Want to maintain good oral health? Start eating smarter

What is the new generation of all-ceramics capable of doing?

Implantology in 2020: There is now something new under the sun or rather ancient

Plaque control, a key element of successful orthodontics

Want to maintain good oral health? Start eating smarter

Dental professionals in France deliver care through telecommunication

By Iveta Ramonaite, Dental Tribune International

LEIPZIG, Germany: Since 14 March, France has been under COVID-19 Level 3 restrictions, including the halting of all non-essential services. To flatten the SARS-CoV-2 infection curve and ensure the safety of dental professionals, staff and patients, dental surgeries in France remain closed, and dental surgeons are only available to answer any possible questions that patients may have by phone or email, other than emergency treatment.

In an interview with Dental Tribune France, Dr Yassine Harichane, a graduate of the dental faculty of Paris Descartes University, said that like many other dentists, he too is only providing emergency dental care, mainly on the phone. Commenting on the situation, he noted that the impact of COVID-19 for dental companies and the profession as a whole will be profound once operations resume and that the consequences will be twofold. Owing to business interruptions, many companies will face financial difficulties and trouble obtaining materials. Additionally, there will be a change in the relationship between dentists and patients as a result of limited physical contact and the constant fear of being infected.

French Dental Association’s response

The coronavirus pandemic has created substantial challenges for dental companies and the profession as a whole, but it also provides opportunities for innovation and growth. The French Dental Association (AFD) has worked to support its members during this time and to promote the importance of dental care.

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In a broadcast on 24 March, Dr Serge Fournier, president of the Ordre national des chirurgiens-dentistes (national dental surgeons) in France, said that, despite the pandemic, she is staying busy. "I go to my office every morning, even on Saturdays and Sundays, where I listen and reply to all the messages and emails and send prescriptions. I’m also in contact with three nursing homes around my office and am fixing their broken dentures and looking at the photographs sent by the nurses to understand the gravity of their symptoms."

"Four times a week, I see some patients from the neighbourhood for pulpitis and then I wear two surgical masks to protect myself and put on the raincoat, which is reusable and can be disinfected."

"When dental activity resumes, hopefully on 11 May, when the lockdown restrictions are to be lifted, Bury said that she will manage one patient at a time and allow 15-minute breaks between patients to be able to sterilise contamination measures in treating dental patients. To help answer some of the questions dentists may have, the French Dental Association has created a question and answer section on its website as well as Facebook and YouTube pages that deals with health, clinical, financial and social issues."

"Busier than ever? Speaking to Dental Tribune International (DTI), Dr Laurence Bury, a dentist and scientific editor at Dental Tribune France, said that, despite the pandemic, she is staying busy. "I go to my office every morning, even on Saturdays and Sundays, where I listen and reply to all the messages and emails and send prescriptions. I’m also in contact with three nursing homes around my office and am fixing their broken dentures and looking at the photographs sent by the nurses to understand the gravity of their symptoms."

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Incredible inside. Incredible outside. Ready for the future with the new Lara sterilizer

By W&H

Be prepared for today and for tomorrow – with the new Lara sterilizer from W&H, users not only have state-of-the-art today, but additional high-tech for the future. Equipped with fast cycle times and a safe documentation system, Lara simplifies and speeds up the sterilisation process. Lara offers so much more: with W&H’s new invented activation code system, users can easily upgrade additional features. This allows Lara to be easily adapted to individual and future requirements of the practice.

Incredibly fast, incredibly easy to use

From inside a full power package, from the outside a real eye-catcher. The new Lara convinces with its smooth surfaces and its colour touchscreen, which allows fast and intuitive navigation through the menu structure. The clear aim of the operating concept is to save time in order to have more time available for the treatment of patients. Even the standard version of Lara is equipped with one of the fastest cycle-times of its class. To meet the demand for complete traceability, a high capacity USB drive automatically records the cycle reports throughout Lara’s entire service life. Users benefit from control and safety during instrument reprocessing. Optional available: a label and cycle report printer, which offers printed documentation without additional computer or software.

An automatic water filling valve provides additional efficiency: it allows connection to a demineralisation system. This means manual filling and draining are no longer required.

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Activation Code "Traceability": this functionality enables the customisation of the steriliser to trace back to the person who initiated the sterilization cycle.

Activation "All-in-one": this code activates all functions mentioned above at once.

Whatever happens in the future – with Lara, you are well-prepared! In addition to the standard Lara functionalities with the high level of W&H quality, the new activation code system offers the opportunity to prepare today for tomorrow’s requirements. This gives dental practices more flexibility and, above all, the certainty that they are optimally equipped for all upcoming tasks.

For further information, please contact:

W&H-Dentalwerk Bürmoos GmbH
Ignaz-Glaser-Strasse 53
Postfach 1
5111 Bürmoos, Austria
Tel: +43 6274 6236-0
Fax: +43 6274 6236-55
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Digital endo assistance
fully automated CanalPro™ Jeni Endo Motor navigates through treatment

By COLTENE

Autonomous driving, operations using a robot arm, computer-aided design (or CAD for short) - there is hardly an area in which humans can now not be assisted by an electronic co-pilot. The more complex the application, the more useful the support via algorithms. Endodontic treatment is no exception and also requires the utmost precision and reliability. Endo-specialists therefore increasingly rely on the fully automatic navigation of the latest endo motors.

Electronically controlled preparation

The internationally recognised, leading dental specialist, COLTENE, has achieved a breakthrough with a virtually-self-propelled endo motor: the fully automatic CanalPro™ Jeni, named after its developer Prof. Dr. Eugenio Pedulla, finds its way through the root canal autonomously and thus accompanies mechanically and chemical preparation step by step. Via touch screen, the Jeni connects directly to the selected NiTi file system such as the HyFlex CM or EDM or the files of MicroMega from the COLTENE group of companies.

What is new is that the user can work forwards continuously from coronal to apical applying only slight pressure and the motor decides independently on the progress of movement. For this purpose, the Jeni assistance system uses complex algorithms and controls the variable file movements at millisecond intervals by constantly regulating rotational movement, speed, torque and file stress. The endo motor adapts to the individual root canal anatomy and guides the preparation step by step. Integrated length measurement is available at the same time. The outstanding comfort and level of safety that Jeni delivers during preparation, is unmistakable.

Jeni recognises the risk of a potential fatigue fracture of the file and informs the dentist with an acoustic signal that a file change is necessary. Jeni recognises the risk of a potential fatigue fracture of the file and informs the dentist with an acoustic signal that a file change is necessary. The CanalPro™ Jeni is also very familiar with the common endodontic irrigation protocol: the device records mechanical reprocessing progress and notifies the chairside dentist and assistant, acoustically, when and how often irrigation should be performed between file changes. This is incredibly important when the long-term success of treatment depends largely on thorough irrigation of the prepared root canals.

Synchronised endo instruments

With the CanalPro™ Jeni Motor, the COLTENE group of companies has added another useful tool to its range of ideally matched endodontic instruments and dental materials. COLTENE has always worked closely with international scientists, practice owners, key opinion leaders and dental teams to design and realise concrete solutions for everyday treatment routines. On www.coltene.com or use of the innovation leaders’ social media channels, interested dentists can find out about the latest trends and ideas from the dental world. In addition, COLTENE also offers a wide range of training courses and practical workshops to ensure the optimal use of technical aids and digital assistants. This way, even endo beginners will be able to achieve competent and efficient preparation after only a short time.

Inject and shape for easier, faster and stronger restorations

By SHOFU

The need for easier, simpler and faster workflow is more critical in dentistry, now more than ever before. Conventional composite restorations are time-consuming and require laborious build-up techniques to minimize polymerization shrinkage, linked to staining, micro-leakage and secondary caries.

Re-engineered nanotechnology with the development of unique S-PRG nano-fillers signals a new milestone in restorative dentistry. Innovation of the next-generation of universal bioactive injectable composite Beautifil Injectable X streamlines restorative workflow by offering predictable strength, durability, natural aesthetics with self-polishing capability and the unique ‘Inject as you Shape’ convenience. Patented S-PRG fillers impart anti-plaque and anti-caries benefits for additional protection and longevity of the restoration. Uniform filler macrostructure imparts remarkable optical qualities for easy shade match and effortless polishing with the OneGloss 2-in-1 Smart polishers. What’s more, restorations exhibit self-polishing capability that maintains gloss and resists surface staining. Restore a wide spectrum of anterior and posterior restorations with ease as you can now shape while injecting the non-droopy, shape retaining paste at the restoration site. Use of custom-made disposable Barrier Sleeves with the ergonomically designed Beautifil Injectable X syringe provides additional protection against cross contamination. Special syringe design prevents oozing and minimal residual paste in the tip for greater savings.

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Celtra Press: The most stable high-strength glass ceramic, regardless of testing method

By Dentsply Sirona

Zirconia reinforced lithium silicate (ZLS) has been available from Dentsply Sirona under the name of Celtra Press. With its three-point bending strength of more than 500 MPa, it has once again significantly raised the benchmark for high-strength glass ceramics. Experiments conducted by the University of Giessen, Germany have now shown that Celtra Press is clearly ahead of its competitors also in terms of biaxial strength.

Internal measurements in a study of three-point bending strength have shown an average result of 597 MPa for Celtra Press.1 In comparison, the millable Celtra Duo ZLS (also from Dentsply Sirona) comes in at 210 MPa after finishing and polishing and at 370 MPa after optional glaze firing.1 This extends the range of indications of the pressable variant of ZLS for the dental technician, which provides a tangible benefit: Celtra Press.1 In comparison, the competitors also in terms of biaxial strength. According to the relevant product literature and technical publications, the material's three-point bending strength is completely disassociated in the glass matrix, and by a power firing step that is already integrated into the stain and glaze firing for monolithic restorations. But there is still another advantage of Celtra that will be immediately convincing to dentists.

The exceptionally high strength of Celtra Press is ensured by the addition of 10% of zirconia, which is completely dissolved in the glass matrix. According to the relevant measurements, both testing methods are acceptable, but the results can be properly assessed only by determining what values were obtained using which testing methods. An important thing to note is that the strength values obtained by the biaxial test method are usually higher than those obtained by three-point bending test. The reason for that is that less effort is generally required to break the standard bar resting on two supports than the standard disk with three supports (Figs. 2 and 3). This is only partially compensated for by recalibration based on geometry data. In addition, the quality of the edge preparation in the biaxial samples is less important compared to the three-point supports.

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Understanding strength measurements

Product literature and technical publications sometimes highlight a material’s three-point bending strength and sometimes its biaxial flexural strength. According to the relevant ICD-FA-2005 standard, both testing methods are acceptable, but the results can be properly assessed only by determining what values were obtained using which testing methods. An important thing to note is that the strength values obtained by the biaxial test method are usually higher than those obtained by three-point bending test. The reason for that is that less effort is generally required to break the standard bar resting on two supports than the standard disk with three supports (Figs. 2 and 3). This is only partially compensated for by recalibration based on geometry data. In addition, the quality of the edge preparation in the biaxial samples is less important compared to the three-point supports.

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Table 2: Both the three-point bending test and the biaxial testing method result in Celtra Press being top-of-the-class among its competitors.

References
1. In-house measurements by Dentsply Sirona.
2. Measurements carried out by the Department of Dentistry, Clinic for Dental Prosthetics, Justus Liebig University, Giessen, Germany.

For more information about the full Dentsply Sirona portfolio please contact your local representative.

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Table 2: Both the three-point bending test and the biaxial testing method result in Celtra Press being top-of-the-class among its competitors.
One of the most important reasons for assembling the study models in a semi-adjustable articulator is that the simulated condylar rotational axis between the arches will be closer to the patient’s mandibular rotation axis, thus allowing a more reliable functional analysis in reference positions of static and dynamic occlusion. This axis of rotation is defined in the mandible by the medial poles of the condyles, which in the articulator is represented by the condylar sphere (fig.1).

When the plaster models are assembled in a non-adjustable articulator, known as “simple hinge articulator”, the only position for analysis is the static, in which the models are fixed and the axis of rotation is in a different location of the patient and in a shorter radius. It results in a wrong trajectory of the mandibular movements, allowing the appearance of possible occlusal interferences of greater magnitude in the posterior region (fig.2).

Thus, the assembly of study or work models in an articulator is essential to achieve a correct diagnosis, planning with predictability, a safe and effective treatment with longevity.

However, other advantages are enumerated: it maximizes clinical procedures, minimizes unnecessary adjustments and repetitions, as a result, we have time-consuming saving and cost reduction.
Minimizing the risk of sharps injuries with Hu-Friedy IMS System

By Hu-Friedy

Dental practices count on their instruments day in and day out for the same instruments that help dental professionals treat their patients effectively can represent safety hazards when not handled properly. Sharp injuries—punctures and cuts inflicted by instruments—are among the most frequent and most costly accidents that can occur in a dental practice.

Sharp injuries aren’t merely painful. Dental instruments are routinely in contact with blood and other bodily fluids, and therefore, can carry dangerous infectious diseases such as hepatitis B and C, and HIV. The U.S. Centers for Disease Control and Prevention (CDC) estimates that the cost of treating each sharps injury in a healthcare setting can range from $500 to $3,000.* The CDC also notes that there are “harder to quantify costs,” including fear and anxiety, lost work time, and litigation.

Accidental cuts and punctures happen most often when instruments are kept and transported loose, rather than organized and stored in secure cassettes. The table attached shows how loose instruments can cause sharp injuries throughout the typical dental office workflow.

How Cassettes Provide a Safer Experience

Cassettes keep dental staff safe by reducing the need to handle contaminated instruments directly. Once cassettes have been configured according to procedure, instruments remain secure throughout the reprocessing cycle. The only time staff members make direct contact with any instrument is while treating patients.

Cassettes eliminate many of the dangers of working with loose instruments. Instruments do not slide out or fall off locked cassettes during transportation. Instruments stay safe even if the cassette is dropped. Cassettes can be placed directly into thermodisinfector and ultrasonic cleaners, rinsed, dried, wrapped, and then sterilized without removing instruments. No need for pouches—which can be punctured—or hand scrubbing.

Cassettes can be used to keep all the instruments required for specific procedures together. Clinicians do not have to sort through loose instruments on a tray.

Cassettes also prevent the spread of infection by helping ensure the proper placement of instruments in automatic cleaners and autoclaves. (If instruments cannot be processed in this manner, the cost of the instruments and the staff time necessary to handle the contaminated instruments should not be calculated.)

Efficiency Gains With Cassettes

A dental professional’s time is best spent treating and caring for patients. All too often, too much time is consumed searching for the right instruments to use for patient procedures, cleaning and sterilizing individual instruments, and moving slowly to avoid accidents. Cassettes can help dental practices get their time back.

Practices that use Hu-Friedy’s cassette-based Instrument Management System (IMS) report saving 5 to 10 minutes per procedure**. Over the course of a day, that can translate into well over an hour.

Another efficiency-boosting benefit of cassettes is that they prolong the life of instruments. Instruments can be bent, broken, or lost during the reprocessing cycle, but cassettes keep them sheltered and secure in a protective layer.

Implementing an Instrument Management System

An Instrument Management System based on cassettes organizes by procedure is not without its costs. Besides the price of the cassettes, dental offices may need to upgrade their sterilization areas to see improved efficiency and productivity immediately. But the investment will pay off in the long run.

According to our calculations, a practice that performs 10 procedures a day can earn an additional $171,930 over six months. The extra revenue comes from having more time to spend with current patients or take on new patients.***

Hu-Friedy Instrument Management System even makes staff training easier. Every instrument has a spot within the cassette. Colour coding makes it simple to find the right procedural set-up.

If you’re interested in making your dental practice safer and more efficient, contact a Hu-Friedy representative to learn more about getting started with the Instrument Management System.


** When compared to single instrument decontamination—based on market survey results. Data on file.

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European Headquarters
Adagropy - Jöran Str 8
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E-Mail: info@hu-friedy.eu
Tel: +49 69 26753640
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Table 1

INDUSTRY

CHAIRSIDE

For the efficient management of a dental practice, personnel and supplies need to be organized, just like their paperwork. An Instrument Management System (IMS) based on cassettes can do this and more.

TRANSPORTING INSTRUMENTS TO AND FROM CHAIRSIDE

In the hectic atmosphere of a busy dental practice, people can collide, trip, and run into objects in their haste. Loose instruments can slide off trays or run into objects in their haste. Loose instruments can slide off trays or run into objects in their haste.

Cassettes can make things easier by keeping them organized and secure onboard.

INSTRUMENT PREP AND PACKAGING

Dental instruments are always on the move. As instruments cycle through a dental office, they undergo cleaning and sterilization, wrapping, organization and storage, preparation for procedures, and use with patient treatment. Almost every step along the way presents the potential for a sharps injury.

A dental professional’s time is best spent treating and caring for patients. All too often, too much time is consumed searching for the right instruments to use for patient procedures, cleaning and sterilizing individual instruments, and moving slowly to avoid accidents. Cassettes can help dental practices get their time back.

Practices that use Hu-Friedy’s cassette-based Instrument Management System (IMS) report saving 5 to 10 minutes per procedure**. Over the course of a day, that can translate into well over an hour.

Another efficiency-boosting benefit of cassettes is that they prolong the life of instruments. Instruments can be bent, broken, or lost during the reprocessing cycle, but cassettes keep them sheltered and secure in a protective layer.

Implementing an Instrument Management System

An Instrument Management System based on cassettes organizes by procedure is not without its costs. Besides the price of the cassettes, dental offices may need to upgrade their sterilization areas to see improved efficiency and productivity immediately. But the investment will pay off in the long run.

According to our calculations, a practice that performs 10 procedures a day can earn an additional $171,930 over six months. The extra revenue comes from having more time to spend with current patients or take on new patients.***

Hu-Friedy Instrument Management System even makes staff training easier. Every instrument has a spot within the cassette. Colour coding makes it simple to find the right procedural set-up.

If you’re interested in making your dental practice safer and more efficient, contact a Hu-Friedy representative to learn more about getting started with the Instrument Management System.


** When compared to single instrument decontamination—based on market survey results. Data on file.
WHAT'S NEW FROM HU-FRIEDY

HIGH DEFINITION BLACK LINE MIRRORS
Proven to Reduce Glare up to 80%*

Designed for enhanced performance, Hu-Friedy’s HD Black Line Mirror is engineered to optimize clinical outcomes by delivering superior visibility throughout any dental procedure.

The Diamond Like Carbon (DLC) coating of the handle and mirror frame reduces glare up to 80%!* The durable black matte finish in combination with the superior brilliance and color of Hu-Friedy’s proprietary HD Mirror glass facilitates quicker and more accurate visibility of the mouth.

SUPERIOR BRILLIANCE & COLOR
HD Mirror provides superior brilliance and color for quicker and more accurate visibility of the mouth †
- 113% reflection factor for exceptional image clarity. †
- 38.5% brighter than rhodium coated mirror glass. †
- 50% brighter than other front surface mirror glass. †

* When comparing the Hu-Friedy DLC coated mirror head and handle to the Hu-Friedy non-coated stainless steel mirror head and handle.
† Data on file and available upon request.

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Akro-Flex™ is an extremely flexible composite instrument which allows clinicians to effortlessly manipulate composite materials during aesthetic restorations.

The inclusion of a ductile material allows Akro-Flex to perform as a solid brush.

UNPARALLELED FLEXIBILITY
By incorporating Nickel Titanium, a material renowned for its super elasticity, Akro-Flex acts as a solid brush. The resilient working ends are excellent when creating fine anatomical detail with delicate, artistic strokes.

ERGONOMIC HANDLE
The smooth, lightweight handle offers increased control due to the large diameter. It creates an ergonomically friendly option that provides maximum comfort and helps reduce hand fatigue. Reducing hand fatigue can increase the longevity of a clinician’s career.

HYPER-THIN PROFILE
Ultra thin working ends reach narrow interproximal spaces with ease. The flexible, versatile working ends allow for better visibility as compared to traditional composite instruments.

Patent pending.
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How the best perform
Tooth whitening that works for you—Opalescence tooth whitening

By Ultradent

As the global leader in tooth whitening, the Opalescence™ whitening family has become beloved and trusted by patients and clinicians alike. With multiple Townie Choice, Reality’s Choice, Dental Product Shopper awards, and more; we’ve got the laurels to prove it.

As proud—and grateful—as we are of these accolades, they aren’t why Opalescence tooth whitening is a success. Ultimately, each and every one of our tooth whitening products is a success because it works for you and your patients! So, let’s take a look at the product itself and see what makes Opalescence tooth whitening so great.

Tooth whitening at home and the dental office

Whether your patients want to whit-en their teeth at home, at your dental office, or as they go about their day, Opalescence whitening products give your patients options to get the white smile they want. With in-office whitener, prefilled whitening trays, custom made whitening trays, and more, Opalescence tooth whitening allows you more versatility and convenience in your whitening treat-ments.

Opalescence tooth whitening offers specialty products that are able to treat unique cases. Whether you’re lightening tetracycline stains, whitening a non-vital tooth after a root canal, or treating a patient with braces, there’s an Opalescence whitening product for everyone.

Opalescence tooth whitening also offers specialty products that are able to treat unique cases. Whether you’re lightening tetracycline stains, whitening a non-vital tooth after a root canal, or treating a patient with braces, there’s an Opalescence whitening product for everyone.

Opalescence™ Boost™ in-office whitening is perfect for those patients who need a brighter smile fast, with most patients seeing noticeable results after a little more than an hour. Opalescence™ PF custom whitening trays allow your patients to comfortably whiten at home and even overnight. Opalescence Go™ whitening’s innovative UltraFit™ tray is perfect for your pa-tients who want to whiten practically anywhere. It is ready to use right out of the package and easily adapts to any smile!

Tooth sensitivity varies from person to person depending on what factors are contributing to their discomfort. Some may have sensitivity to hot or cold temperatures or sensitivity af-ter a filling or a crown, but no matter the cause sensitivity is a pain!

The versatility, effectiveness, and convenience of Opalescence tooth whitening makes it easy to use, whether you’re a whitening patient or a dental professional. In the end, that is what makes Opalescence so great—that it works for you and your patients.

For example, Opalescence™ Boost™ in-office whitening is perfect for those patients who need a brighter smile fast, with most patients seeing noticeable results after a little more than an hour. Opalescence™ PF custom whitening trays allow your patients to comfortably whiten at home and even overnight. Opalescence Go™ whitening’s innovative UltraFit™ tray is perfect for your pa-tients who want to whiten practically anywhere. It is ready to use right out of the package and easily adapts to any smile!

Opalescence tooth whitening also offers specialty products that are able to treat unique cases. Whether you’re lightening tetracycline stains, whitening a non-vital tooth after a root canal, or treating a patient with braces, there’s an Opalescence whiten-ing product for everyone.

Tooth whitening that is safe and actually work

Many patients think that tooth whitening is bad for their enamel, will damage their teeth, or will be un-comfortable—or even painful! The reality is that tooth whitening is very safe. With Opalescence tooth whitening you are able to determine the right whitening treatment for your patients by tailoring their whitening based on strength and wear time. Our products are also designed with patients’ comfort in mind to ensure that they have the best whitening experience possible.

One key factor that sets Opalescence whitening apart is its patented sticky viscous gel. Other tooth whiteners can be hard to apply, making them ineffective and discouraging to use. But Opalescence PF whitening gel is the perfect consistency, allowing it to stay inside the custom-made tray and in contact with the teeth rather than seeping out past the gumline.

Not only will it stay in place, Opalescence whitening gel is designed with a perfectly balanced and buffered pH to closely match the pH of the mouth. And unlike other whitening products, Opalescence whitening gels are water-based to keep teeth hydrated during the whitening pro-cess. Its high-water content not only helps reduce sensitivity, but it also reduces the likelihood of shade re-lapse in the future because your pa-tient’s teeth will stay hydrated from start to finish.

Tooth Whitening for Sensitive Teeth

For your patients searching for tooth whitening but are concerned about tooth sensitivity, we are here to help. Tooth sensitivity varies from person to person depending on what factors are contributing to their discomfort. Some may have sensitivity to hot or cold temperatures or sensitivity after a filling or a crown, but no matter the cause sensitivity is a pain!

There are many ways to help manage your patient’s sensitivity prior to, during, and following Opalescence whitening treatment. Ultradent’s Enamelast™ fluoride varnish, Ul-trafit™ desensitizing gel, and Opalescence™ Sensitivity Relief Toothpaste can each be used at different stages of the whitening process to treat various contributing factors.

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Fast, easy, effective.
Highly esthetic results with CEREC® Primemill

By Dentsply Sirona

CEREC Primemill, Dentsply Sirona’s new milling machine, has taken chairside dental restorations to the next level. Thanks to its state-of-the-art technology, a wide range of restorations can now be manufactured faster, using a large variety of materials with results that are very precise and particularly easy to achieve. Josef Kunkela, DDMD, PhD, an innovative and renowned dentist and founder of the Kunkela Academy in the Czech Republic, has offered chairside restorations in his practice for the past 13 years. As a clinical tester for Dentsply Sirona, he had the opportunity to comprehensively evaluate the new milling machine. The following is a description of his first experiences with CEREC Primemill based on a patient case.

I have two essential requirements for digital restorative dentistry: I want to satisfy my patients to the best of my ability for example by producing accurately fitting and very aesthetic restorations. I also want to retain complete control over the workflow. This is exactly what CEREC has offered me for 13 years. It’s not just about switching from conventional to digital impression taking, it’s about the entire process.

With the right workflow, I can work very efficiently. This is where CEREC Primemill takes us to a new level. It is a machine that is simple to operate, works with a really fascinating speed and yields high-quality results.

As a beta tester of CEREC Primemill, I had the opportunity to follow the development process. When this milling machine was set up in my practice, I immediately noticed the new touch interface. In my opinion, it is a great feature to get information about milling cycles and the right instrument recommendation for every procedure.

The second striking point is that the machine works very quietly and above all quickly. CEREC Primemill only takes approximately five minutes using Super Fast mode to fabricate a zirconia crown. In my practice, the assistant takes over the first scan with the new CEREC Primescan. After I have examined the patient and made the therapy decision (which restoration, which shade), the assistant can prepare the CEREC Primemill. Meanwhile, I prepare the teeth to be restored and take the digital impression with CEREC Primescan. The fabrication process then starts directly after the design of the restoration, which is carried out by a dental technician in my affiliated practice laboratory. I can fully concentrate on my work with the patient and on his dental situation. This is efficient and very important for me.

Of course, a perfect workflow also requires the right quality. How useful is it to be finished with everything in the shortest possible time if the restoration does not fit exactly or is visually unattractive? This is where CEREC Primemill once again offers impressive results. The surface of the materials is extremely smooth and the margins are very clearly defined. From a clinical point of view, the following aspects convince me above all else about CEREC. The entire scanning process, including bite registration and preparation control, is very simple. In addition, there are the advantages of the initial scan catalogue of beautiful natural smile, recycle patient smile, family cross copy smile, gingiva mask over design proposal model, index for direct restorations. If you are going to fabricate a direct restoration of broken incisal edge or corner and if you would like to use layering technique, you benefit from having scanned the initial situation before and from having made a silicone index according to the 3D-printed model of patient’s natural dentition. And there is greater patient convenience because of the reduction of appointment for treatment and temporary restorations. From an organisational and economic point of view, the efficient workflow, the reduced number of appointments and the ability to delegate many work steps are particularly noteworthy. My experience shows that CEREC begins to pay off at the reception desk when a well-trained assistant plans the appointment and can explain the advantages of this treatment method to the patient.

![Initial situation: The patient wants to have an aesthetic solution for her diastema.](image1)

![Mock-up design of the veneers in the inLab SW 19.](image2)

![Try-in of the milled mock-up veneers.](image3)

![Milled veneer in detail.](image4)

![Close-up of the veneer surface which shows the good adaption of the natural surface of the teeth.](image5)

![Final situation – the new smile.](image6)
All-ceramic rehabilitation with CAD/CAM restorations made of a zirconia–reinforced lithium silicate (Celtra Duo)

By Dr Tim Hausdörfer and Joachim Riechel MDT, Germany

Abstract

Patient: A 55-year-old woman presented at the Department of Preventive Dentistry, Periodontology and Cariology of the University of Göttingen. The patient had been insufficiently treated due to extensive ceramic fractures. Part of the hard tissue of the upper maxillary incisors with their—some laterally. The PMMA veneers were then temporarily fixed with a small amount of a flowable composite.

A few days later, the patient returned to the practice. Depending on the degree of satisfaction, the veneers are either re-shaped or used directly as a template for the final restoration. In this case everything fit perfectly. We then imported the data seamlessly from the InLab software into the CEREC software in dxd format. In the CEREC software, we simply changed the material setting to composite block and then fabricated the veneers in the new CEREC Primesil. In doing so, we were able to achieve a high level of precision. We used the fine mode because it is ideally suited for the production of ultra-thin veneers.

In order to maintain the high transparency of her natural teeth, the milled veneers were slightly cut back at the incisal edge and constructed with the same restoration material as the blocks used for milling. We then polished the surface in a two-stage system and bonded it adhesively under a rubber dam with composite. The result shows very natural anatomy of the anterior teeth.

To sum it up: The CEREC system is exceptionally versatile in allowing us to freely scan, design and switch from lab side to chairside software and then mill or grind a restoration in the extraordinarily precise and accurate CEREC Primesil. Capturing the patient’s initial situation, position, shape and surface structure for potential future reference, which can also serve as donor anatomy for other patients, will serve more and more purposes not just in dental prosthetics but also for the manufacturing of 3D models and siliconekeys, which are then used for layering restorative materials, digital implants or dentures.

Treatment: A periodontal and conservative pretreatment was performed. The functional pretreatment included raising the bite using a centric splint. The posterior teeth were restored supplied with veneered crowns and bridges with zirconia frameworks. The aesthetic restoration of the maxillary anterior teeth was performed with crowns and veneers made of zirconia-reinforced lithium silicate ceramics (Celtra Duo).

Introduction

Zirconia-reinforced lithium silicate ceramics (ZLS) have good mechanical and optical properties. Their mechanical strength makes them well-suited for partial and full posterior crowns and also—thanks to their good shade match and excellent polishability—for aesthetic anterior restorations (such as veneers). The present article illustrates the versatile application of CAD/CAM-made ZLS restorations (Celtra Duo; Dentsply Sirona Restorative, Konstanz, Germany) based on the complex case of a patient with extensive restorative treatment needs.

Case report

A 55-year-old woman presented at the Department of Preventive Dentistry, Periodontology and Cariology of the University of Göttingen. The clinical and radiological examination revealed an adult dentition that had been insufficiently treated with fillings and dental restorations and exhibited a loss of vertical dimension of occlusion (Figs. 1 and 2). Insufficient restorations (secondary caries) were found on teeth 24, 25, 26, 27, 28, 35, 36, 47 and 48. The existing bridge (17–19) was insufficient due to extensive ceramic fractures.
treatment of tooth 34 was adequate, while tooth 46 required a primary endodontic treatment due to a reversible pulpitis. All other teeth were vital and free of symptoms. The periodontal findings showed moderate gingivitis (periodontal screening index 1–3 in all sextants). Teeth 13, 23, 24, and 23 additionally exhibited vestibular gingival recessions.

In addition to an oral rehabilitation, the patient also wanted to improve her anterior tooth aesthetics.

She first received extensive oral hygiene instructions and professional tooth cleaning. The insufficient restorations on teeth 24, 25, 26, 27, 35, 37, and 47 were replaced by call restorations (Luxacore; DMG, Hamburg, Germany) that were adhesively cemented (Optifill FD, Kerrhawe SA, Bioggi, Switzerland). Teeth 38, 48, and the class V cavities of teeth 24 and 25 were definitely restored by direct composite fillings (Venus; Heraeus Kulzer, Hanau, Germany).

The gingival recessions on teeth 24 and 25 were not surgical covered because a sufficient amount of attached gingiva was present and no further progression was observed. In addition, the patient had a low smile line, meaning that this posed no aesthetic problems.

A formal treatment plan and cost estimate was provided and checked by a dental expert of the patient’s health insurer. The following measures were approved: Crown restorations for teeth 11, 21, 23, 24, 25, 26, 27, 35, 37, and 47 plus a remake of bridge 17-14.

The functional pre-treatment was performed with the aid of a centric splint in the maxilla which simulated a bite raised by 2 mm. The patient did not show any symptoms of myoantrouphy or coronoidotibular dysfunction after establishing her new vertical dimension of occlusion. In a first prosthetic treatment step, the posterior teeth were supplied with crowns (teeth 14, 26, 27, 47 and a bridge teeth 17–19) in veneering zirconia. Teeth 32–42 were bleached and their incisal edges clinically lengthened by means of direct composite restorations (Es- senta and G-Premio Bond, GC, Bad Homburg, Germany) in order to obtain a uniform aesthetic result.

Within the framework of the Cel- teca Challenge project, the patient could be offered a cost-effective and reversible pulpitis. All other teeth were vital and free of symptoms. The preparations (Fig. 5) followed the preparation guidelines for all-ceramic restorations and the appropriate minimum wall thickness requirements for lithium silicate ceramic restorations. The preparation for the partial crowns 24 and 25 had rounded axial line angles and a 90° shoulder at the preparation margin. To prepare for the veneers (33, 12, 11, 23), approximately 0.5-0.7 mm of hard tissue was removed on the labial aspect and a 0.9 mm chamfer provided (Fig. 6). The intact proximal surfaces remained untouched. Otherwise, the teeth were prepared for circular full veneers (“360-degree veneers”). The crowns of teeth 22 and 23 were prepared with a 1 mm circum- sial shoulder. Reduction of the incisal edges could be dispensed with as a consequence of raising the bite by 2 mm.

A conventional impression was taken of the prepared teeth and the casts were scanned. Prior to taking the im- pression, the patient was placed on a centric relation splint (Erkodent, Pfalzgrafenweiler, Germany) and a laboratory-made wax-up and subse- quent sintering of the model were performed. The patient had a low smile line, meaning that this posed no aesthetic problems. Very good aesthetic results can be achieved with ZLS even in monolithic ceramic restorations.

The restorations themselves were used with the CEREC CAD/CAM (Dentsply Sirona, Bensheim, Germany) for 60 seconds and conditioned with 36% phosphoric acid (DeTrey Etch; Ultradent, South Jordan, Utah, USA) followed by thorough removal of any excess resin and light curing, the occlusion was checked and the restorations were polished (Figs. 13 and 14).

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Fundamental principles in designing reprocessing areas

By Christian Stempf, Austria

It is recognized all too often that very little consideration is given to sterilization or reprocessing areas in either existing or newly designed dental practices. And yet reprocessing instruments between patients is crucial to meet today’s hygiene rules in dental offices. Dental practitioners also have a moral and legal duty of care calling for effective, well-defined and implemented infection control measures to prevent the transmission of infectious diseases to patients and staff.

Beyond the purely regulatory and safety aspects, many dentists have made the sterilization area a key asset for their activity. Located in a prime and visible location lets patients understand up front that their health and safety is important.

The staff don’t hesitate to share this passion for hygiene with patients, happy to answer any questions they may have. Flattered by this attention, it makes the patient feel confident and secure. To create new reprocessing areas or enhance existing ones is not an “insurmountable” challenge. It simply requires some basic principles this article will outline.

Having sufficient space dedicated to the reprocessing area is essential. In most of the cases it is underestimated. The room must be functional, well lit and in proportion to the size of the dental practice and volume of instruments to be reprocessed. There must be space for cleaning and sterilization devices with their respective accessories as well as enough bench space for intermediate stages i.e. before/after cleaning, before/after packaging and after sterilization.

The first fundamental principal is to have two areas in the room, a dirty zone and a clean zone. Rationally, instruments must travel in one direction from the dirty zone towards the clean zone. As a consequence of this one-way flow, processed (clean) instruments must not enter the dirty zone; hence one preferred design for a reprocessing area would be rectangular - a corridor with two doors (IN & OUT) (Fig 1). Both zones require ventilation and the airflow should be designed to prevent air from the dirty zone being forced into the clean zone. At the entrance, there should be a hand washing basin equipped with an eye washing station, vital in case of accidental splashing of disinfectant or any harmful fluid. Liquid soap and hydro-alcoholic gel dispensers should have an automated dispenser (or elbow operated) which avoid contaminating them with soiled hands. It is recommended to put dry hands with paper tissues.

Form follows function

The configuration of each part of the room follows the reprocessing steps i.e. pre-disinfection, rinsing, cleaning, drying, packaging and sterilization. This room must not be used for any other purpose. Floors and working surfaces must be smooth avoiding sharp corners and edges to be easy to clean and disinfect.

Waste

Waste should be disposed of into bags or containers through openings in the bench. Sharps and cutting items must be safely disposed of in specific plastic containers to protect staff, be collected and processed by specialized companies in an appropriate manner.

A basin will permit rinsing of the instruments with tap water aiming to remove any residual chemicals particularly in hollow and hinged items. Chemical residues could lead to irreversible staining and damage to instruments should a thorough rinsing step be missed.

Cleaning

The cleaning step is of utmost importance. Mechanical cleaning by means of an ultrasonic cleaner offers a good level of performance. Note: Manual cleaning is discouraged, as it is the least efficient method of cleaning particularly for complex or hollow instruments and rough surfaces. The degree of cleanliness relies on the operator’s experience and appreciation and also raises the risk to staff of skin penetrating injuries.

In order to remove chemicals and bioburden, all instruments must be thoroughly rinsed with tap water in a second basin. Ideally this would be followed by a second rinse with demineralized water to eliminate residues and salts present in tap water that could lead to whitish stains on sterilized instruments.

Washers or washer-disinfector are a preferred mechanical cleaning method thanks to the higher performance of the cleaning cycle validated by the manufacturer in compliance with stringent applicable standards (e.g. ISO-EN843, EN 14971). The cycle process includes pre-washing, rinsing, washing and drying with manual intervention which allows free space on the bench, sparing the soaking container(s) and one basin. It is wise to keep the second basin.

Pre-disinfection - Soaking

In order to prevent blood, saliva and debris from drying, all used and non-used instruments must be soaked as soon as possible after the procedure, using one or more disinfectant containing devices depending on the number, type and size of the instruments i.e. a small one for burs and files, bigger one(s) for hooks, forceps, etc. Note the manufacturer’s guidelines NOT to immerse or soak certain instruments such as transmission instruments in solutions!

The manufacturer’s guideline on the concentration and contact time of the chemicals must be strictly observed. The temperature of the solution should not exceed 40-45°C, thus preventing coagulation of blood proteins which increases the challenge of cleaning.

Another benefit of this crucial first step is the reduction of the microbial population, decreasing the risk of infection during handling and cleaning.

A basin will permit rinsing of the instruments with tap water aiming to remove any residual chemicals particularly in hollow and hinged items. Chemical residues could lead to irreversible staining and damage to instruments should a thorough rinsing step be missed.

Conclusion

All readers should reflect on these two definitions:

Reprocessing: All activities required to ensure that a used medical device is safe for reuse (ADA Guidelines for Infection Control -2012).

Sterilization: “Validated process used to render a product free from viable microorganisms.”

...the presence of a viable microorganism on any individual item can be expressed in terms of probability. This probability may be reduced to a very low number, it can never be reduced to zero” (ISO/TS 11139:2006).

In other words, the better each step is accomplished, the closer to “zero” Always bear in mind that each step of the reprocessing cycle is important but not necessarily skipped which would compromise sterility and the safety of patients and staff.

About the author

Christian Stempf has worked extensively within the European dental industry. He has been involved in infection prevention for nearly 10 years, working with various medical devices, in particular sterilization and organization of sterilization processes.

He has gathered valuable practical knowledge and experience through his daily activities and contacts with health care professionals and experts in the field of infection prevention and control in the world.

Mr Stempf is a member of the European (CEN-TC102) normalization committee participating in the working groups on bench sterilizers (EN13060) and other disinfectors (EN15883).

Christian Stempf has this experience offering lectures in all objectives on the topic of sterilization and infection prevention for healthcare professionals as well as comprehensive courses for dental assistants worldwide.

Packaging - Sterilization

An area should be considered for a pouch sealing device as well as a validated means of storage of packages prior to process in the bench top sterilizer. To ensure safe and efficient sterilization it is crucial to check the load and cycle type for compatibility. Selecting a cycle which is not designed and validated for the type of load (instruments) will lead to non-sterile products.

Additional space beside the sterilizer is intended for cooling and labeling of packages which have been released by the operator for storage and use (Fig 3). Special attention must be paid to ensure that pouches are hermetically sealed and are completely dry. Dump instruments/packages are not accepted as sterile.

For extended storage time, pouched items could be stored outside the reprocessing area and surgery (operatory) in clean and dry drawers or cabinets. In doing so, single pouched items could safely be stored for up to 3 months.

Fig 1. Instruments must travel in one direction in the reprocessing area from the dirty zone towards the clean zone. Conversely, airflow should be designed to prevent air from the dirty zone being forced into the clean zone.

Fig 2. Dirty instruments are cleaned and rinsed on entry to the reprocessing area.

Fig 3. Clean and dry instruments are then packaged and sterilized.
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The copyCAD

By Dr Yassine Harichane, France

Introduction
Nature has always captivated us with its beauty. Whether it is a landscape, a sunset or the intricate details of a leaf, one marvels at natural aesthetics. The goal of an artist is to copy nature in every medium: painting, sculpture, music, photography. It is easy to see parallels in dentistry. The teeth and soft tissue display details on the macroscopic and microscopic scale that make up all their beauty. Even the smile has characteristics that define what is beautiful and what is not. Like an artist, the dentist and the dental technician use all their combined talents to create life-like restorations. The secret to imitating nature is in the details of daily practice and hard work.

Fortunately for dental practices and laboratories, technology has advanced considerably, making the ability to imitate nature much more achievable while paving the way for new practical methodologies. Performing a single restoration on a central maxillary incisor is a challenge, both technically and artistic. Whether it is a filling, a crown or an implant, all the skills of the artistic dentist must come into play because the patient naturally expects a result symmetrical to the contralateral tooth. Using the latest technology, it is as simple as the copy and paste function one is so accustomed to using on a computer. The dentist has gone from being an artist to a computer scientist with the same optics: copying nature in all its perfection.

On the basis of a clinical case without the utilisation of an intra-oral scan, I will demonstrate a workflow with CAD/CAM technology. This will show that the ability to copy nature has now become accessible to all practitioners.

Preparation
In this clinical case (Figs. 1 & 2), the patient wanted the aesthetic aspects of her smile to be improved without losing unique features she had come to consider as part of her look and personality. The maxillary anterior teeth showed caries and defective restorations, but their overall shape and symmetry were preserved because they would be preserved because they possessed this copy and paste function (Fig. 4), so the scan and design processes take less than 1 hour. The six provisional crowns were then milled over the course of 1 hour and 30 minutes from a resin disc suitable for producing long-term provisional restorations (Structur CAD, VOCO; Figs. 5 & 6). Finishing the provisional crowns—checking the contact points, controlling the occlusion and polishing—required 30 minutes, allowing delivery of the crowns two days after taking the impression. The result obtained was strikingly natural (Fig. 7) thanks to the material’s aesthetic properties: natural shade, easy polishing and improvable with characterization. Concerning the form, the provisional crowns had an asymmetry that is found only in

Fig. 1: Initial situation, smiling.
Fig. 2: Initial situation, frontal view with lips retracted.
Fig. 3: V-Posil impression.
Fig. 4: Screenshot of the design software.
Fig. 5: Structur CAD disc.
Fig. 6: Screenshot of the nesting software.
Fig. 7: Structur CAD provisional crown.
Fig. 8: Try-in of provisional crowns.
Fig. 9: Smile with provisional crowns.
Fig. 10: Porcelain crowns luted with Futurabond DC and Bifix QM (VOCO).
Fig. 11: Final result.

Temporisation
The second step was to prepare the provisional crowns by copying and pasting the patient’s teeth. After preparing the teeth, the impression is sent to the laboratory, which will scan and design the provisional crowns. Most CAD/CAM software possesses this copy and paste function (Fig. 4), so the scan and design processes take less than 1 hour. The six provisional crowns were then milled over the course of 1 hour and 30 minutes from a resin disc suitable for producing long-term provisional restorations (Structur CAD, VOCO; Figs. 5 & 6). Finishing the provisional crowns—checking the contact points, controlling the occlusion and polishing—required 30 minutes, allowing delivery of the crowns two days after taking the impression. The result obtained was strikingly natural (Fig. 7) thanks to the material’s aesthetic properties: natural shade, easy polishing and improvable with characterization. Concerning the form, the provisional crowns had an asymmetry that is found only in
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- over 90 inserts specifically designed for a wide variety of clinical applications

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nature being both spontaneous and pleasant. They were temporarily cemented in the mouth to validate the prosthetic project (Figs. 8 & 9). The material’s biocompatibility clinically allows for a three-year maximum period in which the crowns can be worn, making it a material perfectly suited for complex cases, or those requiring periodontal rehabilitation. The material’s composition provides not only excellent resistance to abrasion, but also the possibility of reworking without major changes. This is an example of an intra-oral scanner being used to validate the therapeutic project before moving to more expensive materials like zirconia or lithium disilicate. In the way, if returned to the laboratory, the cost will be lower by using a millable temporary core. After provisional crowns are validated, the dental technician only needs to press a button to start producing the definitive crowns in the desired material.

For patients, digital dentistry is an education on just how far dentistry has evolved. Technological advancements in clinical procedures are replacing many of those treatments of their childhood memories. It is now possible for the patient to reclaim the smile of his or her twenties. Better still, it is possible to copy the child’s juvenile smile and place it into the deteriorated dental arch of the father. The smile will become a legacy that will be passed down through families.

Conclusion
Technology is making significant progress in dentistry, it is up to us to appreciate it. The emergence of new tools, such as intra-oral scanners, and unique new materials, like malleable temporary resins, makes it possible to develop new therapeutic concepts and procedures. Copying and pasting is now a part of the dentist’s and dental technician’s therapeutic armamentarium. A copycat is an artist who tries to capture nature in all its glory through painting. Now, a copyCAD is an artist who can capture nature in all its perfection through CAE/CAM technology.

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Editorial note
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About the author
Dr Yassine Harichane graduated from the Paris Descartes University and conducted several research there. He is an author of numerous publications and a member of the Cosmetic Dentistry Study Group (CDSG) at the Paris Descartes University in Paris, France.
Autonomous «navigation» in the endo canal owing to revolutionary software

› Jeni mode continuously adapts to the individual root canal anatomy
› Control of the file movement at millisecond intervals
› Irrigation with aplomb
› Apex locator – measuring length without interruption
Meeting patients' needs and transforming smiles with direct veneers

By Dr. Mohammad Zuhair Al Khairo, UAE

Introduction

"I can't afford e.max veneers, do you have something more affordable?" is a question often encountered in clinical practice today.

Being a restorative dentist with more than 15 years of experience in private practice, I have been asked this question innumerable times. With the recent advances in direct resin technology, I am able to confidently say "YES" and provide an alternative of composite resin-bonded veneers with an emphasis on preserving tooth structure. The next question the patient asks with much anticipation is "what is the difference?" Since I started using a nano-hybrid, bioactive composite resin with a porcelain like shade, the one-word answer to this question is "COST!!".

Compared to a decade or two ago, today we encounter more internet-informed patients who visit the clinic with a preconceived notion, which, you are expected to fulfill. Therefore, the dynamics of treatment planning has changed towards providing a suitable solution while managing patient expectation.

The advancement in composite resin technology with natural shade replication has created an avenue for clinicians to offer highly standardized, predictable restorations in terms of aesthetics, strength, polishability and durability. Shofu composites are unique as they are bioactive and provide an additional acid neutralization and anti-plaque effect to minimize caries risk while enhancing longevity of the restorations.

Being a firm believer in prevention and minimally invasive treatment, we follow a stringent prevention protocol that I call "3X Protocol". Part of this protocol emphasizes "X for Prevention from Extension" which has been modified from GV black principle "Extension for Prevention". Another "X" for "Experitation" evaluates the cost benefit and to provide cost-based treatment options to the patient. The final "X" would be managing patient expectation as this is a crucial element of cosmetic dentistry. The "3X Protocol" has enabled us to provide a more conservative patient-centred treatment with the desired aesthetic outcome while preserving natural tooth structure.

The patient case presented below is an anterior diastema with old discoloured composite restorations. In clinical situations with multiple diastemas, it is important to first evaluate treatment options from a restorative point of view before considering orthodontic treatment. In order to achieve long term stability and predictable outcomes over time, the restorative plan should consider different aspects such as:

1. Arch / space discrepancy in relation to occlusion.
2. Restorative material of choice
3. Biological cost and patient's financial limitations.

Patient case

A young female patient visited the clinic requesting for an enhanced smile as she was unhappy with the appearance of her front teeth after completing orthodontic treatment. Upon careful examination it was observed that composite resin restorations were used for diastema closure before orthodontic treatment (Fig 1 - 2). The filled teeth had chipped at the incisal edge and had a grey discolouration. After careful evaluation the following treatment options were suggested to the patient:

1. e.max veneers with minimum tooth preparation,
2. Direct resin-bonded veneers with no tooth preparation.

After the treatment planning discussion, the patient requested to proceed with direct resin-bonded composite veneers to enhance her smile. After the old composite fillings were removed (Fig.3, 4), smile design was done to restore the golden proportion by modifying the shape and size of the teeth. Based on the smile design a mock up was created to help obtain patient approval on the expected outcome and fabricate the silicone index.

Materials used

- Prep: Shade Selection & Documentary - EyeSpecial CII (Shofu)
- Restore: Beautifil II LS shade A2O, A1, Beautifil Flow Plus F03 shade INC and Beautifil II Enamel HVT Composite (Shofu)
- Polish: Onestouch polish, Super Snap X-Treme Green and Pink disks - Super polish: Super Buff impregnated buff disk for enamel like lustre (Shofu)

Restorative approach:

Smile design

Digital Smile Design DSD was used to reestablish proper proportion of the teeth and redesign the smile according to lower lip line. (Fig. 5)

Tip: Smile design is a great aid to establish correct golden proportion and help convince the patient on the treatment plan.

Wax-up

Indirect wax up was performed according to the smile design. (Fig. 6)

Tip: Since it is a pretemp case the lab should be informed not to prepare the cast during wax-up.

Direct mock-up

Silicon mold was used to create a direct mock-up trial to ensure proportion compatibility, occlusion and obtain patient approval.

Tip: checking the occlusion at this stage helps identify the points of interference that might affect the final restoration design and minimize adjustments.

Silicon index

Silicone index with putty impression material was used to create the palatal shell of the restoration for each tooth separately. (Fig. 8)

Tip: make the index with incisal wrap to help duplicating the thickness of the incisal edge. (Fig. 9)

Shade selection

Accurate shade selection was carried out using the direct technique where small buttons of each composite material was placed directly on the tooth surface. Beautifil II LS shade A2O was identified for the specimen. Beautifil II Enamel HVT was identified to restore the value since the case involved bleaching ten days prior to the restorative procedure. Beautifil II LS shade A1 and B1 were compared under Shade Isolate Mode using EyeSpecial CII to determine the ideal Chroma and shade A1 was selected for the most suitable shade (Fig 10, 11). Beautifil Flow PLUS F03 INC shade was selected to create the palatal shell.

Fig 1: Pre-operative view of patient smile
Fig 2: Pre-operative retracted view
Fig 3: Smile after removal of old restorations
Fig 4: Retracted view after removal of old restorations
Fig 5: Digital Smile Design
Fig 6: Indirect wax-up
Fig 7: Direct mock-up to assess occlusion and obtain patient approval
Fig 8: Silicone Index fabricated with putty impression material
Fig 9: index with incisal wrap to help duplicating the thickness of the incisal edge
Fig 10: Direct placement technique for shade selection
Fig 11: Final recipe of shades for the restoration
Fig 12: Shade confirmation using the Isolate Shade Mode of EyeSpecial CII camera
Fig 13: Shofu EyeSpecial camera
Fig 14: Natural aesthetics achieved with direct veneers
Fig 15: Patient smile post treatment
Fig 16: Smile design according to lower lip line. (Fig. 5)
Tips: Shade Isolate Mode removes the influence of the background gingival colour and helps obtain a more accurate shade selection. (Fig 13)

Composite layering

Teeth were polished using non-fluoridated paste, etched and bonded. Restoration of each tooth was completed separately in a progressive manner according to a customized colour scheme, (Fig 14) - Palatal shell was created using the silicone index with a very thin layer of Beautifil Flow Plus F03 shade INC composite - Proximal walls were created using Beautifil II Enamel shade FVT on top - Beautifil II LS shade A20 was used incisally as a very thin line to help recreate the Halo effect and placed incisally as a very thin line to help achieve enamel-like luster - One Gloss polisher was used in the cervical area and to achieve the natural surface texture - Super-Snap X-Treme Green and Pink disks were used to polish the restoration - Super Buff impregnated super polish was used for final polishing to achieve enamel like luster

Results and conclusions

The planned cosmetic restorative treatment with non-prep composite resin veneers was successfully completed and the patient was extremely happy with her enhanced “natural” smile (Fig 14, 15). The emphasis on shade selection and adoption of the 3X protocol which takes into consideration “prevention from deformation” by avoiding over-preparation, “prevention from undue exposure” by eliminating cost while maintaining quality and “managing patient expectations”. As a clinician, our final aim with cosmetic treatment is to recreate a natural smile that meets or exceeds the patient’s expectations while ensuring longevity of the restorations. This concept can be easily achieved today with the help of innovative, bioactive composite capable of recreating natural life-like aesthetics with a predictable outcome.

About the author

Dr. Mohammad Zuhair Al Khair
Dr. M. Zuhair AK. earned his bachelor degree in dental surgery from Mosul University, Iraq in the year 1999 with the degree of honour. Two years later he specialized and trained in Conservative Dentistry where he was mentored by the renowned Prof. Abdul Hay Abdul Majeed Salman. At the department of Conservative Dentistry, Mosul University, Iraq. He had his own practice in Iraq early in year 2001 where he gained a very big reputation for his delicate, professional and honest way of dealing with his patients. Since then he moved to Dubai UAE to extend his experience across a different part of the globe. His settling in Dubai for more than 8 years now gave him the chance to give his input by practicing international quality healthcare standard which has been internally developed and constantly improved over the years through rigorous clinical quality control and data collection. He is more and more towards developing a high standard dental practice that offers a good quality dental service through combining the experience of a highly trained team and state of the art dental equipment.

By Dental Tribune International

The dental community is facing extraordinary times, and it has responded by adapting and implementing new strategies. This is also true for continuing education (CE) in dentistry. Embracing the opportunities of e-learning, Italy-based dental company Mectron has recently launched a webinar platform, which will provide dental professionals access to clinically relevant presentations 24/7 free of charge.

The new industry-wide dental CE platform delivers free CE accredited content through the convenience of the Internet. After quick and easy registration, dental professionals will be able to attend live webinars and watch recorded webinars on demand, and there will cover a wide range of topics relevant to the oral healthcare professional community, including implant treatment and prophylaxis. Twelve webinars in English, French, German, Italian and Portuguese are already planned and will become available soon on the platform. More webinars will be scheduled in the second half of this year.

André Reinhold, Mectron’s international marketing manager, told Dental Tribune International that the company had been planning to start a Web-based education platform for some time already. However, the recent COVID-19 outbreak and the related restrictions on travel and events, which have rendered maintaining customer relations almost impossible, prompted Mectron to go online now.

“E-learning has become an effective tool for us to stay in contact with our customers and reach out to new customers, especially in regions in which Mectron does not yet have a local branch,” Reinhold said. “Although this online platform cannot replace physical presentations in the long run, it definitely facilitates access to and helps raise interest in our products. Through the webinars, dental professionals are provided with a comprehensive overview of the advantages of our products in daily practice,” he explained.

The feedback has been overwhelm- ingly positive. “Within the first week of the launch, over 1,500 members registered. The registrations for the single webinars have also exceeded our expectations,” Reinhold stated.

Since 1979, Mectron has been one of the major players in the international dental industry, producing surgical, ultrasonic, air polishing and LED polymerisation devices, which are available in over 80 countries worldwide. With the introduction of the first ultrasonic titanium handpieces, the first LED polymerisation lamps for composite materials and, in 2001, the first ultrasonic surgical unit for piezoelectric bone surgery, Mectron has developed some of the most important innovations in the dental field.
Testing a novel endodontic sealer

By Drs Paolo Generali and Francesca Cerdati, Italy

The aim of endodontic treatment is to eliminate microorganisms and their by-products from the root canal system, together with avoiding its re-contamination. The outcome of endodontic treatment is strictly linked to several steps: root canal debridement, disinfection, allows a further bacterial elimination and the creation of a tight communication between the dentinal walls and core material. Sealer penetration refers to the amount of a root filling by increasing the surface contact area between the root filling materials and dentinal walls. Furthermore, retention of root filling material might be improved by mechanical locking. However, contrary to common belief, a positive correlation between sealer penetration into dentinal tubules and sealability has never been established.

A study by Russell et al. investigated the penetration and adaptation of common types of root canal sealers (AH Plus, Kerr Pulp Canal Sealer, MTA Fillapex and EndoREZ) in cross-sections of tooth roots exhibiting the butterfly effect and to determine if this differs between coronal and middle root sections. Penetration and adaptation quality varied between obturation material groups but this did not reach significance, reporting AH Plus as the most performing material between the tested cements and Pulp Canal Sealer and EndoREZ as the less performing. The superior adaptation and penetration of a sealer may be attributed to its physical properties within tooth canals. This has been described as a decrease in viscosity and an increase in flow parallel to an increase in shear rate during filling procedures.

When using gutta-percha with sealer as core material for filling the canal space, the amount of sealer should be kept at the lowest, whereas the amount of gutta-percha placed into the canal must be maximized. Many different sealers are available on the market, but all of them ideally aim to have the following features: tissue tolerance, no shrinkage with setting, slow setting time, adhesiveness, radiopacity, bacteriostatic properties, absence of staining, solubility in solvents, masticability to oral and tissue fluids, easy handling.

The different endodontic sealers are categorized based on their main components: zinc oxide eugenol (ZOE), calcium hydroxide, glass ionomer, resin-based, polydimethylsiloxane (silicon)-based and bioceramic-based sealers. Resin-based sealers became popular because of their adhesive properties and have been reported to be used with single gutta-percha cone technique for root canal obturation. Even bioceramic sealers can be used with this technique. The most commonly used sealers in root canal treatment are ZOE-based sealers, modified for endodontic purposes based on Grossman or Bickert’s formula. The powder of these sealers contains zinc oxide (ZnO), which combines with a liquid, generally eugenol. ZnO is an environment-friendly material, which has been used widely in medical applications, with antibacterial properties and favorable characteristics in terms of biocompatibility. Unlike resin-based sealers, which are subject to shrinkage, setting reaction of ZOE-based sealers is a chelation reaction occurring between eugenol and the zinc ion of the zinc oxide; this reaction might also occur with the zinc oxide phase of gutta-percha along with the calcium ions of dentin. This might explain the decreased setting shrinkage associated with the ZOE-based sealers.

Michaud et al. have shown that volumetric expansion of gutta percha (almost 135.5%) occurred in contact with eugenol during a 30-day period, and a pilot study done earlier showed a remarkable increase in the gutta-percha dimensions when placed in eugenol that continued even after 4.5 years. Theoretically, sealer penetration into dentinal tubules could improve sealing of a root filling by increasing the surface contact area between the root filling materials and dentinal walls. Furthermore, retention of root filling material might be improved by mechanical locking. However, contrary to common belief, a positive correlation between sealer penetration into dentinal tubules and sealability has never been established.

Sealers should be used to fill the morphologic root canal system irregularities, to avoid gap formation between the dentinal walls and core material. Moreover, sealers should facilitate the placement of the filling core with a lubricant action, penetrate into dentinal tubules to prevent microleakage and entomb any remaining bacteria. Many different sealers are available on the market, but all of them ideally aim to have the following features: tissue tolerance, no shrinkage with setting, slow setting time, adhesiveness, radiopacity, bacteriostatic properties, absence of staining, solubility in solvents, masticability to oral and tissue fluids, easy handling.

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liquid component. This has given rise to a number of Zinc Oxide Non-Eugenol-based sealers (ZOE). In 2019, a new sealer containing Tea Tree essential Oil (EssenSeal, ProDent) was launched on the market (Fig. 8).

Tea Tree Oil is the essential oil obtained from the Australian native Melaleuca alternifolia or tea tree, indigenous to northern New South Wales and southern Queensland. Tea tree oil (TTO) is a complex mixture of essential oils, comprising approximately 100 components, most of which are monoterpenes, sesquiterpenes, and their related alcohols. TTO has been shown to possess a wide range of therapeutic properties, including anti-inflammatory activity, antimicrobial activity against a wide spectrum of microorganisms, for example Staphylococcus aureus, a range of bacteria, viruses, including herpes simplex and influenza viruses, many fungi including some azole-resistant yeasts. TTO has also demonstrated a potential biofilm inhibiting activity. In an animal study, TTO succeeded to promote healing of the extracted sockets and prevent alveolitis.

According to Siqueira, the microbial flora present in failed canals has unique characteristics, with extremely resistant bacterial strain and even yeasts, and these pathogens survive in an inhospitable environment, often organizing in biofilms. Incorporating plant extracts or purified compounds derived from plants into the root canal system is an emerging area of great interest in the medical and scientific community. Antibiotic resistance has directed researchers to alternative therapies, including traditional plant-based medicines. Many such plants are those traditionally used by indigenous communities to treat infectious diseases. This is the case of TTO, that has been used therapeutically for long time, and has been shown to be effective against resistant micro-organisms, and biofilms suggest particularly its use in retreatment procedures.

The clinical impressions while using this sealer are positive: mixing and manipulation of the cement are easily done and the final product has a smooth consistency that allows an easy placement of the gutta-percha cone into the root canal. In addition, this sealer diffuses a pleasant scent during manipulation and its white colour should prevent discoloration issues.

A procedure performed on a freshly extracted tooth showed good penetration of root canal anatomy and sufficient radiopacity. A clinical case shows the good penetration of the sealer into the root canals and the absence of voids (Fig. 5-8). The white colour, the pleasant scent and the good handling make this product suitable for everyday endodontic treatments, in addition the interesting properties of TTO against resistant microorganisms and biofilms suggest particularly its use in retreatment procedures.

Editorial note: A full list of references can be obtained from the publisher.
Researchers develop model to automatically localise mandibular canals

The Importance of Proper Light Curing

There are several clinical challenges dentists encounter if they choose an inadequate curing light or apply inappropriate light curing techniques including weak adhesion and compromised physical and chemical properties of the restorative material. In fact, studies revealed that more than 37% of composite restorations are insufficiently cured. This will likely have a negative impact on the longevity of the restoration.

The following guidelines are based on the Consensus Statements on Light Curing (Northern Light Meetings, Halifax) and are intended to help you achieve more predictable and reliable outcomes.

Shining A Light On Curing

Be aware of the key performance indicators: Make sure your light delivers a minimum of 500 mW/cm² in standard mode. Be cautious when using high output lights (above 2,000 mW/cm²) that advocate very short exposure times (e.g. 1-5 seconds).

• SmartLite® Pro: ~1,250 mW/cm² over the whole curing area

Maximize Coverage. Choose a light with a uniform output that covers as much of the restoration as possible. If the light tip is smaller than the restoration, use overlapping exposures.

• SmartLite® Pro: Large active curing area of 10 mm diameter

Cure Over Distance. Select a light that offers the least reduction in irradiance as distance from the tip increases.

• SmartLite® Pro: Collimated beam for reliable curing over larger distances

How To Properly Light Cure

Inspect And Clean. First make sure the light is free of defects and debris. Apply barrier sleeve to protect lens and handpiece from gross contamination.

Place Light. Position light as close as possible (without touching) and with tip parallel to the surface of the restoration.

Double Check. Light cure restoration for recommended time. Follow the resin manufacturer's curing table.

Researchers develop model to automatically localise mandibular canals

ESPOO, Finland: To place an implant, dental professionals first have to localise the mandibular canal, which is typically done using CBCT imaging techniques. Since this often requires considerable time and energy, Finnish researchers have recently developed a method for automatically localising the exact location of mandibular canals. The model is based on training and using deep neural networks, employing a dataset consisting of CBCT scans.

After training the model on the coarsely annotated volumes, the researchers were able to accurately localise the mandibular canals of the voxel-level annotated set, the mean curve distance and average symmetric surface distance being 0.60m and 0.46mm, respectively. The results show that the model successfully outperformed the statistical shape models typically used in research.

According to the researchers, the new model can achieve near-human accuracy in cases in which the patient does not have any pre-existing conditions and does not require special treatment. “In more complex cases, one may need to adjust the estimate, so we are not yet talking about a fully stand-alone system,” said lead author Joel Jaskari, a doctoral candidate at Aalto University in Finland, in a press release.

The researchers noted that the aim of the study was to optimise the workflows of radiologists. “The aim of this research work is not, however, to replace radiologists but to make their job faster and more efficient so that they will have time to focus on the most complex cases,” explained Prof. Kimmo Kaski, senior adviser in computational science at Aalto University in Finland, in a press release.

Planmeca, which specialises in developing 3D and 2D digital imaging devices, dental units, and CAM/CAD solutions and software, is currently integrating the model into its dedicated software. The model will be used with Planmeca 3D tomography equipment.

The study, titled “Deep learning localising mandibular canals in dental cone beam computed tomography volumes”, was published online on 3 April 2020 in Scientific Reports.

By Dental Tribune International

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