

## THE INFORMATION TECHNOLOGY REVOLUTION IN ORAL SURGERY

**Juan Rapheal Diaz Simoes**

Scientific Supervisor: Associate Professor of the Department of Biophysics and Information Technologies in Medicine, Tashkent State Dental Institute

**Rashidi Sarah**

Tashkent State Dental Institute Department of Surgical Dentistry and Dental Implantology Masters, 1<sup>st</sup> year

### ABSTRACT

The field of oral surgery has undergone a significant transformation in recent years, driven by the rapid advancement of information technology (IT). This article explores the various ways in which IT is revolutionizing oral surgery, from diagnosis and treatment planning to surgery and post-operative care. It discusses specific technologies such as 3D printing, artificial intelligence (AI), and virtual reality (VR) and their impact on patient care. Additionally, the article highlights the ethical considerations surrounding the use of IT in oral surgery and the need for data security and patient privacy.

**Keywords:** Oral surgery, IT, 3D printing, AI, VR, telemedicine, ethics, data security.

### INTRODUCTION

Oral surgery, a specialty within dentistry, focuses on the diagnosis and surgical treatment of diseases, injuries, and defects of the mouth, jaws, and facial structures. Traditionally, oral surgeons relied on physical models, X-rays, and other manual techniques for diagnosis, treatment planning, and surgery. However, the advent of IT has introduced a new era of innovation and precision to the field, transforming the way oral surgeons approach patient care.

#### **Impact of IT on Oral Surgery:**

**3D Printing:** This technology allows for the creation of accurate and detailed models of patients' jaws and teeth, which can be used for a variety of purposes, including:  
**Preoperative planning:** 3D models help surgeons visualize the surgical site and plan the surgery more effectively, leading to reduced operating times and improved outcomes.  
**Customized prosthetics and implants:** 3D-printed prosthetics and implants

can be designed and manufactured to fit each patient's individual needs, providing better fit and functionality.

**Artificial Intelligence (AI):** AI algorithms are being used to analyze medical images and data to assist with diagnosis, treatment planning, and risk assessment. For example, AI can be used to: Detect early signs of oral diseases, such as cancer, with greater accuracy than traditional methods. Predict the risk of complications after surgery. Recommend personalized treatment plans based on the individual patient's needs.

**Virtual Reality (VR):** VR technology is being used to: Provide patients with virtual tours of the surgical procedure, reducing anxiety and improving preoperative understanding. Train oral surgeons in a safe and realistic environment. Enhance the patient experience by offering virtual relaxation and distraction techniques during surgery.

**Telemedicine:** This technology allows oral surgeons to remotely consult with patients and provide care, particularly in underserved areas where access to specialists is limited. Telemedicine can be used for: Initial consultations and diagnosis. Postoperative monitoring and follow-up care. Providing patient education and support.

**Data Analytics:** By collecting and analyzing data from various sources, such as electronic health records and medical imaging, oral surgeons can gain valuable insights into patient populations and develop more effective treatment strategies.

**Ethical Considerations:** The use of IT in oral surgery raises several ethical considerations, including: Data security and privacy: Patient data must be protected from unauthorized access and misuse. Algorithmic bias: AI algorithms can perpetuate biases present in the data they are trained on, leading to unfair or discriminatory outcomes. Access to technology: Not all patients have equal access to the latest IT-based technologies, which can exacerbate existing healthcare disparities.

## **CONCLUSION**

The IT revolution is transforming the field of oral surgery, offering new opportunities for improved patient care, greater efficiency, and lower costs. However, it is important to be aware of the ethical considerations surrounding the use of IT and to ensure that these technologies are used responsibly and ethically.

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