

A View of Dentistry in Future - A Narrative Review

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Abstract:

Dentistry is a fast-growing field, it was worth of \$15 billion in 2020 and predicted to double by 2027. In this 21st century, there are lots of new trends and innovations emerging. These innovations have helped the dentist face the pandemic period smoothly and utilised to grow itself i.e., Teledentistry, Artificial Intelligence, 3D printing, Smart products, Virtual Reality (VR), Augmented reality (AR), Robotics, etc. The majority of these trends are aimed at improving patient care and overall patient experience, such as comfort, accessibility, cost and improved therapies.

Keywords: Innovation, Artificial Intelligence, Virtual Reality, Augmented reality, 3D printing, Smart products.

INTRODUCTION

Few years back black & white keypad mobiles. But now there were smart mobiles with voice recognition system and all special features. This is the type of technology development in the field of communication during the period of time. Similarly, the technological advancements in dentistry are a clear indication of the exciting technological growth that has occurred in the dental industry. Yet in comparison to biomedical engineering and medicine electronics, automotive, and other fields. It appears that dentistry is more than a decade behind in wide-scale

adoption or integration of new technologies scale basis. This shows dentistry is very much incorporated with developing engineering and technology through various ways. The gaining of knowledge on this technology not only to the dentist but also with the entire team working in the dental clinic. It's help in storage of the data, transportation and easy decision making^[1]. During the pandemic, Teledentistry which is one of the best mode of communication for the dentist with their patients^[2]. Communication between many people is frequently necessary in pediatric dentistry, including general practitioners (GPs), paediatricians, other medical specialists, and social workers. All patients, but especially those at the centre of multidisciplinary teams, require effective communication. So, technology helps in it^[3].

Current technology in Dentistry:

Currently using advanced technologies in dental fields are:^[4]

- Digital Radiography (RVG)
- Computer-aided Implant Dentistry
- Cone Beam Computed Tomography (CBCT)
- Electrical and Surgical Implant hand- piece
- Shade Matching
- Lasers
- CAD/CAM

Digital Radiography (RVG)

Traditional radiography requires many steps to process it manually, which was discovered in 1895. Later in 1987, digital radiography system was introduced in 1987. Dr. Francis Mouyen introduced the sensor for digital radiography and launched first digital radiography system called RVG (Radio visio gram). The diagnostic accuracy of caries detection depends heavily on contrast resolution^[5]. In addition to identifying suspects, determining the cause of death, identifying bodies, finding errors in tooth charting, legal issues, identifying bodies, post-mortem examination, and forensic anthropology, forensic dentistry uses radiology to determine an individual's age by analysing the stage of tooth eruption^[6].

Cone Beam Computed Tomography (CBCT)

With this type of computerized tomography, dentists can quickly view a patient's oral or maxillofacial anatomy in three dimensions. It provides a complete image that can be viewed in 3600 and is accurate to a minimum of 1/10th. We can closely examine the tissues to examine the sinuses, gums, and teeth^[7]. We can measure the bone's thickness and the direction of the nerves thanks to the image's clarity. When dental implants are placed, it serves as an implant surgical guide for periodontists and oral surgeons, which improves the accuracy of the procedure. Thus, it makes it possible to diagnose TMJ issues and to implant implants with greater precision^[8].

Practice and management of patient records

Currently, computer-specific software for dental offices has advanced so that everything that allows for the patient's dental wellbeing can be recorded in addition to scheduling appointments. With a variety of online appointment scheduling tools at their disposal, dentists today make it simpler for clients to schedule and keep appointments for oral hygiene and treatment^[7]. Some offices haven't converted, though. In order to ensure proper care and reduce needless patient office visits, communication programmes also make it simple for dentists to clearly communicate information about a patient's case with their laboratories and specialists. While the patient is seated, real-time computer consultations are also an option. Thus, any aesthetically pleasing or practical issue can be discussed and fixed^[9].

As per DCI regulation in 2014, “all the dental clinics and colleges have to keep the necessary records for both out-patients and in-patients documents for at least three years from the start of the treatment in the any format.” So, everywhere online mode of record management started^[10].

As per DCI regulation in 2019, Online Faculty & Students Attendance Monitoring System (OFSAMS) at dental institutions across the country was established to easy monitor of attendance^[11].

3D Printing

From 2021 to 2028, the global 3D market is projected to grow by 21%. Due to accessibility and lower costs, 3D printing will be able to play a much larger role in dental practises as it moves closer to becoming more widely accepted. The production of custom dentures, crowns, invisible teeth aligners, and other items is significantly sped up by 3D printing, which uses materials like resins^[12]. As 3D technology develops, more potential uses are even becoming apparent, with general dentistry, implantology, and prosthodontics all potentially benefiting. Software for treatment planning incorporates a digital scan from a CBCT scan or an intraoral digital scanner to create a 3D image^[7].

Some implant companies have their own systems^[13]:

- 3M True Definition (3m.com/3M/en_US/Dental/)
- PlanScan from Planmeca (planmecacadcam.com)
- Carestream CS 3500 (carestreamdental.com)
- iTero by Align Technology (itero.com)
- CEREC (sirona.com)
- The DWIO system from Dental Wings (dentalwings.com)
- Trios from 3Shape (www.3shape.com)
- Lythos by Ormco (ormco.com)

LASERS

One wavelength of monochromatic electromagnetic energy is what is known as a laser. The most popular soft tissue lasers used by dentists are diode lasers. Numerous procedures, including soft-tissue gingivectomy, biopsy, impression toughening, frenectomy, adjunct periodontal procedures, implantology, endodontics, and tooth whitening, make use of it. The target tissue can be precisely and effectively cut, coagulated, abated, or vaporised using the laser's infrared wavelengths. The units' small size, portability, cordlessness, and low price make them appealing and simple to add to the practice's investment portfolio. Sutures are no longer necessary thanks to minimally invasive oral surgery made possible by laser dentistry. Additionally, it permits less bleeding, minimal to no pain, quicker healing, and a decreased risk of infection^[7].

BENEFITS OF DIGITAL DENTISTRY

- Cost and time efficiency have increased.
- Greater accuracy compared to earlier techniques.
- High degree of outcome predictability.
- Practice management will become more effective thanks to technology.
- The demands for decision-making in clinical practise will be increasingly supported by educational software and intelligent assistants^[14].

LIMITATIONS OF DIGITAL DENTISTRY

- Cost is the main barrier to most aspects of digital dentistry. It frequently costs more money to adopt new technology, especially in the "innovator" or "early adopter" stages.
- Lack of training, knowledge, and motivation are the clinician's other main barriers to exploring new, advanced dental technology.
- Slower adoption rates are frequently result of a lack of understanding of new technology^[15].

CONCLUSION

The wise course of action is to go entirely digital. There is no question in anyone's mind that this is what dental care and dental education will look like in the future. Return on investment can be excellent, practising dentistry can be more enjoyable, and patients can receive better care when properly implemented and fully educated. It is most certainly NOT a fade; it is a WAY that WE ARE ALL GOING TO TAKE.

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