

Digital Dentistry: The Future is Here

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Introduction

With the presenting of modern technology in our lives, everything became so much easier, faster and the impossible turned to possible in almost every field. This includes the dental field, as before the invention of the great technologies; no one thought that it's possible to limit too many appointments in the dental office to only one visit.

Digital dentistry is a term that means the use of computer-based or digital components to carry the dental procedures rather than using electrical or mechanical ones.

Types of digital dentistry technologies

There're so many types of in-office digital dental technologies, such as:

- A) **CAD/CAM:** CAD/CAM (computer-assisted design, computer-assisted manufacture) technology enables dental restorations such as crowns, veneers, inlays and onlays to be fabricated using computerized milling technology. It consists of:
 - a. An optical scanner that captures the intraoral or extraoral condition.
 - b. Software that can turn the captured images into a digital model.
 - c. Technology that changes the data into a product.

This technology decreased the chair time, increased the productivity and quality of required prosthesis, and gave the opportunity of using new materials that causes revolutionary changes in the dental world. Although all these advantages, there're still some disadvantages of this method, because CAD/CAM requires a large

initial investment, and occlusal detail isn't always the best and has to be amended by hand.

- B) **Intraoral cameras:** These types of cameras can produce high-quality images of teeth, which allow the patient to be part of the treatment for more understanding. Also, it helps the dentist to see teeth more clearly.
- C) **Cone beam CT:** A form of computerized tomography that can produce high-quality 3D image of the patient's oral and maxillofacial anatomy, and it can be used when the regular x-ray and panorama isn't enough. Cone beam CT scanners are square-shaped machines that include either an upright chair for sitting or a moveable table so patients can lie down during the examination. Scanners that include a chair have a rotating C-arm, an x-ray image intensifier that contains an x-ray source and detector. Advantages of this technology include the increased quality of images with a wide variety of angles and views with only one scan. Because of the required high dose, CBCT should be only limited to only the required cases.
- D) **Digital X-rays:** Digital radiographs capture dental images through a sensor that processes the image onto a computer screen by special software. In this way, it became easier and faster to take an x-ray than the traditional films. Also, it allows the dentist to magnify the image to see all the details.
- E) **Optical scanners:** They are used in dentistry to provide a digital map of the teeth, as well as to create a digital impression of the tooth's anatomy. Advantages include accuracy in the selection of restoration shades and facilitating the procedure of taking an

impression by using the traditional ways that may cause some inconvenience for patients.

- F) **Dental lasers:** One of the greatest dental technologies is the Laser. It can cut through hard, soft tissues or both with less pain and bleeding than the traditional painful procedures. Laser has many uses such as: removing teeth decay, elimination of periodontal problems and teeth whitening.

Advantages of digital dentistry

- 1) Precise results and easier procedures
- 2) Better patient experience and comfort
- 3) Saves time and cost
- 4) Efficient communication with patients and labs
- 5) Excellent return on investment.

Limitations of digital dentistry

Limitations on digital dentistry include cost, lack of desire to adapt to new dental technology, and misunderstanding of new technologies [1-6].

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