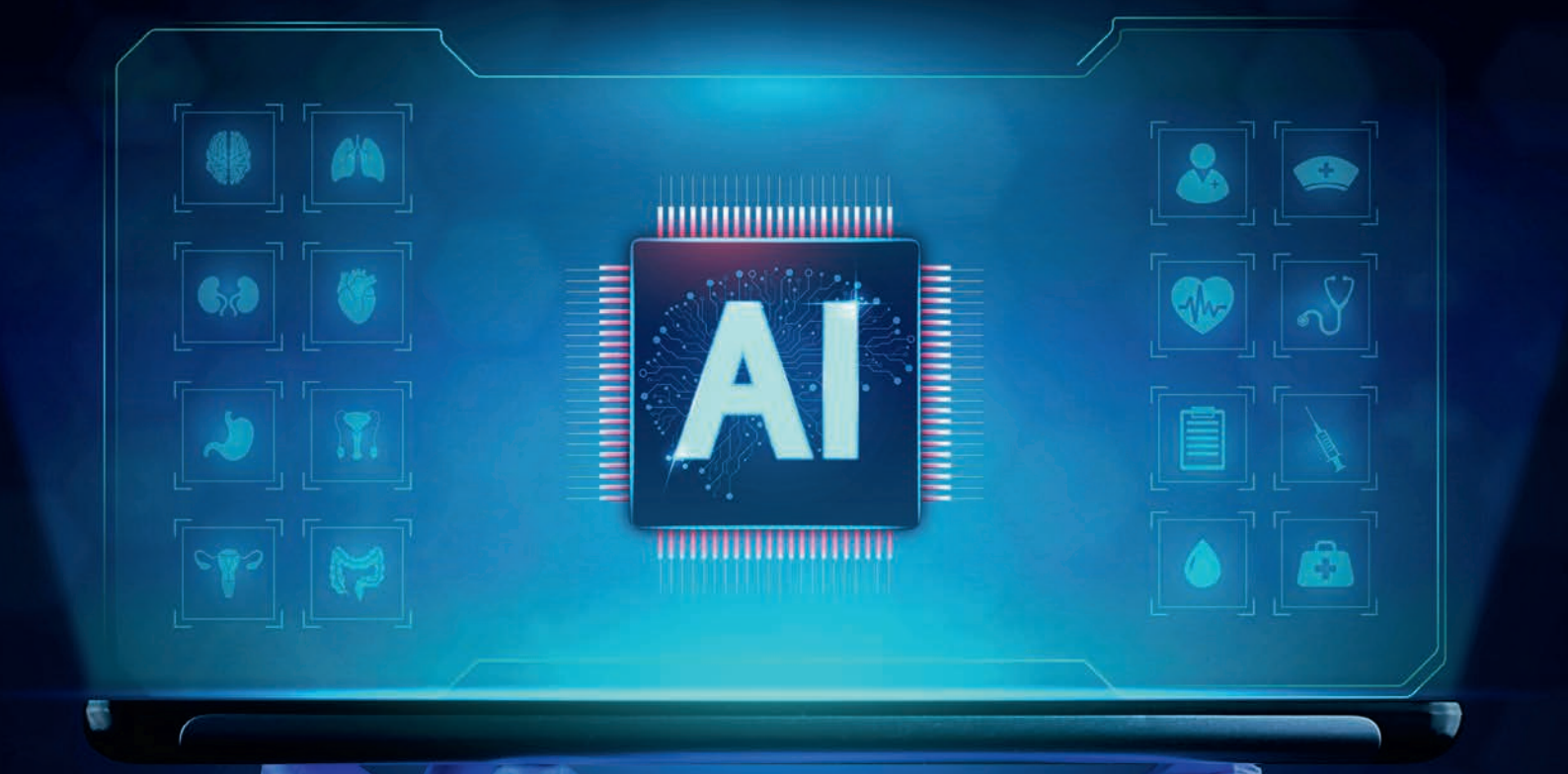
issn 2193-4673 • Vol. 4 • Issue 4/2023

4/23

# digital

**international magazine of** digital dentistry

including AI supplement




## interview
Big data in implant dentistry—
"We are standing at the beginning"

## case report
A fully guided digital workflow for
predictable implant planning and placement

## AI supplement
More predictable, more precise, more profitable:
Artificial intelligence in dentistry

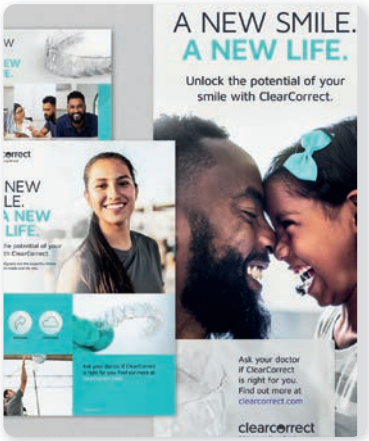
dti] Dental Tribune International

# The Partnership that Builds

## Exceptional Service and Support to Grow Your Practice

Our new practice growth offering brings a comprehensive suite of marketing, education, and business resources to empower clinicians and staff to grow their practice, and offer ClearCorrect with confidence.

**Downloadable Patient Marketing Kit**




**Downloadable Patient Conversion Kit**

**Practice Growth Education & Guides**

With a foundation you can trust, along with our comprehensive continuous education options, ClearCorrect is proud to offer a partnership that helps you build a thriving practice through new commercial and educational support tools. Learn about our new practice growth offering and how ClearCorrect provides a Partnership that Builds.

clearcorrect
A Straumann Group Brand

480.1433_en_01 | Approved for global use | ©ClearCorrect 2023

**Magda Wojtkiewicz**

Managing Editor

# Artificial intelligence opens a new chapter in dental healthcare

**Artificial intelligence** (AI) is already present in our everyday life, whether we are aware of it or not. AI is also revolutionising the field of dentistry, offering a wide range of applications that improve patient care, diagnostics and practice management. In this issue of digital, you will find our second AI supplement, a section dedicated to AI and its presence in dentistry. Before you dive into the details, here are some examples of AI being applied in dentistry.

### Diagnostic and imaging support

One of the most significant applications of AI in dentistry is in diagnostic support. AI algorithms can analyse dental radiographs and photographs, aiding dentists in the detection of issues such as dental caries, periodontal disease and oral cancer. These algorithms can identify abnormalities and anomalies in radiographs and scans, supporting early disease detection and timely intervention.

### Treatment planning

AI can assist dentists in creating treatment plans tailored to individual patients. By analysing patient data, including medical history, images and dental records, AI can suggest optimal treatment plans and prosthetic designs. This not only improves the precision of treatments but also enhances treatment outcomes.

### Predictive analytics

AI can predict oral health outcomes and treatment success based on historical patient data. Dentists can use these insights to develop treatment plans that are more personalised and provide better patient management.

### Virtual consultations and teledentistry

The rise of virtual consultations and teledentistry has been accelerated by AI. Chatbots and virtual assistants powered by AI can provide patients with information, guidance and even initial assessments of dental issues. Teledentistry platforms utilise AI to facilitate remote consultations, enabling dentists to diagnose and treat patients from a distance.

### Patient management

AI streamlines various patient management tasks within dental practices. It can handle appointment scheduling, send automated reminders to patients and assist with billing, making the dental office more efficient and patient-friendly.

### Natural language processing in electronic health records

AI-driven natural language processing tools are increasingly being used to analyse textual information within electronic health records. By extracting and analysing relevant patient data, AI can enhance decision-making and improve patient care.

### Oral health monitoring

AI-powered devices and apps are being developed to monitor patients' oral hygiene habits. These tools can provide personalised recommendations for better oral care, helping patients maintain their oral health between dental visits.

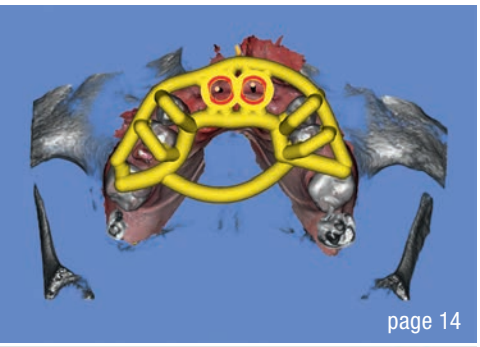
### Education and training

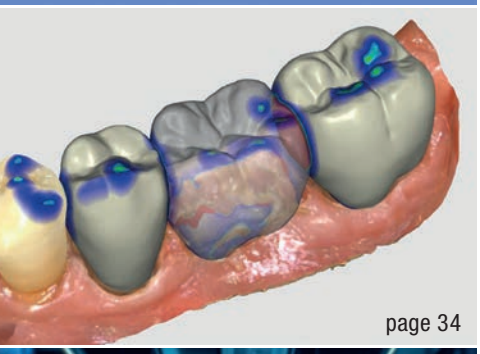
In dental education, AI is playing a crucial role in providing realistic training experiences. Dental simulators and virtual reality tools, powered by AI algorithms, allow students and dentists to practice various dental procedures in a safe and controlled environment.

### Quality assurance

AI can ensure the quality of dental impressions and prostheses. By analysing these products, AI can verify that they meet specific standards and accuracy criteria, reducing errors and enhancing patient satisfaction.

As AI technologies continue to evolve, the applications in dentistry are expected to expand even further. Dentists and dental practices that embrace AI can already benefit from improved diagnostic accuracy, personalised treatment planning, enhanced patient engagement and greater efficiency in practice management. However, it is essential to stay updated with the latest advancements in the field, as AI in dentistry continues to evolve rapidly.


page 14


page 34

page 36

Cover image courtesy of
Antonio Marca/Shutterstock.com

## editorial

Artificial intelligence opens a new chapter in dental healthcare 03

## industry news

Introducing SmileShade:
Revolutionising dental shade identification and communication 06

Digital dentistry:
Dentsply Sirona and 3Shape expand their workflow integration 08

CleanImplant Foundation provides dentists and patients with guidance for clean oral implants 10

## interview

Big data in implant dentistry—"We are standing at the beginning" 12
An interview with Prof. Arjan Vissink

## case report

A fully guided digital workflow for predictable implant planning and placement 14

Immediate full-arch zirconia implant therapy utilising the power of robotic assistance and digital scanning 18

Implant placement in narrow spaces—a guided approach 24

Maxillary full-arch implant-supported rehabilitation with a digital workflow:
Two-year follow-up 30

Unilateral occlusal elevation with a bridge fabricated from KATANA Zirconia Block 34

## AI supplement

More predictable, more precise, more profitable:
Artificial intelligence in dentistry 36

"AI's primary function is to bolster human skills, not to overshadow them" 42
An interview with Dr Hanyao Huang

Artificial intelligence in dentistry: Streamlining orthodontic care 44

Leveraging the power of artificial intelligence in dentistry 45

The missing link 46

## manufacturer news 52

## meetings

The Implant Solutions World Summit—An exclusive, state-of-the-art congress focused on science and implant dentistry 58

Long-awaited Digital Dentistry Show to premiere in Berlin in June 2024 60

MIS announces Global Conference in Palma de Mallorca 62

International events 64

## about the publisher

submission guidelines 65

international imprint 66

CONELOG®
SYSTEM

NEW!

# CAMLOG®/CONELOG® Titanium bases CAD/CAM free for individual fabricated restorations

**Flexible solutions with angled screw channel:**

- Enhancing esthetics in the esthetic zone
- Two gingiva and chimney heights
- Roughened bonding surface
- Included abutment and lab screw
- Dedicated configured Ballpoint screwdriver

CAMLOG®/CONELOG® are registered trade marks of Camlog Biotechnologies GmbH.
They may however not be registered in all markets.

VISIT OUR
**WEBSITE!**

biohorizons
camlog

# Introducing SmileShade: Revolutionising dental shade identification and communication

By Dental Tribune International

The SmileShade app uses a novel digital workflow to help dental professionals accurately assess dental shade. *(Image: © Les Kalman)*

**Research Driven**, a Canadian company specialising in the development of medical and dental devices and technologies, has recently announced the launch of SmileShade, an innovative dental colour identification and communication mobile app. Developed with support from an Implant Dentistry Research and Education Foundation grant from the International Congress of Oral Implantologists, SmileShade is poised to revolutionise the way in which dentists assess and communicate dental shade.

SmileShade leverages groundbreaking technology to accurately capture dental colour, allowing dentists to communicate and implement precise shade matches with ease. The app can significantly streamline the shade matching process, ultimately leading to better patient outcomes and enhanced dental experiences.

The key features of SmileShade are the following:

1. *Bluetooth sensor technology:* SmileShade utilises advanced Bluetooth sensors that can accurately capture dental shades with unprecedented precision. This technology allows dentists to identify and communicate the ideal shade match for restorative procedures.
2. *VITA and IPS e.max integration:* SmileShade seamlessly integrates with industry standard shade guides, including the VITA and IPS e.max (HT) shade guides. This ensures that dentists can match shades consistently and reliably, enhancing the quality of dental restorations.
3. *Intuitive mobile app:* The SmileShade mobile app is user-friendly and designed with dentists in mind. It offers a seamless user experience, enabling quick and efficient shade identification and communication.
4. *Enhanced communication:* Dentists can easily share shade information with dental laboratories, colleagues and patients, fostering improved collaboration and informed decision-making. The shade comparison feature is beneficial for all stages of treatment documentation.
5. Research-backed innovation: SmileShade is the result of extensive research and development conducted by experienced researchers and developers.

SmileShade aims to enhance the dental experience for both practitioners and patients by providing an efficient, accurate and user-friendly solution for dental shade identification and communication. The software was an honouree of the 2022 Consumer Electronic Show Innovation Awards, a global competition recognising outstanding design and engineering in consumer technology products.

Dr Les Kalman, an assistant professor of restorative dentistry in the Schulich School of Medicine and Dentistry at Western University in London and the creator of SmileShade, commented: “SmileShade is the result of years of research and development, and we are excited to offer dentists a novel mobile, digital tool that will streamline their work and elevate the quality of dental care they provide.”

Dental professionals can download SmileShade free from the App Store and visit the official website for more information: www.smileshade.ca.

# Looking to get the most out of your TRIOS?

Owning a TRIOS scanner is just the first step in advancing your clinic. The service offerings that come with your TRIOS guide your next steps from expert teams who have your goals in mind. Together, we help you plan for the future, experience more now, and maximize your investment.

**Your learning. Continuously covered.**

Helping you develop clinic-enhancing solutions for today and tomorrow.

**Your queries. Expertly covered.**

Giving you convenient, expert-led support at your fingertips.

**Your investment. Fully covered.**

Helping you develop clinic-enhancing solutions for today and tomorrow.

© everything possible - stock.adobe.com

# Digital dentistry: Dentsply Sirona and 3Shape expand their workflow integration

By Dentsply Sirona

**Dentsply Sirona**, the world's largest manufacturer of professional dental products and technologies, and 3Shape, a leading innovator of digital solutions for dental patient care, have begun the next chapter in their workflow integration. The harmonisation of DS Core, Primemill and Primeprint with the 3Shape TRIOS intra-oral scanner, powered by 3Shape Unite, creates more integrated workflows for digital dentistry. Dentists and dental technicians will benefit from simple, secure and connected technology solutions for effective collaboration, which will enable them to provide excellent dental care and move forward with confidence.

## Seamless execution of laboratory orders with DS Core to 3Shape Dental System

Dentsply Sirona intra-oral scanners, such as Primescan, will now connect directly with the 3Shape Dental System software via DS Core. Dentists will be able to easily transmit orders to their laboratory partners via DS Core. In the laboratory, this data can then be directly processed in 3Shape Dental System, which will save valuable time.

## Innovative in-office Primemill and Primeprint solutions for 3Shape TRIOS users via DS Core

Dentists will be able to seamlessly connect TRIOS scanners to Primemill and Primeprint for in-office milling and printing via 3Shape Unite, DS Core and inLab CAD software. Thus, high-quality prosthetic restorations, such as permanent crowns; temporary restorations, such as provisional crowns; removable prostheses; models; dental appliances, such as splints; and surgical guides can be manufactured directly in the dental practice on the same day.

For Dentsply Sirona and 3Shape, this is an important next step in their workflow integration and will advance digital dentistry in practices and laboratories and help improve oral health worldwide.

"3Shape and Dentsply Sirona are providing seamless workflows for our shared customer base. Dentists and labs will now benefit from smooth in-office manufacturing and send-to-lab solutions thanks to an expanded and validated interconnection of our systems. By being faithful to 3Shape's open system principles, we are excited to combine such powerful opportunities in the industry," said Dr Rune Fisker, senior vice president of product strategy at 3Shape.

"The closer integration of leading offerings from Dentsply Sirona and 3Shape via DS Core opens new possibilities for dental practices and labs. Our customers expect to easily combine solutions from different companies in their practice to confidently deliver optimal performance. We are committed to expanding workflow integrations through our platform, DS Core, and thereby help dental professionals move forward with confidence.

We are excited that 3Shape TRIOS users will now be able to expand their practices easily with in-office manufacturing solutions such as Primemill and Primeprint," commented Andreas Frank, an executive vice president and chief business officer at Dentsply Sirona.

More information is available at www.dentsplysirona.com and www.3shape.com.

© MIS Implants Technologies Ltd. All rights reserved.

# REVOLUTION IN A BOX!

## MIS® C1 XD™

FULL PROCEDURE IN EVERY IMPLANT PACKAGE. **MAKE IT SIMPLE**

Every MIS C1 implant is now supplied with XD Single-Use drills. These single-use drills are designed for optimal implant-drill compatibility and high initial stability, while ensuring safe and simplified procedures. Learn more about MIS at: www.mis-implants.com