn.

In an interesting turn in the debate between amalgam and composite fillings, it was found that there were no major differences between patients receiving either material in terms of filling failure rates. The researchers suggested that this shows composite fillings are at least as durable as amalgam fillings and offer a viable alternative with no toxic ingredients.

“A better understanding of individual susceptibility to dental disease and variation in treatment outcomes will allow the dental field to move forward,” said lead author Prof. Alexandre Vieira, from the Pittsburgh dental school’s Department of Oral Biology. “In the future, genetic information may be used to personalize dental treatments and enhance treatment outcomes.”

The study, titled “A pragmatic study of the value of genetic information in the treatment of dental amalgam fillings,” was published on Nov. 6 in the open-access journal Frontiers in Medicine.
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Teeth within an hour: A ticking time bomb

By Dr. Göran Urde, Sweden

In my lecture at this year’s EAO meeting, attendees received an overview of over 50 years of working with implants and why we did it in certain ways back then and why we do it differently today. When I started placing implants, they were only for specialists in oral surgery and prosthetics. Periodontists were not even allowed to listen to our lectures. One also had to be thoroughly trained if one wanted to purchase implants. Companies kept records of the clinician’s success rates and if he or she had a higher than normal failure rate, they showed him or her the door to figure out alone what had gone wrong.

In some instances, the warranty did not even apply if the dentist was not properly trained if one wanted to purchase implants. Often, these were just weekend courses after which the dentist was supposed to be a fully qualified surgeon and prosthetist and knew everything, including single-tooth restoration, full-arch rehabilitation of severely resorbed jaws with bone grafts and immediate loading concepts. It was totally absurd. To place implants, one needs to be well trained—learn to walk before one starts to run.

To my delight, I see that more and more implant companies are abandoning weekend courses and instead offering high quality courses over a longer period. Attendees have to treat patients under supervision and companies even offer mentor support, which means clinicians are receiving guidance in conducting their treatments. The best courses are of a general nature, where the sole purpose is to train dentists to place implants and do this well and not how to do it with a specific implant system.

One thing that worries me a great deal is the copy cat versions of implants that are being marketed to less experienced dentists who cannot determine what a good product is. I always tell my audience to never treat patients differently than they would treat their own family. The unfortunate thing is that I often see members of the audience looking down because they feel ashamed. They do not understand that they get what they pay for and that failures are very costly and can hurt both their reputation and patients.

Another topic that gets me going is the marketing of new teeth in an hour. Patients that for decades have not taken care of their natural dentition are now being treated in accordance with concepts like immediate loading. Within an hour, any remaining decayed teeth are removed and replaced with implant supported crowns and bridges in the belief that the patients will start taking care of their new teeth. Unfortunately, this is not realistic.

In my opinion, this a ticking time bomb. It is just a matter of time before patients will come back with problems like peri-implantitis and failing implants. Who is going to sort that out? In the good old days, patients had to cooperate first and then we placed the implants. Maybe this was a bit harsh, but success rates were higher then and fewer patients ended up with problems. One does not have to be a rocket scientist to understand that, with a mouth full of pathogens, the success rates will go down.

I have been heavily involved in developing concepts like “Tooth Now”, according to which a tooth is extracted and immediately replaced with an implant and loaded with the final abutment and a temporary crown, with extremely high success rates when it comes to both implant survival and even more so the aesthetic outcome. Therefore, I am not against immediate loading at all, but case selection is very important. That is why good training courses conducted over longer periods are so important.

Guided surgery is both good and bad. The saying of “garbage in, garbage out” is apt in this regard: if one has the wrong information or interprets the digital information incorrectly, one might get into trouble if a fully guided surgical template is based on that. I do not agree with fully guided surgery as it is today, as I believe our brain needs to be connected instead of just computing. Do not get me wrong, I love to work with digital planning tools like NobelClinician (Nobel Biocare) to optimize my treatments, but instead of fully guided I prefer to use simpler surgical and/or pilot bar guides that do not force me to drill in a certain way.

Editorial note: At EAO 2017, Dr. Göran Urde presented a paper titled “Evolution of surgical protocols in implant dentistry” as part of the scientific program.
The use of CBCT and CAD/CAM techniques in complex implant-supported rehabilitation of maxilla—Part I

By Dr. Tomasz Smigiel, Poland

Introduction
Patients who visit our clinic and wish to receive prosthetic treatment are frequently unaware of the possibilities that modern medicine has to offer. Neither are they aware of the fact that implantological treatment is not a ‘one-day’ treatment and that the integration of implants with bone tissues takes some time. That time can range from several weeks to several months. What they are also unaware of is the fact that after some time from the moment the teeth have been extracted, the bone will atrophy and hence it is often necessary to perform augmentation procedures first before dental implants can be placed.

Therefore, a complete treatment may last from several months to up to a year. As a result, the temporary prosthetic restoration, which the patient will have to use till the end of the treatment, is recommended. It is important to notify the patient that following augmentation procedures, using bone blocks and biomaterial, it is inadvisable to use a functionally unstable prosthesis as it may damage the augmentation material and damage the prognosis connected with the graft’s integration.

As a result, in such cases one may apply a temporary prosthesis based on telescopic crowns as the whole load will be transferred onto teeth or implants, not the mucosa. Telescopic prostheses are a type of prostheses that are not functionally unstable, unlike ordinary acrylic prostheses or some other skeletal types.

Case report
A 62 year old patient with residual dentition used an ordinary acrylic prosthesis. The main reason why the patient wished to change the prosthesis was discomfort due to the fact that the palate was covered up while the prosthesis was movable. In order to obtain maximally precise diagnostics, a demonstrative panoramic photograph was taken as well as CBCT.

During the process of treatment planning, a few proposals for prosthetic solutions were presented, including permanent and temporary restorations, based on existing teeth as well as implants of various combinations. However, due to significant atrophy in the lateral part and a low lying fundus of the left and right maxillary sinus, it appeared necessary to perform augmentation procedures (sinus lift), in order to make implantation possible. It became clear that treatment in this case would require more time and hence in the period between procedures, from the moment treatment began till the time the final prosthesis was accepted, the patient should be provided with a convenient temporary restoration. Being fully aware of advantages and disadvantages of different solutions, the patient decided on a restoration based on eight implants with a combined mounting and the use of screw-based abutments and telescopic crowns of implants. Application of telescopic crowns at the front of the maxilla allowed us to make a very convenient temporary restoration, partial prosthesis based on four telescopes.

Fig. 1: Analysis of the scope of teeth exposure—mouth slightly open
Fig. 3: Analysis of implantation possibility based on CBCT of the frontal region: vertical dimension 16.1 mm, horizontal dimension 5.4 mm
Fig. 5: Analysis of implantation possibility based on CBCT of the right-side maxillary sinus region: vertical dimension 5.6 mm, horizontal dimension 10.4 mm
Fig. 7: Preparation for taking impressions. Closed boy impression copings mounted onto the implants.
Fig. 2: Analysis of teeth exposure—maximum scope of smile
Fig. 4: Analysis of implantation possibility based on CBCT of the left frontal region: vertical dimension 17.2 mm, horizontal dimension 4.2 mm
Fig. 6: Analysis of implantation possibility based on CBCT of right-side maxillary sinus region: vertical dimension 4.7 mm, horizontal dimension 6.4 mm
Fig. 8: An impression taken on an individual boy—Impregum. Implant analogues together with impression copings placed within the impression.

Fig. 8: An impression taken on an individual boy—Impregum. Implant analogues together with impression copings placed within the impression.

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OSSTEM IMPLANT

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IMPLANT TRIBUNE
Each treatment should start with a well-prepared plan. For most pa-
tients appearance after treatment will always be very important that is why an intraoral analysis must be made in order to assess the static structure of the mounth, as well as an
analysis of the lips’ dynamics along with teeth exposure during speak-
ing and smiling (Figs. 1 & 2).

We analysed the aesthetic aspects in a way that enables us to reach
an optimal balance between white (teeth) and pink (gums) aesthet-
ics. Of course, in toothless patients, one should take note of the fact that
that teeth setup as well as reconstruction of atrophied tissues will constitute a
support for the lips. Such an analy-

sis may be made on the basis of a

positioning model and for the prepa-
ration of the temporary prosthesis

based on telescopes.

In the next phase, implants were

inserted. In compliance with the

results of the CBCT study, a sinus

lift procedure was performed with

a simultaneous implantation in

the region of lateral teeth. Eight

Ankylors implants were introduced,

raising both maxillary sinuses at

the same time. After six weeks, the

implant exposure procedure was

performed.

Because of the fact that implants

were partially anchored into the

bone at the lateral sections, partially

within the augmentation mate-

rial while primary stability was

achieved, we decided to expose implants at lateral sections without

occlusal load so as to perform the

so called bone training with a view
to improving the condition of the

gingiva. An impression was taken (Figs. 7 & 8) for the

positional model and for the prepa-
ration of the temporary prosthesis

based on telescopes. The model was scanned while the abutments were made ready in such a way that they could serve as
telescopic crowns, also in the final

stage (Fig. 9).

Primary and secondary telescopic
crowns were designed on the abut-
ments (Figs. 10 & 11) on the assump-
tion that secondary crowns had been made ready twice; that is, for
the sake of temporary prosthesis

and at the same time for gluing it

into the final construction (Figs. 12

& 13). Abutments were mounted on

implants by means of Pattern Resin

(Figs. 14 & 15) in such a way that the

position does not change during

mounting.

A temporary skeletal prosthesis,

based on four telescopes, shall be

placed on such a foundation (Figs.

16 & 17). Primary telescopic crowns

were glued last (Fig. 18). Secondary telescopic crowns, made

directly from acetal by means of the CAD/

CAM virtual designing method,

were tried on primary crowns (Fig.

19). Figures from 20 to 22 present a macroscopic view of zirconia pri-

mary crowns testing and acetal sec-

ondary crowns.

At that stage, our patient received a

temporary prosthesis, while lateral

implants remained unloaded (Figs.

23 & 24). In the second part of the ar-
ticle, we will present the designing

process (Figs. 25 and 26) along with

the process of manufacture of the fi-
nal construction made from TRINIA

material with glued zirconia crowns

as well as veneering by means of

pink composite material.

Work completed in cooperation with

Inter-Dent laboratory in Warsaw, Po-

land.

Editorial note: This article is the first

one from the two parts series. Part II


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My complete conversion - London lingual orthodontics provider
Dr Asif Chatoo describes his navigation of digital technology

By Dr Asif Chatoo, London

My professional journey has no end or destination. If I ever felt satisfied by one system and I applied it in the same way without acquiring new knowledge or discovering more advanced technologies and materials, I would consider myself ready for retirement, which I am certainly not. My voyage through digital technology, however, has just reached a natural conclusion. I realised recently that I had progressed through all aspects of digital technology as it relates to orthodontic treatment and I had completed a circle (Fig. 1).

My journey started with photography some years ago, but the process accelerated, and in recent years, everything has gone digital, including radiography, record-taking, treatment planning, and the manufacture of brackets and wires.

Over the course of my digital conversion, I have tried several different systems, all of which have delivered important benefits. The system I have used most as I completed the digital circle over the last two years is suresmile (OraMetrix). It is a treatment management system and among its benefits is that it is immediate. Adult patients are particularly grateful not to have impressions taken, and the orthodontic nurses are delighted to avoid this most trying aspect of record-taking. It was invariably messy. Being impression-free has brought more value to the team than going paperless.

It goes without saying that a key benefit of digital technology is the integration of the orthodontic processes and records. For instance, a scan of the patient’s teeth can be superimposed on to a photograph, which I can in turn integrate with a grid. I can relate the tooth positions to facial planes and check that the dental midline is centrally located. I can show the patient his or her teeth and bite and I can provide him or her with a visual simulation of the difference that treatment will make. The patient can then ask questions. My vision for the finished result may not be the patient’s vision and being able to manipulate the outcome on screen means one can be absolutely sure the patient understands the treatment planning. The patient can influence the treatment if he or she wishes, and if he or she changes his or her mind towards the end, the technology allows for last-minute manoeuvring.

In order to convey how this approach differs from other treatments on offer, I compare it to the difference between an off-the-peg suit and going to a tailor in Savile Row. Many of the patients I treat at my practice are referred by leading specialists, and among its benefits is that is comfortable at rest. More than anything, I want them to be wow factor. I have gone 360 degrees to facial planes and check that the dental midline is centrally located. I can show the patient his or her teeth and bite and I can provide him or her with a visual simulation of the difference that treatment will make. The patient can then ask questions. My vision for the finished result may not be the patient’s vision and being able to manipulate the outcome on screen means one can be absolutely sure the patient understands the treatment planning. The patient can influence the treatment if he or she wishes, and if he or she changes his or her mind towards the end, the technology allows for last-minute manoeuvring. In order to convey how this approach differs from other treatments on offer, I compare it to the difference between an off-the-peg suit and going to a tailor in Savile Row. Many of the patients I treat at my practice are referred by leading specialists, and among its benefits is that is comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfortable at rest. More than anything, I want them to be comfort
A Practical Treatment Objective: Alveolar Bone Modeling with a Fixed, Continuous-Arch Appliance

By Thomas W. Barron & Frank Bogdan, USA

Bone is a dynamic tissue that is continuously adapting its structure via the processes of remodeling and modeling. Remodeling is the coupled sequence of resorption and formation involved in physiological turnover. It is necessary to adjust internal architecture in response to mechanical needs, repair microdamages in the bone matrix, and to maintain plasma calcium homeostasis.

Remodeling can only be observed histologically or by chemical assay of biomarkers. Modeling is a change in the size and shape of a bone that can be observed and measured radiographically. It is the net gross anatomic result of bone resorption and formation on a given bone surface in response to growth and development or mechanical load. These processes are well accepted phenomena in the field of physiology.

In the orthodontic literature, it is widely held that the alveolar bones of the maxilla and mandible are immutable—that once formed, their size and shape cannot be changed significantly with tooth-borne, continuous arch, orthodontic appliances. Attempts to do so have been associated with root and cortical plate resorption, loss of periodontal attachment and unstable tipping of teeth. Under this paradigm, orthodontic treatment must maintain the existing size and shape of the alveolar bone.

In recent years, there has been a growing body of clinical evidence bolstered by studies that challenge the immutability of the alveolar bone and the mandate to treat to the existing dentoalveolar arch form.

The purpose of this article is to present a review of the literature challenging alveolar bone immutability along with clinical cases treated with passive self-ligating orthodontic brackets and low-force, low-load force protocols that demonstrate alveolar bone modeling.

Challenging Alveolar Bone Immutability

The alveolar process is defined as that part of the maxilla and mandible that forms and supports the socket of the teeth. It includes the thin lamella of bone that surrounds the root of the tooth and gives attachment to the principal fibers of the periodontal ligament.

It also includes the supporting inner and outer cortical plates of compact bone along with the spongy bone between the cortical plates. Though anatomically, no distinct boundary exists between the body of the maxilla or the mandible and their respective alveolar processes, the bone surrounding the teeth from root apex to the crest of the socket is considered to be the alveolar bone.

By means of the teeth, alveolar bone can be loaded with biomechanical force. The cellular response of the PDL to orthodontic force has been well characterized on both the pressure and tension sides of the bone, with the thickness of the cortical bone being the rate limiting factor in bone turnover. It is necessary to adjust the equilibrium of forces acting on the pressure of the bone surface and allowing the light continuous force of the tongue to dominate. According to Frankel, when the forces of the cheeks are eliminated, the teeth tip laterally in the direction of least resistance. The alveolar walls in the radicular area are likewise deformed in a buccal direction.

Furthermore, the acrylic shields extend into the vestibule exert a constant outward pull on the connective tissue fibers and muscle attachments that is transmitted to the alveolar bone by the fibers of the periosteum. Apposition of buccal bone aids in the lateral movement of the dentoskeletal. The ability of periosteal tension to induce apposition of bone on the lateral alveolar has been demonstrated in the animal studies of Altman and Harvold in addition, a study by Bendern, et al. utilizing metallic implants placed in the maxillae of patients treated with the Frankel appliance demonstrated that widening of the maxilla was due to deposition of new bone along the lateral border of the alveolar bone rather than increased growth at the midpalatal suture.

This phenomenon of alveolar modeling, specifically lateral translation of the alveolar, achieved by disrupting the equilibrium of the inner and outer oral muscular and periosteal tension is consistent with the Functional Matrix Theory of Moss.

While granting the innate growth potential of cartilage and bone, his theory holds that growth of the face occurs as a response to functional needs and neuromuscular influences and is mediated by the soft tissue in which the jaws are embedded. The theory, simply stated, is that bones do not grow but are grown, emphasizing the ontogenetic priority of function over form. The Frankel appliance achieves a change in form by changing the function of the matrix tissues of the frontal musculature.

Orthodontic appliances induce alveolar bone modeling, or changing the size and shape of the alveolus rather than increased apical modeling—specifically lateral translation of the alveolar bone rather than increased growth at the midpalatal suture.

Load-Induced Alveolar Bone Modeling

It is commonly observed in the field of dental medicine that the continuous load of a growing odontogenic cyst can significantly model the alveolar bone of the maxilla and mandible, causing remarkable dis-
placement of the cortical bone. This pathologic process is well established and has been extensively documented in case reports and textbooks. The intratunnel pressure of various odontogenic cysts has been measured and found to exert an ultra-low force load on the alveolar bone. This phenomenon clearly demonstrates that the developed alveolus can be modeled via pathologic induction with light, continuous force. Another commonly observed example of bone modeling is the bulge of the cortical plate associated with a palatally impacted canine. The impacted tooth is typically associated with an enlarged follicle. When the canine is exposed and brought into the center of the alveolus, a normal palatal contour returns.

Kokich and Kokich demonstrated localized modeling of the adult alveolus in response to tooth displacement. Light, continuous orthodontic force was employed to distalize a tooth into the atrophic alveolar ridge associated with a congenitally absent second premolar. The distalized tooth moved with its supporting bone, changing the size and shape of the atrophic alveolus (Fig. 2).

Fontenelle reported alveolar bone modeling with a passive/active dissociated appliance in non-growing patients. The appliance (Fig. 4) consisted of a passive, rigid cast lingual arch and active, low-modulus wires activated between the cast lingual arches. Dissociation of the passive and active components facilitates the application of low, constantforce load with near constant moment-to-force ratios, resulting in bone modeling induced by dental displacement. Clinical cases were shown demonstrating lateral modeling of the alveolus as observed by Frankel and localized alveolar modeling with tooth displacement as observed by Kokich and Kokich. Williams and Murphy described alveolar bone modeling with evidence of apposition of bone on the maxillary buccal alveolus in permanent dentition patients (Fig. 5a-c). This was induced by a light, continuous low-load appliance bilaterally to the maxillary alveolus with the Max 2000 alveolar development appliance (Fig. 5a). Their appliance consists of two nickel titanium springs embedded in and connecting separate acrylic panels in a framework retained by bands on the first bicuspid and first molars. The transpalatal springs delivered 150 grams of force each in a lateral direction. Biopsies were performed on two patients upon completion of lateral alveolar development. The specimens were harvested via full-thickness flaps from the labial alveolar crest between the maxillary right first bicuspid and canine (Fig. 5b). An internal control specimen was taken from interpulpal bone of the ipsilateral mandibular first bicuspid and canine (Fig. 5c). Standard hematoxylin and eosin-stained sections were examined with and without polarized light and a histological specimen was subjected to fractional analysis.

The maxillary treatment sections demonstrated the absence of the lamellar pattern characteristic of mature bone and polarized light demonstrated a woven bone pattern characteristic of immature or new bone (Fig. 6). In addition, fractional analysis of the polarized light specimen demonstrated fractal patterns suggestive of woven bone modeling.

Alveolar Bone Modeling with a Fixed, Continuous-Arch Appliance

In recent years, fixed, passive self-ligating (PSL) appliances have been developed along with low-friction/low-force, continuous-arch protocols for orthodontic treatment. Dr. Hisham Badawi has reported evidence with his OSIM apparatus support- ing the ability of passive self-ligating brackets to deliver lower magnitude forces compared with elastomeric ligated appliances applied to the same malocclusion in an in vitro model (Fig. 7). Evidence has also been reported supporting the ability of passive self-ligating brackets to achieve a reduction in the frictional resistance to sliding at the bracket/wire interface. The resultant load applied to the teeth and transmitted to the alveolar bone essentially decreases as the frictional resistance to sliding and the force required to overcome it decreases. Clinical evidence has been reported demonstrating significant widening of the dental arches following treatment with the low-friction/low-force Damon System. An increase in the transverse dimension of the alveolar bone has also been reported in response to the low, biomechanical load delivered by this treatment regimen.

The following case reports provide examples of the alveolar bone mod- eling the authors have observed over a combined 28 years of experience utilizing the Damon passive self-ligating fixed appliance and treatment protocols advocated by Dr. Dwight Damon.

Discussion

The case reports presented demonstrate examples of the change

CASE STUDY 1
CHILD ALVEOLAR MODELING: Pre- and Posttreatment Images Demonstrate Alveolar Bone Modeling

Diagnosis

A 9-year-old male patient presented in the mixed dentition with premature loss of his maxillary left primary canine with space loss and a blocked-out, unerupted permanent canine. His mandibular arch presented with severe crowding and completely blocked-out, unerupted lateral incisors. He exhibited normal incisal edges and mandibular competence. The lateral cephalometric view of the maxillary and mandibular arches were normal. The lateral cephalometric view of the mandibular arch illustrates the significant change in the size and shape of the mandibular alveolar bone induced by this appliance. Similar changes were seen in the maxilla as well. The patient’s parents were pleased with the result of Phase I treatment and opted not to pursue Phase II finishing treatment.

Result

Pre-and posttreatment images demonstrate the treatment result after a period of treatment. The size corrected view of the mandibular arch illustrates the significant change in the size and shape of the mandibular alveolar bone induced by this appliance. For each tooth, the patient’s parents were pleased with the result of Phase I treatment and opted not to pursue Phase II finishing treatment.
CASE STUDY 2
PERIADOLESCENT ALVEOLAR MODELING:
Pre/posttreatment Comparison Demonstrates Alveolar Modeling

Periappliance treatment protocols. Specifically, the increase in the transverse dimension of the alveolus appears to be the result of lateral translation of the buccal and lingual cortical plates induced by the biomechanical load applied to the teeth and transmitted to the alveolar bone. These cases provide additional clinical evidence for the ability of the alveolar bone to undergo biomechanical load-induced modeling.

As Frankel had done previously with his Function Regulator appliance, Damon has proposed a mechanism of action for the definite/alveolar response to his treatment regimen. Based on clinical observations and analysis of photographs, platter study model measurements and medical CT surveys35,36 of treated cases, he suggests that the light, continuous force delivered by his treatment approach disrupts the equilibrium of the tooth positions maintained by the inner and outer oral musculature acting on the movable alveolus and dentition. When the anterior component of the force acting along the continuous archwire is kept low, it is mitigated by the restorative pressure of the lips. Her parents wanted to attempt a nonextraction treatment plan. Informed consent was obtained and a therapeutic diagnosis was initiated.

Treatment Summary
Damon protocols were employed with initial 0.030” Copper Ni-Ti wires and NiTi open-coil springs activated one half of a bracket width to begin to create space for the unbracketed, blocked-out teeth. Eyedlet attachments were placed on the lingually blocked-out teeth and lightly ligated to the coil springs with enough force to minimally deflect the archwire. Since the alignment at the 10-week appointment was deemed insufficient to engage a larger wire and comfortably close the bracket slot, the initial wires were inspected for deformation and replaced. The springs were then reactivated, the blocked-out teeth ligated and the patient reappointed for 8 weeks.

Although in significantly crowded cases the transitional wire is typically a 0.016” Copper Ni-Ti wire engaged in preparation for a 0.019” x 0.025” Copper Ni-Ti wire, at the fifth week bracket alignment was again deemed insufficient for rectangular wire engagement so a 0.016” Copper Ni-Ti wire was placed, the springs were fractured and the blocked-out teeth ligated. At subsequent appointments as space was created, initially blocked-out teeth were bracketed and engaged with 0.016” Copper Ni-Ti wires. At 8.5 months, the decision was made to continue with the nonextraction treatment plan. This severely crowded case did not progress beyond the 0.016” Copper Ni-Ti wires until 12 months into the treatment.

Results
The final result was obtained after 23 months of treatment. Retention included bonded lingual wire retainers and clear, vacuum-formed Essix-style removable retainers to be worn while sleeping. Size-corrected lower occlusal photographs taken at initial bonding and debonding illustrate the change in the size and shape of the mandibular alveolus induced by passive self-ligation treatment. By the three-year posttreatment follow up appointment, teeth #8 and #9 had been crowned and the bonded maxillary lingual wire had been removed. The patient reported infrequent removable retainer wear and the alveolar modeling obtained had remained remarkably stable.

Conclusions
This article presents case reports demonstrating a change in the size and shape of the alveolar bone in a child, adolescent and adult patients treated by a continuous-arch, self-ligating appliance. These cases, along with a growing body of evidence, challenge the immutability of the alveolar bone and the axioms of treating to the existing arch form. It is the authors’ considered opinion that Melvin Moss’s Functional Matrix Theory is correct and the change in alveolar form induced by this low-friction, low-force treatment approach provides an opportunity to recapture the full genetic potential of the patient’s alveolus. Furthermore, alveolar bone modeling is a practical treatment objective that can be achieved with a forced eruption appliance.
Virtual reality and orthodontics: A new patient experience

By Yasmine Harichane, Canada

Imagine the following scenario: your patient arrives, both relaxed and calm, at your practice. Although the patient is visiting the practice for the first time, he is familiar with it and knows its interior well. Without further introduction, the patient takes a seat in the dental chair, and the orthodontic procedure is performed quickly and comfortably with patient compliance. There are no complications or tension, and the treatment is easily achieved. Imagine such a soothing and comfortable environment in which to treat patients. Now imagine this very same scenario, where the patient can wear the VR headset once physically seated in the chair, the patient can visualize the front desk, inside and outside the office, where he can visualize the front desk, admire the treatment rooms or the cleanliness of the sterilization room (Fig. 5). The aim is to offer a virtual visit of the practice to allow the patient to choose a quality clinic, as well as familiarize himself with the space before his first appointment. Once physically seated in the chair, the patient can wear the VR headset for the treatment and visualize a restful environment of his choosing. From here on, it is solely a matter of preference as the patient might enjoy the beach, a VR video of Honolulu, or maybe even climbing a mountain. Any VR video is acceptable, as long as it achieves its purpose: calming the patient during a treatment session. Thus, everything becomes less tense, and the patient is relaxed. This might also be convenient for the dentist, as he can then execute whatever treatment is necessary as quickly and efficiently as possible.

![Virtual Reality](https://example.com/vr_image)

**Figure 8. Orthodontic bone modeling, or shape-specific formation and reposition, occurs along the periodontal ligament and periodontal surfaces.**


**References**

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**Figure 1: Canadian forest in VR.**

![Canadian Forest in VR](https://example.com/canadian_forest)

**Figure 3: Dedicated camera.**

![Dedicated Camera](https://example.com/dedicated_camera)

**Figure 4: Orthodontic bone modeling.**

![Orthodontic Bone Modeling](https://example.com/orthodontic_bone_modeling)

**Figure 5: Restful environment.**

![Restful Environment](https://example.com/restful_environment)
Convincing the patient to undertake an orthodontic treatment is one thing, convincing him to follow the relevant recommendations is another. Obtaining patient compliance is not easy, especially in the case of younger patients. Furthermore, dentists have an unfortunate notorious association with pain and suffering, which might induce anxiety in a patient. Again, VR can be applied here to divert the attention of the most dynamic patients. Another aspect worthy of mention regarding the benefits is the intellectual retention of instructions on hygiene procedures, for example, which might be dependent on support. It is plausible to assume that verbal instructions on hygiene may be forgotten once the patient has left the clinic. Most orthodontic practices provide only leaflets, but few patients retain these or follow their recommendations. A VR video featuring the practitioner or team members might have a much greater impact on follow-up care at home. The message could be pre-recorded and viewed on demand by the patient. The aim of this format is that it can provide different intellectual integration between information, which is connected to a stream of visual and auditory stimuli. The clinician might wish to promote the patient retaining the provided information in an easier way to achieve greater clinical success. For example, youngsters might remember their favourite movie line by heart, as opposed to information provided by their dentist. This is because it demands less of youngsters to remember words that are connected with pictures.

For the health practitioner, VR may yield an unexpected, but welcome, advantage in terms of professional education (Fig. 6). Many of us have not been able to attend a conference on the other side of the world for logistical reasons. In the near future, it will be possible to attend an orthodontic congress and listen to international speakers while sitting comfortably at home. Similarly, the demonstration of a new therapeutic technique will be easier with a VR video rather than plunging into a detailed explanation in an article without any illustration. The trainer can record his or her procedures with a 360° camera to allow the student to learn through immersion the technical movements and ergonomics of the technique being taught.

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Fig. 2: VR headset.

Fig. 3: Nikon KeyMission 360°.

Fig. 4: Nikon KeyMission 100p.

Fig. 5: Operating room in VR.
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