GARRISON DENTAL SOLUTIONS STELLT DAS STRATA-G-TEILMATRIZENSYSTEM VOR

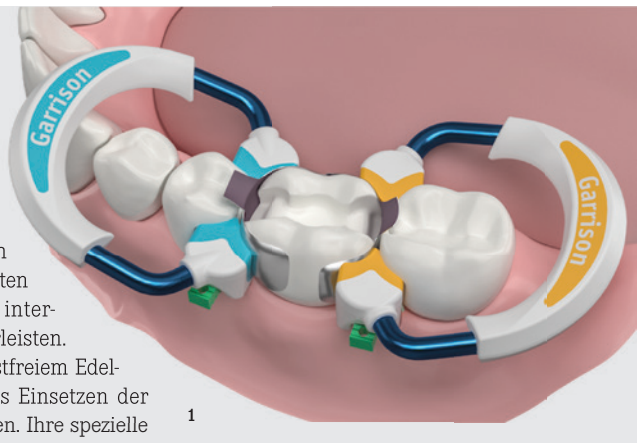
■ Seit 1996 hat sich Garrison Dental Solutions als Innovationsführer im Bereich der Teilmatrizensysteme etabliert und setzt mit dem Strata-G-Teilmatrizensystem weiterhin Maßstäbe in der modernen Zahnheilkunde. Als führender Anbieter von Teilmatrizensystemen für Klasse II-Kompositrestaurationen bietet Garrison eine hochentwickelte Lösung für Zahnärztinnen und Zahnärzte, die Präzision und Effizienz in ihrer täglichen Arbeit maximieren möchten. Mit dem Strata-G-Teilmatrizensystem stellt das Unternehmen eine leistungsstarke Lösung für optimale Klasse II-Restaurationen bereit, die weltweit von Anwendern geschätzt wird.

Das Strata-G-Teilmatrizensystem wurde speziell entwickelt, um eine breite Palette von Klasse II-Kompositrestaurationen zu ermöglichen. Es umfasst drei verschiedene Separierringe, fünf Größen von Matrizenbändern, vier Größen interproximaler Keile sowie eine hochwertige Ringseparierzange. Die vielseitige Anwendung macht es ideal für mesiookklusale, distookklusale und mesiookklusodistale (MOD) Präparationen, die im Seitenzahnbereich vorkommen.

Dank über 25 Jahren Erfahrung in der Herstellung von Teilmatrizensystemen hat Garrison das bislang umfassendste und benutzerfreundlichste System entwickelt. Das Drei-Ring-System mit kurzen blauen, hohen orangen und breiten grünen Separierringen verfügt über StrataBond-Silikonspitzen zur Minimierung von Überschüssen sowie Ultra-Grip-Retentionsspitzen, die ein Verrutschen verhindern. Zusätzlich sorgt die PEEK-verstärkte Ringkonstruktion für erhöhte Haltbarkeit und maximalen Handhabungskomfort.

Die ultradünnen, weichen Matrizenbänder bieten eine verbesserte Randleistenunterstützung. Ihre abgestuften subgingivalen Verlängerungen erleichtern das Einsetzen und Entfernen. Ergänzt wird das System durch die Strata-G Ultra-Adaptive-Keile, die sich sanft an Zahnunregelmäßigkeiten anpassen und eine optimale interproximale Abdichtung gewährleisten.

Die Garrison-Zange aus rostfreiem Edelstahl ermöglicht ein einfaches Einsetzen der Ringe, selbst bei großen Molaren. Ihre spezielle Spitzenkerbe erlaubt eine Butterfly-Platzierung für MOD-Fälle (Abb. 1). Das farbkodierte und übersichtlich organisierte Strata-G-System erleichtert den Arbeitsablauf und ist mit einer breiten Auswahl an Nachfüllpackungen erhältlich, um eine durchgehende Nutzung zu gewährleisten. ◂◂



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THE ROLE OF AI AND INTUITIVE MATERIALS IN RESTORATIVE DENTISTRY

■ *Artificial intelligence (AI) is poised to play a transformative role in restorative therapy at multiple levels—from caries diagnostics and material development to achieving optimal aesthetic outcomes. Some of these advancements are already tangible and being integrated into clinical practice.*

AI is becoming increasingly embedded in daily life, particularly excelling in image recognition and analysis. It can easily differentiate between everyday objects and human faces and conduct a broad range of evaluations. In dentistry, its capabilities are especially pronounced in digital radiography.

For instance, in histopathological imaging, AI can now distinguish cell nuclei and contours—often as accurately as, and significantly faster than, a trained pathologist. While the pathologist remains essential for intricate assessments beyond the machine's capabilities, AI's ability to classify skin lesion images is already surpassing that of dermatologists in speed. Additionally, it can segment organs in abdominal or thoracic CT scans, helping clinicians streamline their workflows.

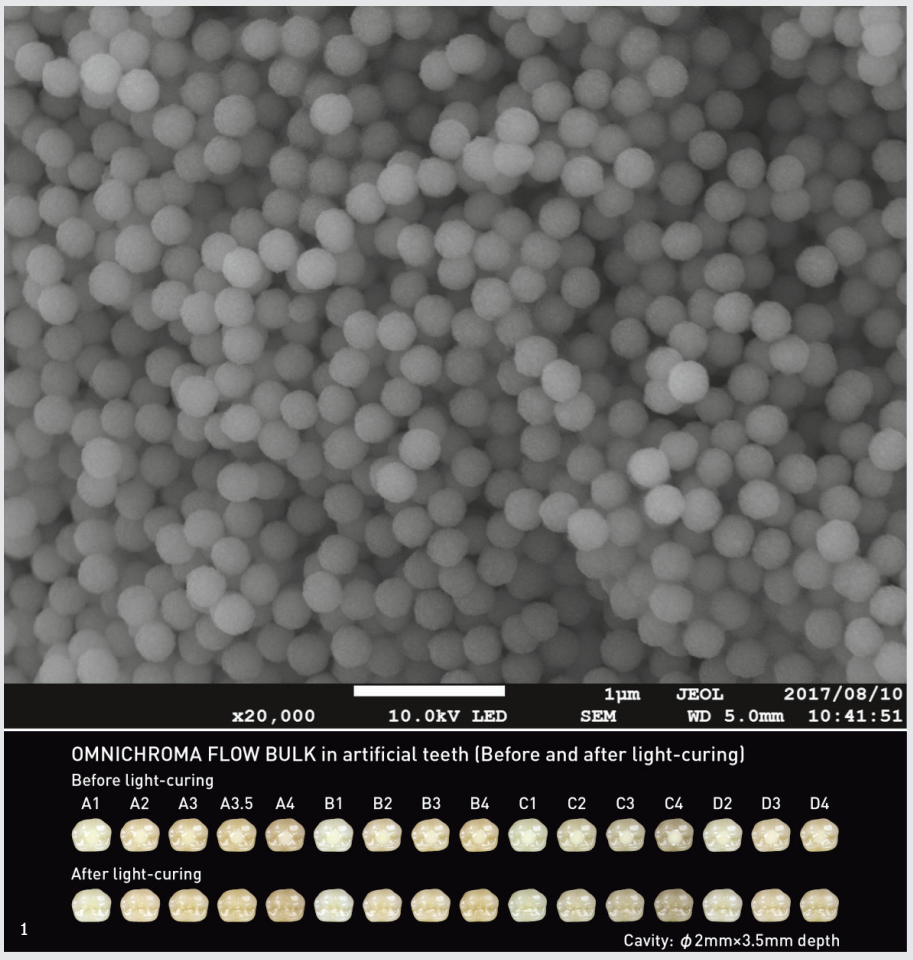
Diagnostics, prognosis and treatment decisions

A few years ago, a research group led by Prof. Falk Schwendicke, who at the time was the head of the Department of Oral Diagnostics, Digital Health and Health Services Research at Charité—Universitätsmedizin Berlin in Germany, began exploring AI's potential in dentistry, drawing inspiration from its applications in dermatology and ophthalmology. The team sought to answer a fundamental question: could AI recognise oral tissue structures, filling materials, prosthetic restorations and implants?

The result of this research was dentalXrai Pro, an AI-driven software designed to analyse dental radiographs with high precision. Developed as part of a research initiative launched in 2017 at Charité, the software enables AI to detect early caries on bitewing radiographs more accurately than human clinicians. It also performs preliminary classifications on panoramic radiographs, visualising them in a traditional dental diagram. By leveraging AI to enhance diagnostic accuracy and streamline patient communication, dentalXrai Pro represents a significant step forward in digital dentistry.

Today, Prof. Schwendicke serves as the director and chair of the Department of Conservative Dentistry and Periodontology at LMU Munich in Germany, where he continues to explore the intersection of AI, digital health, and dental research.

These advancements hint at AI's broader potential in dentistry—where analysed images could be integrated with other clinical data to identify patterns, enabling more precise diagnoses and predictive insights.



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AI in material development

Beyond diagnostics, AI's ability to recognise patterns and structures is proving invaluable in materials science, particularly in the development of restorative materials such as composites and adhesives.

Traditionally, predicting the physical properties of theoretical materials requires solving complex mathematical equations or employing numerical methods to approximate solutions. However, conventional simulation techniques become impractically slow at higher levels of complexity.

AI and neural networks designed for materials simulation offer a compelling alternative. These technologies can calculate localised stresses in complex materials thousands of times faster than traditional computing methods. In the future, AI could accelerate the development of dental materials—including composites, adhesives, ceramics and alloys—enhancing their durability and performance.

AI and natural intuition

AI operates based on the data it is trained on. For radiographic analysis software to function effectively, it must first be fed with vast datasets of images. Once trained, it can identify structures in new radiographs with remarkable accuracy. In this way, AI mirrors natural intelligence.

Humans, however, possess an additional layer of intuitive reasoning. This intuition allows clinicians to reach conclusions seemingly without deliberate analysis—whether it's a gut feeling about a diagnosis, an instinctive recognition of subtle colour variations, or a sense of temperature changes indicating patient distress.

Intuitive materials: From structure to colour

Some advanced filling materials exhibit a similarly intuitive quality. These materials can automatically adapt to their surroundings, mimicking the shade of adjacent teeth without requiring extensive manual colour matching.

This 'direct implementation' occurs at the microstructural level (Fig. 1), where the material itself creates the desired colour effect. A prime example is Omnichroma and its bulk-fill variant, Omnichroma Flow BULK (Tokuyama Dental; Fig. 2), which utilise a single base shade to seamlessly match all colours from A1 to D4.

As AI continues to reshape dentistry, its integration with innovative materials will further enhance restorative techniques, improving both clinical efficiency and patient outcomes. ◂◂

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