

# Digital intraoral scanner applications for comprehensive dentistry: Periodontal, orthodontic, and restorative treatment planning.

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It is a common occurrence for patients to express concern regarding a single tooth, report discomfort in an area in the mouth or request product recommendations during a preventive dental hygiene appointment. As primary care providers and periodontal therapists, dental hygienists benefit from regular patient interaction to build trust and rapport and have the opportunity to advise patients on the best methods to keep their tissues and teeth in optimum condition for both their oral health and overall health.

There has never been a better time to offer and deliver comprehensive dental care. Advancements to research and development in all facets of dentistry have enabled patients to keep their teeth longer with certainty. Coupled with increased consumer awareness regarding smile enhancements, the dental professional has substantially more to offer to devise a customized prevention plan. Patients accept regular hygiene appointments as commonplace to control periodontal conditions and maintain optimal tissue health. Invisalign® clear aligner therapy makes it possible for adults to consider orthodontic therapy along with the enamel-like ceramics used in restorative dentistry, giving the opportunity to replace lost, worn, and missing tooth structures in a manner that reflects the patient's original appearance and anatomy.

Case presentation has evolved significantly in recent decades as a result of demographic changes, broader access to dental information, and patients increasingly viewing proper dentistry as a core component of their overall health care.<sup>1</sup> While implementation of the Problem, Consequence, and Solution model is highly accepted, the techniques used to create perceived value continue to evolve. The following case demonstrates how using the iTero Element® scanner's software apps can significantly enhance patient communication and enable the dental professional to share their concerns and intentions authentically.

Patrick presents with one chief concern. He is dissatisfied with the appearance of his upper left lateral incisor previously replaced with a Maryland bridge (Figure 1). Based on his previous experience, his expectation is a restorative solution. In restorative dentistry, "ideal" is an excellent target but compromise is usually our reality when faced with problematic occlusal cases.

From the dentist's perspective, close examination of Patrick's dentition reveals a slightly deep bite with a mild omega-shaped arch form, lingually inclined posterior

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Figure 1

teeth, upper anterior spacing, zenith discrepancies, and an anteriorly displaced central incisor provides less than ideal circumstances to achieve an extraordinary restorative outcome for replacing the missing lateral incisor. Periodontally, the dental hygienist, observes less than optimal generalized tissue color and texture, and early receding of the gingival margins. Both the dentist and dental hygienist agree that Patrick requires a comprehensive prevention plan utilizing a periodontal, orthodontic and restorative model rather than a 'quick fix.' Adjunctive orthodontic treatment for adults is, by definition, tooth movement carried out to facilitate other dental

procedures necessary to control disease, to restore function and enhance appearance.<sup>2</sup> Today's advancements allow us to optimize function by creating a stable foundation to minimize wear and build future restorations with ideal occlusal forces.

To assist Patrick to visualize the value of a comprehensive treatment approach, we take a quick scan with the iTero Element® intra-oral scanner and utilize the Occlusogram feature. The Occlusogram helps to "show" patients why they need treatment, as opposed to simply "telling" them they need it. Looking at Patrick's Occlusogram (Figure 2), the hygienist explains to Patrick that the color map allows for easy identification of the size of tooth contact, location, symmetry, and the intensity of his bite.

Providing an instant, relatable visual for the patient to be able to see areas that are at risk and create awareness. With Patrick, the focus is on the additional pressures on the front teeth, notably the lower right central incisor that exhibits a receding gingival margin and evidence of incisal wear. The excessive spacing between the upper left central incisor and canine is also identified to suitably restore the missing tooth with confidence (Figure 3).

Once Patrick understands the benefits of comprehensive care versus fixing one tooth, the Invisalign Outcome Simulator is used to communicate the expected changes that orthodontic treatment with Invisalign clear aligners can achieve (Figure 4). The simulation can be projected in several views to benefit the patient's comprehension of the clinical intention. The maxillary occlusal view allows Patrick to see an improvement in arch

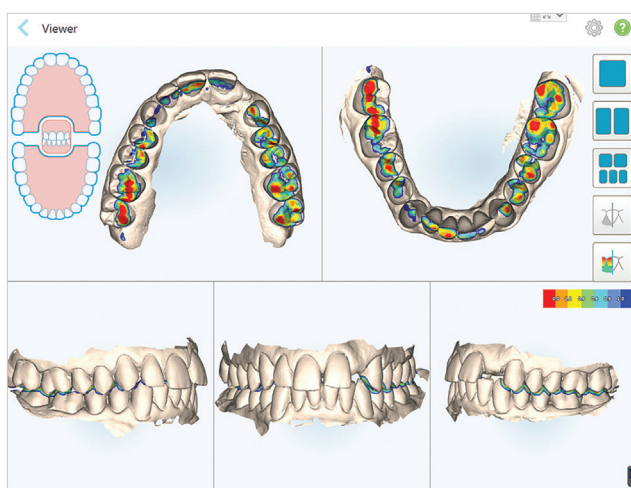


Figure 2

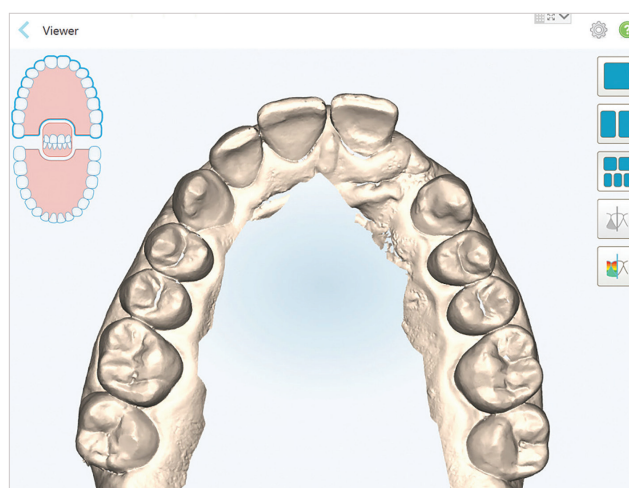


Figure 3

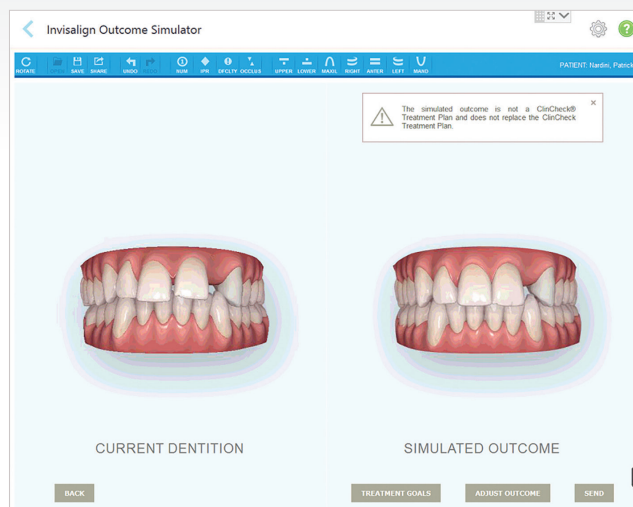


Figure 4

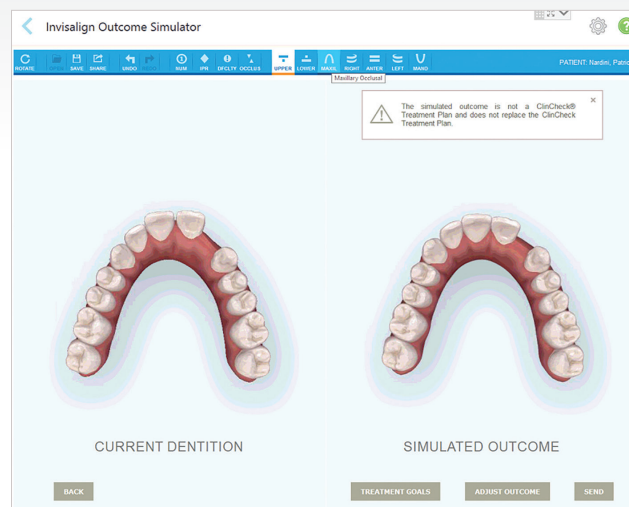


Figure 5

symmetry overall and ideal spacing to restore the missing lateral incisor (Figure 5).

Patrick underwent 42-weeks\* of clear aligner therapy. A benefit of Invisalign treatment is the ability to monitor the progression of tooth movement or tracking, providing a unique ability to plan adjunctive procedures and minimize delays between treatment phases. For Patrick, this meant accurately predicting the timing of the clinical placement of his implant. Patrick opted for a zirconia implant. Once his choice was determined and integrated into his treatment plan, he was appointed to have the abutment prepped and digitally scanned using the iTero Element scanner. iTero digital workflows support laboratory production using patented iTero milled models, laboratory printed models and model-

less direct-to-restoration production. Occlusal relation is scanned directly and efficiently transferred to the unique iTero articulator. Laboratory scripts are seamlessly added and communicated within the patient restorative file. The iTero modeling process helps to ensure efficient laboratory submission, minimize scan retakes and enable consistent restorative outcomes (Figures 6,7).

The result (Figure 8) is a predictable, aesthetic restoration with expectations of longevity in the overall healthier oral environment. Patrick's implant was restored with an e.max crown and minimal additive esthetic bonding to the adjacent teeth to address tooth size discrepancies with the opposing quadrant. Notably, his tissues are also much healthier with improved color and tone. The goal of comprehensive

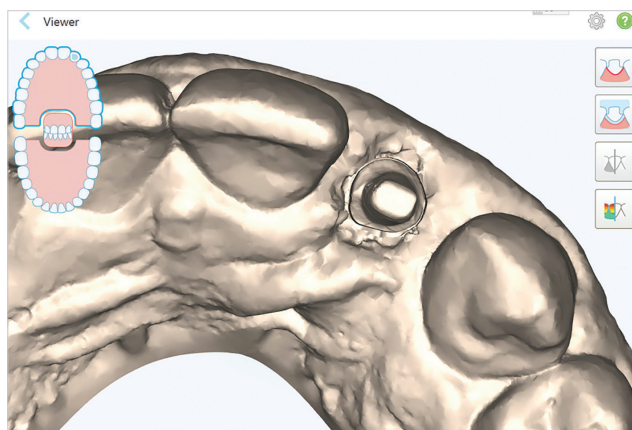


Figure 6

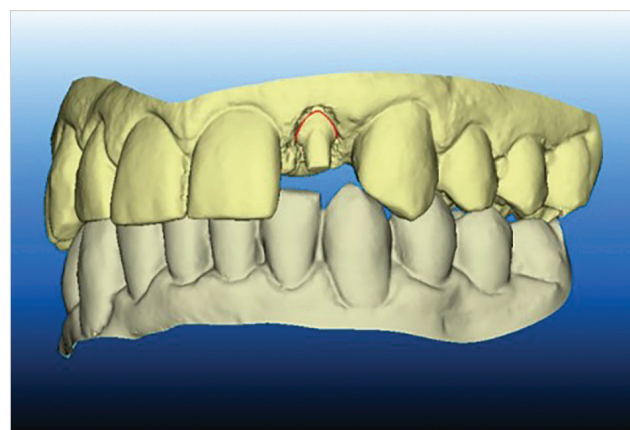


Figure 7



Figure 8

orthodontics for adults is the same as for adolescents, to produce the best combination of dental occlusion, dental and facial appearance, and stability of the result to maximize benefits to the patient.<sup>2,3</sup> With the iTero Element scanner, dental professionals, can have improved confidence in data collection and analysis. It also helps to develop a digital restorative workflow to provide exceptional opportunities to engage, educate and empower our patients to make great choices for their oral and overall health.

## References

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- \* Treatment times may vary depending on case complexity and must be determined by the doctor

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