issn 2193-4673 • Vol. 4 • Issue 1/2023

1/23

digital

international magazine of digital dentistry

including AI supplement

opinion
Intra-oral scanners in the dental office

trends & applications
Exploring novel technologies for improved efficiency

AI supplement
Artificial intelligence: A gift to dentists

dti Dental Tribune International

Partners in excellence. United by smiles.

clearcorrect
A Straumann Group Brand

ClearCorrect®, the Straumann Group's flagship orthodontic brand, is excited to announce **new products and clinical features**, an improved digital workflow, added support, and treatment planning services to help doctors treat more complex cases.

To become a partner or learn more visit:
clearcorrect.com

Acc.1249_en_01

Dr Scott D. Ganz

Editor-in-Chief

Digital, analogue or both?

Recently, a clinician was having an issue with a digital workflow. A fully edentulous patient required a complete maxillary denture. Using an intra-oral scanner, the maxillary edentulous arch was digitised. The surface was captured in full colour. The idea was to then use a recently acquired 3D printer, wash station and polymerisation unit to create a physical model using the specific die and model resin. To accomplish model fabrication, the surface data STL file was imported into the printer software. Using the native printer software, the 3D design was to be positioned on the build platform and printing supports generated. However, the file only contained a single surface layer. An important step had not been taken: closing the scan and adding a flat base. The resultant print would have contained only a single layer and not a complete model. The missing steps could have been generated on the intra-oral scanner software prior to exporting the STL file or by the printer software if it had this capability.

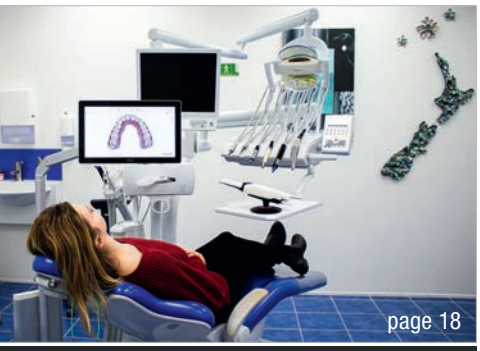
Why print the resin model in the first place? The clinician wanted to use the 3D printer and specific resin to obtain a physical model of the maxillary arch on which to design and fabricate an analogue custom impression tray, avoiding the need to pour a stone model. The next patient visit was scheduled for intra-oral border moulding with the custom tray to achieve a seal with the analogue impression material. This was all to avoid dental stone! Is this truly a digital workflow or a cumbersome amalgam of analogue and digital?

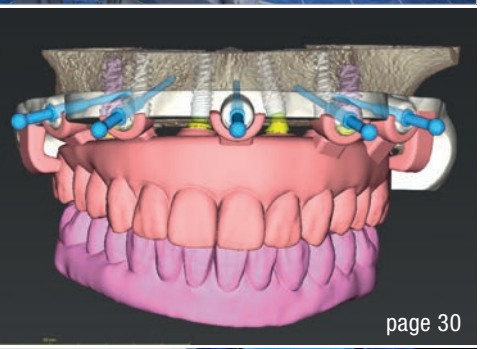
If the clinician was fully versed in the laboratory phase of the digital workflow, there would have been little need to create a physical model. Once the intra-oral scan had been completed, a closed virtual model could have been fabricated as previously mentioned. Using free readily available software like Meshmixer (Autodesk) and the virtual model, a custom tray could have been easily designed which would mimic the analogue version. Therefore, instead of printing a physical model, which would necessitate a significant volume of resin (even if hollow), only the actual tray would need to be printed, saving both time and resin. Of course, this is still a mixture of analogue and digital workflows. The rationale for a custom impression tray was to create an accurate representation of the maxilla to achieve a better fit of the resultant complete denture.

The point of this story is to acknowledge that, despite the huge jumps in technology, there are still gaps in the educational process of how to achieve, or work effectively towards, a fully digital workflow. In the meantime, clinicians will continue to make an effort to utilise new protocols, but the tried-and-true conventional analogue methods will remain for many years to come. To learn more about the state of the art in the digital dental universe, please delve into this first issue of digital for 2023. I hope that you will enjoy the extra section on artificial intelligence!

Respectfully,

Dr Scott D. Ganz
Editor-in-Chief


page 18

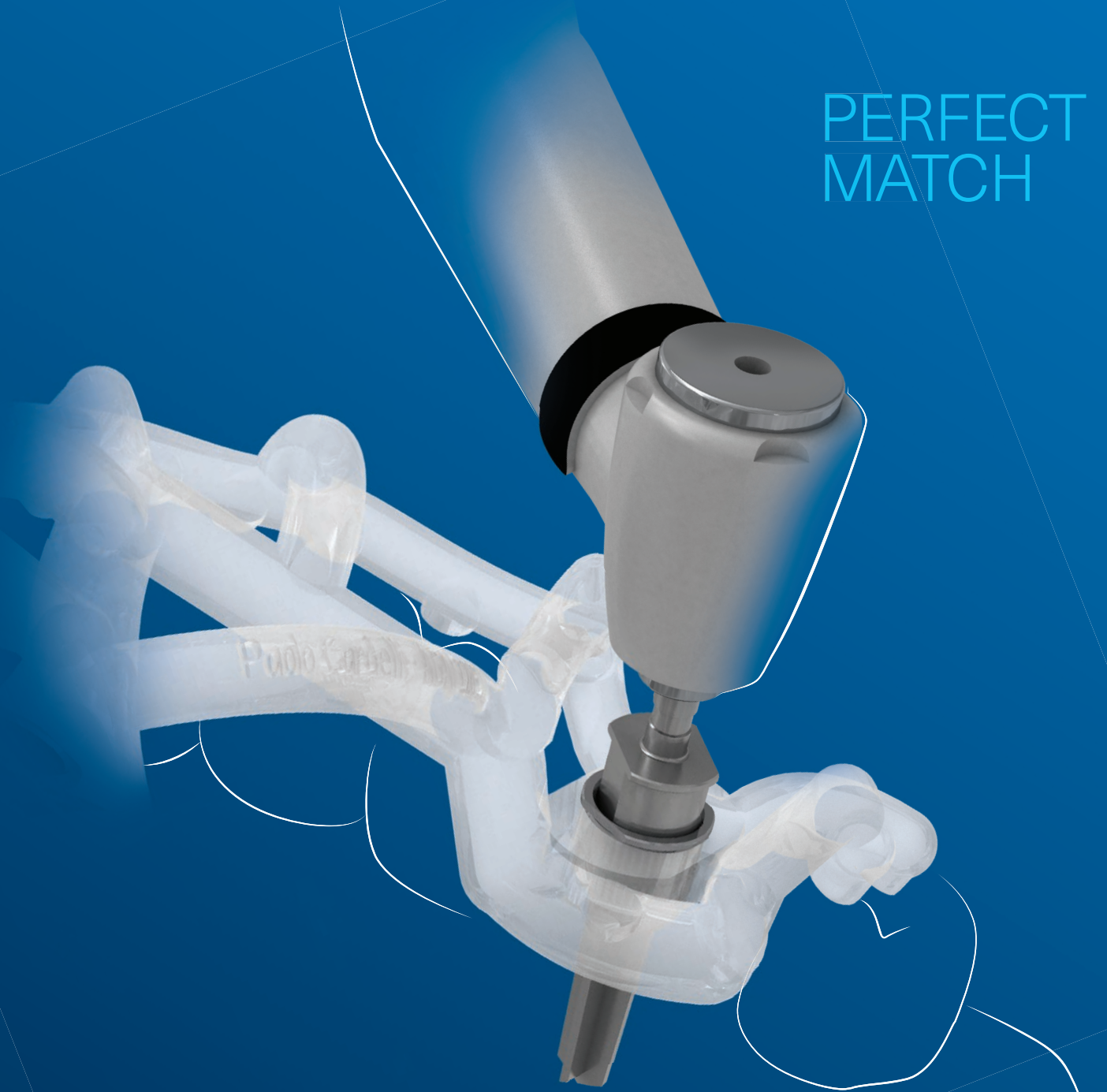

page 30


page 60

AI logo courtesy of BAIVECTOR/Shutterstock.com.

Cover image courtesy of MODJAW (www.modjaw.com).

PERFECT MATCH



DESIGNED FOR ACCURACY. **MAKE IT SIMPLE**

The 3D printed template is designed with an open-frame for maximum visibility, irrigation and accessibility from all angles without the need for removal. MGUIDE is a keyless system, designed for single handed procedures, eliminating the need for unnecessary tools. Learn more about MIS at: www.mis-implants.com

“Connect To The (Work-)Flow”

Amann Girrbach connects the workflow of laboratories and dental practices for restorations

By Amann Girrbach

“Connect To The (Work-)Flow”—with this motto Amann Girrbach summarises the essence of the company’s strategy in its International Dental Show (IDS) campaign: to connect treatment processes in dental laboratories and dental practices intelligently, simply and end to end in a perfect dental workflow. Visitors to IDS 2023 will have the opportunity to experience this live in approximately 640 m² of exhibition space. The complete digital workflow and individual product highlights and innovations will be made tangible on-site.

IDS is the leading trade fair for the dental industry and will be held in Cologne in Germany from 14 to 18 March. Here, Amann Girrbach will be showcasing an optimised and integrated end-to-end process chain for dental restorations.

“As the open workflow company in the dental industry, Amann Girrbach will introduce visitors to digital workflows spanning the entire work process. We aim to holistically connect dental laboratories and dental practices for the benefit of patients, since we believe that in a perfect dental workflow everything is smart, simple and seamlessly interwoven to allow users to concentrate fully on their work. Our goal is to combine analogue and digital steps, products and services in a safe and open system, to ultimately make everyone’s daily work easier through high reproducibility of work and to create better patient care,” explained Dr Wolfgang Reim, CEO of Amann Girrbach.

At the newly designed booth, new digital standards in dental technology will be showcased and demonstrated, and attendees will be able to engage with product experts.

Under the umbrella of the motto “Connect To The (Work-) Flow”, Amann Girrbach would like to invite interested parties to become part of a movement that connects and benefits collectively from digital achievements. “We are familiar with dental practice and all its hurdles and see it as our task not only to provide excellent products but also to optimise the entire workflow right through to numerous service offerings,” Dr Reim emphasised.

With innovations such as the AG.Live workflow management platform and the interdisciplinary Ceramill Direct Restoration Solution system, the company is consistent in pursuing this objective. “We enable users in dental practices and laboratories to do something that a single product alone cannot achieve: we deliver an open overall system with established analogue and innovative digital products that ensures significant time- and cost-savings,” Dr Reim noted—all to make the dentistry of tomorrow better today, for dental laboratories, dental practices and patients.

Editorial note: All the latest information on Amann Girrbach’s IDS participation and the trade fair itself can be found regularly on the campaign homepage, ids.amanngirrbach.com, and in the IDS newsletter. Visit the Amann Girrbach booth (#C040/D041) in Hall 1.2 at IDS.

simply.TRIOS 5

Intraoral scanning that simply makes sense

Hygienic by design for minimal risk of cross-contamination. Smaller and lighter than ever for next-level ergonomics. And a ScanAssist engine with intelligent-alignment technology that makes precision scanning effortless, every time.

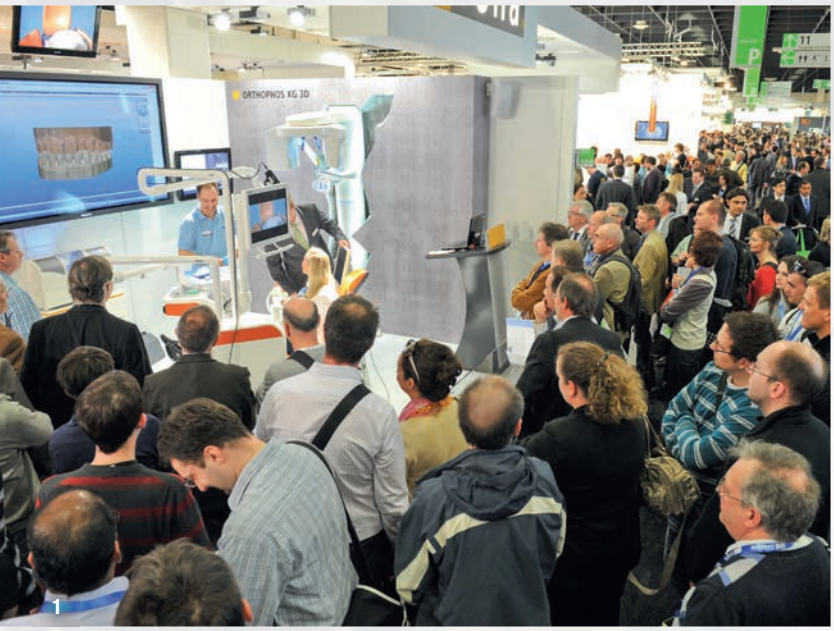
Digitisation—key for the next 100 years of dental practice and the dental laboratory

Dr Christian Ehrensberger, Germany

Digital technology has continually changed many working processes in the dental practice and laboratory in the past 20 years, and patients have enjoyed the increasing benefits of high-quality dentistry resulting from digitisation. Digital dentistry will be one of the main focuses of the 40th International Dental Show (IDS), which is celebrating its 100th anniversary. For example, attendees will be able to learn about the expanding applications of intra-oral scanners and developments such as automatic blank changers to make fabrication of CAD/CAM restorations more effective. For many years, IDS has acted as fuel for dental progress. From 14 to 18 March, visitors to IDS will be able to experience the development of the next 100 years in Koelnmesse's exhibition halls in Cologne in Germany.

Targeted chairside prostheses and intra-oral scanners with a wide range of applications

The number of fabrication options is increasing in the dental practice: crowns, inlays and more can be fabricated chairside or quickly sent to the practice laboratory.



1

2

Fig. 1: Digital technologies offer increasingly more opportunities for dental practices and laboratories. *(Image: © Koelnmesse/IDS Cologne)* **Fig. 2:** A wealth of opportunities are on offer at the International Dental Show—like nowhere else in the world. *(Image: Koelnmesse/IDS Cologne/Thomas Klerx)*

This often allows the patient to be treated in a single appointment, even with three-unit zirconia bridges, and ever more patients place great value on the increased convenience this affords. It is an advantage to have an integrated digital procedure that includes a high-speed milling system and speed sintering furnace.

Intra-oral scanners are often at the centre of the entire workflow, and their range of indications is expanding. Full-mouth scans, individual jaw scans, mucosal scans and scan matching are now all feasible. The limits of intra-oral scanners are also being explored. Currently, those include the capture of deep subgingival preparations and the direct translation of an intra-oral scan into functional movements, as required for the fabrication of digital dentures, for example.

Intra-oral scanners achieve the accuracy of elastomeric impressions and are even superior when it comes to single-tooth restorations and smaller-span bridges.[1,2] In future, they will also provide considerable support for dentists regarding preliminary examinations. For example, intra-oral scanners that measure fluorescence could be used to score caries.[3]

More basic intra-oral scanners and those with multifunctionality should be compared regarding their suitability for private dental practice. Depending on the practice's size and professional orientation, the acquisition of several scanners should be considered.

3

Fig. 3: Dentistry has tradition! At the 40th International Dental Show, celebrating its 100th anniversary, visitors will be able to learn about current state-of-the-art technology. *(Image: © Rheinisches Bildarchiv Köln)*

Pioneering digital dental laboratories—the opportunity of globalisation

Owing to globalisation, distance now plays a lesser role in the working relationship between dental laboratories and dental practices, and it is becoming easier to work with the desired laboratory partner. For example, a Bavarian laboratory can now work with dentists in Schleswig-Holstein or provide quality prostheses to dentists in Brazil. This option is becoming increasingly popular, since dental laboratories are often significantly more digitally advanced than some dental practices. As a communication forum, IDS provides an excellent opportunity to connect with existing contacts and establish new ones.

Off to IDS

The state-of-the-art technology of proven and innovative concepts and products for the entire digital workflow will be on display at the 40th IDS. The world's leading dental trade fair will provide in-depth information that will help private dental practices and laboratories to make well-informed decisions when choosing their desired direction.

Editorial note: Please scan this QR code for the list of references.

contact

Dr Christian Ehrensberger
Schwanthalerstr. 27
60594 Frankfurt am Main
cu_ehrensberger@web.de