

Editorial

Modern Approaches in Orthodontics and Orofacial Treatments: An Updated Perspective of Innovative Technologies

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The technological advancements in orthodontics and oral rehabilitation are continuous and consistent. In this regard, clinicians need to be updated concerning new tools and applications that can improve treatment effectiveness and efficiency, optimize a patient’s treatment experience and improve the clinical workflow [1]. Today, technological advancements in the medical field are synonymous with digital systems and applications aimed at diagnosis, treatment planning and patient outcomes [2]. This also arises from the study published in recent literature and, specifically, in this Special Issue where many researchers have proposed and tested new methodologies mostly involving digital tools and derivate systems [3]. In this regard, we reported a brief description of the main clinical topics that underwent significant updates in recent years in digital orthodontics and oral rehabilitations.

Precision and Accuracy in Diagnosis: Digital Impressions and Scanning.

Traditional methods for dental impressions have several limitations, such as distortion, discomfort and workflow efficiency. Digital scanners create accurate 3D models of a patient’s teeth, providing orthodontists with precise information for diagnosis. This accuracy contributes to more effective treatment planning [4,5].

Efficiency and Time Saving: 3D Printing.

The use of 3D printing in orthodontics allows for the fabrication of personalized models, appliances and aligners [6]. This technology streamlines the production process, reducing the time required to create custom orthodontic devices compared to traditional methods [7].

Enhanced Treatment Planning: Digital Treatment Planning Software.

Advanced software enables orthodontists to visualize treatment outcomes more accurately. With digital treatment planning, orthodontists can simulate tooth movements, predict treatment duration and communicate effectively with patients about the expected results [8,9].

Improved Patient Experience: Clear Aligner Technology.

Digital orthodontics has popularized clear aligners, providing patients with a more discreet and comfortable alternative to traditional braces. Clear aligners are customized using digital impressions, contributing to a better overall treatment experience [10,11].

Remote Monitoring and Teledentistry: Digital Monitoring Devices.

Smart orthodontic devices equipped with sensors allow for the remote monitoring of treatment progress. This facilitates timely adjustments and reduces the need for frequent in-person appointments. Tele-orthodontics, enabled by digital communication, provides greater accessibility for consultations and follow-ups [12].

Data-Driven Decision Making: Artificial Intelligence (AI) Integration.



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AI algorithms analyze large datasets, aiding orthodontists in treatment planning and predicting outcomes. Machine learning can identify patterns and provide insights that contribute to more informed decision making, leading to personalized and effective treatment strategies [13].

Enhanced Patient Education: Augmented Reality (AR) and Virtual Reality (VR).

AR and VR technologies enhance patient education by providing interactive and immersive experiences. Patients can better understand their treatment plans, visualize potential outcomes and feel more engaged in their orthodontic journey [14–16].

Reduced Radiation Exposure: Cone Beam Computed Tomography (CBCT).

CBCT imaging, while not exclusively digital orthodontics, has become an integral part of treatment planning. It offers detailed 3D images with lower radiation exposure compared to traditional CT scans, contributing to patient safety [17,18].

Customization and Personalization: Digital Appliances.

Three-dimensional printing and digital technologies allow for the creation of highly customized orthodontic appliances. This level of customization ensures that treatment plans are tailored to each patient's unique dental anatomy, improving the effectiveness of orthodontic interventions [19,20].

With the increasing interest in digital technology, new studies are still warmly encouraged to investigate the effectiveness of new clinical protocols in orthodontics. These enhancements not only confer advantages to orthodontic professionals in the diagnosis and decision-making process but also augment the quality of healthcare rendered to patients, thereby making the orthodontic treatments more accessible, amenable and efficacious [21].

Conflicts of Interest: The author declares no conflict of interest.

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