



## APOS Trends in Orthodontics

Guest Editorial

# Digital orthodontics and the future of our specialization

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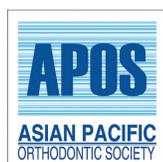
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The “digital revolution in orthodontics” is one of the topics most commonly discussed at current congresses, symposia, and other meetings, usually with the objective of transforming non-digital procedures into digital ones. Although the first innovative devices,<sup>[1]</sup> procedures,<sup>[2]</sup> and techniques<sup>[3]</sup> were published at the beginning of this century, there is still a lack of evidence regarding their effectiveness in obtaining better outcomes<sup>[4]</sup> that justify the replacement of the traditional ones.

As it is well known, digitalization<sup>[5]</sup> should be aimed at using technologies to improve the cost/effective ratio (efficiency) of internal procedures and patient experience, and not merely to convert the analogical workflow into full digital one. Intraoral scanning is a good example of digital procedure because it simplifies the clinical protocol by following two steps – scanning and online sending – unlike traditional impression, which is longer, more invasive, and more complex with its inclusion of trays, impression material, mixing, human resources, packaging, express courier, and offline sending. Furthermore, digital impression is perceived as more satisfactory as it is considered significantly more comfortable<sup>[6]</sup> than the conventional technique.

On the contrary, if some tooth movements are missed due to the reduced predictability of 3D-designed and customized appliances,<sup>[4]</sup> leading to additional appointments and/or treatment replanning, patients become dissatisfied because their initial expectations have not been met; also, additional treatment phases and longer treatment time lead to inefficient clinical process, with higher fixed and variable costs.<sup>[7]</sup> For these reasons, digitalized appliances should be used when tooth movements are realistically obtainable, guaranteeing a safe and satisfying orthodontic journey.

Therefore, digital orthodontics should implement the best hybrid protocols for each specific case; it should obtain excellent results in the most efficient, comfortable, and predictable manner, rather than merely substitute the digital for the traditional. Indeed, the hybridization between the digital and the traditional should not only refer to the exclusive use of hybrid devices for hybrid mechanics but also of hybrid processes to make treatment more efficient and satisfying.

A good example of hybridization is the combination of teledentistry and in-office visits to monitor orthodontic progress. Teledentistry, which was widely used during the COVID-19 pandemic, may improve the orthodontic journey of non-resident patients by reducing their in-person visits. Obviously, substituting teleorthodontics for all orthodontic treatments, as may occur in smile direct clubs, is not feasible and not realistic. Such a substitution would be dangerous to public health<sup>[7]</sup> because certain seats and medical procedures must be performed by the orthodontists in the office,

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as it must occur for the following essential diagnostic data: (1) The health of teeth and periodontics, (2) the research of discrepancy between centric occlusion and centric relation, (3) temporomandibular joint and muscular disorders, (4) midline deviations and asymmetries, (5) cant and subdivision.

Furthermore, time spent at the computer, which should be mixed with time spent on clinical examinations, is a critical issue. As orthodontics is still a medical specialty, the time spent listening to patients' needs and performing clinical examinations should allow for good diagnoses and treatment plans. However, the more time is spent at the computer, the less time is spent on clinical examinations. Since the diagnostic phase is not substitutable even with the best artificial intelligence, computer-aided designed processes should not preclude the human cognitive process when determining the best treatment plan.

In conclusion, the hybridization between digital and traditional procedures may allow orthodontists to customize the best treatment plan for each patient. Digital orthodontics represents a great opportunity for the future prosperity of our specialty. It implies the development of more clinical skills and expertise that will allow orthodontists to obtain desired outcomes, wisely choose efficient treatment plans and mechanics, and provide an excellent patient experience.

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