

# DENTAL TRIBUNE

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## Interview: “A hybrid model of the latest digital tools and face-to-face interaction represent the future of dentistry”

By Dental Tribune MEA

Dental Tribune MEA had the pleasure to interview Markus Sebastian, SVP and MD of Align Technology EMEA, during his recent visit to Dubai, United Arab Emirates. The interview takes a look at the company's operations in the Middle

East, the announcement of the opening of the first manufacturing facility in EMEA region as well as their recently announced innovations and regional plans.

Angelo Maura, general manager, Middle East and Africa of Align Technology was also part of the interview,

covering the recently published whitepaper on the Digital Shift in the Orthodontic Industry.

Markus, welcome once again to Dubai, UAE. How has Align Technology performed so far this

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Markus Sebastian, SVP and MD of Align Technology EMEA

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year in 2021, both globally and in the EMEA region?

**Markus:** Looking at our Q1-3 2021 performance, we have done well in the EMEA region, with the growth being driven by markets, such as Spain, France, the Netherlands and Germany. A few countries did very well in the first part of the year compared to last year and we can attribute this to the acceleration of the digital treatments during the pandemic - for obvious reasons. Globally, we have announced numbers for the third quarter - and we did very well as an organization. For the Q3 2021, total company revenues were up 38.4%, year-over-year. It has been a strong quarter for the company, with 11.6 million patients treated to date. We couldn't have achieved it without over 200,000 Invisalign trained doctors globally - dentists and orthodontists - their passion and commitment for transforming smiles and changing lives of their patients.

What is remarkable is how we did on the scaling side: digitalisation really moved up significantly on everyone's agenda. That's one of the reasons why iTero scanners were in high demand during the first three quarters of the year - everywhere globally, but especially in Europe. With this continued trend towards digitalisation, it is becoming more important for dentists to consider digitalisation for the future of their practices, and patients - also in the Middle East.

You recently announced the development of Align's first manufacturing facility in the EMEA region - how will this impact business and how do you envisage it providing additional support for Drs in this region?

**Markus:** This is another attempt by Align to get closer to dentists and orthodontists here, in the EMEA region - as part of our global operational expansion efforts. Three years ago, we moved three operational centres,

where ClinCheck treatment planning is done from Costa Rica to Europe—Germany, Spain and Poland. This year, we also added a treatment planning facility in France. We are continuing this trend of regionalisation, so that we can be present in all the major markets in the future with dedicated centres.

Aligner fabrication also plays a major role for us in order to be much closer to dentists, which obviously has a number of advantages. We plan to open the manufacturing facility in Wroclaw, Poland in 2022, and over time, manufacture all our aligners for EMEA doctors from the new facility. It's a major investment for Align Technology, with our plans to add over 2,500 jobs over the next few years.

Has the pandemic hindered these plans?

**Markus:** The pandemic actually did not hinder the process as such - we were lucky to be able to continue with the original planning and preparations, despite the lockdown.

We started the construction earlier this year, after we announced that we are going into Poland with clear aligner fabrication, and we plan to be ready in early 2022. I'm confident that we will be up and operating from Poland in the first half of the year - according to the progress the team is making.

Here, I would like to recognise our operations team, our vendors and officials for their support and commitment to make this project happen.

During the pandemic, what measures did you take to help doctors and patients navigate the challenges they were facing?

**Markus:** First of all, we introduced an immediate recovery programme for dentists and orthodontists. We also introduced a couple of educa-

## “The affect of the pandemic on dental practices has demonstrated the importance of digitalisation in practices.”

tional activities to help keep businesses running. In some markets, dental practices were closed for several months, so we introduced the Invisalign Virtual Appointment tool through a platform called Smile Consult, in order to give them the opportunity to connect with their patients virtually, during a time when access to the practice was limited or not allowed. We also put a lot of emphasis on the education and used this time to enlarge our footprint in education in order to help build doctors' confidence in handling and using our products in their day-to-day practice.

We increased our investments significantly during this time, because we knew that this was needed by dentists and orthodontists. Honestly, we focused and listened very carefully to our customers to show empathy in this new situation, as well as understand what they needed the most - and the need was obviously different from country to country.

Also, the measures in place and the impact of the COVID-19 pandemic were very different across the regions, however we have taken the necessary measures to be able to provide the best service for our dentists across the board, and I think the relationship has become even closer in the last year.

We analysed the feedback from Invisalign trained dentists, and we are very happy with the feedback we have received, but we always know we have to do better each time. There is never a point where I would say we have reached all our objectives, because we still have a lot of opportunities to train more dental professionals, make clear aligner therapy available to more consumers - and to help dental practices operate better. Doctors are at the centre of everything that Align does, and doctor-led therapy is essential to treating patients with great outcomes and in a safe way.

Concerning risks, the direct-to-consumer segment poses a considerable risk, and therefore we want to strengthen the dentist in order to cope with the situation and to give clear arguments that the quality and outcome of the treatment of a dentist-led process are the best ones possible. Our aim is to support them in the best possible way.

Align Technology is known for accelerating new technology innovations. Can you tell us about some of the key innovations that distinguish within the industry?

**Markus:** I was at IDS (Dental industry and Dental trade fair) in late September, and our approach was different this time, which is probably the future of the way Align will be present during these kinds of meetings.

We did a hybrid model: we had a big booth of over 600m<sup>2</sup> there and a live studio, where we had a lot of interviews, meetings, educational sessions, and presentations by dentists and by internal staff. We had over 20,000 dentists sign into our digital broadcast, and up to 8,000-10,000 dentists watched the sessions live every day. This international meeting, as you know, is the biggest

dental conference in the world, and many dentists from Asia and from America joined the sessions—that's our future!

Everything at IDS was focused mainly on two products: iTero intraoral scanners, especially our new series, the iTero Element Plus series, which we launched in the beginning of the year, and the Align Digital Platform. We connected all the dots, all the different opportunities with exocad and with the restorative element as well as the orthodontic element and the possibility of even combining both. That's really the opportunity for us in the future. We are concentrating a lot on the digital platform to explore the opportunity of the digital practice more in the future for our dentists.

The next question is for Angelo. Align recently released a white paper in the Middle East around digitisation and patient care during the pandemic, why was this developed and what were the key findings?

**Angelo:** The story behind it is that we really wanted to understand how the behaviour and how the attitude of the public and of dentists has shifted because of the pandemic. Teledentistry has always been here, but what happened with COVID-19 was that it accelerated the adoption of teledentistry because it had become necessary and no longer optional.

We wanted to understand more, so we did two things. We ran a YouGov survey for 1,000 respondents, half from the UAE and half from Saudi Arabia, from different walks of life, with different demographics and in different geographical places. We also ran round-table discussions with some of the biggest key stakeholders in the region, such as Dr Mubarak Al-Saeed from Kuwait and Drs Reem al-Ansari and Suliman Shahin from Saudi Arabia. We asked how their attitudes had changed towards teledentistry, digital, and remote care. These individuals formed the Align Technology Advisory Council, upon which the white-paper we developed was centred.

When it came to the research, we found that, even though only a third of prospective patients used digital tools to connect with their dentist during the pandemic, 78% of them said that they found it convenient - and even more convenient than before. Almost all of them said that they would like to keep using it also after the COVID-19 pandemic. On the dentists' side, it was not only because they found it convenient; it was also because they found it more efficient, because it meant that they could see more patients in less time.

One of the things that we spoke about as part of the Advisory Council was the value of a face-to-face interaction between the dentist and patient. The dentists advised that we keep pursuing digitalisation of tools, but without completely doing away with the importance of physical interaction. They have appreciated our digital interaction tools

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Angelo Maura – General Manager for MEA at Align Technology

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that Markus mentioned, the virtual tools and visualisation tools on the scanner and so on. Another key topic that arose was the call for more agility among peers to be robust in the face of change, and in order to be robust in the face of change, it is fundamental to implement a digital workflow in the practice, because of the repeatability of the treatment, the quality of the treatment, the ability to communicate better with the patient and visualise the outcome for the patient. They found that to be very important. In conclusion, the dentists all agreed that there is a need to strike a balance between the important dentist-led treatment and face-to-face interaction, as well as the use of digital tools in order to be more efficient and more convenient; at the end of the day it is a win-win situation for both doctor and patient.

Our next question is for Markus. As tele dentistry has become an increasingly accepted form of patient doctor interaction, what role do you think tele dentistry can play in the future of the dental sector?

**Markus:** I think the outcome of the white paper answers this question. A hybrid model of the latest digital tools and face-to-face interaction represent the future of dentistry. Dentists will use the opportunity to choose the capacity in their practice for those patient cases who must attend in person and to do all consulting virtually and digitally in the future. That's something that is highly likely in the years to come. The question is who will be doing this first and who will be exploring the opportunities best. It is all about the capacities and the drive of individual dentists to make that change. Once they do, things will become more efficient for both dentists and patients. We also must not forget the human and logistical elements of this: patients have to travel to get to their dentist's practice, they have to find parking space - it takes some time. Doing this from home or from where you are,

even at work, is so much easier and more convenient for patients and the outcome of efficiency for dentists is even better.

**Do you think patients will still be inclined to continue opting for teledentistry in the post-COVID era?**

**Markus:** Well, it depends on what we all learn from the entire pandemic. If we go back to square one, to where we were in February 2020, then obviously not - but I don't think this will be the case. The pandemic has taught us a couple of lessons. It has taught us that we don't have to travel like we did in the past, for everything we need; it is possible to stay connected in other ways. The same is true for treatment. Of course, there are many treatments that have to be done in the practice—there is no doubt about it—so we are not talking about 100% teledentistry, but there is a certain amount which can be shifted, which can be done also at a time when practices are not open. Many people who are working, who are busy, can't come during normal practice times, and it is just more convenient for everybody involved.

**Going back to Angelo, what are your plans for the region in the coming years?**

**Angelo:** Like Markus explained, the affect of the pandemic on dental practices has demonstrated the importance of digitalisation in practices. In a nutshell, this is the same objective that we will have in the region like we have globally. We will keep driving towards that kind of digital shift that we know will continue to benefit patients and dentists. To talk specifically about the region, there is a huge drive towards the 2030 visions that are common in the UAE, Saudi Arabia and other countries in the Gulf Cooperation Council region. A key objective of these visions is the advancement of digital and artificial intelligence, and this of course applies in healthcare as well. This is where Align Technology can play a

role. We will keep working in unison towards these visions to help dental practices move towards digitalisation and keep educating practices on the importance of treating malocclusion as the basis of oral health. We will also continue expanding the reach of our treatment, especially concerning growing patients, and expanding to adjacent restorative opportunities. This is going to be our direction for years to come, as we continue our geographical expansion.

**Markus:** The Middle Eastern region is still very young for us, yet it is one of our most important areas of focus and growth. Our investment will continue and will increase in the future because we are just at the starting point in the Middle Eastern region.

**Can we expect any new products to come out soon?**

**Markus:** We are investing a lot in research and development. We are working on a number of improvements of our products and services which will help our dentists use ClinCheck software in their every day practice, and to speed up the process from the moment the patient has the initial visit with their dentist - to the moment they receive their aligners. Regarding aligner fabrication, it is all about reducing the time from the first scan to when the dentist gives the patient the full aligner set. We are working hard to achieve this. On the iTero side, we will continue to improve our offerings to make sure we continue to offer high scanning accuracy, including in 5D.

Thank you both Markus and Angelo for your valuable inputs and timings. **DTI**

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# New minimum wage for Saudi dentists from April

## By Jeremy Booth, Dental Tribune International

**RIYADH, Saudi Arabia:** As part of an ongoing shake-up of its dental industry, the government of Saudi Arabia has established a minimum wage for dentists working in private practice. The move is part of sweeping changes to the kingdom's labour laws, aimed at creating stable job opportunities for citizens of the western Asian monarchy.

From 11 April, the monthly minimum wage for dentists will be SAR 7,000 (€1,640). A minimum wage will also be established for certain other healthcare areas, including pharmacy, radiography and physiotherapy. The changes are part of a broader set of adjustments to Saudi labour laws and are known as the Nitaqat—or Saudisation—programme.

Announced in October last year, the

programme aims to reserve 60% of jobs in private dental clinics for Saudi nationals in order to create more jobs for them and to expand their participation in the labour market. According to Saudi Gazette, the re-jigging of healthcare employment regulations will create 8,500 jobs for Saudi nationals.

Only dentists who are paid at least the minimum monthly salary and who have obtained professional ac-

creditation from the Saudi Commission for Health Specialties will fall under the Nitaqat programme.

Dental Tribune International understands that the minimum wage will not apply to dentists working in government-run dental settings, where jobs are typically highly sought after and well remunerated.

Arab News reported in October last year that Saudisation had already

led to Saudi nationals holding 30% of dental jobs. The news agency said in May 2017 that the Ministry of Human Resources and Social Development had stopped recruiting dentists from abroad to reduce unemployment among Saudi dental graduates. <sup>DT</sup>

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# Top marks: Dental handpieces made in Germany

By Dentsply Sirona

High-quality handpieces enable dental students to deliver excellent work results in class. With its handpiece factory and Instrument Service Center in Bensheim, Germany, Dentsply Sirona is a reliable partner for universities and consistently delivers top tier quality. Sustainability is a priority along the process chain. When developing and producing dental handpieces, it is often the minuscule technical details that makes all the difference. After all, there are handpiece models that have working speeds of up to 200,000 rpm, so even the smallest of parts have to be manufactured and tested without compromise in quality standards.



The handpiece factory at Bensheim allows for precision manufacturing and is fit for the future thanks to its modern and flexible production. An entire department for Quality Management works to ensure compliance with and monitoring of quality standards. Each handpiece undergoes comprehensive testing. Speeds, loads, practice: Over three phases, the experts put the handpieces through their paces and monitor closely whether statutory and internal guidelines were observed.

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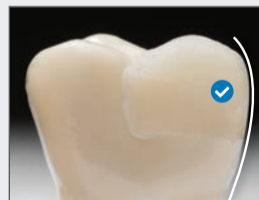
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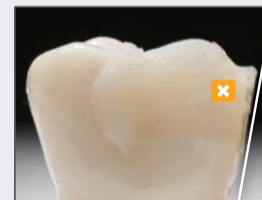
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# Study highlights how artificial intelligence can be used for detection of caries

By Brendan Day, Dental Tribune International

Though artificial intelligence (AI) is being increasingly integrated into a variety of dental products and services, the body of literature evaluating its perceived benefits is scarce. To help rectify this, researchers from Charité— Universitätsmedizin Berlin have recently published the results of a randomised controlled

trial they conducted. These results demonstrate that AI can increase the diagnostic accuracy of dentists.

Artificial intelligence technologies are steadily being adopted by dental practices aiming to digitise and streamline their workflows. From initial consultations, diagnosis and treatment planning through to surgical procedures and postoperative care, a range of dental tasks can now

be augmented by the various AI solutions that have been developed in recent years.

The performance of these AI-powered tools in medical and dental settings, however, has rarely been tested in clinical trials. As a result, the real impact of AI on the decision-making and diagnostics processes of dental practitioners remains somewhat unknown. This lack of clarity

can carry over into decisions regarding available courses of treatment and their advantages.

The research team thus commenced a trial using dentalXrai Pro, a software program that allows dental practitioners to analyse radiographs based on AI. The dentalXrai Pro project was co-founded at Charité by Prof. Falk Schwendicke, head of the Department of Oral Diagnostics,

Digital Health and Health Services Research, and has since been spun off into a start-up simply titled dentalXrai.

The AI-utilising software was employed by the 22 participating dentists to support their detection of caries on 20 bitewing images randomly chosen from a pool of 140. Of the 20 images analysed by each dentist, ten were examined with the assistance of this AI tool, whereas the other ten were not.

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According to the study authors, their hypothesis—that dentists using AI would be significantly more accurate than those not using AI—proved to be partially correct. In their discussion, they noted that “using AI significantly increased dentists’ sensitivity, especially on enamel caries lesions, but did not greatly alter specificity; on more advanced lesions AI did not impact on accuracy at all”. They stated that it was likely the AI was more helpful in situations where changes between images were miniscule, and that it played a lesser role when carious developments were significant and relatively easy to notice.

“Our results demonstrate that combining the AI model performance with human expertise can reach accuracies which are beyond those of the AI itself (...) or the human experts on their own,” the authors wrote.

It was also noted, however, that using the AI software led to an increased likelihood of the dentists deciding to use invasive restorative therapy to treat the carious lesions. “In this sense, using an AI support to improve sensitivity may increase the risk of type I errors and overtreatment,” the authors remarked, adding that it could be beneficial for the dental industry to provide evidence-backed treatment recommendations for lesions of various depths. In their view, this would ideally lead to “better, not necessarily more invasive care”.

Prof. Schwendicke confirmed that further studies regarding the dentalXrai Pro software are already being planned.

“We are already planning on examining a different sample cohort using the updated version of this software that will be available early next year,” he told DTI. “Gathering evidence to better evaluate the benefits that AI can deliver dentists is at the core of what we do,” he explained.

*Editorial note: The study, titled “Artificial intelligence for caries detection: Randomized trial”, was published online on 14 October 2021 in the Journal of Dentistry, ahead of inclusion in the December 2021 issue. DTI*

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# What does it mean to be the best in practice

By Hu-Friedy

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## Teledentistry: A bridge between present and future

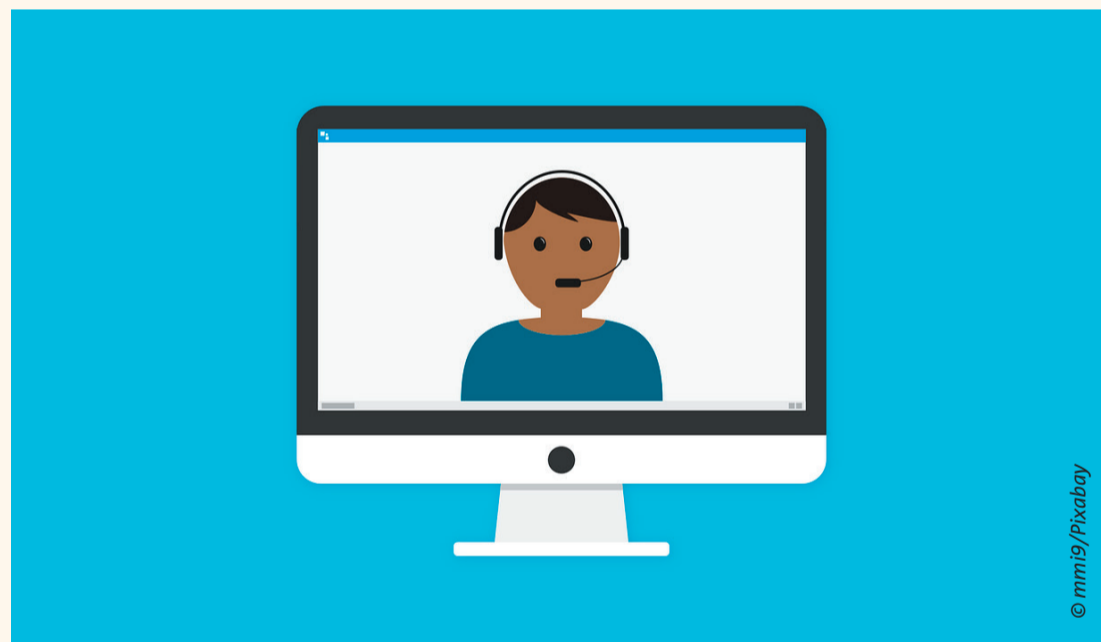
By Dr Carlo Fornaini, France and Italy

The COVID-19 pandemic has dramatically and totally changed all medical clinical practices. The aims of limiting physician-patient contact and reducing hospitalisation have become major concerns, pushing researchers to find novel ways to perform medical care.<sup>1</sup>

The new field called "telemedicine" has achieved great importance, and today it can be used in several medical specialties:

- Store-and-forward telemedicine, common in the medical fields of dermatology, radiology and pathology, makes it unnecessary for the medical practitioner to meet in person with a patient because patient information such as medical images or biosignals can be sent to the specialist as needed after it has been acquired from the patient.<sup>2</sup>
- Remote monitoring, also known as self-monitoring or self-testing and extensively used in the management of chronic diseases such as cardiovascular disease, diabetes mellitus and asthma, uses a range of technological devices to monitor the health and clinical symptoms of a patient remotely.<sup>3</sup>
- Real-time interactive services can provide immediate advice to patients who require medical attention, utilising for this purpose several media, including the phone and the Internet, followed by an assessment similar to one conducted during face-to-face appointments.<sup>4</sup>

The term "teledentistry", first used in 1997 when Cook defined it as "... the practice of using videoconferencing technologies to diagnose and provide advice about treatment over a distance,"<sup>5</sup> is a new area of dentistry that integrates electronic health records, telecommunications technology, digital imaging and the Internet,



in order to improve access to care for patients in remote settings. It allows specialists located many miles away to make a diagnosis and recommend treatment options and/or referral for patients who, otherwise, would find it difficult to see them.<sup>6</sup>

In the field of oral and maxillofacial surgery, it has been reported that diagnostic evaluation of impacted teeth using teledentistry is as efficient as real-time patient assessment. Similarly, it has been shown that screening for dental caries in children using teledentistry is comparable with traditional techniques such as tactile and visual dental examinations. In the field of endodontics, teledentistry has been successfully used to identify root canal orifices and periapical lesions of anterior teeth.<sup>7</sup>

Beyond the pandemic, there are several situations where it is convenient to have a consultation via teledentistry, such as in the case of geriatric, special needs and oncological patients who sometimes have difficulties coming to the clinic.<sup>8,9</sup>

Whereas several dental clinical treatments can today be remotely performed, for others, it is possible to hypothesise that, in the future, there will be the opportunity of full "at-distance" management.

The field of oral medicine is becoming increasingly interesting. By using smartphones or intra-oral cameras, which are very inexpensive today, it is possible, by sending images to the specialist, for him or her to make a tentative diagnosis and to decide, for example, whether a biopsy is necessary. Some studies have demonstrated that screening for potentially malignant oral disorders using photo messaging can serve as an effective adjunct and a potential cost-effective tool in a low-resource setting.<sup>10</sup>

Moreover, by utilising smartphone-based mobile digital PCR devices which allow, in a simple way, smartphones and tablets to be transformed into chemical laboratories, the research of particular salivary biomarkers in the saliva will be also possible.<sup>11</sup>

A recent study at Newcastle Dental Hospital's Paediatric Dentistry New Patient Service recently demonstrated that teledentistry can be used for numerous applications in paediatric dentistry, including initial triage, remote assessment, reinforcement of oral disease prevention, implementation of initial management and building of rapport to maximise safety and minimise inconvenience for both parent and child.<sup>12</sup> Another study showed that including a teledentistry consultation in the standard care provided to patients in an eating disorder day hospital could be beneficial, notably for screening for particular pathologies and preventing dental erosion.<sup>13</sup>

In conservative dentistry, remineralisation treatment which offers the advantage of being non-invasive, is increasingly being used as a minimal intervention treatment in managing incipient enamel caries, and a solution of 38% silver diamine fluoride (SDF) has been reported as an effective treatment for caries arrest.<sup>14</sup> Therefore, it is possible to think that the treatment of small carious le-

sions may be performed at home with SDF application supervised by a remote follow-up.

Tele-orthodontics, a term first used and described by Squires, may be a cost-effective way to provide care by reducing expenses, such as transportation for a consultation with a specialist, and additionally, it may help general practitioners to screen and/or appropriately refer potential patients for future orthodontic therapy.<sup>15</sup> With tele-orthodontics it is possible to check tooth movement and treatment progression using at-home digital photographic technology with a smartphone device and, when associated with aligner therapy, it allows the patient to progress through aligner trays independently, which may, in turn, reduce the number of in-office visits and help orthodontists monitor treatment progress even when the patients are at home.<sup>16</sup>

Teledentistry represents the future of oral health: patients, doctors and companies will have to make a great effort to be ready for this important opportunity, which will completely change current ways of performing oral treatment.<sup>17</sup>

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

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# Study: Orthodontists believe COVID-19 could permanently change their profession

By Brendan Day, Dental Tribune International

**JEDDAH, Saudi Arabia:** A recent study conducted by dental researchers from Saudi Arabia's Batterjee Medical College sought to better understand how COVID-19-related lockdowns have affected orthodontic practice in the Middle East. According to their findings, a majority of orthodontists believe that the pandemic will have a lasting effect on the way they treat patients, and many anticipate a reduced patient load in the future.

For the study, the research team circulated an online questionnaire among orthodontists and orthodontic residents across Saudi Arabia, the UAE, Oman, Kuwait and Qatar. A total of 315 responses were recorded—205 from male practitioners and 110 from female practitioners. Orthodontic residents comprised 32% of the sample group, and the remainder were either orthodontic

consultants or owners of clinical practices. The responses were collected between April and December 2020.

## Predictions of significant shifts in provision of orthodontic services

Over the past two years, the COVID-19 pandemic has continued to have an impact on the capacity of dental professionals to deliver treatment in the usual way and this been a challenge to them. Previous studies have indicated that traditional in-person consultations can be replaced by measures such as teledentistry and still enjoy a relatively high acceptance rate among patients, whereas remote monitoring tools can significantly reduce the number of in-person visits an orthodontic patient needs without compromising the treatment outcome.

In their study, the Jeddah-based researchers found that 88% of respondents believe that COVID-19 will permanently alter the way they treat

patients, whereas 78% stated that they will have fewer patients in the future as a result of the pandemic. Despite this, a clear majority (68%) do not think that COVID-19 will affect the feasibility of orthodontics moving forward as a dental speciality.

Whereas 89% of participants stated that the pandemic had had a negative impact on their income, there were nevertheless some silver linings noted on a more personal level—88% reported that they remained excited about the orthodontic profession, and 66% said that lockdowns had actually improved their social lives and relationships with family and friends.

The study, titled "Perceived impact of the COVID-19 pandemic on orthodontic practice in the Middle East", was published online on 10 November 2021 in the Journal of Pharmacy and BioAllied Sciences. [DTI](#)



A new study has found that 88% of 88% of orthodontists and orthodontic residents believe that COVID-19 will permanently alter the way they treat patients.

## Poor oral health may increase risk of severe COVID-19 for cardiac patients

By Franziska Beier, Dental Tribune International

**CAIRO, Egypt:** Previous studies have linked poor oral hygiene with hyper-inflammation and cardiovascular disease. Similarly, the severity of COVID-19 has been associated with hyper-inflammatory responses. Thus, researchers at Cairo University in Egypt have investigated whether there is a correlation between poor oral health and greater COVID-19 severity in patients with cardiovascular disease. They found that oral

health status is an additional risk factor for such patients.

Using a questionnaire, the researchers evaluated oral health status, severity of COVID-19 symptoms, duration of recovery and C-reactive protein (CRP) levels in 308 SARS-CoV-2-positive Egyptian patients and an additional 86 such patients with cardiovascular disease. The latter were the subject of a subgroup analysis. The impact of oral health on COVID-19 severity was assessed using an oral health score, and the

effects of oral health on CRP levels and recovery time were assessed as secondary end points.

According to the researchers, the correlation between oral health and COVID-19 severity showed a significant inverse relationship, as did the correlation between oral health and recovery time and CRP levels. Poor oral health correlated with increased CRP levels and delayed recovery, especially in patients with cardiac disease.

Dr Ahmed Mustafa Basuoni, cardiology consultant at the university and co-author of the study, commented in a press release: "Oral tissues could act as a reservoir for SARS-CoV-2, developing a high viral load in the oral cavity. Therefore, we recommended maintenance of oral health and improving oral hygiene measures, especially during COVID-19 infection. Simple measures like practising proper oral hygiene, raising awareness of oral health importance either in relation to COVID-19 infection or systemic diseases by using media

and community medicine, regular dental visits, especially in patients with [cardiovascular disease], and using [antimicrobial] mouthwashes [could help in] preventing or decreasing the severity of COVID-19 disease."

He added: "Oral health should be a part of routine history taking and examination in cardiac patients. Lifestyle measures should be instructed to all cardiac patients regarding good oral hygiene with regular dental visits." [DTI](#)

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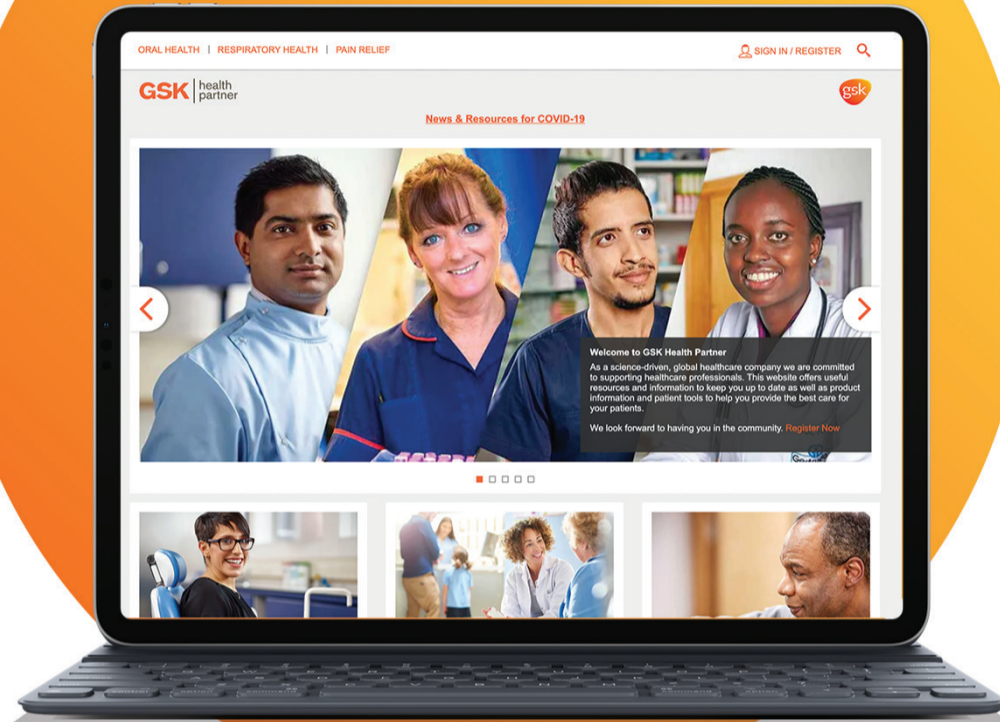
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# The copyCAD 2: Complete success for a complete denture

By Dr Yassine Harichane, France

## Introduction

In our previous article (CAD/CAM 2/2020), we described a clinical case in which we used digital dental technologies to copy a patient's smile. In this article, we will describe another clinical case for which it was possible to make a copyCAD: a dental copy and paste using CAD/CAM technology.

The ageing of the population results in an increasingly older population in dental practices. These patients dream of regaining their former smiles without changing their habits too much. Once again, digital dentistry comes to the dentist's aid to offer tools combining performance and ingenuity. The technique of dental copy and paste has been described many times in the literature.

In this clinical situation, we will describe the digital copying of a maxillary complete denture. This type of prosthesis is very widespread in the population, and repair, relining or even replacement is often necessary. Because patients are living longer and longer, we are observing both an ageing of the prosthetic components

and a maturation of the soft tissue. The practitioner must therefore give a facelift to the prosthesis and to the patient at the same time.

In analogue dentistry, the production of dentures involves numerous and meticulous steps. An alternative is to send the patient's prosthesis to the dental laboratory to be copied. In digital dentistry, it is possible to create a copy of this denture faster and better.

## Clinical case

A patient with an immediate maxillary complete denture presented for consultation (Fig. 1). The extractions having been carried out six months before, we observed atrophy of hard and soft tissue in the upper jaw. In the lower jaw, the teeth were present and the restorations adapted. Since the aesthetics and the occlusion were validated over the long term by the patient, making a copy was proposed, taking the new clinical situation in the upper jaw into account.

## First dental appointment (30 minutes)

First, the denture is relined with a hard composite-based material (Ufi Gel hard C, VOCO; Fig. 2). The mate-

rial allows an extension of the edges of the prosthesis for better retention. An adjustment of the occlusion can be done at this time in order to have a homogeneous distribution of the contacts and the absence of interference. The patient is photographed with the complete denture in the mouth to control the height of the lower third of the face, the support of the lips, the inclination of the occlusal plane and the aesthetics of the smile (Fig. 3). During this session, it is possible to scan the relined prosthesis with an intra-oral scanner in order to be able to return the denture to the patient during the session. The digital impression can accurately record the surface and upper surface of a prosthesis with impressive precision. If the practitioner does not have an intra-oral scanner, it is always possible to send the denture to a dental technician who owns a laboratory scanner. A digital or physical impression of the antagonistic arch and of the occlusion is also sent to the dental laboratory.

## Dental laboratory (two to three days)

The dental technician receives digital files of the denture, antagonist and occlusion. It is possible to make

all the changes by working on virtual models (3Shape Dental System). From the photographs of the patient, the laboratory technician, with the guidance of the practitioner, is able to determine the changes to be made to the current denture: increase or decrease the incisal rod, modify the anatomy of the teeth, correct a possible defect of the occlusal plane inclination, but also improve the smile curve. The dental technician can also digitally improve the appearance of the false gingiva by creating a buccal bulge, simulating tooth roots (Figs. 4 & 5). All these modifications are submitted online to the dentist for approval of the virtual prosthetic project. As all these corrections can be made easily on the digital model, there is no need to reset the teeth or to add or remove wax like on a physical model.

In order to fabricate the denture, it is necessary to digitally separate the prosthetic teeth from the base (Fig. 6). From the STL files (Fig. 7), the laboratory then 3D-prints the base using a gingiva-coloured resin (V-Print dentbase, VOCO) and mills the teeth from a composite disc (CediTEC DT, VOCO; Fig. 8). A gingiva-coloured cement (CediTEC Adhesive, VOCO) is

used to bond the prosthetic teeth to the base (Fig. 9). At this stage, characterisation is possible to yield a more natural look. This characterisation can be performed on the teeth as well as on the false gingiva. The result is breathtakingly natural (Fig. 10), and the copy greatly surpasses the original (Fig. 11).

It should be noted that it is always possible to print a try-in. For this an STL file is designed by combining both the teeth and the base (Fig. 12a). The job is sent to a 3D printer loaded with a try-in resin (V-Print Try-In, VOCO). The try-in denture (Fig. 12b) physically confirms the function and aesthetics of the prosthetic project before moving on to the full procedure as described.

## Second dental appointment (15 minutes)

The denture is delivered to the patient with careful control of function (retention, support, occlusion, phonation) and aesthetics (soft-tissue support, static and dynamic smile, tooth shade). An additional appointment should always be offered to the

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Fig. 1: Initial situation.



Fig. 2: Reline maxillary denture.



Fig. 3: Digital assessment of the denture.



Fig. 4: Virtual denture before gingiva carving.



Fig. 5: Virtual denture after gingiva carving.

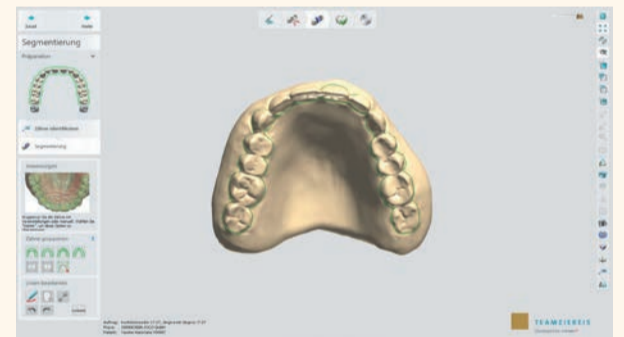


Fig. 6: Virtual model segmentation.

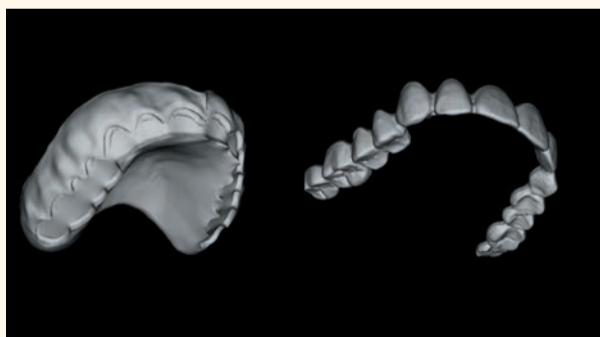


Fig. 7: STL files of the base and the prosthetic teeth.



Fig. 8: 3D-printed base and milled teeth with supports.



Fig. 9: 3D-printed base and milled teeth without supports.



Fig. 10: Digital copy denture.



Fig. 11: Comparison of relined denture (left) and digital denture (right).



Figs. 12a & b: STL file (a) and 3D-printed try-in denture (b).





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Fig. 13: Patient's smile.



Fig. 14: Final situation.

patient in order to make any necessary adjustments, but above all to reassess the clinical situation. In the case of this patient, she said that she was delighted to rediscover her smile again and noticed improved comfort in wearing the prosthesis (Figs. 13 & 14).

#### Discussion

All dental disciplines benefit from digital advancements. The removable prosthesis is no exception thanks to the contributions of the digital impression and milling but especially of 3D printing. Indeed, it is possible to copy a removable prosthesis in great detail and add improvements.

These changes can be minimal, such as the tooth shade or the prosthetic tooth anatomy, or major, such as the correction of the occlusal plane inclination or a sagging of the lower third of the face by wear of the prosthesis or bone atrophy.

Everybody benefits from a denture

digital copy. The practitioner benefits from digital technology by integrating a workflow for the removable prostheses. Working time is reduced to two short clinical sessions when the patient already has a denture. Communication with the laboratory is optimised and patient satisfaction is visible. Producing complete re-

movable prostheses becomes a simple, fast and profitable task.

The dental technician also benefits from this digital workflow. By copying the existing prosthesis, he or she can spend less time on the setting and more time on fine adjustments and creativity. By manipulating virtual models, validation of the prosthetic project by electronic communication with the practitioner is feasible and much faster. By using 3D printing, dental technician will be able to rationalise his or her production line and delegate time-consuming and unrewarding tasks to machines. The results are reproducible and allow easy and quick fabrication of a replacement prosthesis if the denture is lost or destroyed.

The patient is the main beneficiary of the digital copy and paste technique. Many patients with removable prostheses have often been disappointed by the end result, particularly in terms of aesthetics if the smile to which they were used was not restored. This feeling is all the stronger when it comes from those around them and confirms that the change is visible and noticeably unsightly. With copying of their dentures, patients can be sure of getting their smiles back in their original form but with the changes they have always wanted: whiter teeth, natural alignment and stronger retention. When the procedure is completed in just two straightforward sessions, patient expectations will be greatly exceeded.

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#### Conclusion

The fabrication of a removable prosthesis has long been considered a difficult task. Indeed, the dentist-prosthetist duo have to follow tedious steps while often taking care of elderly patients. Digital dentistry has brought a wind of change by making it fast, efficient and profitable. CAD/CAM tools allow, after just one short clinical session, copying and delivery of an existing denture, after 3D printing, in record time back to the patient in an even shorter clinical session. The patient will be delighted with this experience at the dentist's practice because he or she will rediscover his or her smile literally and figuratively. Duplicating a complete denture requires ordinary technical skills; duplicating the positive emotions felt by a patient requires extraordinary human skills.

#### Disclosure

The author did not report any disclosures. **DT**

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# Dentsply Sirona presents winners of the Smart Integration Award 2021: Recognizing innovative women in dentistry

## By Dentsply Sirona

Dentsply Sirona presented the second iteration of its Smart Integration Award to women in dentistry on November 12. With the award, which was launched in 2019, Dentsply Sirona recognizes visionary treatment concepts and the outstanding achievements of women in dentistry worldwide, while creating a network of women in dentistry. The 2021 applicants came from nearly 40 countries. The award ceremony took place virtually this year.

Dentists and dental technicians from around the world submitted their ideas for integrating digital technologies into the practices and dental laboratories of the future and improving the treatment experience for patients. The award ceremony was attended by 90 nominees, who had been selected by an international jury of Dentsply Sirona executives and renowned external experts. Winners were awarded in five categories: "Digital Clinical Workflow", "Digital Patient Communication", "Innovative Infection Control and Prevention",

"Management of Dental Equipment", and "Smart Lab-Dentist Cooperation".

The innovation categories in the field of digital dentistry were expanded this year due to the high level of global interest. The pool of applicants was also larger: for the first time, dentists and dental technicians from the USA were also able to apply. With the Smart Integration Award, Dentsply Sirona wants to do justice to the growing proportion of women in dental professions, promote their skills, and improve their career opportunities.

### Focus on digital workflow

Two of this year's Smart Integration Award winners are Dr. Shivi Gupta from San Diego, USA, and Christine Trautmann from Darmstadt, Germany. Gupta took the prize in the "Digital Patient Communication" category. In three exemplary case descriptions, the CAD/CAM expert showed how she achieves high esthetic and functional success in treatment in her practice using a completely digital workflow. This also allows her to offer patients an efficient, comfortable treatment experience and precise results.

Christine Trautmann convinced the jury in the "Smart Lab-Dentist Coop-

eration" category with her presentation of a fully digitalized ordering process between the dentist and lab.

"End-to-end digitized workflows are still a vision in this field – but a very desirable one," Trautmann said in the interview. "That's because they facilitate communication between both parties equally and give dental technicians the ability to meet individual restoration requirements even better."

Dr. Terri Dolan, Vice President and Chief Clinical Officer at Dentsply Sirona sees great potential in the Smart Integration Award: "The significant interest from women worldwide shows us how important awards like this are. They recognize achievement and boost professional confidence, helping us promote gender parity in dentistry to support the next generation of female leaders." Dolan, who is a dentist herself, is responsible for the Key Opinion Leader Network development program at Dentsply Sirona.

Prof. Ihsane Ben Yahya, President of the World Dental Federation FDI, attended the award ceremony as guest of honor. She is also convinced that initiatives such as the Smart Integration Award will increase the influence of women in dentistry: "I am certain that tonight's winners are the leaders of tomorrow. And that the women gathered here will help lead the way to empower patients everywhere with innovative solutions and ideas that can revolutionize our industry." Supporting and empowering women in dentistry is the common goal of FDI and Dentsply Sirona.

### Advanced training and international networking

Immediately after the award ceremony, the winners of the Smart Integration Award 2021 embarked on a two-day expert training program consisting of training sessions, workshops, and seminars on numerous specialist topics relating to treatments. The program is designed to enable women to draw on the great potential of digital technologies in dentistry and dental technology.

Furthermore, the expert program promotes international networking among women in dentistry. The winners of the Smart Integration Award become automatically part of the "Smart Integration Network". Members of this network contribute practical and thus expert knowledge to further develop existing Dentsply



Susanne Schmidinger, Director Global Brand Marketing Enabling Devices at Dentsply Sirona, is one of the Jury members and opened the Award Ceremony.



Dr. Shivi Gupta won with her description of a completely digital workflow with which she achieves high esthetic and functional treatment success.



Winner Christine Trautmann (left) convinced the jury with her vision of a fully digitized ordering process between dentist and laboratory.



Dr. Terri Dolan, Vice President and Chief Clinical Officer at Dentsply Sirona, is responsible for the development of the Key Opinion Leader Network. She sees great potential in the Smart Integration Award.



Prof. Ihsane Ben Yahya, President of the World Dental Federation FDI, is convinced that initiatives such as the Smart Integration Award will increase the influence of women in dentistry.

Sirona products and find new, innovative solutions.

### Corporate goals: integration and equity

Beyond the Smart Integration Award, Dentsply Sirona is comprehensively committed to equal rights, equal opportunities, and sustainability. Various initiatives for women support their development in dental professions and make their achievements visible. One of these is "First to 50," a global program to promote women as speakers. It aims to connect women to professional coaches to support their professional development and empower them to become speakers. Other measures relate to improved opportunities for networking and sharing experiences at panel discussions and conferences.

To achieve inclusion and equal opportunities for all employees within the company, Dentsply Sirona has launched Employee Resource Groups (ERGs) – interest groups to promote equity, diversity and inclusion. These include the "DS Women" initiative, which was founded in

October 2020 and already has more than 750 members from 30 nations. The stated goal of DS Women is to promote more women to leadership positions at Dentsply Sirona.

### Equal opportunities as a pillar of sustainability

In its new sustainability strategy published in September 2021, Dentsply Sirona also makes a clear commitment to equity. Among other things, the company defines the achievement of gender parity and gender pay equality by 2025 as a milestone on the way to a "brighter world." For Dentsply Sirona, the strategic pillar "Healthy Business" includes having 50 percent of its board members be gender and/or ethnically mixed and having 60 percent of its board committees chaired by women. [DFI](#)

All winners of the Smart Integration Award 2021 can be found at: [www.dentsplysirona.com/smart-integration-award](http://www.dentsplysirona.com/smart-integration-award)

Learn more about the Smart Integration Network: [www.dentsplysirona.com/expert-development](http://www.dentsplysirona.com/expert-development)

More about Dentsply Sirona's sustainability strategy: [www.dentsplysirona.com/en/company/our-sustainability.html](http://www.dentsplysirona.com/en/company/our-sustainability.html)



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Nine talented women were honored in the Digital Clinical Workflow category.



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PM-BH-PAD-20-00018

# Formlabs announces release of two new biocompatible resins



Formlabs has released two new resins, which will be certified according to USP Class VI safety standards and provide better access to improved ergonomics.

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By Dental Tribune International

**SOMERVILLE, Mass., U.S.:** The dramatic shift toward more personalized dental treatment is perhaps no more evident than within digital dentistry. In another step toward improving the treatment experience for both patient and dentist, leading 3D-printing company Formlabs has recently announced that it will be offering two new biocompatible resins: BioMed White and BioMed Black. According to Formlabs, the two new resins were developed to diversify the medical resins available to the health care community and are designed for applications for which opaque materials are preferred for functionality or esthetic quality. They will be certified according to USP Class VI safety standards and provide premium esthetics that enable superior patient outcomes by providing access to improved ergonomics through fast medical device iterations, reliable surgical planning, and more.

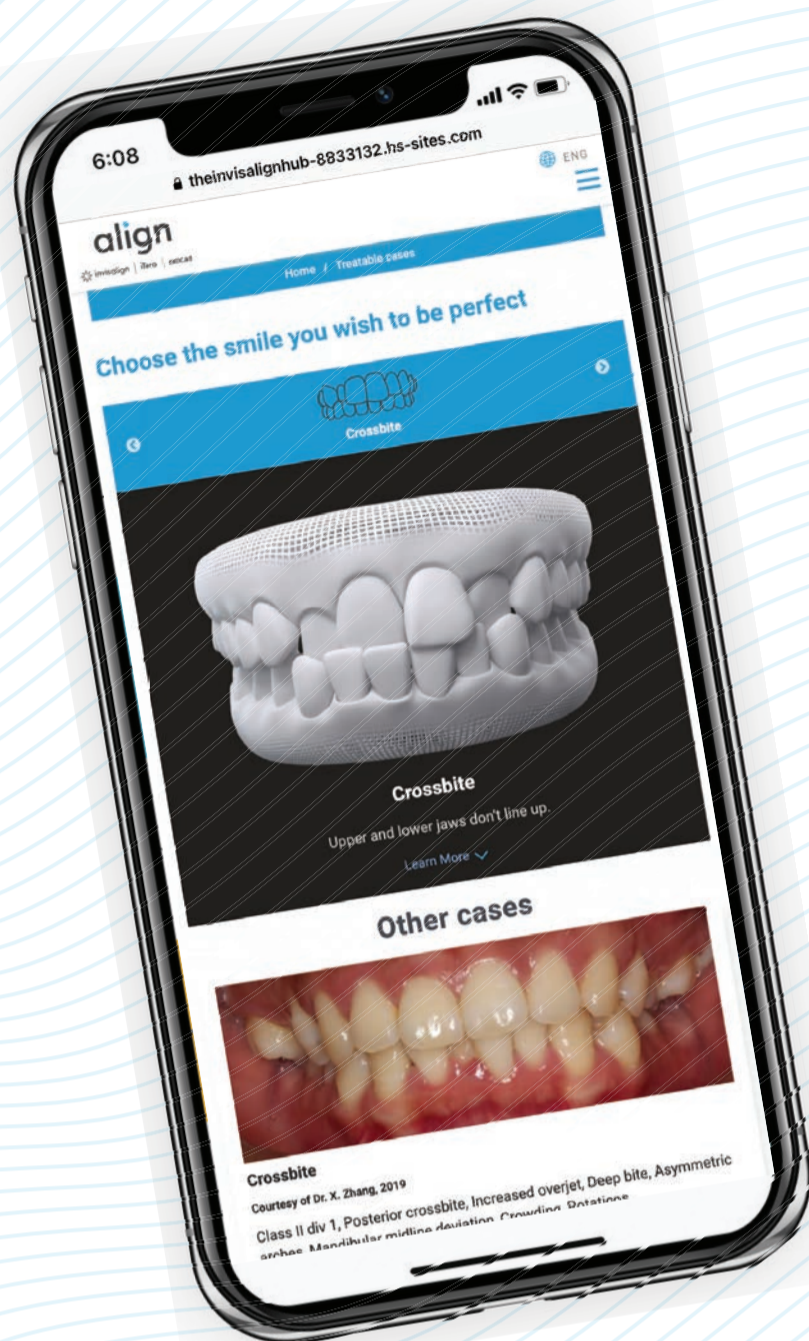
With the 3D-printing options within dentistry continually expanding, the demand for both effective and safe materials for medical use is also increasing. In a press release, Director of Medical Market Development Gaurav Manchanda said, "The addition of these resins to Formlabs' materials library will allow for greater flexibility in design and function and can be used in a variety of applications ranging from medical device manufacturing, biopharmaceutical processing, and consumer goods such as medical device components, wearables, and custom dental appliances."

The resins were first unveiled late in November at the Radiological Society of North America's 2021 symposium. [DT](#)

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# “It was easy to turn off the pain” — Patient receives dental implant under self-hypnosis

By Franziska Beier, Dental Tribune International

Physically lying in a dentist's office but mentally walking barefoot through a mountain river—that is how a patient successfully received a dental implant under self-hypnosis without any anaesthesia. The patient, who underwent such a procedure for the first time under these conditions, was very satisfied with the result and reported that he felt hardly any pain during the procedure.

It all started when the patient, Tomas Schröck, a hypnotherapist with his own practice in Leipzig, asked his dentist, Dr Nico Lindemann, co-owner of a dental practice Dr Lindemann, Kurtz-Hoffmann and colleagues in Leipzig, whether he would be willing to support him in a self-experiment: an implant surgery performed under selfhypnosis without any analgesics or anaesthesia

“Even though I had been involved with hypnosis before, owing to the patient's desire for self-hypnosis, I would have to hand over the responsibility of pain elimination solely to him. On the one hand, I was optimistic that it would work. On the other hand, I wondered whether I could trust him enough so that the procedure could be performed properly as planned,” Lindemann told Dental Tribune International.

When asked about his motivation for the self-experiment, Schröck said that he primarily wanted to raise awareness of hypnosis and demonstrate what can be achieved. Especially for patients afraid of dental treatments or with drug intolerances, self-hypnosis can be a very helpful enabler of treatment without fear or substantial pain. He was also curious and wanted to try out on himself what he had been teaching his patients for years.

“During self-hypnosis, one assumes both the role of hypnotist and the person being hypnotised and gives oneself corresponding stimuli. At first glance, this may seem contradictory. However, once one understands how hypnosis works, it becomes clearer,” Schröck explained. It is assumed that everyone expe-

riences trance states several times a day, often without realising it. Schröck gave the example of monotonous car journeys, during which the mind drifts off into everyday thoughts and the journey thus quickly passes. The same applies to hobbies, where time flies by. These moments, in which much occurs automatically via the subconscious, are everyday trances. This ability can be used for self-hypnosis. Individually selected memories or images are trained until they function largely automatically and only a few stimuli from the consciousness are necessary.

For his procedure, Schröck employed a memory of walking barefoot through an ice-cold mountain lake. “I chose this memory for two reasons. The feet are physically furthest away from the mouth and thus from the site of surgery, and I associate a strong feeling of euphoria with this memory. Euphoria and fear or negative pain tend to be mutually exclusive in my world,” he explained.

He continued: “The art of self-hypnosis is to consciously self-regulate oneself on one level in order to have unconscious experiences on another level. That means you are not switched off or entirely passive in self-hypnosis. As soon as I became too aware of what was happening in my mouth, I directed my attention back to my resource place in the mountain stream.” For the most part, Schröck only felt greatly diminished pain during the operation.

#### Keeping an eye on bleeding behaviour and hand signals

“The team was slightly nervous before the operation,” Lindemann said. All eventualities during the procedure—for example, what would happen if the patient did experience severe pain—were considered by the dental team in advance, so the nervousness quickly dissipated once the operation had begun. When asked to what extent the team supported the patient during the procedure, Lindemann replied: “We created a very calm and relaxed environment. In addition, we agreed on signals that the patient should give us in case he felt pain or he needed a break to get back into a deep enough state of hypnosis.”



Fig.1: Dr Nico Lindemann operating on Tomas Schröck, who was under self-hypnosis



Fig.2: Tomas Schröck started practising his self-hypnosis technique several times a day six weeks before the operation.

During the placement of a single implant with minor osseous augmentation in an open procedure in the mandible with subsequent suture closure, the dental team had to pay particular attention to the bleeding behaviour, which differs from that under vaso-constriction.

#### A matter of trust

Although the hypnotherapist was convinced that his self-experiment would succeed, he harboured some doubts. In the run-up, he asked himself whether he would really manage

to concentrate for the entire duration of the surgery. “I am very satisfied with the result.

In retrospect, I was even a little surprised at how quickly it went, and how easy it was to turn off the pain,” Schröck explained.

He failed only to control the bleeding to a level less than one would expect without anaesthesia. “There are enough studies and case vignettes in which similar things have been proved. Unfortunately, in the heat of

the moment, I forgot to focus on that too.” However, he plans to work on that aspect in the subsequent operation, during which the cover screw will be removed.

According to Lindemann, the mutual trust between the patient and the team made it possible to fully concentrate on the operation. He concluded: “I am grateful for my great team and for the trust that our patient placed in me.” **DT**



Fig. 3: Before the operation, Tomas Schröck tested his pain sensation with the help of a vascular clamp.



Fig. 4: A single implant was placed in the mandible.



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# Dentsply Sirona equips Qatar's first dental school

Dentsply Sirona equips Qatar's first dental school with cutting-edge training tools to prepare the next generation of dental professionals



## By Dentsply Sirona

Qatar University, the country's primary institution for higher education, is partnering with Dentsply Sirona to equip the university's brand-new preclinical lab at the newly founded College of Dental Medicine. Dentsply Sirona is providing state-of-the-art simulator workstations, instruments, as well as the latest CEREC and inLab software systems to prepare students for the digital future of dentistry.

Universities and large clinics around the world have entrusted Dentsply Sirona's International Special Clinic Solutions (ISCS) division and its comprehensive approach to achieve their specific goals. When Qatar University's College of Dental Medicine in Doha, envisioned their brand-new preclinical laboratory, they worked with Dentsply Sirona's team to comprehensively equip it with state-of-the-art technology to prepare students for dentistry's digital future.

32 Sim Intego workstations plus two additional instructor units now offer the best possible learning environment following the latest technological advancements. Additionally, 15 CEREC AI units and the inLab system will be used to support future dentists in their training for highly specialized procedures.

"The new College of Dental Medicine at Qatar University sees it as part of its core mission to incorporate digital technologies and the latest advance-

ments into its teaching. Thanks to Dentsply Sirona's innovative products and team of experts we were able to create a future-proof training environment," said Dr. Hanin Daas, Director of Dental Laboratories at Qatar University.

## Preparing for the future of dentistry on cutting-edge equipment

All products installed at the University of Qatar have been designed and produced in Germany using particularly robust and durable materials that are ideal for a university setting. The state-of-the-art Sim Intego workstations in the preclinic allow students to train in practice-like conditions. Sim Intego includes key components of treatment centers such as the dentist element so that students already familiarize themselves with the actual treatment process in their preclinical semesters.

Furthermore, the university also opted for the lightweight T1 line instruments series. These easy-to-handle instruments help ensure the College of Dental Medicine is able to deliver the best training of correct instrumentation techniques to deliver optimal results.

The International Special Clinic Solutions team selected the ideal product mix for Qatar University to fulfill their plan to make the most modern learning tools available to their students. During the preclinical training, CEREC and inLab systems will prepare the students for using CAD/CAM technology in dentistry. Additionally, staff will be supported by a multimedia teaching system designed to enhance communication and to give students the best view of demonstrations at the master workstation. With a one touch button, it is possible to share real-time, high-quality images from any device on any screen in the classroom.

Dentsply Sirona is proud to have been selected by Qatar University to help turn their vision of educating world-class dental professionals and the nation's first graduates of dental medicine into a reality. In consultations for the preclinic area, the International Special Clinic Solutions team discussed the university's ideas and goals thoroughly and addressed each individual requirement in detail. The engineering team in Germany then developed a custom-made concept that delivers the required portfolio from start to finish.

The College of Dental Medicine's preclinical lab educates students in the basics of clinical dentistry before they practice on actual patients. The new lab provides a technologically advanced environment to train students in digital dentistry thus ensuring that the next generation of dental practitioners are well prepared to meet the demands of the future. [DT](#)



The newly founded College of Dental Medicine at Qatar University selected Dentsply Sirona to equip its preclinic area.



Find out more by scanning the QR code.

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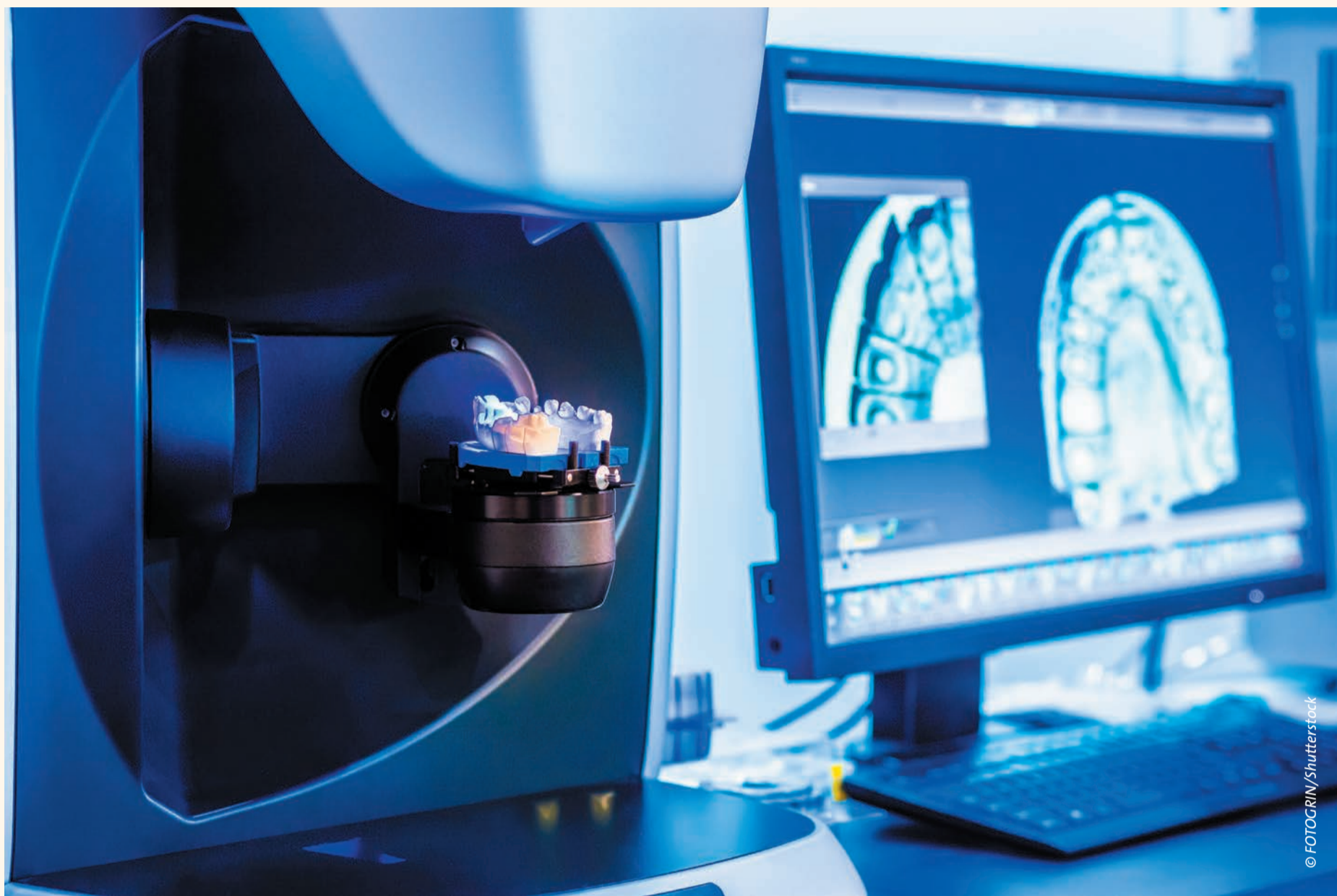
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# Dental educational institutions move with the tech revolution



Whereas the idea of modernising dental educational institutions sounds like a good one, the logistics and costs are a significant hurdle.

**By Luke Gribble, Dental Tribune International**

**LEIPZIG, Germany:** The digital dentistry revolution is here. That is a common sentiment among many dental professionals, and it is backed up by the growth in areas such as 3D printing and clear aligners. However, whereas dental professionals are modernising their workflow, how are dental educational institutions worldwide reacting to these changes, and what challenges do they face in making sure their students are prepared for the working world?

One dental school leading the way in the digital education revolution is King's College London. As reported by Planmeca, the Faculty of Dentistry, Oral and Craniofacial Sciences is the first dental school in the world to incorporate state-of-the-art digital dentistry into dental education.

Optimising a blend of clinical, simulation, haptic and CAD/CAM technologies, the school allows students to train on real human teeth with the help of virtual reality. This mixture of technology and a more traditional approach was recently acknowledged when King's won the Technological or Digital Innovation of the Year trophy at the 17th Times Higher Education awards. Speaking about the success, Prof. Michael Escudier, interim executive dean of the Faculty of Dentistry, Oral and Craniofacial Sciences, said: "This is a won-

derful recognition of the huge team effort that went into the innovative and integrated use of technology to support student learning and enable their timely progression into the healthcare workforce."

That progression into the workforce is something many educational institutions are thinking about. Students want to obtain the best education possible, and the latest technology is an essential criterion in their selection process. Speaking to Dental Tribune International, Prof. Axel Spahr, Director of Oral Rehabilitation and Head Discipline of Periodontics, University of Sydney, said, "For the Sydney Dental School, it is of paramount importance to offer a dental education that involves all modern and state-of-the-art techniques and materials. Teaching leading-edge technologies and techniques and using top-notch equipment and state-of-the-art materials are the most important criteria which will attract applications from future students."

That process has been one involving both students and teachers. "From the beginning, the Sydney Dental School has involved the students of both the undergraduate and postgraduate programme as well as the student representatives and student organisations in this process that we call the digital dentistry journey," said Prof. Spahr. Having plans to in-

tegrate more digital technology over the coming years, Prof. Spahr said, "It is an absolute and vital necessity and major future goal for the Sydney Dental School to implement and establish full digital dentistry teaching and training at both undergraduate and postgraduate level."

Of course, implementing a comprehensive digital workflow requires a significant amount of planning and funding. Someone well versed at implementing digital technology into the educational setting is Dr Ilser Turkyilmaz, from the Department of Prosthodontics at the New York University College of Dentistry. Dr Turkyilmaz is leading digital transformation at the school, has written several papers on the challenges dental educational institutions face in modernising their offerings, and provides advice to many schools across the US on how best to approach the current digital revolution.

Speaking independently to Dental Tribune International, Dr Turkyilmaz said the three main hurdles a school faces are cost, training and infrastructure when planning to upgrade and modernise. He explained, "In the first place, it requires significant investment if a school wants to upgrade its workflow. Secondly, the faculty has to be willing to be trained and to upskill in order to go on then and educate students. Thirdly, be-

cause all this technology has been designed for mostly single-practice chairside use where a dentist might scan one or two crowns a day, unfortunately in large dental education institutions, that model does not work in the same manner, and the infrastructure needed to accommodate sometimes hundreds of students is immense."

Specifically, one of the main challenges is data security. Dr Turkyilmaz said, "Two years ago, we started thinking about some new ideas on data security and spoke with many companies about how we could integrate a secure workflow. In the end, Planmeca was the only company willing to work with us in a way that allowed us to create what we have called the fully integrated workflow." Although Dr Turkyilmaz was unable to share any concrete details owing to ongoing developments, he did say that there is a chance for dental companies like Planmeca to become more involved with dental schools. "Students who are not trained to use this new technology will be less willing to adopt it into their practice when they start working," he said, noting that, if companies were more willing to invest in education, the returns could be significant when students enter the workforce.

However, whereas the need to remain up-to-date with the latest technology and trends is essential

for dental schools and their students, according to Dr Turkyilmaz, completely letting go of traditional methods is not a good idea either. "Training in a hybrid model of digital and traditional techniques is best. I know of examples where students have only been trained to use digital technology and do not know, for example, how to take an impression using traditional techniques. This is a problem, because if you go for an interview at a private practice and your prospective employer has not implemented things like intra-oral scanners, then you will find that you are not very hireable."

This balance between traditional methods and new technology within an educational setting is not new. Commenting on how the future might look, Dr Turkyilmaz said, "Technology has changed the world. Dentistry and dental education are not immune to that. Many of the techniques we are currently using are almost completely different from what was delivered 20 or 30 years ago. And I am sure that, in another 20 or 30 years, the situation will be vastly different again." DT

# Interview: What will the future of dentistry look like?

By Brendan Day, Dental Tribune International

For Dr Victoria Sampson, the connection between oral and systemic health is of central concern when dealing with her dental patients. She employs biomarkers and inflammatory markers to diagnose and monitor patients throughout the course of treatment and collaborates with specialists from other fields to create a more holistic form of treatment. At the upcoming GBT Summit—Virtual Edition, Dr Sampson will be participating in a round-table conversation with Dr Steffen Rieger and dental hygienist Thuy Vu on the future of dentistry. She spoke with Dental Tribune International about her approach to dentistry and how she sees the field evolving in the coming years.

**Your approach to dentistry is preventative and minimally invasive in its nature. Do you regard these as areas that will become increasingly important for dental practitioners in the future?**

Definitely. We are now living in a society where our patients have more knowledge of their own health and of what treatments are available. They want to have the most preventative and least invasive treatment possible to ensure optimal health.

As an industry, we have modernised in such a way that we are able to catch disease earlier and provide more minimally invasive treatments. We have all lived through a pandemic, which has taught us how important health is and reinforced the idea that prevention is always better than cure. I always try to teach my patients that oral health is a very important part of general health and that in order to be at optimal health, they must also take care of their mouths. We now know that poor oral health can contribute to numerous other systemic diseases and conditions, such as diabetes, heart disease and infertility. Dental professionals are slowly starting to understand that the work they do has huge consequences for the rest of the body. It is our duty to arrest disease and prevent problems from happening.

**What other aspects of dentistry do you think will change or evolve in the future?**

I think that we are going to see a huge digitalisation of dentistry in the next ten years, similar to the rest of healthcare. Many dentists already follow a digital workflow to allow for seamless communication with laboratory technicians through intra-oral scanning and CAD/CAM restorations. I think this is just the beginning. There is already so much research going into incorporating artificial intelligence and image recognition to help us diagnose and monitor dental and systemic diseases. I think this soon won't be a thing of the future, but very much something we use to help us every day.

I also think, and hope, that dental professionals will become more aware of how important saliva is and how much information it can give us not only of a patient's dental health but also of their systemic health. I envisage that patients will start going to their dentist for saliva tests in the same way that they go to their doctor



Dr Victoria Sampson.

now for blood tests. We are already quite used to using the mouth as a site for testing, thanks to COVID-19, and I think this will become more common in the dental practice. We are now starting to understand that saliva can give a snapshot of the oral microbiome, be used for genetic testing and indicate enzyme levels, collagen breakdown, inflammatory markers and even cancer markers. By diagnosing and monitoring dental diseases in a quantitative way, we will hopefully start to achieve better long-term outcomes for our patients. Unfortunately, we usually

diagnose dental disease when it is too late and destruction has already occurred—be it periodontal disease or dental caries. If we were able to screen patients for early signs of inflammation, microbiome dysbiosis, high levels of certain enzyme activity or collagen breakdown, we would hopefully be able to prevent the disease from happening.

**In your opinion, what can dental teams do to make sure they are prepared to adapt to changes in dentistry?**

They need to be open to change.

“Dental professionals are slowly starting to understand that the work they do has huge consequences for the rest of the body”

Dentistry can be extremely habitual and dental professionals often stick to what they are used to. When we have the health of our patients in our hands, it can be very daunting to try new things out, particularly when you think your own method already works. Whereas I don't think we should be experimenting on our patients, we should, however, be open to trying new things to enhance our patient's journeys and improve their treatment outcomes. For example, we use bleeding on probing as a diagnostic tool to diagnose inflammation of the gums. This can be subjective and also inconclusive. If we were able to quantitatively diagnose inflammation through looking at inflammatory markers or looking for pathogenic bacteria in the mouth, our patients' treatment outcomes would be improved since we would have a number to work with and a cause of the inflammation to eradicate. We aren't trying to reinvent the wheel, just make it better and more accurate!

I also strongly recommend that dental professionals update their knowl-

edge through regular reading of research papers and attending conferences. Our industry can be quite lonely, and it is important to keep your finger on the pulse by staying updated.

**What are you looking forward to most about this round-table discussion?**

I am truly excited about having the opportunity to speak to like-minded professionals of such a high calibre on the future of dentistry. We are all practising dental professionals from different countries who will be able to share how we do things and what we expect the future to be like. We also all do very different things in practice but share a similar mindset. I am excited about being able to learn more about what they do and where they see dentistry going in the next five years. I usually lecture alone so I am also looking forward to having fun and interactive discussions! <sup>DT</sup>

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# Interview: The profound impact of the onset of the pandemic was something that none of us had expected



Aboubakr Eliwa, general manager for the Middle East at Kulzer

By Dental Tribune MEA

Another challenging year influenced by SARS-CoV-2 is behind us. It puts every company in new and unknown situations that they try to solve in order to help dental professionals. During this interview with Aboubakr Eliwa, general manager for the Middle East at Kulzer, we will find out more about what Kulzer has already done to help dentists and dental technicians during these difficult times and what the company still plans to do.

**Mr Eliwa, could you please tell us in brief how you and your team have been functioning during the past two years of the pandemic? Were there any changes to the team or to their responsibilities?**

The Kulzer Middle East team has been busier than ever during the

past couple of years of pandemic. During the lockdown, we took the opportunity to develop as individuals and to discover new ways to communicate with our clients. We reached out and made sure that, despite the constraints, travel restrictions and lockdowns, we were available to our clients and were there to support them with numerous scientific webinars and live demonstrations featuring top local and international speakers in order to keep our customers updated with Kulzer's innovative technology.

We had several role promotions and also welcomed new team members in the Middle East. Overall, the last two years were challenging yet fulfilling.

**Could you please tell us about the experiences you have had during**

**the past year with dentists and dental technicians in your region? How did you, as Kulzer, experience COVID-19? What have you learned from your experiences?**

The profound impact of the onset of the pandemic was something that none of us had expected. Some dental practices have closed down, and most have reduced capacity on reopening owing to the restrictions imposed by the authorities and to the reluctance of patients to visit. The result has been a significant drop in income. As a company, we have also experienced an increase in operating costs, which include shipping fees and fees for flight booking and rebooking.

Travel restrictions were a major issue. Kulzer Middle East has always been passionate about bringing continuing education to dentists and dental technicians, but flexibility of travel has been greatly affected.

On a positive note, the changing times have paved the way to virtual endeavours. We turned to our mobile phones and laptops, and we saw opportunities. This has helped us a great deal in keeping in touch with our patrons.

We learned a number of important things:

- Preventive measures should be a top priority in terms of dealing with our health and safety.
- Hybrid or flexible working does not lead to less productivity.
- Teamwork is dreamwork—without proper communication and cooperation within our team it would have been a difficult couple of years.

**Did Kulzer do anything in order to reduce COVID-19 infection risk for patients and practice staff?**

Our priorities were, and still are, to secure the health of customers, patients and our employees and to ensure operational capability. That is why Kulzer took major safety precautions from the beginning, and these often even exceeded the governmental regulations. In addition to implementing strict hygiene rules, since the spring of 2020, the management has strongly recommended that administrative staff work remotely, if the job allows it. Our sales teams were asked to reduce personal customer contacts and, in some countries where infection rates were very high, attendance at meetings was even stopped completely. And in production and R&D, we took measures to reduce person-to-person contact, and we limited access to the facilities in order to reduce the risk of infection. Until now, these measures have helped us to ensure that no SARS-CoV-2 infections are being transmitted in the workplace or towards our customers and that we can produce at full capacity. Together with our logistics partners, we are delivering all ordered goods, without limitations.

**What did Kulzer, as a company, do in order to remain in contact with customers? Were there any live webinars provided during that time? If so, on what subjects?**

Kulzer reacted quickly. Thanks to

an already very good digital environment, we could easily switch to online communication with our customers. In addition, the global teams were provided with the right skills to offer webinars in the respective countries in their local languages. This was a great help in keeping in touch directly with our customers.

We created the KulzerCOM Mobile Academy that gives us the opportunity to drive to our customers—so that they can have a short travelling distance, can learn more about new products and can contact their colleagues in a safe environment in small groups. The tour started in Germany in 2021 and will continue in 2022 throughout Europe.

**The KulzerCOM Mobile Academy started in September 2021. Could you tell us a bit more about this activity and how it has been perceived by the customers?**

The KulzerCOM Mobile Academy is a new format connecting product experience and education. On 200m<sup>2</sup> (two pavilions of 100 m<sup>2</sup> each) and in trucks of approximately 40 tons each, the academy offers interested visitors the opportunity to get to know Kulzer's dental solution concepts and deepen their knowledge by attending compact expert lectures close to their home or office. Our visitors especially appreciate the opportunity to find out about new technologies and innovations and find it a very informative event, which relates well to everyday practice.

**Is Kulzer going to continue with the Mobile Academy during this year? Are there any plans of implementing this concept in our region?**

The KulzerCOM Mobile Academy will continue in 2022 in Europe. Originally, there was also a tour planned for the US. However, owing to the current and ongoing COVID-19 situation worldwide and especially in the US, this tour was cancelled. In Europe, we plan to bring the Kulzer solutions close to customers in some cities in Eastern Europe and Western Europe, including in Germany and Austria.

We have just entered 2022, a year of new possibilities and challenges. What are Kulzer's plans for this year, especially in the Middle East region? We plan to increase our online marketing presence. Greater scientific collaboration with more key opinion leaders to represent our brands is planned. We want to keep our momentum in terms of providing education to our dentists and dental technicians. In addition, we will continue expanding and plan to recruit new team members. Later this year, we will hold one of the largest and most exclusive Kulzer events, and for this, we have invited a number of sought-after speakers. This event will be announced within the next few months. <sup>[1]</sup>

Thank you for the interview.

AD

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# Mr. CEREC's 80th birthday and a software that makes the CEREC system even more powerful

By Dentsply Sirona

Over 35 years ago, a new invention revolutionized dentistry for years to come: CEREC. The inventor of this method for ceramic restorations, Prof. em. Dr. Dr. Werner Mörmann, recently celebrated his 80th birthday. Having continuously worked to develop the system since its launch, Dentsply Sirona sends its best wishes to the CEREC pioneer. The latest CEREC software upgrade builds on the history of digital dentistry and offers enhancements for the entire CEREC workflow.

Approximately every four seconds, an impression is taken with an intraoral scanner from Dentsply Sirona. Digital dentistry is currently thriving, but it started from humble beginnings.

More than 35 years ago, when Prof. Dr. Dr. Werner H. Mörmann and electrical engineer Dr. Marco Brandestini were looking for an alternative to amalgam fillings, the idea of a machine for computer-assisted production of ceramic restorations was born – marking the beginning of digitalization in dentistry. Together, they designed an intraoral scanner for taking optical impressions of the preparation, a milling unit for the computer-aided fabrication of restorations, and an according software, known today as CEREC (Ceramic RE-Construction).

## The all-new CEREC impresses with cutting-edge technology

With the intraoral scanner Primescan, CEREC Primemill for the fabrication of restorations, the sintering furnace CEREC SpeedFire and the latest CEREC Software 5.2, the combined system has reached a new level of accuracy and speed. It also continues to be easy to operate and can be used for a wide range of indications.

The latest 5.2 upgrade of the Connect and CEREC software, as well as improved firmware, allow Primescan



Dr. Dr. Werner H. Mörmann and Dr. Marco Brandestini proudly present a CEREC prototype in 1986.

and CEREC users to implement various treatment concepts with digital workflows more efficiently, quickly and comfortably. Up to 1.5 million 3D data points are captured during scanning with Primescan intraoral scanners. This makes the scanning process much smoother and twice as fast\*. The software is now even easier to use and optimizes the workflow. The mode "Full Range Dynamic Occlusion" was introduced for the articulation calculation. This includes a wider range of lower jaw movement in the calculations, thereby helping

to detect more functional occlusal interferences.

CEREC Primemill users also benefit from the software upgrade. Extra Fine Grinding is now available for many materials and substantially faster than with Dentsply Sirona's MC XL milling unit. The Fast Grinding option is also now available for more materials. Dr. Andreas Bindl, dentist from Zurich who himself worked as senior physician under Prof. Dr. Dr. Mörmann, was particularly impressed by the filigree crown

margin after using the Extra Fine Grinding mode: "The high level of accuracy achieved through the new milling modes makes post-processing virtually redundant. And that is indeed an important and new quality."

## CEREC system continues to open the door to new possibilities in digital dentistry

Today, CEREC is the key to numerous integrated workflows – in restorative dentistry, as well as implant dentistry and orthodontics. The potential

applications of Prof. Dr. Dr. Werner H. Mörmann's pioneering achievement are still being discovered. The CEREC system is constantly being further developed in close cooperation with users, scientists and Dentsply Sirona engineers. As Prof. Dr. Dr. Werner H. Mörmann already said on the occasion of CEREC's 35th anniversary: "35 years ago, people laughed at our idea for digital dentistry, but today it has become a standard in treatment and documentation. And I stand by my prediction that by the 50th anniversary of CEREC, if not sooner, every practice will have CEREC or at least an intraoral scanner."

Dentsply Sirona would like to offer Prof. Dr. Dr. Werner Mörmann its sincere congratulations on his 80th birthday, wishes him all the best and promises to keep up the enthusiasm, pioneering spirit and development momentum he initiated. [D](#)

If you want to learn more about CEREC, visit [www.dentsplysirona.com/cerec](http://www.dentsplysirona.com/cerec).



Find out more by scanning the QR code.

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Prof. em. Dr. Dr. Werner H. Mörmann, inventor of the CEREC method.



The CEREC with CEREC Primescan, CEREC Software 5.2, CEREC Primemill and CEREC SpeedFire have advanced digital dentistry.



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# Are you ready for CEREC?

For CEREC users, it's simple: CEREC makes even the best dentists better. So going digital was a great decision, but until they did it they too had their doubts. Would everything go smoothly straight away? **No.** Could they learn to handle the technology? **Absolutely.** What about the quality of restorations? **Outstanding in every way.**

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