

# CAD/CAM Technology in Dentistry

Created by:

Philopater Magdy 23101843 - Zeina Hamed Hassanien 23101052

## Introduction

CAD/CAM, that is, Computer-Aided Design/Computer-Aided Manufacturing technology, has utterly changed the face of dentistry.



## What is CAD/CAM in Dentistry?

CAD/CAM in dentistry involves three major steps: digital scanning, computer-aided design, and computer-aided manufacturing. These three steps together allow for highly accurate and personalized dental restorations with less time involvement and more patient satisfaction.

## The three major steps

**Digital Scanning:** The initial step involves capturing a detailed, 3D digital image of the patient's teeth and gums using an intraoral scanner.

**Computer-Aided Design (CAD):** Once the digital scan is completed, specialized software is used to design a precise digital model of the required restoration, such as a crown, bridge.

**CAM:** After the design is finalized, CAM technology is used to fabricate the restoration. This is done through milling machines or 3D printers.



## Materials Used in CAD/CAM Restorations

**Zirconia:** With its strength and durability, is often used for making long-lasting crowns and bridges.

**Lithium Disilicate:** Strong and esthetic material used for anterior crowns and veneers.

**Porcelain:** Highly translucent and tooth-colored, with an aesthetic look similar to teeth, is often selected in cosmetic restorations.

**Acrylics:** The acrylic material usually works with dentures, partial dentures, and temporary restorations.

**Titanium:** has extensive application owing to its mechanical property and good biocompatibility.

## CAD/CAM Steps

**Digital Intraoral Scanning:** The dentist captures intraoral high-resolution images by means of a handheld intraoral scanner. This process is far quicker than the conventional method of taking impressions.

**Designing the Restoration:** The digital scan is sent to a dental laboratory where technicians design the restoration with the use of CAD software. This software gives finite control to make modifications in size, shape, and fit according to the specific needs of the patient.

**Fabrication of the Restoration:** After designing is complete, fabrication is done by using CAM technology. There are two major methods of fabrication: Milling and 3D printing.

Both methods guarantee high precision, requiring only minimal adjustments and providing restorations that fit the patient's mouth



## Advantages of CAD/CAM

Enhanced Patient Experience, Speed Comfort, Precision, accuracy, Simplified Workflow, Fewer Appointments, Decreased Mistakes, Cost-Effective, Time Efficiency .



## Applications of CAD/CAM

Crowns and Bridges, Dentures , Implants, Orthodontics, Nightguards and Splints, Digital Workflow.



## Conclusion

The integration of CAD/CAM technology in dental practice has several benefits: the enhancement of accuracy, less treatment time, and, most importantly, patient comfort. As digital workflows take over, both patients and dental professionals will be able to enjoy more efficient, cost-effective, and accurate dental treatments. The future of dentistry is surely digital, and CAD/CAM technology is leading the way forward to quicker, more comfortable, and highly accurate dental care.

