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New opportunities — Digital technology is an expression of our modern lifestyle. It would be hard to imagine life without it.
→ Change starting on page 06

Sirona Laser Days — Dentists experienced in laser treatment become familiar with a new technology.
→ Event starting on page 32

Title image — The cover shows the integrated digital solutions Sirona offers its customers in implantology and prosthodontics. Also exciting are the new possibilities in the area of functional diagnostics and treatment.
→ Innovative therapies from page 34
DEAR READERS,

We live in a networked world where everything is linked and information flows endlessly. Digital technologies already enable people and machines to communicate and interact in ways that a few decades ago were only possible in the imaginations of science fiction authors. Today, these various possibilities have become a key ingredient in everyday life, both privately and professionally. Digital systems are fun as they make our lives easier and speed up workflows – in dental practices and dental laboratories.

Connected via networks, digital systems don’t just control devices and manage data; they have also proven to be essential for modern dentistry: in regards to findings, diagnoses, planning and treatment – the workflows are better, faster, more efficient and more reliable. Furthermore, digitalization forms the basis for completely new therapies thanks to the integration and combination of various technologies. Innovations emerge for the benefit of our customers and their patients. Dentistry is thus a good example of what is already possible in digitalization.

Sirona has always been a pioneer as far as digital systems are concerned. We not only launched the first digital x-ray system on the market, but also invented digital impressions and computer-aided dental restorations with CEREC, and rendered this suitable for use in practices. Our customers can trust in clinically tested and scientifically proven technologies that set new quality standards.

The unique expertise in the development and production of digital technologies explains Sirona’s special market position. More than any company in the dental industry, we are able to integrate systems and procedures. This is why Sirona leads the technological developments in the dental industry, and also why Sirona is called “The Dental Company”. Digital technologies are what make us successful – after all they are the basis for the success of our customers’ practices.

At the trade fair IDS 2015 and in this issue of VISION, we will show you the latest dental technologies and illustrate how our products can be integrated into a perfect workflow for innovative treatment methods during everyday working life. You will be amazed by the possibilities.

Enjoy reading!
Yours,

JEFFREY T. SLOVIN, President and CEO
DIGITAL NETWORK

Whether we are purchasing items online using a smartphone, reading eBooks, or saving data in the cloud – digital technologies have long become part of our everyday routine and affect the way we live and work. The digital market is booming and there are constantly new digital trends to choose from. But even today’s rapid advances in digitization started out small – a few facts and figures:

ACCORDING TO UN PREDICTIONS, 3.8 BILLION PEOPLE WILL BE ONLINE IN 2018. AROUND HALF OF THE WORLD’S POPULATION WILL THEN SAVE THEIR PERSONAL DOCUMENTS NOT ONLY ON THEIR OWN COMPUTER, TABLET, OR SMARTPHONE, BUT IN THE CLOUD AS WELL, EITHER ADDITIONALLY OR EXCLUSIVELY.

— 1941 —
THE FIRST COMPUTER LAYS THE CORNERSTONE FOR THE DIGITAL ERA

— 1956 —
IBM DEVELOPS THE FIRST HARD DRIVE

— 1969 —
ARPANET, PRECURSOR TO THE INTERNET, IS BORN

— 1969 —
CCD CHIPS STORE ELECTRONIC DATA

— 1972 —
E-MAIL INTRODUCES DIGITAL CORRESPONDENCE

— 1975 —
THE FIRST DIGITAL CAMERA STORES PHOTOS

THE DIGITAL BOOK MARKET BENEFITS FROM INCREASING USE OF TABLETS.
BY 2018, SALES OF EBOOKS WILL SURPASS SALES OF PRINTED BOOKS IN THE US AND IN THE UK. IN JAPAN, CHINA, AND OTHER EUROPEAN COUNTRIES, PRINTED BOOKS ARE STILL HOLDING THEIR GROUND.

BY 2040, 70% OF ALL COUPLES WILL MEET ONLINE. AROUND 33% ALREADY DO TODAY.

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1980–1989

— 1980 —
ISDN BECOMES THE INTERNATIONAL STANDARD FOR THE DIGITAL TELEPHONE NETWORK

— 1981 —
THE FIRST CD IS PRESENTED AT THE BERLIN RADIO SHOW

— 1985 —
The first CAD/CAM inlay is placed using CEREC

---

1990–1999

— 1993 —
IBM DEVELOPS THE FIRST SMARTPHONE

— 1994 —
SIRONA INTRODUCES C1, THE FIRST FULLY DIGITAL TREATMENT CENTER

— 1995 —
ORTHOPHOS DS IS THE FIRST DIGITAL PANORAMIC X-RAY UNIT

— 1997 —
The DVD increases the storage capacity of the CD

---

2000–2009

— 2001 —
SIRONA INTRODUCES THE INLAB SYSTEM FOR THE DENTAL LABORATORY MARKET

— 2004 —
FACEBOOK TAKES WEB 2.0 MAINSTREAM

— 2006 —
GALILEOS ENABLES 3D X-RAYS

— 2007 —
The iPhone brings about a breakthrough in mobile data usage

---

2010–TODAY

— 2010 —
INTEGRATED IMPLANTOLOGY WITH CEREC AND GALILEOS

— 2012 —
CLOUD COMPUTING IS THE MEGATREND IN THE DIGITAL ECONOMY

— 2013 —
EDWARD SNOWDEN LEAKS NSA ACTIVITIES TO THE WORLD

— 2015 —
SIRONA PRESENTS INTEGRATED DIGITAL WORKFLOWS FOR IMPLANTOLOGY, ORTHODONTICS, ENDODONTICS, AND PROSTHETICS
MODERN LIFESTYLES ARE SET TO A DIGITAL BEAT

Times Square, New York: Night after night innumerable visitors marvel at the constant change of advertising and news ticker messages on the largest and most expensive LED displays in the world. Without digital technologies, the intersection between Broadway and 7th Avenue would not be totally dark, it would just be significantly less exciting.
Back in 1974 a new fashion accessory caused a major stir: Large, essentially red illuminated digits or liquid crystal displays replaced the faces of analog watches. In retrospect, even then digital watches were far more than just a fashion item; they were a clear indication of the pending end of the analog age. Exactly forty years later, the direct descendant of Seiko, Casio and co. was announced – the Apple Watch. There is no doubt, society has changed dramatically over the past four decades of digitalization. And these changes are set to continue.

“Digitalization is the entire process from recording and processing through to the saving of analog information on a digital storage medium.” Admittedly the definition of digitalization is anything other than spectacular! In a nutshell: Analog data is replaced by digital data which comprises binary signals – 1/0, off and on. Whilst this may not sound very exciting, it is in fact revolutionary. Let us not forget, digitalization makes many processes in our day-to-day work and home lives possible in the first place. How did this come about? And why?

**IT IS ESTIMATED THAT MANKIND WAS FIRST ABLE TO SAVE MORE INFORMATION DIGITALLY THAN ANALOGICALLY IN 2002**

A search to identify the reasons for digitalization is closely linked with the advantages of digital data storage. After all, digital data can only be read, processed, duplicated and used in any other manner after it has been stored digitally. The foundation stone for this was laid in 1956 by IBM with the first ever computer hard disk. This, however, had a diameter of over 60 cm and was able to hold just five megabytes of data. In reality, the breakthrough for digital storage occurred in the early 1970s when significantly smaller data carriers were launched on the market. These included the first diskette from IBM which was designed to replace the standard punch card of the time. It is only since then that the most important advantages of digital data have been employed: →

The equation “digital = smart” has only been valid for a few years. Digital watches in 1974 merely told the time. Modern smart watches can be used for communication, coordinating appointments, navigation as well as measuring one’s fitness. →
→ CDs and DVDs require much less space than books and images. For example, 143 books with, on average, 250 pages can fit on one CD. Digitally stored information can be found more quickly and more easily in data files than in paper folders. Moreover, when you copy books, the quality visibly deteriorates. On the other hand, digital files can be multiplied easily without any loss in quality.

INCREASE IN THE EXCHANGE OF DATA

It is estimated that in 2002 mankind was first able to save more information digitally than it could archive analogically. This marked the start of the “digital age”. Yet it is essentially the possibilities for processing and rapidly exchanging data which shaped the further development of digitalization and which continue to influence it today. The Internet and, in turn, worldwide networking are not conceivable without the forwarding and distribution of digital data.

Smart phones and tablets are designed for the mobile and digital exchange of data. Whereby this data was comprised exclusively of language with the first digital mobile phones and the GSM standard in the early 1990s, modern mobile gadgets are true allrounders. And they are used accordingly: Social networks have a fixed place on the large and small screens as do music streaming services, and photos and videos from the cloud.

GREAT ONLINE BUSINESS OPPORTUNITIES

Apps for smart phones & co. not only change the private lives of users but also the entire structure of the service sector. Thanks to digitalization and the Internet, new technologies, applications and business ideas are being developed continuously. For example, the mobile banking app of the future may come from Apple and not your local bank. Photo services for mobile phones today are not offered by the once powerful yet no longer existent industry giants Kodak and Agfa. Compared to the analog world, in the digital landscape it is often other companies which emerge as the market leader.

E-commerce is a good example of this: When it comes to turnover, Amazon is the undisputed king of online retailing. In 2004 the company had already left trading giants in its wake in terms of online trading. In 2013 Amazon achieved a turnover in excess of $ 74 billion – this is one sixth of that of Walmart, the highest-grossing company in the world. Digitalization can therefore be seen as a motor for growth.

PRODUCTION IN THE DIGITAL AGE

And in companies? Here digitalization opens up a whole host of new opportunities. Many business processes today are completely digital and can now be handled more quickly and cheaply than ever before. The most well-known example has to be e-mail, the success story of which began at the end of the 1980s.

Intelligent technical systems are highly complex. In order to optimize human/machine interaction and simplify communication within the development team, so-called “virtual design reviews” can be used during product development. The illustration shows the simulation of a dough kneading machine from WP Kemper, made by Heinz Nixdorf Institut of the University of Paderborn.

In Industry 4.0, machines and objects interact to realize production tasks autonomously, i.e., without human intervention – similar to vehicle production at Audi.
FOR US DIGITALIZATION MEANS, FIRST AND FOREMOST, A CHANGE IN THE WAY WE THINK AND SIGNIFICANT CHANGES TO OUR DAILY LIVES.

Current developments presently focus on the “industrial Internet” sector: Customers are able to define every single detail of the product they want when ordering in order to receive a highly customized product. To enable the industry to produce these increasingly customized products in a short space of time without increasing the price, the value-added processes need to be changed radically. Take for example production: In the “smart factories” of the future, all components should be linked together via the cloud. What’s more, the term “smart factory” really should be taken literally since here the components “know” to which other component they belong, how they get there and which machine puts them together.

Beyond networking, the storage and rapid processing of large volumes of data (“big data”) facilitate completely new production processes. From tooth implantation through to car manufacturing, true-to-life models can be simulated in 3D and all the necessary production steps and error scenarios can be configured even before production. Digitalization is thus a cost saver.

FOCUSED ON MANKIND

Forty years after the first digital watch, experts today have, in part, differing ideas on the future priorities of digitalization. However, there is agreement that mankind and not machines should form the focal point of this advancing digital evolution. The factories of the future and industry 4.0 cannot function without manpower. The know-how and flexibility as well as the decision-making abilities of well-trained experts are essential to control and regulate processes.

Thus digitalization is developing around mankind. Are we being oppressed? No, we are being liberated! Workplaces no longer have to be in a fixed place; they are starting to transform into states. Just this scenario alone provides an idea of the far-reaching consequences of digitalization. Companies and policy makers are now faced with the challenge of enabling more flexible working hours – society must recognize this as normality and take advantage of the opportunities for reconciling work and family commitments. Undoubtedly other areas such as leisure time, education and the sciences will also see drastic changes. There is a great love of digital experimentation. Not all of the pending changes will work or prove positive. Yet one thing is certain, digitalization is going to make its presence increasingly felt in our lives. For us digitalization means, first and foremost, a change in the way we think and significant changes to our daily lives, and is thus far more than simply wearing a smart watch on one’s wrist.

DIGITALIZATION: THE MOTOR BEHIND TECHNICAL CHANGE, INCLUDING IN THE DENTAL INDUSTRY.

Computer technology and flexible automation in production have resulted in increased industrial efficiency. This is also beneficial to users of dental technologies: Dentists, dental technicians and clinics. Sirona realized the advantages presented by digital technologies early on and started to make them available to the dental world.

CAD/CAM: In 1986, with the first tooth restoration produced with the aid of a computer, the company became a forerunner for dental CAD/CAM technology. Although it was initially somewhat controversial, the innovative procedure for chairside treatments in a single session has proven itself to be reliable and is now well-established on the market. Today, more than 5.5 million CEREC restorations are placed each year.

Imaging systems: In 1995, with the ORTHOPHOS® DS, x-rays also became digital. As a digital technology pioneer, in addition to intraoral, panoramic and cephalometric systems, Sirona now also offers several 3D x-ray systems with various volumes: GALILEOS, ORTHOPHOS SL and the 2D/3D hybrid unit ORTHOPHOS XG 3D.

Integrated dental technologies: The combination of 3D x-ray data with CAD/CAM and other digital technologies facilitates advanced treatment methods in the fields of implantology, endodontics, orthodontics and prosthodontics.

Treatment centers: 1994 saw the launch of the first treatment center C1 which could be digitally controlled and which was equipped with monitors on the dentist and assistant element. The features which are now standard with contemporary centers have long been included in the Sirona range.

Instruments: Nowadays the controls for lasers and special instruments for periodontology and endodontics are 100% digital. The hygiene system DAC UNIVERSAL also supports initial validation and revalidation thanks to digital process control. The documentation of instrument reprocessing is forwarded to the practice software and archived.
We live in a world full of numbers. Digitalization is now a component part of our working and private lives. This presents both risks and opportunities and, as such, ambivalence prevails. In a discussion Dr. med. Sylvia Thun and Dr. Axel Wehmeier, experts in formation technology for healthcare systems, it is evident that embracing the digital world will improve our quality of life.
44 zettabytes – a 44 and 21 zeros – that is the expected global volume of data in 2020. This is the equivalent of all the known stars in the universe. So what are we doing with all this information?

— Prof. Thun: We are not simply talking here about masses of data. Digitalization is not an end in itself. Data is closely linked to create new information. It’s difficult today to escape this added volume of information, and this also applies to healthcare. Today medical devices are digital. This is valued by practitioners and patients alike since both benefit from the exceptional safety and efficiency offered in terms of diagnoses and treatments. Yet, nevertheless, a lot of the potential is still not used in this sector.

In your view what challenges does our digitalized world present?

— Dr. Wehmeier: We can observe an interesting phenomenon. On the one hand, digital devices and machines are developing at an incredible pace. On the other hand, digital networking, which in my view is all-important, is progressing only slowly, especially with respect to healthcare. To give just two examples: Digital x-rays are made, yet these are still carried from doctor to doctor on a DVD and patients still take print-outs of their ultrasound examination home with them. This is almost an anachronism in the digital age.

You just have to take a look at Singapore to see there is another way. Here our company has implemented digital networking as part of a project in a retirement home: All doctors and care staff have access to the residents’ electronic files and can thus enter new examination results at any time. Denmark has also established a patient-centered infrastructure. Care providers and payors communicate for the most part electronically. This saves on average 50 minutes of administration time a day as correspondence and invoicing are digital.

The advantages of networked systems are obvious: Quick access to data which is important for treatment, multiple examinations and the associated documentation are reduced and the quality of care is increased.

Professor, aside from the purely monetary aspect, what price do we have to pay for digitalization?

— Prof. Thun: The ambivalence seen in connection with the digitalization of many areas of our lives is based on the fact that we are not sure what is happening with our personal data. And data which contains information on our health is extremely personal. The question on safety has an ethical component: How transparent do we want to be? And there are also technical problems: Who determines what is recorded in a patient’s electronic file? What can I control or influence as a patient? How is abuse prevented? The practitioners, i.e., doctors and dentists, have to be sure that the system not only works properly, but that payors also handle the data with the interests of patients in mind. After all, one thing is certain: The data belongs to the patient.

— Dr. Wehmeier: Yes, but we can only participate in these major medical advances if we make use of the data available to us. Those who don’t provide patient data must face the consequences, i.e., that medically necessary or life-saving measures are not initiated. This will become increasingly important as more and more different systems which are used to communicate with and about patients are also safely linked up. I am therefore in favor of a world in which the systems can ‘talk’ to each other and where, for example, there are case files which migrate from system to system within an integrated treatment approach. We should not be afraid of this. For me the positives far outweigh the negatives. Patients can remain in charge of their data and then decide who can see and use it.

The key issue of digitalization is integration. What form will medical and dental treatments take in the future?

— Prof. Thun: As well as tackling technical challenges I also see changes for those who operate in a health world which is more digitally networked than ever before. No doubt there are areas in which robot-like devices can be used yet ultimately we still need doctors and dentists, they have to be part of the treatment for legal reasons. And I believe that we still want them. This in turn means that doctors and dentists must put their trust in digital medicine. For this reason, training and courses need to be offered on this subject. We must achieve a situation in which it is a matter of course for practitioners to use and also further develop digital processes.

— Dr. Wehmeier: I believe that in the long term this will be complemented by telemedicine services. Of course these should not and cannot replace conventional treatment, especially in dentistry. As part of a treatment method in line with guidelines, telemedicine should make additional tools available to aid treatment, particularly when interdisciplinary cooperation is required – cranio-mandibular dysfunction (CMD) is a very good example of this. From a technical perspective, the issue must include communication standards and it must be ensured that all systems and applications are interoperable with the telematics infrastructure.
SOFTWARE IS THE SOUL OF DIGITAL SYSTEMS

Precision device manufacturer or software “smithy”? The question as to what Sirona is will possibly be answered differently by dentists depending on which product they are currently using. Yet for the developers from Sirona one thing is sure: At the start of the 21st century, a dental device manufacturer has to be both. After all, modern dental devices are digital and any further development means a new software version.
The new x-ray software SIDEXIS 4 is the quintessence of two decades of experience in the field of digital imaging. A particular advantage is that it provides the possibility to assess in 2D and in 3D in just one software or comparing 3D volumes (top). The user also can see the entire patient history, available at a glance in the timeline (left).

**March 2015.** One of the many highlights which Sirona will be presenting at the IDS in Cologne is a new x-ray software: SIDEXIS 4 serves to assist image acquisition, processing and archiving. It supports and controls all digital x-ray devices from Sirona used in practices, and networks them with the practice administration program as well as the implantology planning and orthodontic analysis programs, amongst other advantages. The modern screen design meets the most stringent standards in terms of user guidance.

Modern control software must satisfy various demands for all imaging systems in dental practices. Many years of experience in the dental industry, close cooperation with customers, outstanding know-how of software development and a lot of hard work are required to merge all these requirements into a single project.

**AND THE UPGRADES JUST KEEP ON COMING**

Review: October 2009. The project SIDEXIS 4 started from scratch. Whilst most software developments are based on previous versions, SIDEXIS 4 was to be a completely new project. As a platform, the software was to enable multiple enhancements for the seamless integration of other digital technologies.

However, the development process was not without an initial foundation as Sirona works closely with many users and receives feedback from them. This feedback was used as a starting point for the development of SIDEXIS 4. “We attach great importance to the criticism, ideas and wishes of our customers,” explained Dr. Nadia Amor, Senior Product Manager Imaging Software at Sirona. This is why Sirona conducted a detailed usability study on the previous software SIDEXIS XG. The company used this as a basis for analyzing possible improvements to the new x-ray software in a structured manner.

The idea pool for the development of the new software took its inspiration from a great range of very different sources, e.g., from observations of the day-to-day working life in our customers’ practices around the world and from the rapid advances seen with respect to information technology. In Sirona’s Center of Innovation in Bensheim, Germany, developers monitor the software market closely and consider how applications from other industries could be used in order to make x-rays simpler, quicker and better.

**SIDRANA MAKES ITS LIFIE DIFFICULT TO MAKE THAT OF ITS CUSTOMERS EASIER**

December 2011: The conception phase began immediately after the results of the analysis had been collected. Together with selected users, the developers described the desired functions and designed the individual components of the software. Following this, the individual steps in software development were repeated countless times: Features were programmed and implemented. External software designers and experts also played a role in the design of user interfaces. After this, the users conducted Beta tests and gave feedback. During these phases the importance of developing, maintaining and continually growing a group of experienced Beta testers with different experiences and requirement profiles cannot be underestimated. Moreover, this group must be closely integrated into testing early on. The testers not only offer visionary approaches, but also remind developers not to lose sight of the core applications whilst also ensuring simple operation.

The standards and regulations in place for medical technical devices obviously also have to be observed. Sirona invests a lot of time and money in guaranteeing that the software meets these demands. Once the software has reached a status which allows live operation in a practice, the circle of testers is further expanded. In this way SIDEXIS 4 was fine-tuned, and moved from being an experimental product to a software ready for the market.

It was not until August 2014 that the release version of SIDEXIS 4 was sufficiently technically stable and reliable and the decision was made to launch the software at the IDS 2015. Dr. Amor: “At this point in time, we felt confident that it satisfied all the important quality requirements. During testing it proved to be user-friendly and intuitive to operate so that following installation and a brief introduction, all practice personnel are able to use it without further assistance.” Moreover, SIDEXIS 4 has also shown that as an integrated unit it improves the workflow in the practice setting as a whole and, with respect to future applications, creates a platform for simple, quick and safe working.

**“IF THE HARDWARE IS THE BRAIN AND THE SINEW OF OUR PRODUCTS, THE SOFTWARE IS THEIR SOUL.”**

**STEVE JOBS**

Within the framework of a Bachelor thesis distinguished by the German Association for Electrical, Electronic & Information Technologies (VDE), a Sirona trainee developed approaches for a new audiovisual technique which can be used to help document the findings from an intraoral camera automatically. A microphone records the spoken findings whilst the dentist records the status visually. The newly developed software divides the audio and video signals automatically into individual states, allocates the spoken findings to the correct images and makes these available to the user as “finding markers”. The technique is still being developed.
After the implant has been inserted and has healed, an individual abutment and a temporary crown are milled with CEREC and then inserted. Based on the implant planning data, the dentist can either order a surgical guide from SICAT or mill one chairside using CEREC. After the hole is drilled, the dentist inserts the implant. For all surgical steps, TENEO can be equipped with the implantology function for programmable control of the instruments. After the implant has been inserted and has healed, an individual abutment and a temporary crown are milled with CEREC and then inserted. A perfect gingival line is also a part of surgically and esthetically precise implants. SIROLaser Blue can help here with its extraordinary cutting and coagulation power. The instruments are reprocessed in DAC UNIVERSAL and then packaged and sterilized in DAC PREMIUM. Test exposure with XIOS XG Supreme sensors.
Sirona is a pioneer in modern dentistry based on digital technologies. X-ray and CAD/CAM systems, treatment centers, instruments, and hygiene devices function not only as useful, advanced stand-alone devices, but as integrated systems which provide innovative solutions for efficient workflows in implantology, endodontics, orthodontics, and prosthetics.

**ENDODONTIC WORKFLOW**

Scan with the intraoral camera

SIROCAM AF

XIOS XG SUPREME SENSOR

XIOS SCAN

The tooth situation is scanned using XIOS XG sensors or storage plates in connection with XIOS Scan.

SIDEXIS 4

Diagnosis of the scans and consultation using SIDEXIS 4: The patient now has a better understanding of the necessity for the procedure and how it will be done.

The root canals are exposed and prepared using, e.g., reciprocal files (RECIPROC®, WAVEONE® and WAVEONE® GOLD). The ApexLocator display (included in the endo package) can also be transferred to the SIVISION monitor.

SIROLASER BLUE

CEREC SOFTWARE

DAC UNIVERSAL

The instruments used are reprocessed for the next treatment at the touch of a button in DAC UNIVERSAL and are then packaged and sterilized in DAC PREMIUM.

The root canals are filled and the tooth is restored with a crown. This can be produced chairside right in the practice using the CEREC milling unit.

At the end of the treatment, the root canals are filled and the tooth is restored with a crown. This can be produced chairside right in the practice using the CEREC milling unit.

Germs in the root canals are then eliminated, e.g., using a laser.
Using a cephalometric, panoramic, or DVT scan, the patient’s situation is recorded with an Orthophos or Galileos and diagnosed with SIDEXIS 4.

The CEREC data can be used for traditional orthodontic treatments or for producing aligners.

After the teeth have successfully been adjusted, the tooth anatomy can often be reconstructed using minimally invasive veneers.

Soft tissue management using a laser.

Cleaning, lubrication, disinfection/sterilization

Sealing

Sterilization

Storage of the instruments for the next use

Contaminated instruments for critical use

Contaminated instruments for semi-critical use

DAC Universal

SIROSEAL Premium

DAC Premium

SIROLASER Blue

INTEGO Pro

Based on this planning data, the dentist orders the required treatment appliance.

INTEGO pro is ideally suited for orthodontic treatments.

Orthodontic Workflow

Data Acquisition and Diagnosis

Planning and Counseling

Treatment

Aligner Production by External Service Provider

Cleaning, lubrication, disinfection/sterilization

Sealing

Sterilization

Storage of the instruments for the next use

Contaminated instruments for critical use

Contaminated instruments for semi-critical use

DAC Universal

SIROSEAL Premium

DAC Premium
A panoramic image is created with an ORTHOPHOS SL or ORTHOPHOS XG to record the patient’s situation and the diagnosis is made using SIDEXIS 4.

The construction is made in the presence of the patient using the CEREC software.

If the dentist does not produce the restoration himself, he sends the model data to the partner dental lab via the Sirona Connect portal. There it is produced with the inLab MC X5 or inLab MC XL production machine.

The CEREC treatment merges two sessions into one. The Lounge upholstery makes the patient’s time in the chair as pleasant and comfortable as possible.

All inlays, onlays, crowns and bridges as well as veneers and individual abutments that are needed can be milled chairside with the CEREC milling unit and can be inserted immediately.

WORKFLOW FOR INSTRUMENT REPROCESSING
Experts recommend automatic over manual reprocessing and thermal disinfection over chemical disinfection. When using automatic cleaning and disinfection devices, the requirements set out in the international standard ISO 15883 apply. It must be possible to validate processes. The DAC UNIVERSAL is therefore ideal: It is the only validatable combination autoclave available on the market that cleans, lubricates and sterilizes. The DAC UNIVERSAL with a graphical user interface and flexible cover for ultrasonic handpieces and tips, and multifunctional syringe tips will be presented at the IDS 2015. To prevent cross-contamination, separate areas must be designated for reprocessing instruments for semi-critical and critical applications. These reprocessing areas are to be divided into “unclean” and “clean” areas. The appropriate location of DAC UNIVERSAL is in the unclean area, directly adjacent to the clean area. In the hygiene process chain, a machine for sealing the instruments (SIROSeal PREMIUM) and the DAC PREMIUM sterilizer follow in the clean area.
Technical advances often result in improved solutions: Tasks can be handled quicker, more easily, more successfully and with less work. This basic principle also applies to dental CAD/CAM technology. Today CEREC is so highly user-friendly and profitable that age is not a barrier to getting started.

**IT'S NEVER TOO LATE TO TAKE THE PLUNGE**

**Major investments** need to be considered carefully beforehand — this is of course also true when equipping dental practices. After all, new purchases should pay for themselves — the result needs to be just right and, ideally, it should decrease workload in the practice. Before buying a CAD/CAM system such as CEREC from Sirona, a few questions need to be addressed: Does the new system work smoothly? Will I as the user be able to handle it? Can I integrate it in the practice workflow? And possibly most important of all: Will the investment pay off?

The good news: Using this technology for the first time is easier than you would think and is worthwhile for all dentists. New software features which further enhance user comfort and offer additional treatment safety make the system especially interesting to newcomers of all ages. Starting out in the world of CAD/CAM production is normally not a cause for concern for younger dentists who have grown up using PCs, mobile phones and tablets.

**TOP NEWS: CEREC MEETS INVISALIGN LEARN MORE »**

Dentists of all ages are enthusiastic about CEREC. So is Dr. Leo Rosenthal from Alexandria, Virginia (U.S.), as the video shows. The passionate 73-year-old dentist first learned how to use CEREC just 4 years ago and is convinced that he has become a better dentist thanks to CEREC. sirona.com/cerec-age
At the IDS 2015 CEREC will once again show that even after 30 years of successful use, it still remains innovative. In addition to prosthetic restorations using highly esthetic and biocompatible ceramic, which, thanks to the new bio jaw mode, now boast an even better fit and a more natural-looking anatomy, the market leader also supports an increasing number of applications in the fields of implantology and orthodontics.

In terms of implantology, CEREC offers solutions that allow comfortable treatment within just a short time — both for fitting screw-retained crowns or custom abutments on implants, and for placing the implant itself. With CEREC Guide 2, Sirona has the quickest and most cost-effective surgical guide in the world that ensures unbeatable treatment safety — without needing a conventional model.

Thanks to the newly developed guided scanning process optimized for orthodontics, users can create a full-jaw image, including bite registration, quickly and accurately in the CEREC system. The digital data is then available for quicker aligner therapy and can also be printed out if needed for many different orthodontic applications.

And experience has shown that even less technology savvy dentists quickly get used to the computer support which makes treatments extremely safe thanks to intuitive operation. Nevertheless, during this initial period, CEREC training is highly recommended to allow users to learn how to use the system as quickly and safely as possible.

**THE FASCINATION OF SIMPLICITY**

CAD/CAM technology becomes even more appealing with its impressive results. An easy-to-operate camera such as the CEREC Omnicam replaces the conventional impression technique using a tray and impression material. Quick, digital, extremely precise — and capable of being used without prior powdering. The various restorations are then designed. The software assists here with intuitive user guidance and active feedback. The subsequent in-house production of the restoration ensures precise results and enthusiastic responses from patients. It also increases the value added in the practice.

That the system is appealing to ever more newcomers can be explained by the fact that Sirona as the CEREC developer can look back on more than 30 years of practice experience. Since the launch of CAD/CAM technology in dentistry, the company has been working continuously and very successfully on making the system more user-friendly and useful. This means that even dentists who have not grown up as “digital natives” can use CEREC. CEREC is a worthwhile product which can be adapted to the specific needs of the field of activity for all those who, years after setting up a practice and specialization, are looking for new, more efficient approaches to replace their traditional methods.

**ECONOMICALLY VAILABLE FOR MANY SCENARIOS**

The procurement of digital technologies can even be worthwhile for dentists with “older” practices whose thoughts are focused more on leaving the practice than on investing in new treatment methods. After all, for them the question of how to invest their savings safely often arises. The chances of securing high returns on the capital markets are currently both very limited and uncertain. Yet with an investment in CEREC, in addition to more fun at work, it is the practice owner who is in control of ensuring that the investment pays off. And even if the practice owner has only a five-year depreciation period before retirement, at the latest CEREC pays for itself when selling the practice as it enhances the value of the latter. And from a holistic perspective, the external impact of modernization should not be underestimated. Patients who, to date, have been used to the impression tray will welcome digital impression taking. And all those who, thanks to CEREC, have received high-quality restorations without the need to make another appointment, will recommend the new treatment method and the practice.

**QUO VADIS, CEREC?**

Even today CEREC is much more than a simple CAD/CAM solution for single restorations. Given its ability to be integrated, the system is the starting point for many modern digital treatment methods. The processing of several restorations at the same time is as self-evident as the simultaneous surgical and prosthetic planning of implants. On the basis of this, CEREC Guide can be used to produce surgical guides directly in-house or alternatively they can be ordered centrally via SICAT. These guides promote the safe insertion of implants. And CEREC can now also be used for orthodontic applications, such as aligner therapy. The journey into the future of dental technology doesn’t stop here! In a nutshell: CEREC is a safe investment for everyday practice life both now and in the future.
Many practice teams still use film for intraoral x-rays because the analog workflow is well-established and because they believe that entering the digital world of x-rays entails high costs and effort. This puts them at a major disadvantage. This no longer has to be the case as Sirona has completed its intraoral family and now also offers storage plates and a scanner.

To open up the advantages of digital x-rays to practices that still use conventional workflows for intraoral x-rays, Sirona has now launched the XIOS Scan plate scanner. Just like their sensor siblings, storage plates in the required sizes have an extraordinarily good image quality. They are designed in such a way that they cannot be read the wrong way round, and offer virtually all the advantages of digital x-rays with a minimal learning and integration curve for dentists and practice teams. Regardless of whether the dentist wants to x-ray with or without cables, using a sensor or imaging plate, a wall module or a mobile unit, or whether the image is made at the treatment center or in the x-ray room, the Sirona x-ray family has the right solution for every practice. Sensors, storage plates, panoramic x-rays, and 3D are compatible with each other, can be operated intuitively via the same SIDEXIS 4 software, and can also be expanded at any time as required.
DIGITIZATION OFFERS NUMEROUS ADVANTAGES

Compared to analog x-rays, digital radiography has numerous advantages. There is no distortion due to films being bent during positioning and the scans cause less exposure to radiation. Further, they don’t have to be developed with long developing times or using environmentally-harmful chemicals in specially provided rooms, but rather are available immediately for diagnosis. The image can also be further processed digitally on the spot. The image can be enlarged, making details visible that are normally difficult to identify when examining an analog x-ray image. Filters help dentists to clearly identify anatomical structures. The focus adjuster in the SIDEXIS software allows users to subsequently change the image impression of the x-ray and adapt it to their needs. They can also individually preset the display parameters, such as sharpness, brightness, or contrast, for four different applications – general dentistry, caries diagnosis, endodontics, and periodontology – thus saving a lot of time. There are also advantages when archiving x-ray images and accessing them again. The scan does not have to be archived in a separate room and then located again at the patient’s subsequent visits; instead it can be accessed with just a few clicks of the mouse.

XIOS SCAN FOR DIGITAL IMAGES FROM ANALOG X-RAYS

The new storage plates offer another simple way to start digital imaging. Instead of chemically developing conventional x-ray images, the image data is saved in the radiation-sensitive layer of a special plate and digitized with an storage plate scanner when read. Once the image data has been read, the storage plate is completely deleted and is then ready for new x-ray scans. As the plates are not scratched in the scanner and there is thus no loss of quality, this process can be repeated thousands of times. The low-maintenance XIOS Scan from Sirona has been tested, for example, on 60,000 scratch-free reading processes. Images are generated at a high resolution of 22 line pairs per millimeter (Lp/mm), thus meeting Sirona’s requirements – best image quality at the lowest dose. The scanner that requires comparatively little counter space can be easily connected to a PC and integrated into an existing practice network. XIOS Scan is compatible with the SIDEXIS 4 x-ray software and SIDEXIS XG from version 2.6.1 and up.

XIOS XG SENSORS FOR THE PERFECT WORKFLOW

Sirona launched a new generation of intraoral sensors that enable image transmission to the practice network, either via a USB module or wirelessly with WiFi technology. Thanks to modern sensor technology and the dynamic focus adjuster in the SIDEXIS software, the XIOS XG Supreme with a theoretical resolution of 33.3 Lp/mm ensures outstanding image quality. The sensor is very easy to use and patient friendly. As it is available in three sensor sizes and has rounded edges, it can be positioned well in the patient’s mouth. In the unlikely event that one of the stable cables is damaged, there is no downtime as it can be replaced quickly, independently and cheaply in the practice.

The third module in the intraoral family is the x-ray tube assembly. Regardless of whether the dentist uses storage plates or sensors, Sirona offers an intuitive, easy-to-use x-ray tube assembly.
It’s the focal point of a dental practice: the treatment center. Here is where the patient, dentist and assistant meet, where diagnosis and treatment come together, and where dentistry happens. In short, all aspects of a dental practice converge here. Taking a look at how these aspects come together to form a network is worthwhile.

**EVERYTHING UNDER CONTROL**

Initially visionary and a little unusual, today almost familiar: a multifunctional space from which several different aspects can be controlled. Sitting at the steering wheel of a car, for example, the driver not only controls the vehicle, but also operates a complete media center including navigation. System errors are visualized on the display — and when driving style shows fatigue, a coffee cup flashes to encourage the driver to take a break. Information networking makes it all possible.

More and more, the new generation of treatment centers from Sirona have become multifunctional systems that do much more than just recline, supply rinsing water and provide a place to put instruments. Treatment centers today are compact control centers with extensive digital technology and functionality. From here, the dentist has access to many other areas of his dental practice.

Thomas Senghaas, specialist in endodontics from Hamburg, Germany, explains that “the right setup is essential, especially for technically demanding and intricate interventions. The chair must be easy to adjust — and by easy I mean comfortable for the patient, ergonomic for the dentist and assistant, and finally have the technical features required for specific treatments. Only then is optimal treatment possible.”

It has now become a matter of course for Senghaas that he can control all movements of the center from the touchpad. The Sirona TENEO treatment center also allows him to save patient-specific treatment

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**NEW GENERATION OF TREATMENT CENTERS: WE ARE NETWORKED**

As the technology leader with decades of experience in the development and production of high-quality dental equipment, Sirona knows the individual needs and requirements of dentists. Additionally, with its products for every practice, Sirona offers a treatment center characterized by good ergonomic design, high quality construction and safe hygiene. The centers can be fully integrated into the practice’s network and equipped with numerous additional functions.

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**TENEO – INNOVATIVE AND COMFORTABLE**

TENEO offers optimum comfort and workflow support. Numerous features such as motor-driven sliding track, intuitive operation and configurable EasyTouch user interface, integrated functions for endodontics, implantation and x-ray software SIDEXIS 4 as well as network compatibility make this the control center for the highest demands.

**SINIUS – EFFICIENT AND COMPACT**

SINIUS stands for maximum efficiency: Available as a sliding track, whip arm or hanging hoses model, it provides the right design for different requirements. The equipment can be selected, allowing the dentist to optimally work alone. This center also has a network interface, making it a control center in the practice.

**INTEGO PRO – ECONOMICAL AND FLEXIBLE**

INTEGO distinguishes itself by an outstanding price-performance ratio. At a low level of investment, the treatment center offers a compelling ergonomic design and high reliability. Interfaces also allow networking in a digital practice and simplify maintenance of the center. With special packages, the center can be configured to suit individual needs.
positions and to call up those positions at subsequent patient visits. The center can be programmed so that the patient is comfortable and relaxed while also allowing the dentist to have consistent optimal access to the patient’s mouth. If the patient’s head needs to be repositioned during treatment, Senghaas does not even have to put down his instruments – the motor-driven headrest can be adjusted by the wireless foot control. The dentist is seated ergonomically in every treatment situation, thus preventing any back problems.

TREATMENT COMFORT – DATA NETWORKING

Another benefit of state-of-the-art treatment centers: All information required for the treatment can be accessed from the treatment center directly. Patient data with medical history, the current treatment status and x-rays from the image archive can be called up centrally from the treatment center thanks to networking with the practice and image processing software. “This means that the practitioner does not have to turn away from the patient during an initial examination, but can view images from the intraoral camera or x-ray images together with the patient and discuss next steps,” explains Senghaas. The images can also be displayed later for treatment planning on a 22” monitor with full HD technology in 16:9 format, transferred to an iPad via WLAN or sent to a colleague as well as to the dental laboratory – maximum convenience both for dentist and patient.

Implantology and Endodontics – The Functional Network

In addition to the availability of information, integration of formerly external functions in the treatment center is becoming increasingly important, e.g., in implantology or endodontics. Dentists working in implantology can display the treatment plan on the monitor during surgery. In addition, the integrated implantology functions can be used to set the parameters for instrument utilization: speed, required torque and necessary volume of sterile coolant.

Dentists like Senghaas, who often provide endodontic treatments, benefit from integrated endodontic functions. In addition to the integrated ApexLocator, this also includes a comprehensive widely-used library that contains current file systems and the important preset parameters. The file library can also be customized. “I’ve saved all the file parameters I need in a personal, comprehensive file library. From the center’s wireless foot control, I can scroll through a list and call up the required file,” explains Senghaas. At the IDS 2015, the reciprocal file systems from VDW [REZI/PROC®] and Dentsply Maillefer [WAVEONE®, WAVEONE®Gold] are also added for TENEO, which allows for efficient and safe preparation of the root canal. In addition to visualization of the apex graphic and drilling parameters on the EasyTouch interface of the dentist element, the apex display can also be shown large-scale on the SIVISION screen. The dentist always keeps an eye on the progress of root canal treatment and has full control over the important medical values such as torque, speed and distance of the apical constriction. “The integrated functions and data networking make the treatment center of greater value than it could ever be just with auxiliary devices,” summarizes Senghaas.
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THE MOVIE
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Without a single working handpiece and with turbines without torque, what Susanne Wallner discovered when she arrived in Namibia with the aid organization "Dentists without Limits" was a far cry from what she was used to from her dental studies. Yet thanks to commitment and dedication, creativity and numerous donations from her home country, her time abroad was both exciting and successful.

I came back to reality with a bump on arrival at one of our destinations: The village of the San people (the indigenous people of Namibia) belonging to the Living Museum of the Ju/'Hoansi-San. Our plan of performing the treatments in the local school was thwarted as it was closed due to the holidays. True to the spirit of the Cuban exchange dentist Carlos, “no difficult, no problem,” we soon set up the treatment chair in the sand under a large tree. Our suction system was connected to the generator and worked perfectly! We captured this unique treatment situation in a very special photo.

My conclusion of my time in Namibia: There is nothing better than looking at the bigger picture and getting to know other people and cultures and offering help where it is needed. And one thing is for sure, I will be back!
Digital technology in the dental laboratory — today it’s not so much a question of whether it is used, it’s how well it supports our work as dental technicians. Sirona’s inLab MC X5, a new milling and grinding machine for dental labs, sets new standards for versatility of uses and materials.

EVERYTHING A LABORATORY NEEDS

Jay Black / It is exciting to be able to test a new machine as an inLab tester before the market launch. What can it do more or better than the inLab MC XL, which we have used for five years? How is it operated? What do the results look like? How easily can it be integrated into the workflow? We were especially interested in the last question. Our lab was one of the first to take part in the world’s largest dental network — Sirona Connect. This means that we are used to working with digital impressions. Now we were curious about what effect the new machine would have on the digital process.

We received our inLab MC X5 last July. The first impression was that it is very compact, so it doesn’t need much space and is very easy to use. But we were especially fascinated by the fact that the five-axis machine provides a great deal of product freedom. We can cover many more indications than before. With it, we can even produce very complex restorations that we used to have made in other laboratories. The machine mills various sizes of standard disks and blocks, thus allowing for a wide range of materials, and making possible the utilization of the best fabrication strategy.

Open for many things

An absolutely new feature of the inLab MC X5 is that it is open — it is completely irrelevant which system was used to generate the digital data of the impression and which program will be used to design the restorations. The CAM software for the machine can easily use STL data from any system, which is definitely not always the case.

Due to the many options for processing, the machine quickly found its place in our laboratory. We use it for wet and dry processing and it is even possible to combine the two methods seamlessly — depending on the material used. Switching between wet and dry processing — for example, from glass ceramic, wax, or PMMA to zirconium dioxide — is fast and uncomplicated. We use the inLab MC X5 for all our full zirconia work and for zirconia frames, for temporary restorations and wax-ups, and for frames of various materials that are then veneered.

Tools used include carbide cutters and diamond grinders for processing standardized disks with a diameter of 98.5 millimeters.
and a height of up to 30 millimeters. Efficient utilization of material is ensured by the disk management function and extensive nesting functions. The great advantage of the specially developed multi-block holder is that up to six blocks of different materials can be put in it simultaneously. This will soon also include dentin and mesostructure blocks.

**IDEAL COMPLEMENT TO OUR MACHINES**

As a laboratory that works with various machines from the inLab family, we were especially interested in seeing how the inLab MC X5 would be integrated into our lab. We were pleased in seeing that it fit in perfectly. It not only meets all demands of a production machine, it also complements Sirona’s special laboratory program perfectly. When we need single crowns quickly, the inLab MC XL does a very good job. When we need larger numbers or more complicated restorations such as multi-unit bridges or telescopes, the strengths of the inLab MC X5 come into play. It is therefore the ideal standalone solution with everything the laboratory needs for digital production. It can also be used optimally in combination with the inLab MC XL, and cleaning and servicing is not difficult.

I can definitely say that the inLab MC X5 does everything that I as a dental technician need. It gives me the feeling that I will be well prepared for the developments that are certain to come in digital production of tooth restorations.

For me, the new inLab MC X5 sets a new standard. With it, Sirona clearly demonstrates that it understands dental technology and has become a technology leader in this market. We can see that Sirona includes dental technicians and their needs in product development.

**CASE STUDY**

The following case study of an upper jaw severely abraded by bruxism shows how we use the machine in routine laboratory work. The patient wanted a zirconium oxide bridge for the entire upper jaw. We received the digital impression data made with CEREC Omnicam via the Sirona Connect portal. The dentist sent us an image of the initial situation (left), for orientation. We loaded the data from the internet platform directly to the inLab software. The bite was opened by 1 mm using the software’s incisal pin tool (middle). The full-anatomy bridge was designed and a temporary restoration was milled from VITA CAD-Temp. We used the period it was worn to verify the precision of bite and fit. Not until the patient was satisfied did we mill the final restoration from BruxZir solid zirconia milling blanks and sinter it in the inFire HTC speed sintering oven (right).

**PROFILE**

**Jay Black** is a dental technician and graduate of the University of Florida (U.S.). Since 1997 he has been the manager of the Winter Springs Dental Lab in the city of 30,000 of the same name in Florida. As an inLab tester, he shares in the further development of the most advanced CAD/CAM systems in dental technology and passes his expertise on to his colleagues as an inLab trainer.
Digital imaging has many benefits for operating convenience and workflow in dentistry: Images are quickly available, easy to evaluate on a monitor, and magnification, contrast, and brightness can be processed retroactively if necessary. The resulting good image quality and additional possibilities for evaluation have contributed to the success of intraoral and panoramic imaging.

But how good is “good”? Since the quality of the raw data is decisive, it made sense to dedicate all efforts for improving image quality to the imaging technology. The new ORTHOPHOS SL combines two new technologies that enable high-resolution images of anatomical structures even at a low dose.

One of these — called the Direct Conversion Sensor (DCS) — makes an especially efficient generation of the x-ray image possible using cadmium telluride semiconductor technology. Because the x-rays are converted directly to electrical impulses and not, first converted to light in an intermediate step — as done previously — fewer signals are lost. This yields better image data and generates images with greater precision.

In another innovation, a reconstructive sharp layer process was added to the highly developed panoramic process in the ORTHOPHOS SL. Several thousand individual projections that are taken from different angles in one cycle allow a digital reconstruction to be made.

The same principle applies to digital radiography as to photography: Despite all processing options, the quality of the raw data is decisive for image quality.
that precisely reproduces individual morphological features. The advantage — the superimpositions of anatomical structures known from pantomography are reduced to a minimum and the anterior teeth are also in sharp focus. The automatic sharp layer technique makes it unnecessary to select the jaw morphology and anterior teeth position in advance and thus simplifies operation of the x-ray machine.

CASE EXAMPLE

A colleague referred a 28-year-old patient to us who complained of spontaneous pain in the region of anterior tooth 21 after endodontic treatment. Persistence of an intraosseous infection was suspected.

We performed volume tomography on the ORTHOPHOS XG 3D to investigate the source of the pain and detected an advanced osseous mass that was found to be a perforating bone defect with loss of palatal and buccal continuity of the alveolar process. The lesion also included a large portion of the root of tooth 22 [Fig. 2].

Despite the advanced loss of supportive bone in the region around tooth 21, we decided against extraction, which would most likely have led to the collapse of the already damaged tissue and thus resulted in an unsatisfactory cosmetic outcome. Instead, we performed an apicoectomy and removed the cystic tissue in the usual manner, and succeeded in maintaining the vitality of tooth 22. As postoperative follow-up, we made a panoramic image on the ORTHOPHOS SL [Fig. 1].

ORTHOPHOS SL HAS THE BEST 2D AND 3D IMAGE QUALITY

→ The ORTHOPHOS SL is available as a panoramic x-ray unit (ORTHOPHOS SL 2D) and as a 2D/3D x-ray unit in two versions: the ORTHOPHOS SL 3D (8 x 8 cm) and the ORTHOPHOS SL 3D (11 x 10 cm). All ORTHOPHOS SL units are available with ceph.

→ The Direct Conversion Sensor (DCS) converts x-rays directly to electrical signals and thus generates greater image precision at the lowest possible dose.

→ The sharp layer technology adapts the panoramic curve to the patient’s individual anatomical features. Manual pre-selection of jaw morphology and tooth position is no longer necessary.

→ Interactive SL allows the focus to be retroactively adapted to the desired object and makes it possible to determine the positions of structures even in difficult cases (e.g., abnormal tooth positions).

→ In the 3D mode, ORTHOPHOS SL (11x10) provides various volume sizes (e.g., 5 x 5.5; 8 x 8; 11 x 10 cm), which can also be flexibly positioned in the entire mid-face region or lower jaw. The high resolution of 80 μm in connection with MARS (Metal Artefact Reduction Software) delivers virtually artifact-free 3D scans with exceptional image quality.
Five months later, we performed a control scan to conclude the case. For this scan, we used the ORTHOPHOS SL with a reduced volume diameter of 5 x 5.5 cm. Because the first image with a larger volume had already shown that the dimension of the bony defect was completely covered in a smaller volume, we were able to minimize the patient’s exposure to radiation. Using the new compare function of the SIDEXIS 4 software, we documented the clearly discernible osseous healing [Fig. 3]. Although we can anticipate only incomplete regeneration due to the large size of the defect, no new procedure is likely to be required if no infection develops.

CONCLUSION

Using sharp layer technology and the very good utilization of quantum efficiency of the Direct Conversion Sensor, the ORTHOPHOS SL makes precise panoramic images at a reduced radiation dose and simplifies the otherwise complicated evaluation of the apical regions of the anterior teeth. We also had excellent 3D image quality; the radiation dose can also be reduced to a minimum for 3D images by selecting different volume sizes depending on the diagnostic question.

PROFILE

Marcin Wojtunik has been a specialist in oral surgery with his own practice in Pfronten im Allgäu (Germany) since 2008. He is a consultant, user trainer, and tester for digital x-ray systems (2D/3D) and for diagnostic and planning software.
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THE MAGIC OF THE COLOR BLUE

Light visible to the human eye is comprised of seven colors of the rainbow. It starts with violet light at a wavelength of 380 nanometers (nm) and ends in the red color space at around 780 nm. Due to its good absorption in hemoglobin, the blue wavelength at 445 nm is particularly well-suited for cutting soft tissue, as international participants learn at the first "Sirona Laser Days".

Bright, flashing blue laser beams cut through the smoke and immerse the room in a magical light while shadowy dancing figures can be seen on stage; this can only mean one thing – it’s show time at Sirona! The manufacturer of dental equipment invited 21 laser practitioners from all around the world to the first "Sirona Laser Days" in Bensheim, Germany. Sirona initiated this exchange with experienced dentists with the aim to increase awareness of the numerous advantages of laser treatment in the market.

Possibly the most important advantage: “Given the improved coagulation, laser treatments are set to replace traditional techniques for a range of applications,” explained Dr. Mariana Petrone de Moraes from Linköping (Sweden). Soft tissue lasers are easy to operate and allow dentists to offer patients practically pain-free treatments. Thus the use of local anesthetic can be reduced or even completely omitted. The tissue-conserving intervention which frequently does not require a postoperative suture results in less wound pain and reduced scarring. Postoperative hemorrhaging and swelling are also very rare.

In addition to the show and entertainment elements, the speakers used their treatment cases to document the various possibilities of laser dentistry. Moreover, special news awaited the experienced users: the SIROLaser Blue, a product they learned more about in three workshops. Dr. Alfred D. Wyatt from Atlanta, Georgia (U.S.): “A really exciting event: There are still so many aspects which will
enhance my understanding of lasers in dentistry. The absolute highlight was the presentation of the new blue laser technology.”

**IMPRESSIVELY CLEAN INCISION WITH BLUE LASER LIGHT**

The cutting and disinfection capacity of a laser normally depends on the energy absorbed in the tissue. What then is more obvious than using a laser diode with a wavelength which is absorbed to the maximum extent in hemoglobin and melanin? That is why Sirona has developed a laser which, in addition to the standard infrared light used for germ reduction with a wavelength of around 970 nm and red laser light (660 nm) for soft laser therapy, also emits blue laser light with a wavelength of 445 nm. The results are impressive:Whilst in the past users had to stroke over the tissue several times with the glass fiber, with the SIROLaser Blue a clean and sufficiently deep incision is made straight away – and without touching the tissue. The blue radiation is absorbed around 100 times more effectively than infrared and thus enables precise, atraumatic incisions to be made at an emphatic speed.

Those who attended the “Sirona Laser Days” were able to try out the SIROLaser Blue for themselves and confirmed its excellent efficiency: “The cutting performance of SIROLaser Blue is extraordinarily good. This means you can work quickly and cleanly – even on tissue where the circulation is not so good,” explained Dr. Johannes Heimann, a dentist with a practice in Frankfurt/Main (Germany) and speaker on laser dentistry.

**MORE “SIRONA LASER DAYS” PLANNED FOR THE FUTURE**

The event also offered sufficient time and opportunities to get to know and engage in discussions with colleagues, for example, during the “Knights’ Feast” held at Auerbach castle in the hills above Bensheim. Time for a few anecdotes. Dr. Morten Worsøe, a dentist from Denmark, explained how he dispels the concerns of his patients about laser technology: ‘When a patient says to me, ‘Lasers are dangerous,’ I wink at the patient and say, ‘Of course, lasers are dangerous. That’s why they’re used so often in ophthalmology.’” Given its great success, the event “Sirona Laser Days” is set to continue in the coming years.

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Dr. Mariana Petrone de Moraes, Dentist in Linköping (Sweden): In every case, blue laser technology is a great alternative to the scalpel and electrotome. Unlike with a scalpel, heavy bleeding can be avoided and we have a better heat control than when using an electrotome.

Dr. Alfred D. Wyatt Jr., Dentist in Atlanta, Georgia (U.S.): I was surprised at how much better the cutting performance of this new laser with a shorter wavelength is. The glass fiber does not even have to come into contact with the soft tissue during use.

Dr. Isabelle Nguyen, Dentist in Marcheprime near Bordeaux (France): I treat many children in my practice. Not only do they think it’s cool that there are no more stitches and less pain, but they also think the laser is really exciting.

Prof. Dr. Giovanni Olivi, Dentist in Rome (Italy): The laser is the only instrument which can cut and coagulate at the same time. The cutting performance of short-wave laser beams is greater and more precise compared to conventional infrared lasers.

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Experience impressions from the Sirona Laser Days on video.

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Laser beams of differing wavelengths have very distinct effects as they are absorbed by human tissue and bacteria to different degrees.

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Short-wave blue laser light cuts easily without contact with the tissue.
Mr. Kusch, you have just celebrated the 10th anniversary of SICAT. How has dentistry changed during this time and how has the cooperation between SICAT and Sirona contributed to these changes?

— The most noticeable change in dentistry over the past decade is certainly that two-dimensional imaging has increasingly been replaced by three-dimensional imaging. Sirona and SICAT have played a significant role in this by increasing its usefulness through the development of integrated solutions. This is because 3D imaging becomes valuable for dentists only when a treatment can be intuitively planned and implemented on patients. The integrated workflow that is made possible by the combination of digital data from Sirona and SICAT systems from one source not only saves users a lot of time, but also improves quality and efficiency.

For what indications is 3D imaging especially valuable?

— 3D x-rays have now become the state-of-the-art, especially in implantology. Without being able to see the size of anatomical...
Craniomandibular dysfunction (CMD) can be diagnosed and treated with SICAT Function in an integrated workflow.

**Craniomandibular dysfunction (CMD) is another indication for which software applications have been announced. What is the current state of development?**

— For the diagnosis and treatment of CMD, we now have a fully functional integrated digital solution. With the GALILEOS 3D x-ray unit from Sirona, which also includes the temporomandibular joints, combined with the SICAT Function software, Jaw Motion Tracker (SICAT JMT+) and digital impressions with CEREC, all necessary data for successful treatment of CMD are available. SICAT Function displays jaw movements in three dimensions.

*Based on this, the user can analyze the finding, plan treatment, and order an appropriate appliance. The SICAT OPTIMOTION treatment appliance is produced in the SICAT laboratory taking the patient’s actual jaw movements and condyle-fossa relationship into consideration.*

What do you view as the advantage of functional diagnostics with your software program over conventional methods?

— The conventional methods can be readily applied by specialists, but the use of many different diagnostic tools makes them very complicated and time-consuming. Our SICAT Function software allows a completely digital workflow and also displays the patient’s actual jaw movements in 3D. The analysis and planning in 3D thus makes it easier for even general dentists to begin functional diagnostics and treatment.

The latest software development from SICAT is for the analysis and treatment of obstructive sleep apnea. How does it work?

— More patients than previously thought suffer from sleep apnea. The patient has difficulty breathing and is stressed the next morning. This not only increases the risk of an accident, but also the risk of cardio-vascular diseases, diabetes, and many other disorders. There are different treatment methods: in moderate and mild cases, what is called a protrusion device is the most elegant solution. It pulls the lower jaw forward without limiting its mobility. The problem is that the devices are generally made on a plaster model which does not take the temporomandibular joints into account. This leads to a situation where the patient may manage to get sleep apnea under control, but can develop CMD. Since thanks to SICAT Function we can apply functional diagnostics here, it is possible to produce sleep apnea appliances (SICAT OPTISLEEP) that are suitable for the temporomandibular joints using SICAT Air.

The SICAT software solutions are based on combination with other digital systems. What role do such solutions play in the future of dentistry?

— The integration of digital systems will increase dramatically in dentistry as in all other areas of life. Our vision is to combine the patient data collected from different imaging methods to create a virtual patient on whom dentists can improve treatment and its quality. This planning gives them the tools needed to treat the actual patient.

Jochen Kusch is the managing director of SICAT and is responsible for Sales & Marketing. He was previously an engineer at Siemens, responsible for the development and marketing of 3D C-arm equipment.
Noise comes from sound waves that are generated through mechanical movements, for example. How we perceive a sound depends on the frequency of the sound waves and the amplitude of the oscillations. The faster the oscillations, the higher the sound. And the higher the wave crests and lower the troughs, the louder the sound. This sound pressure amplitude is generally measured in decibels, dB(A) for short. The rule of thumb is as follows: If we double the perceived volume at medium pitch, the sound pressure level is increased by 10 dB(A). This means that a conversation at 60 dB(A) is twice as loud as one at 50 dB(A).

**NOISE IN THE DENTAL PRACTICE**

There can be only a handful of patients that have no problems perceiving noise in the treatment room. For most people
the use of instruments means potentially an unpleasant experience. Especially fearful patients suffer from stress that acoustic noise such as the rotation of dental turbines causes. For a practice team a noise does not have to be unpleasantly loud to cause damage over the years. Constant noise at 85 dB(A) or above can result in cardiovascular diseases, headaches, or sleep disorders. The body produces increased amounts of the hormones adrenaline, noradrenaline, and cortisol that raise blood pressure and heart rates as well as activating coagulation. Furthermore, hearing damage can occur — tinnitus and age-related hearing loss are attributable to enduring noise. Meanwhile, studies have shown that an above-average number of dentists suffer from hearing loss in the frequency range of 3,000 to 4,000 Hertz. In this range, human hearing is particularly good and, at the same time, sensitive.

WHAT CAN BE DONE TO PREVENT THIS?

Everyday noise exposure in dental practices can be reduced by using quieter turbines. In this respect, the powerful turbines in the new generation from Sirona are especially suitable. T1, T2 and T3 turbines from Sirona have rotors with low-vibration ceramic ball bearings, and use a new spray system for cooling, which generates less noise at the outlet openings. This reduces volume to almost 60 dB(A), equivalent to the level of a normal conversation. As shown in an independent study conducted by the engineering firm advacoustics, Sirona’s turbines are almost 14 dB(A) quieter — less than half as loud — compared to equivalent turbines from other leading manufacturers under the same conditions. The results of the study can be read in the Sirona guide “Noise reduction in the dental practice.”

WHAT MAKES SIRONA TURBINES QUIETER?

**ROTOR:**
One cause of noise generation is the imbalance of the rotor in combination with the high rotational frequency. Sirona has fitted its turbines with low-vibration turbine blocks for this reason. The noise level is also reduced thanks to the decrease in speed.

**SPRAY:**
Another major source of noise is the spray. The combination of air and water at the outlet of the spray causes noise. The new Sirona 4-nozzle spray effectively reduces the noise level to a minimum.

HOW DENTISTS CAN PROTECT THEMSELVES, THEIR TEAM AND PATIENTS AGAINST NOISE IN THE PRACTICE:

- Sound-insulating measures in the practice rooms: Walls and doors should be fitted with sound insulation. Special paints, vinyl flooring, and carpets also have a sound-absorbing effect.

- Use of sound-absorbing surfaces: Sound absorbers are available in different looks and can be inconspicuously integrated into your practice. Wooden and plastic furniture are also sound absorbers.

- Noise reduction at the sources of noise: The quiet yet powerful turbines from Sirona limit turbine sound to the level of 60 dB(A).

More information on the study and how to reduce noise in the practice is provided in the Sirona guide “Noise reduction in the dental practice.”
Katia Wagner from Vienna has completed her degree in dentistry and is now working on her thesis. In 2013 she won the title of Miss Earth Air in Manila. Unlike other beauty contests, the focus here is not merely on looks but also commitment to ecological and humanitarian causes. For example, Ms. Wagner teaches Philippine school children more about dental hygiene and supports projects such as WADI, a system which measures the purity of water, the solar energy provider “Care Energy”, a mangrove reforestation project in Thailand as well as the children’s rehabilitation initiative “Kinderreha”. She also works as an international model and is the Managing Director of the cosmetic chain Nails2go.

**Dedication and commitment are important for success. What do dentists also need to ensure professional success?**

— In addition to professional expertise, I also consider tolerance to be essential. Particularly in professions where you deal with people, the ability to listen and adapt to others is all-important, regardless of the stresses of the job.

**What do you think a dentist practice will look like in ten years?**

— The notion of “angels in white coats” will cease to exist in the near future. After all, patients are becoming more confident and clear about what they expect. I am convinced that the importance of esthetic dentistry will increase in Europe.

**Be honest: Are you afraid of going to the dentist?**

— Not at all. But I have to say my colleagues have always been really nice to me.

**What is your philosophy for life?**

— I practice the golden rule “Treat others how you would like to be treated yourself.”

**Is that why you are also involved in helping sick children?**

— Yes, I have been very lucky and feel obliged to help others who have not been so fortunate. A healthy childhood should not be taken for granted. That is why I want to help those who have been dealt a different hand. I support the initiative “Kinderreha” which builds rehabilitation centers for children where kids can be kids again following serious illnesses.

**What connects beauty and health in your opinion?**

— Beauty and health are inextricably linked. Beauty has a lot to do with well-being. And, without a doubt, well-being is integral to health. I am extremely grateful that I am healthy and am pleased that in my capacity as Miss Earth Air, the Managing Director of a cosmetics chain and future dentist I can contribute to the health and beauty of others.

**TRUE BEAUTY COMES FROM WITHIN**

Beauty as well as a sense of commitment to environmental and social projects are what count in the Miss Earth contest. Dentist Katia Wagner cut just as fine a figure here as she does every day at the treatment center. Moreover in 2013 she was crowned Miss Earth Air in Manila. Six questions for this dedicated dentist.

**What is your philosophy for life?**

— I practice the golden rule “Treat others how you would like to be treated yourself.”
DIGITAL COMPANION FOR DAILY PRACTICE ROUTINES

Applications for smartphones – apps for short – provide quick access to Internet-based information. The dental segment offers many applications for smartphones and tablets – for patients and dentists. They range from funny games and useful software to comprehensive technical and knowledge offerings.

DENTAL USERS

Apple: € 5.99
Android: Not available
Language: German, English, Italian and French
Compatibility: Requires iOS 3.0 or later.
Compatible with iPhone, iPad and iPod touch.
Developer: pst - praxis systemtechnik

Knowing how it works is the key to working efficiently. Dental Users offers specific and practical e-learning tutorials at the highest technical and educational level. With the help of short videos, multimedia-based talks and downloadable information, practice owners and their teams can find instructions on how to properly handle the new workflows from all areas of modern dentistry. The contents can either be viewed in the app or called up online. Furthermore, events such as conferences or courses and talks can be booked directly in the app.

AND THE WINNER IS ...

The correct solution to the SUDOKU puzzle we were looking for in the last issue of VISION is QUALITY.

The winner of the iPad Air 64 GB is: Dr. Ulrich Knabe, Berlin (Germany). Congratulations!

THE NEXT ISSUE OF VISION MAGAZINE WILL BE PUBLISHED IN FALL 2015.
VISION is available as an interactive iPad App, too.

You can download the free VISION App on your device via the AppStore.

Sirona Dental GmbH
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Austria
Dear readers of the VISION magazine!

You are looking at the IDS issue of our VISION magazine. Now we would like to ask how you liked the magazine. Your feedback helps us to further develop following editions and adapt to the interests of our readers.

Please send us your feedback by post to: Sirona Dental GmbH, attn: Marion Weixlberger, Sirona Straße 1, A-5071 Wals/Salzburg
By fax to: +43 (0)662 2450 510 or by e-mail to: vision@sirona.com

As a thank you we are raffling off within all submissions a silver grey iPad Air 2 (64 GB) with a total value of about 600 dollars/euros. Sirona employees as well as employees of ergo Kommunikation are excluded and legal action is ruled out.

Questionnaire

Thank you for your feedback!

Rating: 1: Excellent, 2: very good, 3: good, 4: fair, 5: poor

1. How did you like the recent issue of the VISION magazine?

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2. Which topic did you like most?

3. Which topic would you like to read about in the upcoming issue?

4. Where do you see room for improvement?

5. How did you receive the VISION magazine?

6. What else would you like to share with the editorial team?
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