

Dentistry – Beyond Imagination

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The advent of new technology has caused significant changes in the field of dentistry, enabling dentists and orthodontists to provide more efficient and effective treatments to their patients. From digital X-rays to 3D printing, technological advancements have transformed the way dental care is delivered, making it more accurate, safe, and patient-friendly. The application of technology in dentistry is not just limited to diagnosis and treatment. It has also made dental care more accessible and affordable, especially for underserved populations.

ARTIFICIAL INTELLIGENCE

Already, dentists employ software to get insights into clinical decision-making, but AI is changing the face of dentistry, just like it is in many other fields. For dentists, it's transforming diagnosis, decision-making, and treatment planning. For patients, it promises more accurate care and better outcomes.



ARTIFICIAL INTELLIGENCE

Operative dentistry: finding cavities earlier
Even with X-rays, dentists sometimes miss small cavities, especially in tricky spots like between teeth. AI can detect early-stage dental caries and vertical root fractures more accurately than traditional methods in a cost-effective way. Problems that get treated earlier, prevent the need for major work later – a huge win for all of us as patients. This is not science fiction, using neural networks can better detect dental decay (and periodontal disease) from radiographs.

Periodontics: protecting your gums
Gum disease (periodontitis) can be hard to spot in its early stages, but it's a major cause of tooth loss. AI

helps dentists catch it early, so treatment can be simpler and more effective. It's like adding an expert gum specialist to the team.

Orthodontics: planning the perfect smile
AI models help orthodontists create the best treatment plans, and predict how the result will look like. This means faster results and less guesswork.

AI in oral and maxillofacial pathology: early detection, targeted treatments
AI is getting good at analysing scans and microscope slides. It can identify suspicious areas that need closer examination and can help distinguish between tumor types. This can lead to earlier cancer detection and more targeted treatment.

Prosthodontics: designing better restorations
Various AI models can assist this process by generating perfect dental crowns and dentures through CAD integration and improving shade matching.

SMART TOOTHBRUSH

The Smart toothbrush makes sure you are brushing your teeth the right way through its app and offers kids fun games to keep up the good habit of regularly cleaning their teeth. Philips' Sonicare smart toothbrush comes packed with sensors in its handle. These provide real-time feedback via a companion app warning you if you are applying too much pressure, where you are brushing and even coach the user as to how to brush properly. And there are so many such devices on the market.



SMART TOOTHBRUSH

AUGMENTED REALITY (AR)

You might be familiar with Augmented Reality (AR) through social media apps; it's the same technology that Snapchat uses to superimpose filters on your face during your guilt trip selfie with a dog face filter. But AR also found a home in dentistry for both educational and clinical purposes.

Image Navigation's DentSim Simulator pairs AR with a mannequin on which students can perform procedures while receiving immediate feedback as their movements are tracked.



AUGMENTED REALITY (AR)

VIRTUAL REALITY IN DENTISTRY

Today, only a few students can peek over the shoulder of the surgeon during an operation and it is challenging to learn the tricks of the trade like that. With a virtual reality camera, surgeons can stream operations globally and allow medical students to actually be there in the OR using their VR goggles. Dentistry even outpaced other fields of medicine in adopting this method.

Back in 2015, Nobel Biocare held the first dental surgery filmed through VR and allowed observers to virtually assist the whole procedure from the surgeon's perspective. In comparison, the first VR-recorded surgery was performed at the Royal London Hospital in 2016. The technology can further be used to help dentists build on their empathy skills through simulations putting them in the shoes of their patients or in challenging situations.



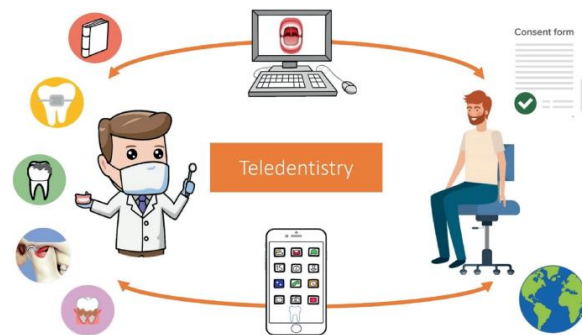
VIRTUAL REALITY

TELEDENTISTRY

Teledentistry services offered by companies like The Telenists and MouthWatch provide easier access to oral and dental care; are significantly cheaper for patients; shift towards cheaper prevention practices; and allow patients to consult with otherwise unavailable medical professionals.

For instance, MouthWatch's TeleDent service offers an all-in-one tele dentistry platform allowing patients to capture images, send relevant information to a dentist remotely, and do a live consult.

The dentist might start a video chat with the patient and the caregiver so that the medical professional can actually see and talk to the patient, build rapport, help connect them and bring them into the office (if necessary).



TELEDENTISTRY

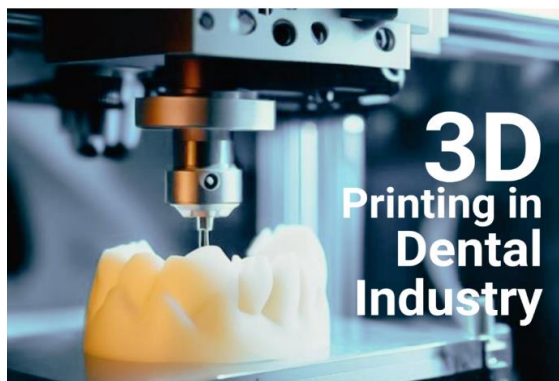
CRISPR

CRISPR is a ground-breaking genome editing method offered by Mother Nature herself, but researchers have discovered its immense potential only recently. As explored in our dedicated articles, it might become the ultimate weapon against cancer or, more controversially, help design babies in the future. And the field of dentistry will also benefit from the technology as well.

3D-PRINTING

Computer-assisted design (CAD) and computer-assisted manufacture (CAM), including 3D-printing, are already revolutionising the sector; they are turning them into low-cost, more effective digital labs. Traditionally, when a patient needs a crown, a dentist must make a mould of the tooth and fashion a temporary crown, then wait for the dental laboratory to make a permanent one. With CAD/CAM technology, the tooth is drilled to prepare it for the

crown and a picture is taken with a computer. This image is then relayed to a machine that manufactures the crown right in the office.



3D-PRINTING

The future of dentistry is bright with the latest advances in tools and technologies. From improved dental imaging and diagnostics to innovative treatments and procedures, patients can expect more precise and personalized care. At-home oral care is also being revolutionized, with smart toothbrushes, oral health apps, and monitoring devices empowering individuals to take charge of their oral health. Dental telemedicine and the incorporation of artificial intelligence are further improving access to care and enhancing treatment outcomes.

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