LEIPZIG, Germany: Vitamin D, also referred to as the sunshine vitamin, is increasingly more difficult to obtain from sun exposure. The increase in the number of people working in offices today has drastically reduced access to direct sunlight. The strict confinement measures worldwide to slow down the spread of SARS-CoV-2 can only have worsened this situation. Vitamin D deficiency has been found to be associated with dental implant failure and complications, and mounting evidence is suggesting that inadequate vitamin D levels in the blood could play a major role in SARS-CoV-2 susceptibility and outcomes.

Vitamin D supports the immune system and is instrumental in development of healthy bone and muscles and strengthening of tooth enamel. Yet, according to an article published by the National Center for Biotechnology Information earlier this year, approximately one billion people worldwide have vitamin D deficiency, and 50% of the global population has vitamin D insufficiency.

A recent article published by Dental Tribune International (DTI) reported on previous studies that highlighted the impact of vitamin D deficiency on osseointegration and failure of immediate implants. Additionally, an optimal diet rich in vitamin D...
Marketing cooperation agreement between EMOVA, representing ITI, and CAPP Events & Training signed

By CAPP / Dental Tribune MEA

The International Team of Implantology (ITI) appointed EMOVA to conduct a programme in the UAE which will facilitate the fulfillment of requirements for obtaining privileges to practice implant dentistry. The ITI Implant Privilege programme will be promoted by CAPP Events & Training.

The ITI Implant Privilege is a modular course with both theory and mentored clinical elements, which has the support of the ITI. The speakers are international, regional and local, all of which are ITI Fellows or Members.

The course is structured and provides evidence and scientific background to implantology. Within the modules is a dedicated day in clinical situations in preparation for the clinical modules. The clinical days are for delegates to work with highly skilled mentors who will support and guide the participants to achieve outstanding implant placements and restoration of 20 or 30 implants. The course will also include a live surgery day with Prof. Bilal Al-Nawas from Gutenberg University Mainz (Germany) who is the main faculty lead of the programme. At the end of the course, the delegates will be awarded the ITI Curriculum Intermediate Certificate.

The signing ceremony was held at CAPP Training Institute and the marketing cooperation agreement was signed by Stephan Scherrer, Managing Director at CAPP, and Petar Mollov, Marketing Director at CAPP Events and Training and Stephan Scherrer, Managing Director at EMOVA, sign the marketing cooperation agreement at CAPP Training Institute in Dubai.

For further information can be found on the website:
www.implant-privilege.ae

By CAPP / Dental Tribune MEA

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THEORY INTERMEDIATE 4 | DATES TO BE ANNOUNCED | SURGICAL INTERVENTION ADVANCED

THEORY INTERMEDIATE 5 | DATES TO BE ANNOUNCED | ADVANCED PROSTHETIC INTERVENTION
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Prioritizing safety while reopening your office

By Ultradent

Reopening dental offices is a welcome sight to clinicians and patients alike, but concerns about COVID-19 are still top of mind among doctors. Ultradent knows how important it is to get back to work and we want to help you do it safely by making sure you have everything you need while protecting you, your staff, and your patients.

Prioritizing effective products and learning on the procedures they assist will smooth the transition as your practice regains some normalcy.

Patient Protection

As we all get back to work, products that reduce exposure are a necessity to ensure everyone in your office stays safe.

Ultradent Syringe Covers and VALO Barrier Sleeves provide reliable, medical-grade protection to prevent cross-contamination. DermaDam dental dams and DermaDam Ultradent Syringe Covers and VALO stay safe.

To ensure everyone in your office is to get back to work and we want to help you do it safely by making sure you have everything you need while protecting you, your staff, and your patients.

The Omni-Matrix Disposable Retainer and Matrix is designed to perfectly customize to any preparation. They are available in winged and wingless styles and stainless steel and mylar so you have the ideal matrix no matter the circumstances. ConSepsis, an antibacterial solution can be used for procedural endodontic disinfection, prior to pulp capping, and after smear layer removal for canal disinfection.

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For more information contact Ultradent

553 West Ultradent Drive
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Web: www.ultradent.com

Synthetic dental dams are strong and tear resistant, and are powder free to reduce allergic reactions. When it comes to hygiene procedures, Ultragrip Te Special disposable prophylaxis angles feature an innovative brush guard that helps prevent up to 95% of splatter.

Essential Products

Returning to work doesn’t necessarily mean a return to the normal workday. Since dental offices were only open for emergency procedures, you may have patients who needed something done, but weren’t able to be seen. Now they’re ready, so make sure you are, too.

From whitening procedures to root canals, Ultradent tips allow you to deliver any chemistry exactly where it’s needed—they’re also single use to prevent cross-contamination. For tissue management needs, Visicoat hemostatic can stop bleeding and subercular fluid in seconds and Ultrapak packing cord packs easily and quickly.

The ConSepsis solution prior to DBA application to disinfect root surface with sensitive root treatment or when bonding.

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Ultradent’s Spring Cover is designed to be flexible and durable.

Ultrodent is the only whitening toothpaste they need! It is safe to use every day. It’s the only toothpaste they need to keep their smiles bright and healthy.

Opalescence Whitening Toothpaste provides total oral care while keeping your patients’ smiles bright, plus it is safe to use every day. It’s the only whitening toothpaste they need.

To see all the other products and offers we have available to you please contact your exclusive distributor in your country or sophia.yadi@ultradent.com

By Bien-Air

Bien-Air has always prioritized provider and patient safety by developing products that protect against cross contamination. With the COVID-19 Pandemic, these features are more important than ever.

The high-speed dental handpiece without anti-retraction valves may aspirate and wlop the debris and fluids during the dental procedures. More importantly, the microbes, including bacteria and viruses, may further contaminate the air and water hoses within the dental unit, and thus can potentially cause cross-infection.

Bien-Air, being conscious of cross contamination risks, has designed its electric attachments and high-speed air handpieces with anti-retraction valves which protect fluid retraction from the oral cavity into non-sterilizable dental handpiece tubing and water lines. Having an anti-retraction valve in the body of the handpiece, which can be autoclaved, significantly reduces the backflow of oral bacteria and viruses into the non-sterilizable dental unit hoses.

As an extra preventive measure for cross infection, Bien-Air Unifix® coupling are also equipped with a unique anti-retraction features protecting the the exhaust air tubing.

Products with anti-retraction valve:

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<th>CONTRA-ANGLES</th>
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<td>Unifix® (anti-reflux)</td>
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**New Neo Spectra ST flow – the simpler, more versatile esthetic flowable composite**

**By Dentsply Sirona**

Dentsply Sirona’s Neo Spectra™ ST flow introduces a new way to deliver optimal solutions in esthetic and composite dentistry. The new Neo Spectra ST flow is specifically designed to highlight the unique properties of SphereTEC technology, enabling the delivery of refined, esthetic restorations with unparalleled accuracy and flowability.

**Introducing Neo Spectra ST flow**

Neo Spectra ST flow is a versatile composite designed to deliver the best of both worlds: the precision of esthetics and the adaptability of flowability. Its spherical shape ensures excellent adaptation to the cavity surface, while its flow-on-demand handling provides ease of use.

**Designed to perfectly complement Neo Spectra ST universal composite, new Neo Spectra ST flow is characterized by its cutting-edge filler technology, SphereTEC - like with its universal composite counterpart. SphereTEC technology delivers a tour-de-force that allows for excellent adaptation to cavity surfaces, and work together with smaller irregular-shaped filler particles in the material to achieve versatile, flow-on-demand handling.**

**Neo Spectra ST flow comes in the VITA®1 Classic range, streamlining composite shades with 12 shades (A1 to A4 and D1 to D3) and one translucent enamel shade (E1) to accommodate less frequent cases.**

**Neo Spectra ST flow is characterized by its cutting-edge filler technology, SphereTEC - like with its universal composite counterpart. SphereTEC technology enables Neo Spectra ST flow composite to excel in the areas that matter most to dentists: handling, esthetics, and durability. SphereTEC fillers, proprietary to Dentsply Sirona and Neo Spectra ST Composites, are spherical-shaped, pre-polymerized fillers created from sub-micron barium glass. Spherical-shaped filler particles allow for excellent adaptation to cavity surfaces, and work together with smaller irregular-shaped filler particles in the material to achieve versatile, flow-on-demand handling. Neo Spectra ST flow resin matrix creates an excellent chameleon shade blending effect, and a perfect match to Neo Spectra ST universal composite shades. The unique structure of SphereTEC fillers maximizes composite strength and durability, while their sub-micron primary particle size ensures excellent esthetics and polishability.**

**Neo Spectra ST flow composite uses five universal CLOUD composite shades A1 to A4 to cover the entire VITA® Classic range, streamlining flowable composite inventory and ensuring highly esthetic clinical results thanks to their distinct chameleon effect. Neo Spectra ST flow composite also offers one bleach shade (B1), two opaque dentin shades (D1 and D3), and one translucent enamel shade (E1) to accommodate less frequent cases.**

**For further information about the new Neo Spectra ST flow composite available from Dentsply Sirona, or to request a sample, please contact your local Dentsply Sirona sales representative.**

**Dentsply Sirona’s Imaging Solutions**

**By Dentsply Sirona**

Dentsply Sirona is revolutionizing the dental industry by offering cutting-edge technology to optimize patient outcomes and enhance the clinic experience. Dentsply Sirona’s latest innovation, the new Axeos™ 3D/2D imaging system, is designed to streamline workflows, improve accuracy, and provide a seamless experience for both patients and dentists.

**Axeos - Experience the Difference**

Recipient of the Red Dot Award for Production Design 2020, the Axeos™ 3D/2D imaging system offers enhanced clinical confidence, improved workflow, and a superior user experience. This system is designed to deliver high-quality images at a fraction of the time, ensuring a positive experience for both patients and dentists.

**Axeos is powered by Siemens and seamlessly integrates with more than 250 practice management software systems and multiple treatment planning software like SICAT® Implant, SICAT® Endo, SICAT® Function and SICAT® Air, giving dental practices the opportunity to enhance current treatment offerings or expand into new procedural offerings in the future.**

**“Our purpose is to support dental professionals in providing healthy, happy smiles. Working with dentists to understand their needs and translating those into product solutions is what drives us. With our new imaging solution, we not only offer outstanding image quality, clinical safety and an easy-to-use interface but also smart integration to ensure seamless workflows and procedures,” says Don Casey, Chief Executive Officer at Dentsply Sirona.**

**“Waiting is a bad experience for both dentist and patient. Even worse, if I am unable to see what I need to see, I will have to repeat the image, then patient is gone because he does not trust my treatment,” says Prof. Chung How Kau, Department of Orthodontics, Birmingham, Alabama, USA.**

**“Axeos has exactly the right balance between excellence, speed and precision. The big volume exposure takes only 16 seconds and the image quality is great in both 2D and 3D formats. The ‘wow’ effect of the Axeos technology sells my treatment.”**

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

**Dentsply Sirona**

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E-mail: MEA-Marketing@dentsplysirona.com

For more information, visit dentsplysirona.com/axeos.
Omicam AF
The flexible tabletop unit. Now available in the Middle East & North Africa

By Dentply Sirona

Dentply Sirona is proud to announce the launch of the Omnicam AF intraoral camera, in the Middle East & North Africa region.

The portable Omnicam AF comprises the individual components of Omnicam, including camera tray and PC.

The camera can be easily taken from one treatment room to another – a big advantage for joint practices with several locations. Scanning and designing can be done separately. For example, you can make the design in the first treatment room and your assistant or colleague can start a new scan in the next one.

In addition to the new Primescan, the proven Omnicam is a real alternative. Omnicam is still one of the smallest scanners available. It is therefore particularly easy to handle, scans powder-free and in colour. Since 2012, it has impressed users worldwide and is always up to date thanks to the continuous software updates.

Benefits of Omnicam:
- Comfortable handling
- Powder-free scanning
- Fast and precise full-arch scans
- Natural colour and easy shade analysis

Proven reliability. Your way.
With more than 7 million scans per year, Omnicam is one of the most widely used scanners on the market – now with the option of the Acquisiption Center (AC) and the flexible tabletop unit (AF).

The Omnicam intraoral scanner gives you the flexibility to start your digital dentistry journey and develop as your practice grows.

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

Medifil IX forte–glass ionomer filling material for a variety of indications

By PROMEDICA

Medifil IX forte can be used without conditioner or adhesive. Its main benefits are the non-sticky consistency and the perfect marginal adaptation.

Perfect for various indications
Medifil IX forte is indicated for restorations of non-occlusion-bearing Class I cavities, semi-permanent restorations of Class I and II cavities, restorations of cervical lesions, Class V cavities, root caries, restorations of Class III cavities, restoration of deciduous teeth, as a base/liner, for core build-ups, as well as for temporary restorations.

The special capsule design is perfect for smaller cavities and areas in the mouth, which are difficult to reach.

Benefits of the special capsule
Medifil IX forte comes in a special kind of capsule, which can be activated without an activator. Instead, the capsule is placed on a firm surface (e.g., a table) and pushed down by hand. The liquid containing flask is pushed into the powder chamber in order to combine powder and liquid. After the ensuing mixing process, the capsule is immediately ready for use.

For more information, please contact
PROMEDICA
Dental Material GmbH
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24537 Neumünster, Germany
Tel: +49 43 21 / 5 41 73
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Medifil IX forte–glass ionomer filling material for a variety of indications

Key Features:
- Applicable for various indications and all cavity classes
- High translucency and a perfect colour adaptation
- Polishable to a high gloss
- Excellent physical properties for durable fillings
- High filler content
- Packable consistency
- Also available as Composan LCM flow

Light-curing micro-hybrid composite
- Applicable for various indications and all cavity classes
- High translucency and a perfect colour adaptation
- Polishable to a high gloss
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- High filler content
- Packable consistency
- Also available as Composan LCM flow

Glass ionomer filling material
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When is too much light a bad thing in dentistry

By Hu-Friedy

The problem most hygienists don’t realize: Glare

Dental hygienists rely on two senses to detect calculus: tactile sensitivity and direct observation. Take one away, and hard-to-access areas are bound to be overlooked, leading to incomplete deposit removal.

This is why we strive to strengthen our two key senses as much as possible, turning to instruments that give us better tactile sensitivity and an array of lights, lenses and mirrors to improve our vision.

One would think the more light, the better the view, right? That’s not necessarily. When light bounces off reflective surfaces and into our eyes, it can make it harder to see minute details intraorally. And that can be a problem.

The problem with glare

Practical experience tells us there can be such a thing as too much light. If you’ve ever driven into the sun in the early morning or late afternoon, you know all too well how blinding light can limit your vision. Commutes at these times of day can become a driving nightmare as you squint, adjust your visor, and avert your gaze to avoid the sun’s rays. The moment the sun dips below the horizon is like sweet relief.

This demonstrates how unwanted, undirected light can become distracting visual “noise.”

The impact of glare – reflected or refracted light – in dental care deserves more study. But what is clear is that there is a lot of light bouncing around the typical dental operatory.

The light emitted by overhead lights and headlamps is stronger than ever, and banks of bright halogen bulbs illuminate many dental offices.

All this light can reflect off traditional metal instruments, limiting visibility. The next time you provide dental treatment, notice how often you shift your position to get a better view. The constant movement can add up, in terms of how long it takes to treat each patient and in the stress you inflict on your body.

Every dental professional is already at risk for developing maculopath- etal issues, the DentistryIQ article reports, “The ability to work with a high level of accuracy and improved control reduces treatment time and operator fatigue.”

Glare may be more than a visual nuisance. A recent DentistryIQ article pointed out that eye problems are the third most reported occupational health issue among dental professionals. Better vision promotes better posture (which is one reason loupes are recommended for practitioners over 40), the age when our ability to focus up close begins to degrade.

A 2017 study published in the Journal of the Tennessee Dental Association notes that the “white” LED headlamps gaining popularity with dental practitioners actually emit a combination of green and blue light. The hazards of retinal damage from blue light are well-documented, the study’s authors note. They also point out “the effect of high-intensity light reflective glare and magnification back to the practitioner’s eyes” is unexamined.

Reducing glare from mouth mirrors

Mouth mirrors are multifunctional instruments used in nearly every dental procedure. Mirrors are essential for visual inspection and oral examination. But a mirror can also be a significant source of glare.

Traditionally, mouth mirrors are held in place by stainless steel handles. Metal can be highly reflective, producing glare that obscures visibility.

Hu-Friedy has designed a new mouth mirror that addresses this issue. The new HD Black Line Mirror head and handle are coated with a durable matte black Diamond Lake Carbon coating, which reduces glare up to 80% compared to shiny stainless-steel instruments. The matte finish cuts down on glare, while the black color provides better visual contrast in the mouth, and front surface mirror glass that offers the same brightness does not increase glare and instead facilitates a sharper, distortion-free image for quicker and more accurate visual inspection.

Ultimately, light can be a friend or a foe to a dental hygienist. When unfiltered and uncontrolled, light becomes glare that can impede your vision and make it harder to do your work. But armed with the right tools, you can marshal the focused light you need to provide superior care for your patients.

* Data on File.

Follow us on:
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To learn more about HD Black Line Mirror, visit www.hu-friedy.eu or contact our local distributor.

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E-Mail: info@hu-friedy.eu
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Extracted article from the book: Logical - A clinical approach to occlusion
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Discover more!
www.HuFriedy.eu/Calibra
Three possible steps into a digital workflow

By Dentsply Sirona

Intraoral scanners are now becoming commonplace in dental surgeries, as dentistry moves increasingly towards a fully digital workflow. Impression-taking has long been recognized as one of the more uncomfortable experiences for patients and a time-consuming process for dental practitioners. However, thanks to digital intraoral scanners such as the revolutionary Primescan® and well-established Omnicam from Dentsply Sirona, alongside major developments in CAD/CAM technologies, the digital workflow is now revolutionizing the standards of restorative treatment.

Dentsply Sirona aims to help dental professionals streamline their workflow through three digital workflows. We refer to these as 1) seamless, 2) validated and 3) open, enabling end-to-end management of hard- and soft-ware as part of planning for specific restorative treatment. The aim is to provide clinicians with the insights to make informed decisions for their patients across all dental specialties.

When planning for implant restorative treatment, choosing a digital intraoral scan with Primescan, you can send the scan directly to your preferred laboratory partner to obtain a patient-specific CAD/CAM abutment. An alternative workflow in this context is using the validated workflow, in which the digital workflow is designed to ensure specifications for instance, having taken an intraoral scan with Primescan you can send the scan directly to your preferred laboratory partner to obtain a patient-specific CAD/CAM abutment. The validated workflow works to the total choice and flexibility. After taking an intraoral scan with Primescan, the clinician can export an open STL file and use it on any equipment and workflow options included. CAD/CAM design and manufacturing in practice, outsourcing to any chosen laboratory or milling centre as well as collaborative implant, orthodontic or restorative treatment planning.

Primescan opens doors

Designed to support a range of digital workflows, Primescan offers the choice of seamless, validated and open transfer options. The 3D data can be further processed using software as part of planning for specific treatment areas including dental crowns and bridges, and guides for dental implants.

Thanks to Primescan’s unprecedented accuracy, powerful processing speeds and ease of use, not only is the taking of digital impressions now much faster, but every step along the preferred digital pathway is integrated and efficient. Transparently priced, open, validated and future-proof, Primescan is your exciting first step into any digital workflow.

NEWS
Dental Tribune Middle East & Africa Edition | 5/2020

By Dental Tribune USA

CHICAGO, ILL., USA: According to a new policy from the American Dental Association, point-of-care testing to screen patients for chronic diseases and other medical conditions, including COVID-19, that could complicate dental care or put the patient and dental staff at risk is within a dentist’s scope of practice. “Yet currently, rapid and reliable COVID-19 tests are not available to dentists for in-office use, which makes no sense,” states ADA President Dr. Daniel Klemmedson.

Klemmedson, who holds degrees in both dentistry and medicine, points out that dentists are doctors of oral health. “It is well within dentists’ scope of practice to screen patients for chronic health conditions as part of their medical care for dental procedures such as biopsies, for diabetes, and screen for chronic or infectious diseases, saliva gland function and oral cancer.”

In addition, according to 2019-2016 data from the U.S. Centers for Disease Control and Prevention, 7.7% of people (282 million) reported having seen a dentist in the previous 12 months but no other medical professional.

“With dental practices reopened across the country, dentists are already screening patients for signs and symptoms of COVID-19, and referring patients for appropriate medical follow-up when indicated,” Klemmedson said. “Unfortunately, such screening alone will not identify all individuals who are infected. Identifying infected patients is key to being able to protect both patients and dental team members from exposure to the virus.”

According to the ADA, it makes sense for COVID-19 point-of-care testing to be offered by dentists.

ADA supports point-of-care COVID-19 testing by dentists

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Adhesion Composites, Anterior Composite Restorations & Rubber Dam Isolation | Composite Veneers | Posterior Composites
Minimally Invasive Veneer Preparations

Module 3 | 22-25 January 2021 | Prof. Paul Tipton, Dr. Adam Toft & Dr. Ashish Rayarel
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Minimally invasive endodontics: challenging prevailing paradigms

By A.H. Gluskin, C.L. Peters and O.A. Peters, USA

The primary goal of endodontic therapy is the long-term retention of a functional tooth by preventing or treating apical periodontitis. However, there are many other factors that impact endodontic outcomes such as the quality of the restoration and structure of the remaining tooth after root canal preparation. Contemporary research efforts are currently directed to better understanding dentin behaviour and structure during aging and function. An alternative approach is to minimise structural changes during root canal therapy, which may result in a new energy that can be labelled ‘minimally invasive endodontics.’ This review addresses current clinical and laboratory data to provide an overview of this new endodontic paradigm.

Introduction

Technological advances in optics, instrumentation, materials, robotics, and computer systems over the last decades have introduced new strategies and possibilities to the medical profession. These innovations are clearly beneficial to patients by dramatically improving morbidity and mortality outcomes associated with many surgical procedures.

Compared to medicine, such a shift to a non-invasive approach to surgery in dentistry has been more moderate and cautious, perhaps with the exception of endodontic and periodontal microsurgery. It is difficult to directly compare operative procedures done to the human body and those done on a tooth; however, a rational approach to dental procedures aiming to remove or reverse disease should be used to conserve maximum structural integrity. This in turn has the potential to increase restorative prognosis for any given tooth.

Preserving structural integrity. It is apparent that remaining structural integrity of the tooth (Fig. 1) is a key factor that determines prognosis as it relates to future function of the tooth after restoration. Maintaining strength and resisting structural deformation becomes the recognized goal of all restorative procedures, especially in endodontics. Appreciation for the biomechanical behaviour of dentin, as the limiting strength factor of any restorative complex, requires the recognition that dentin is weakened uniquely by our restorative procedures.

More than two decades ago a study was designed to compare the impact of endodontic versus restorative procedures on tooth strength. The study identified approximately 20% loss of tooth strength with each prepared surface. These findings highlight that marginal ridges are a key factor in retaining tooth strength.

Another fundamental understanding of dentin behaviour within remaining structure comes with the abandonment of the widely held clinical perception that endodontically treated teeth are more brittle and hence more vulnerable to fracture. An early investigation demonstrated moisture loss of 5% after root treatment gave credence to this hypothesis. While animal models have some limitations to human, there is currently an abundance of studies in human teeth showing that the den- tin properties of endodontically treated teeth do not differ in any meaningful way from those of sound dentin.

Conversely, the predominant reason that endodontically treated teeth are more prone to fracture relates more than any other attribute to the structural loss of those root treated teeth. The study identified approximately 20% loss of tooth strength with each prepared surface. These findings highlight that marginal ridges are a key factor in retaining tooth strength.

Unfortunately, structural loss alone cannot answer every clinical ques- tion that relates to dentin failure. The fracture behaviour relates the rel- evance of fatigue as a main mechanism for tooth fracture and the resistance of dental tissues to both the initiation and propagation of cracks is an important research area. Recently, investigations have focused on the influence of various factors such as irrigants and medications on dentin and post and core restorations and the results of age-related changes in dentin.

Biomechanical behaviour of dentin

When endodontically treated teeth fail, the failure function that outcome is determined primarily by two attributes. Those causes stated most simply are: (a) the degree of stress experienced by the tooth under load, and (b) the inherent biome- chanical properties of dentin itself. Recently, these studies show minimal dehy- dration effects from pulpal removal and demonstrate biomechanical behaviours in strength and toughness testing that are similar to vital dentin.

Unfortunately, only a minimal number of long-term controlled clinical studies are available to assess the relationship between restoration, especially with posts, tooth fracture (Fig. 2) and the biomechanical behaviour of re- stored teeth. Within the confinements of bench top research, experimental evidence compels us to utilise ‘best practices’, yet our long-term data re- mains incomplete. The mechanical demands of human masticatory forces create an endless number of impacting variables and only those long-term clinical outcomes remain the gold standard for evidence.

Teeth that physically fail through a vertical or unintentional root fracture do not have to undergo endodontic treatment to experience this outcome. It has been demonstrated in the dental literature that all teeth, especially molars, can fracture without any endodontic treatment, and while some states this is not a com- mon finding there are others who declare that the incidence is under- reported. However, when fracture occurs, it will inevitably have a dev- astating effect on both the periodon- tal attachment and the bone adja- cent to the fracture. Once a fracture begins in the root and continues it is characterized by involvement of the root canal in the fracture pro- gression, bacterial contamination of the failed section, food-debris, cements, necrotic tissue and bacteria, as well as inflammation associated with a reactive periodontium. Studies in- volving Chinese populations have reported that fractures may occur within teeth with vital pulps in individuals with excessive or repetitive oral chewing habits. This is in agree- ment with Yeh who also suggested heavy masticatory forces as a cause for root fracture. In addition, root fractures seem to be more prevalent in seniors and male populations, pre-existing attrition is often a com- ponent of the condition.

Minimally invasive access strategies

Root canal anatomy and the com- plexity of human pulpal systems provide significant challenges for endodontic therapy. The first prior- ity of effective therapy is to access the pulp chambers of teeth with ‘straight- line’ access to the orifice(s) of the root canal. Access cavities were to be prepared and expanded so that their smallest dimensions were dictated by the separation of the orifices on

Fig. 1 Undue dentin removal during access preparation (in tooth 16). (a) Post-operative periapical radiograph. (b) Pre-operative periapical radiograph. (c) Compare build-up with fiber post in the pulpal cavity after completion of the root canal treatment in tooth 16.

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the pulp floor and their widest dimensions were at the occlusal. In this era of enhanced lighting and magnification, as well as highly flexible rotary instruments, this approach to a doctrinaire access paradigm is being questioned as perhaps overly invasive of the tooth and an approach that may condemn a tooth to structural failure.22,23

Recently, maintaining structural integrity of the peri-cervical area of the tooth (about four mm above and below the alveolar crest) has been emphasised. Maintenance of the peri-cervical dentin (PCD), especially in molars is felt to be critical to their long-term survivability and optimum function.23 Some argue that in treatment planning for endodontics, on a molar tooth especially, clinicians must consider the significantly higher overall compressive forces that create a situation requiring a different set of rules for the calculation of ferrule, post and core design, resistance to fracturing, and most importantly, endodontic access (Fig. 3) and removal of radicular dentin during endodontic shaping.23

In keeping with this philosophy of minimal invasion of bulk dentin structure, the use of round burs and Gates-Glidden burs is now discouraged. While both of these types of instruments have been essential in endodontics for decades, they are now recognised as instruments that commonly gouge the endodontic access and the coronal third of the root canal (Fig. 4), those areas adjacent to the cemento-enamel junction (CEJ) of the tooth with critical structural prerequisites. Gouging of the access and coronal canal space must be avoided in order to preserve maximal resistance to structural flexure and ultimate failure.24 By directing the conservation of dentin and protecting dentin above and below the PCD the practitioner ensures a more viable and proven method to reinforce the endodontically treated tooth. No man-made material or technique can compensate for tooth structure lost in those key areas.

Shaping the root canal space

Root canals are sometimes depicted as smooth hollow tubes that are more or less tapered in shape. These misleading images do not reflect the intricate anatomical structure and complexity of root canal systems. They are often asymmetrical or oval in cross section, they branch, dilate and divide and the canal walls show concavities and convexities.24 Complex root canal anatomy should be considered one of the most significant challenges in creating root canal shapes that will support good obturation outcomes and leave sufficient remaining strength in the root. After biomechanical instrumentation, the completed root canal shapes need to withstand the internal compressive forces of obturation; provide sufficient resistance form to contain softened and compressible filling materials and retain enough strength for mastication (Fig. 5).

In a series of morphometric measurements on anterior and posterior teeth, Kerikes and Tronstad25–27 found a wide range of measurements at the apical constriction of all teeth, thus creating two separate philosophies for practitioners, each focused on its own set of evidence-based protocols supporting a position on how to clean these apical diameters and ultimately shape the root.

In another study that questioned our understanding of the true horizontal diameters necessary to clean the terminus, Jos et al.28 coined the term ‘working width’ to alert clinicians to the critical need to understand the horizontal dimension of apical size and its clinical implication in cleaning the apical terminus.

Consequently, current shaping strategies employed by today’s clinicians align with two general trends in contemporary endodontic practice. A significant number of practitioners believe that enhanced apical instrumentation and larger apical diameters with minimal taper in the canal shape leads to weakening of the root structure and a loss of control over the obturation component of treatment. They advocate smaller apical preparations, continuous taper, and...
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a preparation that promotes resistance form, a tight apical seal and a conservative approach to creating sufficient shape for adequate disinfection (Fig. 6). Smaller apical sizes preserve dentin. The arguments are strategic and technique-driven, albeit often supported by inferred outcomes. The impetus for smaller apical sizes has been directed at the disconnection and obturation phase of endodontic therapy.20

On the other hand, there is a significant body of literature that presents evidence that larger apical canal diameters (Fig. 7) are important to shape the apical canal wall, flush debris, allow deeper irrigation to the terminus and decrease remaining bacterial contamination in the system.19,20 Studies vary on which size diameter will accomplish maximum cleaning. Some researchers have suggested file diameters ranging from #35–#45 to accomplish significant bacterial reduction. Others have shown that minimal sizes can accomplish this task as adequately as larger diameters.19,20 What is remarkably clear from the evidence is that no matter which school of thought one ascribes to, it is not possible that any apical preparation technique will render the terminus entirely free of bacterial contamination in an infected canal.21

In essence, structural considerations in shaping continue to remain a compelling argument for conservative shapes. Weine et al.22 and others23,24 have described and elucidated the structural damage and preparation errors that can occur while shaping root canals with stainless steel instruments to large sizes. Transportation, ledging, apical perforation and loss of the original canal position are all well recognized shaping errors that often lead to loss of working length, ledging and damage to the apical terminus leading to weakening of the root structure at its most fragile levels.25

There is now a large body of conclusive research quantifying the use of rotary and hand nickel-titanium instrumentation, who report that the use of this super-elastic metal alloy offers less straightening and better centered preparations compared to traditional stainless steel instruments in preparing the wide range of anatomical variability seen in teeth.26,27,28

These studies have focused on the geometry of shape produced by these instruments alone or in combination with stainless steel, including corrosion, taper, flow and maintenance of original canal position. Most of these studies have recorded the degree of change from original position and have measured the loss of original canal positions based on the definitions by Weine.29 In comparing stainless steel versus nickel-titanium, researchers have focused on both the mechanics of the systems and the systems themselves.30,31 Collectively these studies suggest that Nickel titanium technology alone or in combination with the conservative use of stainless steel instruments provides shapes that are better centered, maintaining the original canal positions with greater conservation of dentin and safer radicular preparations.

Dissection and other considerations in minimally invasive endodontics

In order to address the microbiologic anatomy of endodontic disease, that is, periradicular inflammation, disinfection is and will always remain, a key element of the overall treatment strategy. At first glance, any minimally invasive approach to root canal treatment is at conflict with dissection. Microbiological studies in vitro, however, do not provide a definitive answer as to the required preparation size for antimicrobial efficacy. Table 1 shows selected studies suggesting a wide range of apical sizes. More recently a clinical study reinitiated the notion of a preparation ‘three sizes larger than the initial size’;66 however a large clinical data set does not support an even greater canal shape as being associated with apical healing67 or retention of a root canal-treated tooth.32,33

Current cleaning and shaping methods appear to be unlikely to predictably remove all biofilms from the root canal system. Therefore, and particularly under the conditions of smaller apical preparation sizes, the search continues for techniques to enhance irrigation efficacy. The possibilities for physical means that enable enhanced disinfection vary from ultrasonic to sonic activation to including laser activation.34,35

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Despite the general trend towards specialization, the majority of patients want holistic treatment from their family dentist. It therefore goes without saying that the practice of today should also offer implantology and oral surgery. Anyone who has dealt with implantology and oral surgery, wants to expand their intellectual and manual spectrum. One should not immediately push oneself to one’s limits, but rather subject oneself to a well-founded scientific learning process.

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ENDODONTICS

Fig. 7 Tooth 36: preparation of short canals to an apical size 55 (mb, ml size 55, size 70) in an attempt to be antimicrobially effective.

Fig. 6 Tooth 86: extremely long roots makes minimal preparation size a good strategy. Case by Dr Jordan West.
In the absence of adequate models for clinical outcomes, only direct clinical studies assessing root canal treatment to bone fill and tooth function/survival will provide convincing evidence regarding canal disinfection efficacy. The effect of a modified access cavity design has only recently been investigated in extracted teeth. Using a combined micro-computed tomography and load-to-fail approach, Krüger et al. found that in premolars shaping was not impacted and load to failure was significantly higher for teeth with minimal access cavity designs. While the idea of minimally invasive endodontics has been promoted recently, there is a scarcity of independent evaluations for a strategy. For example, root canal preparations sometimes associated with this strategy such as V: Taper (SS White, Lakewood, NJ, USA) and Endo-EZ ART (Ultradent, South Jordan UT, USA) have not been shown to actually perform in a superior manner to traditional rotary instrumentation in the laboratory. Another aspect of this discussion is the finding of micro-cracks induced by various rotary shaping procedures in canal preparation. In recent years several investigations have illustrated such micro-cracks in extracted teeth. While it is not clear at this point if such cracks are generated in vivo, it may be reasonable to develop instruments that reduce vibration and rotational stresses during intracanal procedures in an effort to lessen additional loads on a structurally weakened root.

Micro-computed tomography studies of root canal shaping have identified canal shaping outcomes but have also demonstrated that hard tissue debris is compacted into unshaped canal areas rendering them potentially inaccessible to irrigation. It is likely future root canal preparation techniques will have to focus on balancing disinfection capacity and intracanal damage with enhanced debridement and disinfection.

Restoration strategies for maximum protection and minimal intrinsic healing. Patients are not well served if the endodontic treatment is successful but the tooth fails, especially with the emergence of implants into the mainstream of dentistry and their choice as an alternative to saving the natural dentition. In extensive reviews of evidence surrounding the restoration of endodontically treated teeth, preserving intact coronal and root dentin structure, especially maintaining the peritubular-cristal松软化 effect, is considered to be crucial for the optimal biomechanical behaviour of restored teeth. Preventing the parallel walls of remaining dentin with the crown margin allows a crown that provides a protective effect by reducing stresses within a tooth. The presence of a 1.5 to 2 mm ferrule has a positive effect on fracture strength compared with endodontically treated teeth. Teeth with a ferrule of one mm of vertical tooth structure and 3 mm of resistance structure were classified as restored with teeth restored without a ferrule.93 Even if the clinical situation does not permit a circumferential ferrule, an incomplete ferrule can be considered a better option than a complete lack of ferrule.94 However, it can be generally concluded that providing an adequate ferrule lessesthe destabilising impact of the post and core systems and the final restoration in the long-term performance of restored root treated teeth.

When it comes to severely damaged teeth with little or no coronal structure, in order to provide space for a ferrule, orthodontic extrusion of the root is often performed. The evidence suggests that orthodontic extrusion is more favourable from a biomechanical behaviour of remaining dentin structure.89 If neither of the alternative methods for providing a ferrule for the restoration can be performed, currently available evidence suggests that a poor treatment outcome and the ultimate restoration of a non-functional tooth has a high probability of failing.80

Is root strengthening a possibility? The past decade has seen a considerable change in clinical strategies for using and placing posts. An advancing principle promoting minimally invasive therapy directs the normal use of post and core endodontically treated teeth. That principle, based on evidence, affirms that retaining tooth structure is more valuable than the use of a post in almost every circumstance where adequate structure exists for a ferrule. The long-term success of endodontic treatment has always been highly dependent on the restorative treatment that follows. A restored tooth must be structurally sound and the sealed state of the root canal system must be maintained. Most endodontically treated teeth today are restored with adhesive materials. Adhesive bonding provides an immediate seal of the pulpal spaces and some immediate thickening of the tooth structure. It is true that this technique is not dependent on gross mechanical retention, so tooth structure can be reduced and the likelihood of post and core fracture can certainly be termimally minimised (fig. 9). Conventional thought has been that posts do not ‘reinforce’ the root. Early restorative protocols considered this true for metal posts, but there is now a growing body of evidence that bonded fibre posts can be placed with no removal of dentinal structure, can provide the root and make it more resistant to fracture. Fibre-reinforced resin posts were introduced over 20 years ago with the promise to provide more elastic support to the core. The reduced stress transfer to tooth structure lowered the likelihood of root fracture. In addition, posts made of materials with a modulus of elasticity similar to dentin were considered more resilient; able to absorb similar impact forces, and distribute the forces of mastication in a more conservative manner to remaining dentin. These outcomes include:

- Crown and root fracture.

As practitioners of the art and science of dentistry, poor outcomes in the course of endodontic treatment should encourage reflection on the careful and prudent practice of endodontics that safeguards against unduest circumstances. Our obligation as experts is to protect patients from iatrogenic harm. This responsibility is met when we as a profession can provide advanced and sophisticated techniques in a safe and controlled manner with preservation of the dentition as an overriding priority in all aspects of our treatments.

Table 1 Summary of selected evidence in the last decade to suggest apical preparation geometry. Note the very wide variation for in vitro vs in vivo and in human vs animal root canals.

| Table 1 | Summary of selected evidence in the last decade to suggest apical preparation geometry. Note the very wide variation for in vitro vs in vivo and in human vs animal root canals. |

![Fig. 4c Adhesive build-up with acrylic plugs in teeth 13, 14, 15 as part of a full mouth rehabilitation. Restorative treatment by Dr T.M. Göhring.](https://example.com/fig4c.png)

**Endodontics**

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**Conclusion**

The causes for post-treatment loss of teeth after endodontic therapy, when the therapy itself has been successful, have been described in this article by citing many diverse authorities. The loss of a tooth after successful endodontic therapy can invariably be attributed to one or more predictable explanations. Often these sequences are clinically avoidable and the result of an approach to therapy that is far more invasive than required and curies the causes of apical periodontitis.

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**Editorial note:** A list of references can be obtained from the March 2014 issue of the British Dental Journal.
The art of a personalised smile design

By Dr Galip Gürel, Turkey; Drs Dimitar Filtchev & Georgi Iliev, Bulgaria; Dr Brasilei Paolucci & Adriano Schadyer, Brazil

Introduction

Aesthetics has become one of the most important outcomes of dental care. Regardless of the quality of the treatment, patients are seeking better-looking smiles. For many years, we, as dentists or laboratory technicians, have been using all the basic aesthetic rules in order to properly create a smile design. These rules should be fundamental to the design. At the end of the treatment, the patient should feel happy. If one can evoke this feeling with a smile design, both the dentist and the patient will be satisfied giving and receiving more than standard, well-aligned teeth. However, the final aesthetic results may often fail to meet the patient’s expectations, owing to a disharmony between the smile design and the patient’s identity. Patients’ demands and the level of information needed have driven the profession to question itself regarding the customisation of smile designs, which it ignored may lead to dissatisfaction with the aesthetic outcome, even though all the aesthetic principles and rules which tend to establish standards have been taken into account.

The mock-up

Visualisation of the smile design will have a great impact on the patient’s understanding of the rest of the treatment. It is much more powerful than only verbally explaining what will be done. Prior to initiating any treatment, it is necessary to visualise the desired outcome. It then becomes possible to formulate the steps required to achieve this result.

Mock-ups facilitate significant improvement in communicating with the patient by showing him or her the potential final outcome of the treatment and allowing an easy comparison of the pre- and postoperative situations, and mock-ups allow the clinician to be able to check the functional aspects. Whether it is a case of worn dentition that requires altering the vertical dimension or just a straightforward veneer case, the aesthetic plane of occlusion and function will be based on the length—internal edge position—and position of the anterior teeth. It is very difficult to convey the envisioned final length of the central incisors to the patient just by adding composite to the internal edges of the central incisors, thus, the patient needs to see the whole smile, including the length and position of the posterior teeth. There are different ways to make the mock-up. It can be created directly in the patient’s mouth or indirectly through a wax-up or by using digital tools.

The personalised smile design

Every human being is unique and the personalised smile design in the patient’s mouth (APT: Aesthetic Pre-evaluative Temporaries) even before the rest of the treatment is planned. No matter what clinical difficulties a dentist will face and how problems will technically be solved, if the patient does not like the final aesthetic outcome, the treatment will be considered a failure.

The visual language

The visual language knowledge applies to the main expressive elements of smile design, such as dental shape, incisal edge, interdental ratio or dominance of central incisors, and 3D positioning of the teeth in the arch, determines four smile design types with primary expression (Fig. 1):

– Strong: composed mainly of rectangular dental shapes, strong dominance, curved incisal edge and angled 3D dental positioning on the arch.

– Delicate: oval dental shapes, medium dominance, curved incisal edge and standard 3D dental positioning.

– Calm or stable: smoothly rounded square dental shapes, weak dominance, inclined incisal edge and angled 3D dental positioning on the arch.

Case presentation

The patient had short teeth and was not happy with the narrow buccal corridors and the yellowish colour of her teeth (Figs. 2a–c).

Aesthetic analysis and Rebel Simplicity

Aesthetic design can be challenging for dentists. Rebel (Vitasemile) is a recent digital previsualisation technique that allows the clinicians to:

– efficiently design the new smile;

– improve the communication between the dental team members involved in the treatment;

– obtain better communication and achieve better patient motivation;

and

– visualise the final aesthetic result even before the treatment is started.
positioned parallel to the horizon.

Figs.4a–f: The forehead and the ears of the patient should be visible. It is crucial to keep the head upright (not tilted to the right or left, or up or down). The eyes should preferably be held away from the face.

smiling

lips at rest

12 o’clock

Retracted open

Retracted closed

Fig.4a–f: The forehead and the ears of the patient should be visible. It is crucial to keep the head upright (not tilted to the right or left, or up or down). The eyes should preferably be positioned parallel to the horizon.

These are the three mandatory steps:
1. a single mock-up on a central incisor to be digitally scanned,
2. a full-face photographic protocol, and
3. a simple questionnaire

Single central incisor mock-up and intra-oral digital scanning
A composite mock-up is performed on one (or two) of the central incisors in order to identify the incisal edge position vertically and the position of the facial surface buccolingually (Fig.3). This is no different from creating any direct mock-up; however, the greatest advantage of creating this mock-up for Rebel is that the dentist does not need to concern himself or herself with the perfect design of this mock-up, meaning that he or she does not need to choose the shape of the tooth (square, triangular, rounded, etc.), the angulations of the axes of the teeth, surface texture, etc. These details of the smile design will be provided by the Rebel artificial intelligence-based software, according to the facial analysis and the personality of the patient. Therefore, this will allow any dentist at any level to start working with mock-ups and end up with high-level wax-ups.

If the dentist does not wish to make a mock-up, then he or she can alternatively write down the additional length that would be needed to be added to the central incisors vertically, and the volume on the facial aspect (e.g., 0.3 mm thicker facially). In that case, the dentist can easily relate the existing length of the tooth to the upper lip position with the help of a periodontal probe. This information should be noted (the additional length that is needed to be added to the central incisors vertically and the volume on the facial aspect e.g., 0.3 mm thicker facially) and included in the file that will be sent to Rebel.

Full-face photographic protocol
The software requires five full-face photographs for facial analysis and classification of the patient and for relation of the 3D intra-oral digital scan to the facial features. The following are the five full-face photograph types needed (Figs. 4a–f).

I. Full-face photograph in rest position
This photograph is for the automatic facial recognition process of the software, and part of the new Rebel smile design will be based on this facial analysis of the patient. Technically, it is very important that the forehead and the ears of the patient are visible. If the patient has long hair, it should be held away from the face. It is crucial to keep the head upright (not tilted to the right, or left, or up or down), preferably positioning the eyes parallel to the horizon and keeping the lips apart. The software automatically checks the required full-face photograph and sends a message immediately to the dentist if the necessary technical requirements have not been met so that he or she can retake the photograph.

II. Full-face photograph of patient smiling
Keep the patient in the same position with the eyes open and parallel to the horizon and the head upright (not tilted to the right or left, or up or down). This time, ask the patient to keep his or her lips apart in a soft smile (if possible, ensure the incisal edges of the maxillary incisors are displayed).

III. Photograph of face in 12 o’clock position
There are two simple ways of taking this specific photograph. An easy way

3D Rebel smile design plays an important role in the entire treatment planning and will guide the actual clinical treatment. This approach makes it possible to share the treatment plan among team members and to create a 3D visualisation of the case in the patient’s mouth. The digital project will be tested and approved even before starting the actual treatment. Accordingly, it will allow the dentist to present the treatment solutions.

The Rebel workflow
Rebel offers probably the simplest steps for transferring all the necessary information to the Rebel digital laboratory.
way is to keep the patient in the same position and ask him or her to incline his or her face 45° forward while giving a full smile, taking the photograph so that it shows the relationship to the maxillary central incisors and the displayed arch position to the lower lip line. The dentist can also move the patient to a supine position on the dental chair and to the 12 o’clock position, ask him or her to smile fully, and take the photograph from a 45° angle.

IV. Full-face photograph with mouth closed and lips retracted. The patient should be asked to hold the full-mouth retractors, again keeping the position of the eyes parallel to the horizon and his or her head upright (not tilted to the right or left, or up or down), and keeping his or her teeth closed and the occlusal plane parallel to the horizon.

V. Full-face photograph with mouth open and lips retracted. The same protocol as for the mouth closed should be repeated, but this time with the teeth (upper and lower jaws) separated.

Questionnaire. An interview to reveal the character and the personality of the patient is completed through a questionnaire available in the software and gives the dentist the primary and complementary characters of the patient (Fig. 5). The temperamental type of each individual is defined by a unique combination of diverse characteristics of the four main temperaments, and therefore, for a precise and practical evaluation, it is necessary to apply a specific questionnaire.

As the dentist is about to send the three mandatory files, he or she will also be asked to include for the Rebel digital laboratory, a description of the clinical case regarding any specific designs, such as the buccal corridors and perfect imperfections, and the intensity of the surface texture, or choose some of the optional features provided if needed. When the entire Rebel workflow has been completed, the software will guide the dentist to exit, and at a click of a button, the file will immediately be sent to the Rebel digital laboratory via e-mail.

Rebel digital laboratory. It has a very sophisticated simplicity, owing to a very complex software behind it which enables the dentist to do the most simplistic, yet most predictable and personalised, 3D wax-up. For every level of dental practice, reproducible and accessible to all professionals, a concept for smile design customization was developed by Paolucci et al. The concept, called “Visual Identity of the Smile,” arose from the association of different knowledge such as aesthetic and functional dental fundamentals, artistic visual language, facial recognition and personality typology. For the objective application of this concept, the Rebel software was developed (Figs. 6a-d).

Rebel software is able to perform facial reading, personality assessment and personal preference evaluation of each patient and convert that information into mathematical language. Through pre-programmed algorithms, an initial 2D smile design is created. The software is capable of transforming this 2D smile design into a 3D customised model automatically. The model generation is performed by a custom 3D library, developed specifically for Rebel simplicity. Every model is personalised according to the proposed tooth configuration.

The Rebel system is actually a virtual laboratory that converts the 2D design into 3D and creates a digital wax-up immediately. The 3D design is created by relating the facial perception and the personality of the patient to the smile design, by applying algorithms for computing the optimal combination of the incisal figuration, tooth axis, dominance of the central incisors and the combination of individual tooth shapes out of thousands of possibilities. It may sound complicated; however, it is the simplest way of creating one of the best 3D digital wax-ups possible. Rebel employs very sophisticated artificial intelligence based software with algorithms, however, it provides great simplicity to the end users, the dentists and dental technicians (Figs. 6a-d).

Back to character/3D printing. This STL file is then sent to the dentist via e-mail, ready to be 3D printed (Figs. 7a-d).

Tooth preparation through the Aesthetic Pre-evaluative Temporaries. The design of the APT (Aesthetic Pre-evaluative Temporaries) creates a very solid reference for the tooth preparation. With the use of a depth cutter, the dentist can start prepar-
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Figs. 8a–d: In the same way, the laboratory can produce these veneers digitally by milling or using pressable ceramics or utilising feldspathic veneers. In this case, the material chosen was the IPS e.max Press pressable ceramic (Ivoclar Vivadent), after one-third incisal cut-back and feldspathic porcelain applied on top with the micro-layering technique and bonded to the teeth.

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Remover
for HyFlex and MicroMega file systems

- One file to remove the root filling material
- Respects the root canal anatomy
- Efficient without any solvent
- Safe thanks to non-cutting tip

The essential piece for your retreatment
the researchers concluded without a deficiency. Given these results, the researchers concluded that vitamin D levels in participants could have increased their susceptibility to the virus.

"Our study has shown that there is an increased risk of COVID-19 infection in healthcare workers who are deficient in vitamin D," said co-author Dr. David Thickett, professor in respiratory medicine in the Institute of Inflammation and Ageing at the University of Birmingham in the UK, in a press release. "Our data adds to the emerging evidence further demonstrates the potential benefits of vitamin D supplementation in individuals at risk of vitamin D deficiency or who are shown to be deficient in a way to potentially alleviate the impact of COVID-19," he added.

A similar study conducted at the University of Chicago Medicine in the US examined 489 patients, whose vitamin D levels had been measured within a year before being tested for SARS-CoV-2. The researchers found that patients who had untreated vitamin D deficiency, that is, less than 20 ng/ml of vitamin D in their blood, were almost twice as likely to test positive for SARS-CoV-2 compared with patients who did not suffer from vitamin D deficiency.

"Vitamin D is important to the function of the immune system and vitamin D supplements have previously been shown to lower the risk of viral respiratory tract infections," commented lead author Dr. David Meltzer, Fanny L. Pritzker Professor of Medicine at the University of Chicago Medicine, in a press release. "Our statistical analysis suggests this may be true for the COVID-19 infection."

"Understanding whether treating vitamin D deficiency changes COVID-19 risk could be of great importance locally, nationally and globally," he said and added that vitamin D is cost-efficient, generally considered safe to take and can be widely scaled.

Taking vitamin D supplementation— Is it necessary?

Expert in senior care pharmacy practice, Dr. William Simonson from the College of Pharmacy at Oregon State University in Corvallis in the US noted in a recent article that, as SARS-CoV-2 is a new virus, the link between vitamin D and SARS-CoV-2 prevention is still highly speculative, as is the case with other treatments. However, he believes that there is “sound reasoning behind this speculation”.

Bodies such as the UK’s Scientific Advisory Committee on Nutrition, National Institute for Health and Care Excellence, and Royal Society have recently published reports in which they advised adhering to the current recommended vitamin D daily intake for overall health and as a possible precaution against the virus. To maintain the optimal level of vitamin D in the blood, the National Health Service advises taking a 10 µg supplement of the vitamin a day.

The UK study, titled “Vitamin D status and semiconversion for COVID-19 in UK healthcare workers who isolated for COVID-19 like symptoms during the 2020 pandemic”, was published online on 6 October 2020 in MedRxiv.

The US study, titled “Association of vitamin D status and other clinical characteristics with COVID-19 test results”, was published online on 3 September 2020 in JAMA Network Open.