align education

Dr. Jack Milgate's journey to the digitization of his practice and consults.

How the Align™ Oral Health Suite on iTero Element™ Plus imaging system enhances patient education to help patients understand recommended treatment.

Dr. Jack Milgate is the leading dentist and owner of Barwon Heads Dental in Victoria, Australia. With over ten years of experience, he's committed to providing top-quality dental care using digital technology.

He's also the co-founder of 3DGuard, a boutique company that designs and manufacturers mouthguards for athletes in Australia.

Dr. Milgate holds a dental degree and a master's in public dental health from La Trobe University. He is a Key Opinion Leader for Align™ Technology since 2019, and in his free time he enjoys playing tennis and traveling.

How building mouthguards for professional football and rugby players opened the door for my digital dentistry journey.

The incorporation of technological advancements in dentistry are generally adopted very slowly, with digital impressions not included in a majority of the dental school curriculum. During my experience as a dental student, I did not get to use an intraoral scanner. In fact, I was two to three years into practicing dentistry when I first used an intraoral scanner.

In 2014, a friend who worked for an Australian Football League (AFL) team offered me and my employer the opportunity to make mouthguards for

their players. Initially, we used alginate impressions to make 88 mouthguards. Producing such volumes was challenging with traditional methods so we tried using an intraoral scanner to scan and print models to manufacture high-end, refined mouthguards. The mouthguard product was a success and soon other professional teams from the AFL and the National Rugby League (NRL) sought our services. To keep up with demand, a second scanner was required, and I purchased my first iTero™ scanner.

The intraoral scanner is valuable for generating digital files to produce mouthguards, however, its potential for providing a more satisfactory experience for professional athletes led me to expand my services with Invisalign® aligner training. Combining the iTero™ scanner with Invisalign® aligners helped me improve the orthodontic and restorative care I provided. In addition, the scanner assisted me in simplifying the record-taking process and improving the accuracy of my work and efficiency in my consultations.

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The moment I realized the scanner was an imaging system to help diagnose conditions and educate patients about their oral health needs.

Since upgrading to the iTero Element™ 5D Plus imaging system equipped with iTero™ NIRI technology (Near Infra-Red Imaging) in 2021, I have been scanning every patient who visits our practice during every appointment. The images produced by this system are much sharper than those captured by our previous model, providing my patients and me with clear clinical findings.

Dental exams can be uncomfortable for patients who may feel anxious about their oral health or the cost of treatment. However, the imaging system has the potential to help put patients at ease by allowing them to see what I see inside their mouths. This eliminates any tension that patients may feel when facing the unknown or worrying that their dentist may suggest unnecessary treatment. By displaying real-time images on a screen, I can show my patients their current oral health status, which can be difficult to interpret from traditional radiographs or even what they see from the mirror.

This technology has set my practice apart and even young patients seem to enjoy seeing the colorful and dynamic images on the screen during their consultations.

Our practice experienced a complete transformation, and we no longer settle for simply creating digital files to use as impressions. We now utilize the images to create detailed digital clinical records that aid us in diagnosing and co-discovering oral health needs with our prospective patients, existing patients coming in for their periodic exams, and those who come in for emergency visits. Incorporating the tools from the iTero Element™ 5D Plus imaging system not only sets us apart as a modern practice but also helps us build trust with patients who are new to our practice. This technology has helped my staff members and I enhance our clinical skills, enabling us to provide superior service and solidify our reputation as a trusted provider in the community.

Recording and monitoring oral health information with the iTero Element™ 5D Plus imaging system helps me to gain a comprehensive understanding of my patient's oral health condition and how their treatment or conditions develop over time. This approach encourages me to improve my clinical skills daily, as I can evaluate my work and demonstrate its value to my patients through the captured data. By utilizing this imaging system, I gather a wealth of information that allows me to create a story of my patient's oral health journey.


Dr. Milgate scanning a 3-year-old patient who refused to sit in the dental chair. Without the scanner, the ability to examine the patient was non-existent **(left)**. Dr. Milgate scanning an adult patient as part of routine oral health records **(right)**.

Incorporating the digital scan in my records protocol – how it changed the way I practice today.

Recording clinical findings using the paper or electronic form of the odontogram or tooth chart is common practice. However, this tool alone does not sufficiently capture a patient's oral health status accurately in just a few minutes, especially during busy times in the practice or when you are understaffed. Furthermore, the odontogram is limited as it only provides a graphic interpretation of the specific location, color, texture, and size of a clinical finding, missing the accuracy included in 3D digital images. It will take extensive notes in the practice management software to intend to describe those findings as close to how they look in the patient's oral cavity.

The inability to capture the real picture with notes requires clinicians and staff to imagine, interpret, and use verbal communication to record clinical findings. As we know, an image says a thousand words. The digital record creates an odontogram-like record with the distinct advantage to visualize the location and severity of a condition, including the size, texture, color, type of the restoration, level of staining, or wear present in hard and soft tissues in the oral cavity, for example.
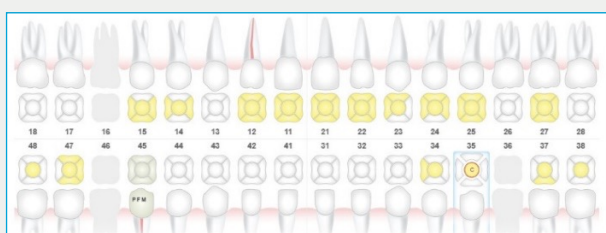

Traditional odontogram or tooth chart used during exams to record clinical findings.

The iTero Element™ 5D Plus imaging system captures sharp digital images from various angles accurately representing the location, color, texture, and volume of clinical findings.

3D technology in dentistry allows for a more efficient and thorough examination of patients. By providing comprehensive information about both arches, interproximal carious lesions, tooth rotations, calculus, occlusion, and alignment, a single 3D scan is an essential tool that allows for easy identification of any issues that require attention. Additionally, the scan creates a standardized record that all practitioners can review, which improves our ability to create reproducible, ideal treatment plans as a team.

Incorporating the intraoral scan to patient records adds confidence and validity to the diagnostic process. With the integration of a standardized 3D scan, 3D intraoral camera images, and iTero™ NIRI technology images, clinicians can engage in a comprehensive dialogue with their patients, team, and fellow clinicians.
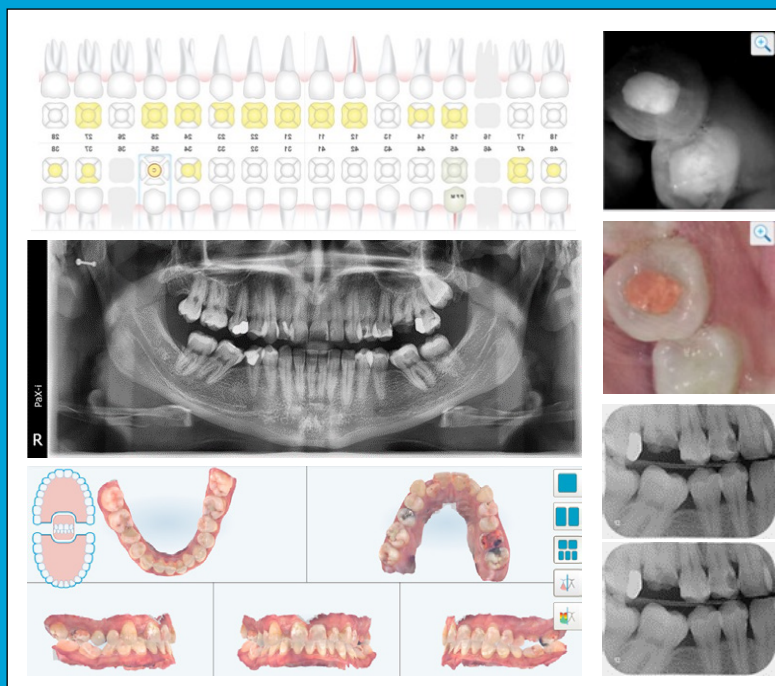
The evolution of dental records in my clinic, from just using the odontogram and adjuvant radiographies to incorporating 3D scans, the iTero™ NIRI technology views, and the 3D Integrated intraoral camera view.
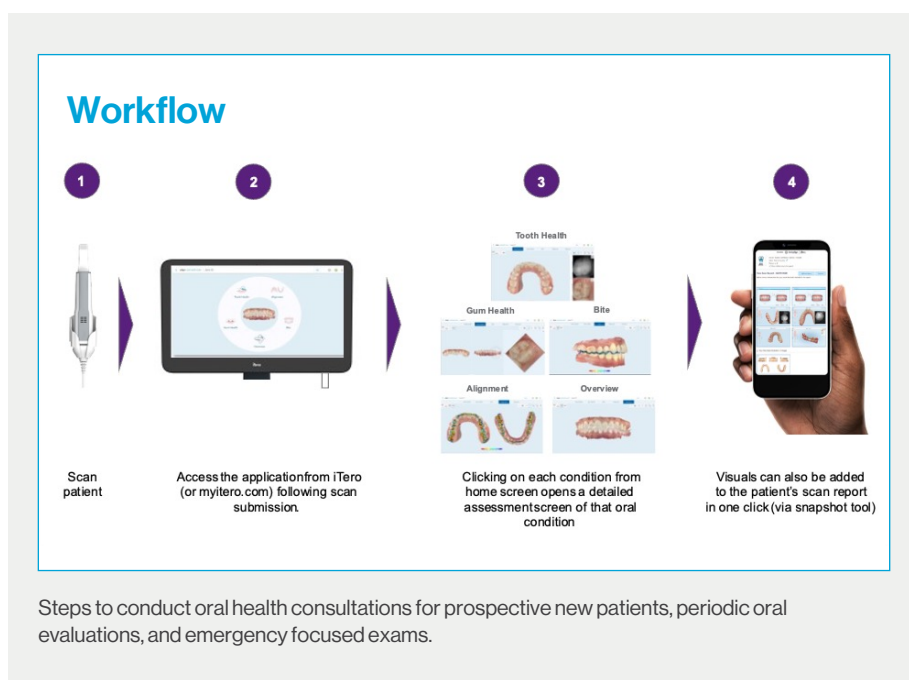
Increasing efficiency and effectiveness during my consult – The Align™ Oral Health Suite – What my prospective and established patients should expect from my consult.

The Align™ Oral Health Suite is a new valuable resource for both new and experienced iTero users. It's especially useful for clinicians who have not been maximizing the value of using all available tools during clinical consults. With this new setup, it's easy to scan every patient and conduct a structured clinical consultation, while creating a digital record with minimal effort. The iTero Element™ 5D Plus imaging system is an essential tool for assessing oral health status during the diagnostic phase. It enables clinicians to have an open and honest conversation with their patients by providing evidence on the screen in front of them.

After scanning the individual, you can activate the Align™ Oral Health Suite button. While the patient is seated, I can access all of their records, including panoramic, bitewing, and periapical radiographs on my computer. Then, I navigate to the landing page where I can select from five different conditions based on the patient's requirements: tooth health, gum health, bite, alignment, and overview.

Under these five conditions, default tools will help you co-discover with the patient and guide them to understand the potential treatment needs and build a treatment plan. This new setup has several advantages:

1. All of the iTero™ tools are easily accessible within this application and organized under the most prevalent oral health conditions that

Workflow

1. Scan patient
2. Access the application from iTero (or myitero.com) following scan submission.
3. Clicking on each condition from home screen opens a detailed assessment screen of that oral condition
4. Visuals can also be added to the patient's scan report in one click (via snapshot tool)

Steps to conduct oral health consultations for prospective new patients, periodic oral evaluations, and emergency focused exams.

give the clinician a structure to follow during the consultation.

2. The user can navigate more efficiently since it requires fewer clicks than the previous setup where tools where not part of a hub.

3. With the innovation of the side-by-side 3D compare, you can show the patient the evolution of an oral health condition or a treatment you have completed. With this information, you can encourage patients to continue with their current treatment plan or suggest additional care if needed. By monitoring the quality of our work and the patients' adherence to self-care, we can ensure everyone is on track to achieve the desired clinical outcomes.

Furthermore, to complement the Align™ Oral Health Suite tool findings, we may add images to the iTero scan report that were captured via the snapshot tool during the consultation. The scan report is an effective way to enhance communication as it visually documents and summarizes notes of what you reviewed with the patient.

Some of my colleagues are hesitant to use intraoral scanners because they believe it takes up too much time.

However, with practice, it only takes me one to two minutes to get a full mouth scan of a patient. With the innovation of the Align™ Oral Health Suite, I can have more focused and trusted conversations with patients about their oral health goals and treatment needs. I personally prefer a fully digital workflow over an analog one, and I believe it will eventually become the new standard in dentistry.

I'd recommend investing the effort to become proficient with this technology and avoid going back to the analog version. The 3D models created with the scan will reveal more information that will allow you to conduct a thorough consult. If you can communicate and educate any prospective patient, the likelihood for them to trust you and accept your treatment plan to achieve a healthy and functional smile will increase.

The following case illustrates how the Align™ Oral Health Suite facilitates this type of effective and educative consultation.

Case study

Initial visit

Diagnostics:

- Presence of caries in smooth surfaces and demineralization in upper incisors and canines. Detected multiple caries, one fractured upper molar and a lower premolar with a build-up composite.

- Multiple worn restorations with potential microfiltration in the restorations present in all quadrants, including build-up in lower right second premolar (tooth 4.5), and broken upper left first molar (2.6) to the gingival line with presence of infected tissue. A total of 12 restorations and lesions needing care.

- Evidence of dental plaque in both arches and calculus in lingual aspect of lower incisors.

- Irregular occlusal plane, unbalanced occlusion, lack of contacts in the right molar area, and no presence of lower first molars.

- Dental crowding and full anterior crossbite of the upper right lateral incisor (tooth 1.2), accentuated Curve of Spee, canine class I relationship in the right side and class II in the left side, and deviated midline.

Composite of images captured during the initial dental visit in April 2021.

Invisalign© treatment simulation using the Invisalign® Outcome Simulator Pro software during the initial consultation. A 3D simulated treatment outcome of the scanned dentition **(left)** is integrated into the patient's face **(right)** to create a real-time in-face orthodontic treatment visualization experience.

Treatment plan

Phase 1: Conduct deep cleaning and focus on removing infections, starting with the extraction of the upper left first molar (tooth 2.6), and endodontic treatment of the upper right lateral incisor (tooth 1.2) and the lower right second premolar (tooth 4.5).

Phase 2: Prepare upper central incisors (teeth 1.1, 2.1), and the upper left lateral incisor (tooth 2.2) for veneers and place provisional restorations. Restore and place composite in upper left canine (tooth 2.3), upper left second premolar (tooth 2.5), upper left second molar (tooth 2.7), lower left first and second premolars (teeth 3.4, 3.5), and lower second molars (teeth 3.7, and 4.7).

Phase 3: Start orthodontic treatment with Invisalign® clear aligners. Once the crossbite presented in the upper right lateral incisor (tooth 1.2) is corrected, restore with veneer.
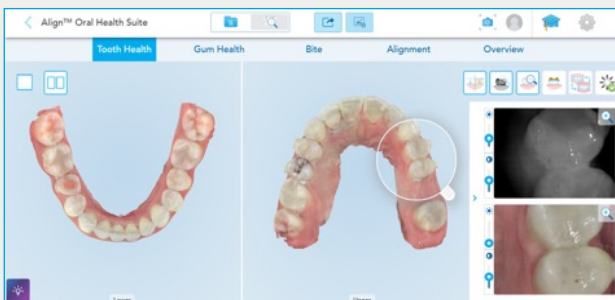
Phase 4: Prepare lower right second premolar (tooth 4.5) and restore with zirconia crown.

Phase 5: Place bonded lingual retainer and Vivera™ retainers for both arches and build mouthguard for sport activities.

We proceeded with phase 1 and 2 procedures, and the patient expressed her interest in improving the esthetics of the anterior teeth due to an upcoming wedding. Thus, I also prioritized that area – specifically on the two upper central incisors, the upper canines, and the upper left lateral incisor (tooth 2.2). The upper right lateral incisor (tooth 1.2) was going to be restored once it got out of crossbite in subsequent phases.

Mid-treatment progress

Prior to starting phase 3, we leveraged the Align™ Oral Health Suite tool to demonstrate the progress after eliminating all infections and old restorations. We decided to move forward with Invisalign® clear aligners treatment to stabilize her occlusion and optimize the space for the restoration on the upper right lateral incisor (tooth 1.2), which was in full crossbite. The patient did not want to pursue any surgical procedures to correct her malocclusion.

Mid-treatment progress consult assessment after starting patient with Invisalign® aligners and placing permanent restorations in upper lateral and central incisors. The Overview condition allows to show a general view of the current oral health. The side-by-side 3D compare tool can be used here to contrast with previous scans and highlight changes over time.

Assessing for caries, tooth wear, restorations quality control, and gingival health using the Tooth Health and the Gum Health conditions. Within these conditions, the iTero™ NIRI technology, the Integrated 3D intraoral camera, and the stone model assist in co-discovering clinical findings, making the consultation more interactive building understanding and trust with the patient.
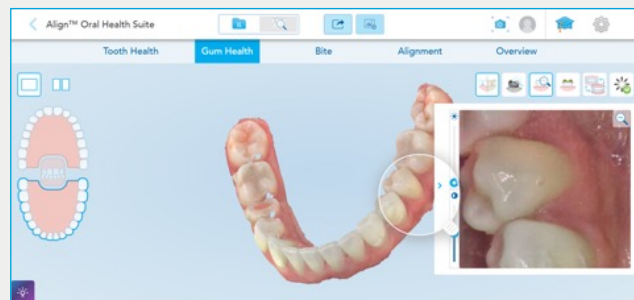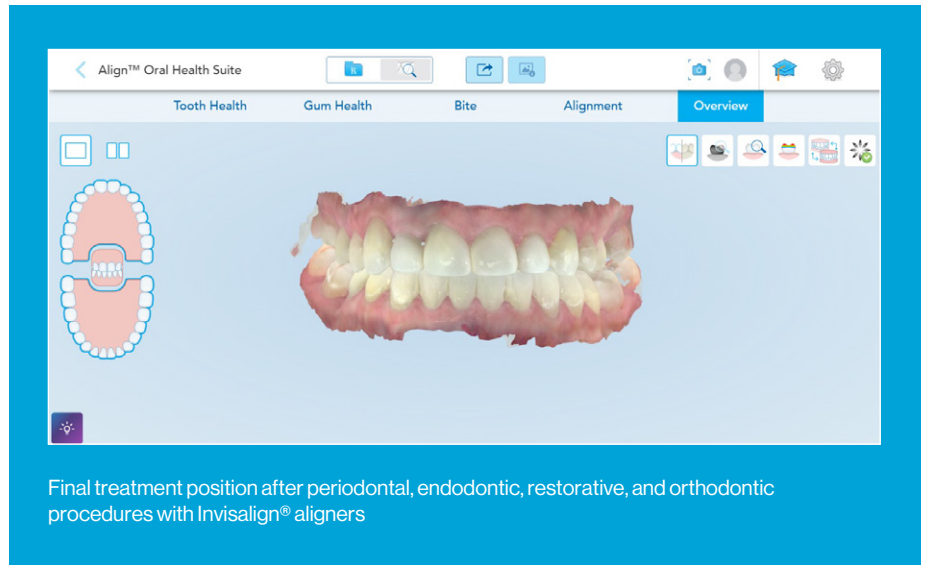

The Bite and Alignment conditions assist the clinician in highlighting the relationship between the upper and lower arches from the sagittal, frontal, and transversal views. The iTero™ Occlusogram tool shows the contact points, and the occlusal default view aids in assessing arch form, and dental crowding or spacing.
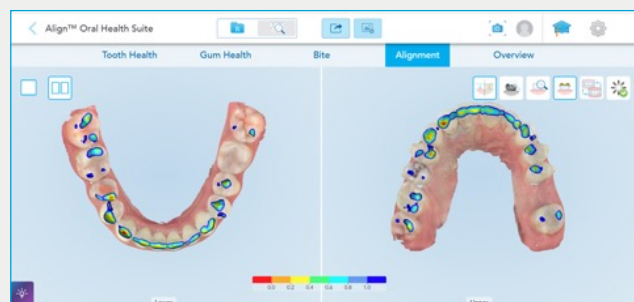
End of treatment

Summary of the esthetic and functional improvements achieved.

- All dental caries and failing restorations were filled or replaced with composites, veneers, and one zirconia crown. Two teeth were endodontically treated and restored.

- The occlusal contacts are better distributed around the arches.

- Resolved upper and lower crowding and corrected the anterior crossbite.

- Built and delivered the sports mouthguard – which was the patient's chief complaint.

- Bonded a lingual retainer and delivered Vivera™ retainers

Final treatment position after periodontal, endodontic, restorative, and orthodontic procedures with Invisalign® aligners

The patient's oral health is now in excellent condition, but she is not ready yet for a dental implant to replace tooth 2.6. Nonetheless, she successfully overcame her dental anxiety and is delighted with her new bright and white functioning teeth. By utilizing the Align™ Oral Health Suite, I can both efficiently and effectively educate and better communicate with my patients. Digital records facilitate the creation of comprehensive and organized patient profiles, which enable me to monitor their oral health status, progress, and final treatment outcomes very easily.
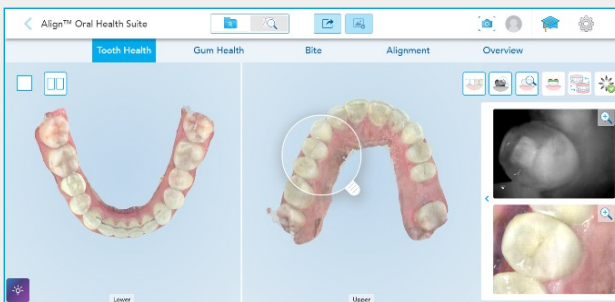
Review of all treatments pertaining to tooth and gum health with patient highlighting areas of special care to maintain oral health until next consultation.
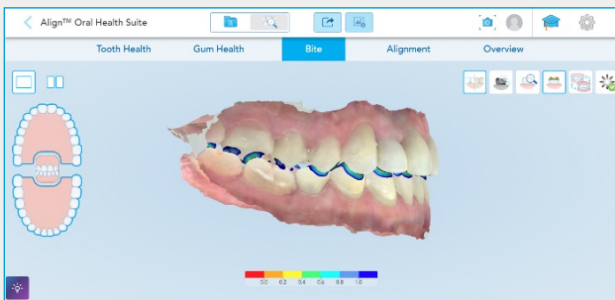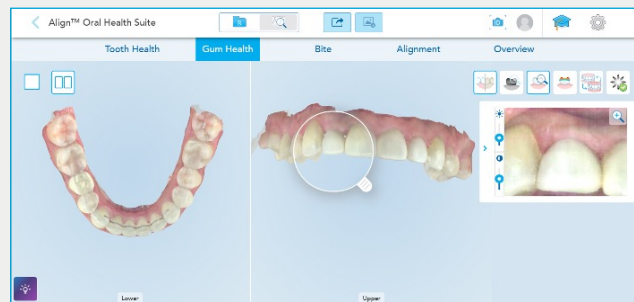
Views of the occlusion and final alignment after 24 months of interdisciplinary oral health treatment.
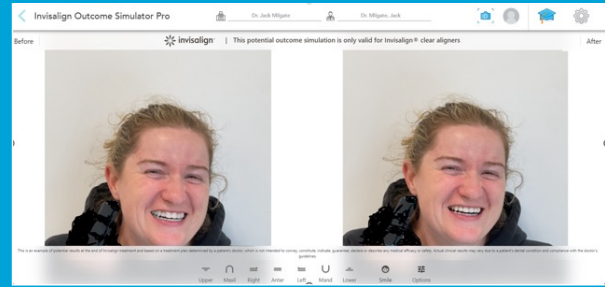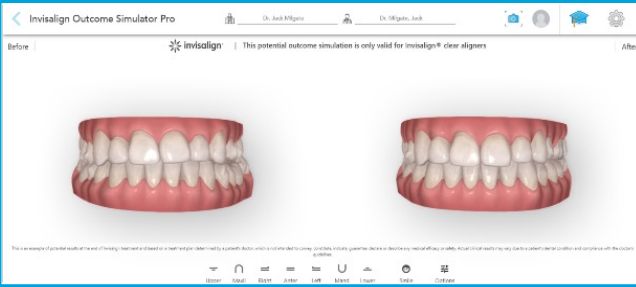
Invisalign© treatment simulation using the Invisalign® Outcome Simulator Pro software after we completed restorative treatment. A 3D simulated treatment outcome of the scanned dentition (left) is integrated into the patient's face (right) to create a real-time in-face orthodontic treatment visualization experience.


Treatment progress from initial visit to the end of treatment 24 months later. Observe the final position in contrast with the simulation created by the Invisalign® Outcome Simulator Pro.

Final records captured with the iTero™ Element 5D imaging system – leveraging the Align™ Oral Health Suite's new side-by-side 3D compare tool.
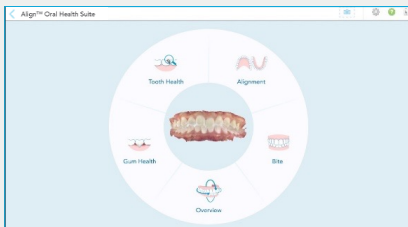
Align™ Oral Health Suite landing page **(top)**, and the new 3D side-by-side comparison tool **(bottom)** contrasting the before and after the comprehensive rehabilitation.
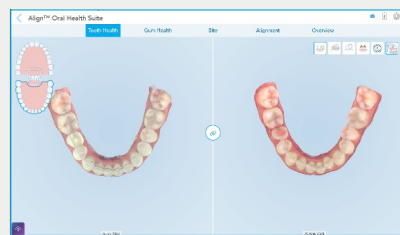
Series of side-by-side 3D compare visualization contrasting the before and after the comprehensive rehabilitation showcasing the Tooth Health and Alignment conditions. On the **right side**, the iTero™ Occlusogram tool depicts the distribution of the contacts between the upper and lower teeth.

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