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DIGITAL DENTISTRY MADE SIMPLE

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DESKTOP HEALTH

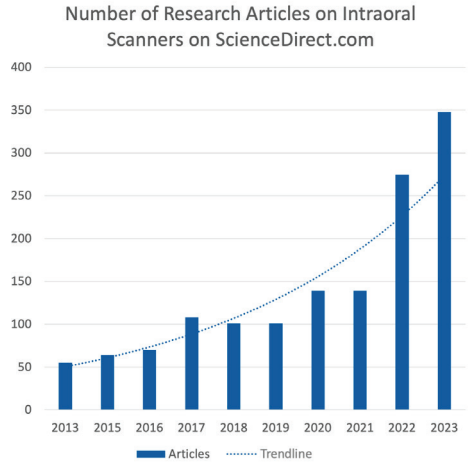
Proof Points: Digital Dentistry Improves Results and Experience for Dentist and Patient Alike

The first intraoral (iOS) scanner was commercialized in 1987[1] — a development that many dental experts recognize as an important step in ushering in the modern era of digital dentistry.

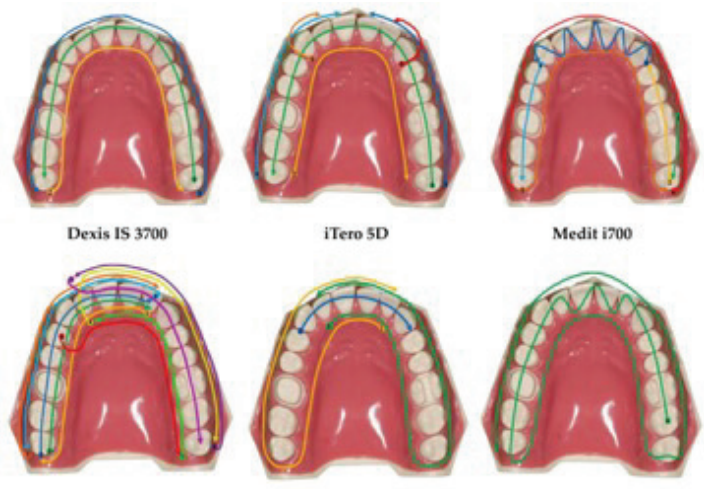
Since then, there have been continuous advancements in the hardware, software, and scanning strategies for intraoral scanning devices — enabling the easy flow of data to CAD/CAM, milling systems and 3D printers for the rapid production of dental prosthesis and restorations. This work can now be done successfully directly at the clinical site — often referred to as "chairside" — or, more often, by dental laboratories.

Over the years, research in peer-reviewed dental and medical journals has validated the use of intraoral scanners for general and specific uses, and have noted the global growth of intraoral scanning as an enabler to better patient and dentist experience, clinical results and efficiency.

Highlights from that growing body of research is included in this ScanUp Proof Points document.



Reliable iOS Accuracy Now Standard



In a 2023 study of six intraoral scanners, **all iOS devices recorded accuracy values within the threshold of clinical acceptability**.

Differences between scanners were "deemed to not be relevant" with the amount of time spent scanning and scanning strategies having a more significant impact.

Source: Intraoral Scans of Full Dental Arches: An In Vitro Measurement Study of the Accuracy of Different Intraoral Scanners – International Journal of Environmental Research and Public Health, March 2023, 8;20(6):4776.

The 2023 finding was similar to an earlier 2021 study that found trueness varied but was favorably similar: Comparison of Accuracy of Current Ten Intraoral Scanners – Biomed Research International 2021; 2021: 2673040.

1. Giuliodori G, Rappelli G, Aquilanti L. Intraoral Scans of Full Dental Arches: An In Vitro Measurement Study of the Accuracy of Different Intraoral Scanners. Int J Environ Res Public Health. 2023 Mar 8;20(6):4776. doi: 10.3390/ijerph20064776. PMID: 36981684; PMCID: PMC10048864.

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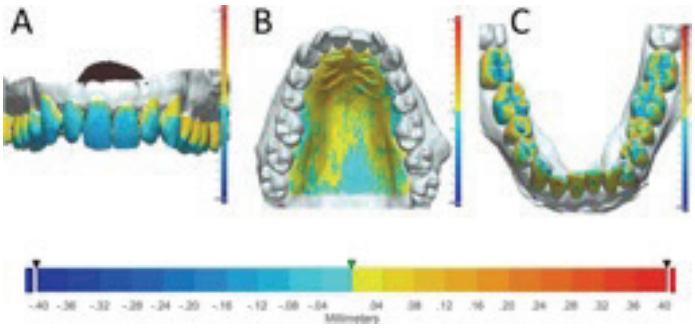
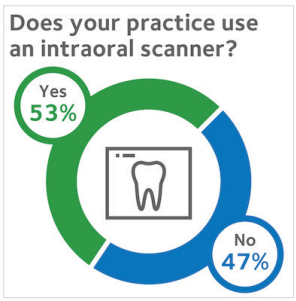
2023 Study: Intraoral Scanning is More Accurate for Palatal Tissues than Impressions

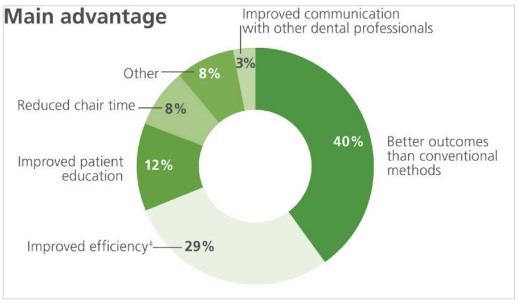
Source: Trueness and precision of complete arch dentate digital models produced by intraoral and desktop scanners: An ex-vivo study – Journal of Dentistry, Volume 139, December 2023, 104764

https://www.sciencedirect.com/science/article/pii/S0300571223003500?via%3Dihub



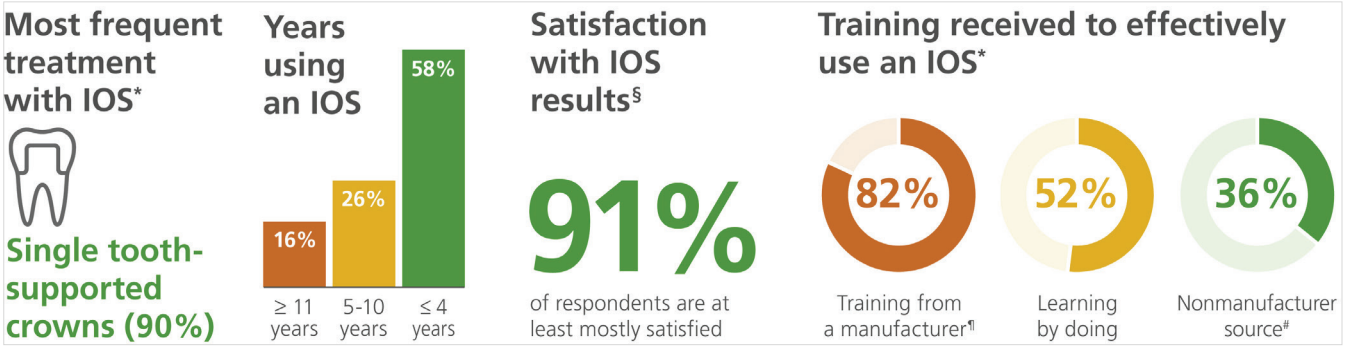
↑ JADA Study: More than Half of U.S. Dentists Now Using an iOS with 91% "Mostly Satisfied"





Source: Intraoral scanners: An American Dental Association Clinical Evaluators Panel survey – The Journal of the American Dental Association, Volume 152, Issue 8, August 2021, Pages 669-670.e2

https://www.sciencedirect.com/science/article/pii/S0002817721003123



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Children Report Higher Comfort with Scanners Over Alginate Impressions

The use of intraoral scanners in children is favorable, offering significantly higher patient perception and comfort compared to conventional alginate impressions.

Source: Intraoral scanners in children: evaluation of the patient perception, reliability and reproducibility, and chairside time—A systematic review – Frontiers in Pediatrics, 26 June 2023, Sec. Children and Health, Volume 11 - 2023

https://pubmed.ncbi.nlm.nih.gov/37435173/

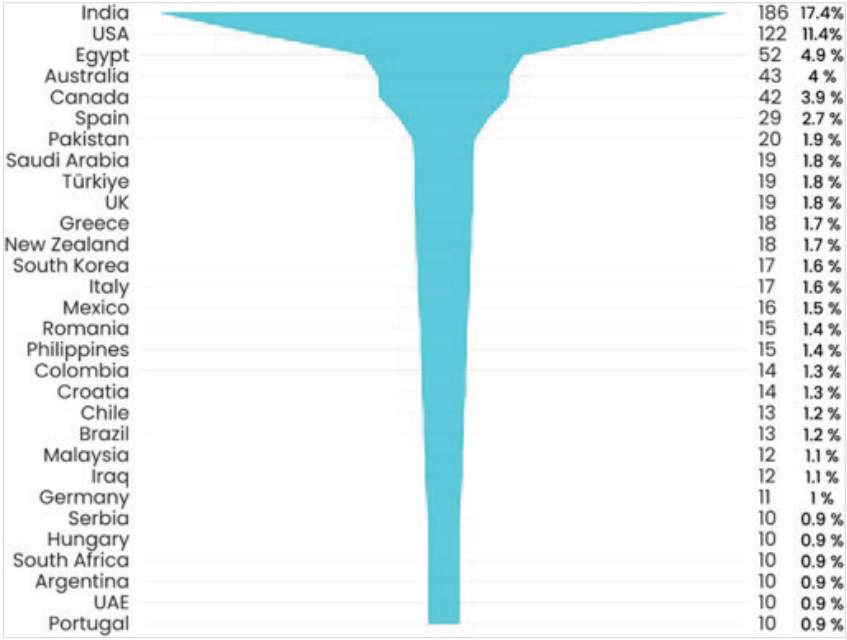
International Survey of Dentists in 100+ Countries: 75% Use Scanner Daily or Weekly

Intraoral scanner use is becoming globally common, with more than 75% of iOS owners using their scanner daily or weekly, according to 2022 global survey of 1,751 dental practices in 109 countries.

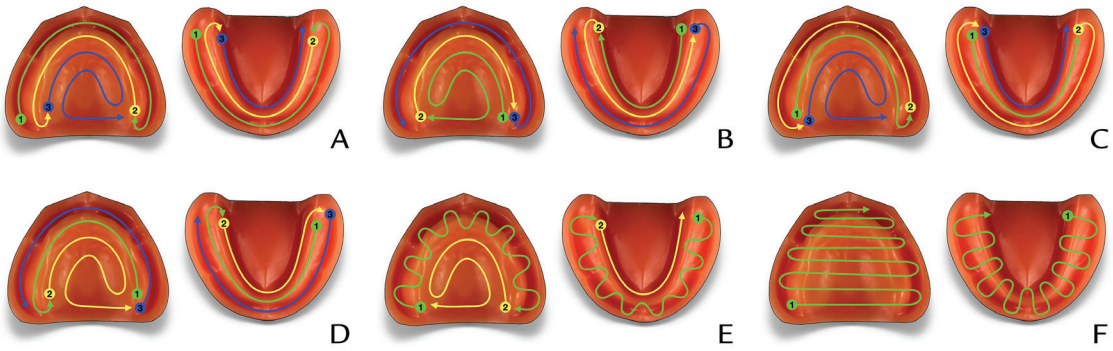
Conclusion: "Digital impression-taking technology is universal, and digital workflow in dentistry will continue to grow."

Source: User Experience of Intraoral Scanners in Dentistry: Transnational Questionnaire Study – International Dental Journal, Volume 73, Issue 5, October 2023, Pages 754-759

https://www.sciencedirect.com/science/article/pii/S0020653923000680
S0020653923000680?via%3Dihub#fig0002



Digital Scans are Accurate for Edentulous Arches, but Scanning Strategy Matters



Digital intraoral scans of completely edentulous arches have been established as a suitable alternative to conventional methods with comparable accuracy levels. However, strategy significantly impacted the accuracy of the digital scans of completely edentulous arches.

Source: Impact of intraoral scanner, scanning strategy, and scanned arch on the scan accuracy of edentulous arches: An in vitro study – The Journal of Prosthetic Dentistry, February 2023

https://www.sciencedirect.com/science/article/pii/S0022391323000690

Accuracy of the Intraoral Scanner for Detection of Tooth Wear

Conclusion: The iTero™ intraoral scanner can be recommended as a screening tool for tooth wear in routine dental practice.

While tooth wear is typically diagnosed from clinical inspection and supplemented by a review of the patient's history, this study explores the usefulness of intraoral scanning to diagnose and monitor tooth wear over time.

"Digital impressions can be taken during each patient visit to compile multiple records. The digital 3D images from different points in time can then be superimposed,19 either in the scanning unit itself or by using an external software. This function can potentially be applied to monitor and detect changes in tooth structure at the chairside to aid in maintaining and updating the treatment plan for the oral health benefit of the patient."

Source: Accuracy of the Intraoral Scanner for Detection of Tooth Wear – International Dental Journal, Volume 73, Issue 1, February 2023, Pages 56-62

https://www.sciencedirect.com/science/article/pii/S0020653922001162

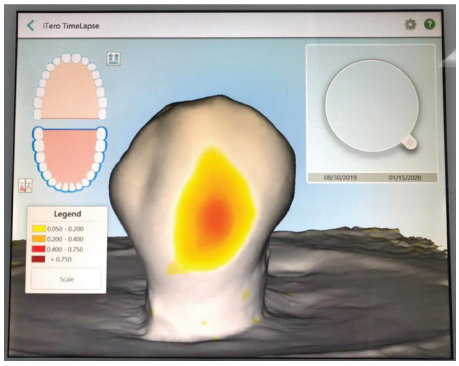


Figure: image superimposition of a representative sample on the iTero intraoral scanner showing the different colour scales with corresponding depth ranges.