

Focus_{on} Photography

Digital Photography for Orthodontic Treatment Planning

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This article discusses the techniques and patient positioning associated with an orthodontic photo guide for clear aligners, and is the second in a series of 4 on the subject of clinical photography.

Full photographic documentation is a critical part of successful orthodontic treatment planning for clear aligners or conventional braces. Although the American Board of Orthodontics (ABO) does not mandate the specific number of photographs to be taken for orthodontic records, it is generally accepted that a typical orthodontic photo sequence will comprise 8 or 9 clinical photographs. Planning for the Invisalign modality principally requires assembling 8 photos to portray the patient extraorally and intraorally, and includes both full-face and retracted views.

What's in a set

The typical orthodontic extraoral set will consist of the following views:

- Full-face frontal, with lips relaxed
- Full-face frontal, smiling
- Full-face profile, facing to the right, with lips relaxed

This series may also include retracted full-face shots or variations of 3/4 profile images.

Essentially, the photographs captured for the orthodontic intraoral set are:

- Anterior image: retracted smile
- Left and right buccal images
- Upper and lower occlusal images

Additionally, this sequence may include a collection of close-up smile photographs.

The presented selection of extraoral and intraoral images will provide the clinician with the maximum possible information about the patients' facial and soft tissue features, the aesthetics of their smiles, and the relationships and proportions between their teeth.

A note on getting the clinical images: Taking another person's photographs, whether inside or outside a dental office, is an intimate act. Therefore, besides the innate clinical value, shooting dental images also provides an opportunity for the clinician or a staff member to gather more information about patients and their clinical conditions.

Extraoral Photographs

The first three clinical shots commonly taken are the extraoral full-face views. Launching a clinical photography session with intraoral images, where taking the retractors in and out of the mouth is necessary, may induce redness on the patient's face and therefore result in esthetically unappealing photographs.

Generally, the first image in the series is the **full face in repose (Figure 1)**, which portrays the patient with the head in a natural position, eyes looking straight forward, the teeth and jaw in a relaxed state, and the lips slightly in contact. The ideal framing of full-face photographs will include the whole of the patient's face, neck, and shoulders, with a reasonable margin of space all around.

Optimally, the clinician and the patient should be positioned at the same height, with the camera level with the patient's interpupillary line, centered vertically on the nose. Importantly, the patient's head should not be tilted in any way, as this may lead to a misinterpretation of the patient's skeletal pattern. For pronounced contrast, the patient should be standing



Figure 1: full face, repose.



Figure 2: full face, smiling.



Figure 3: full face, profile.

against a plain, nonreflective dark or gray backdrop, with hands at the sides and hair pulled back or tucked behind the ears, and about a foot away from the background.

The principles used for taking the repose photograph can also be applied to capturing the **full-face smiling** photo (**Figure 2**). The distinction lies in the smile, which should be exhibited in a natural manner. The last photo in the full-face series, the **full-face profile** photo (**Figure 3**), is produced similarly to the other full-face views, except that the patient is turned 90 degrees, having his or her right-side profile facing the clinician.

Intraoral Photographs

Similarly to extraoral photos, achieving successful intraoral images requires diligent attention to detail. Principally, capturing this type of image will necessitate the use of ancillary equipment, including the mirror and retractors. Preferably, intraoral photographs should be taken in the operatory, with the patient and the clinician seated knee to knee, and ideally on the same level, to avoid producing images with angular deviations.

The first photo usually taken in this sequence is the **anterior retracted smile** view (**Figure 4**), with the teeth positioned in maximum intercuspation. C-shaped retractors should be used to achieve photographs with maximum visualization of all teeth, the sulci, and the alveolar ridges.

A common error associated with retraction is pulling the lips outward and backward. The clinician should avoid doing so, as it may cause the buccal soft tissue to rest against the teeth and obstruct the view of buccal corridors.

The anterior smile photo should be taken 90 degrees to the facial midline, using the upper frenal attachment as a guide. The dental midlines are not reliable for this purpose, as they can be shifted to one side or the other, depending on the present malocclusion.

Buccal images

Next in the intraoral series are the **right and left buccal** photographs (**Figures 5, 6**), which are created using the same patient-operator position as the anterior retracted smile view(s). To facilitate optimal results, the clinician or assistant should use V-shaped retractors. These retractors will enable the operator to open the buccal corridor up to the first molar.

To capture the right buccal view, the right retractor should be pulled back, while the retractor on the opposite side should be slightly relaxed. In both views, the teeth should be in maximum intercuspation. For achieving optimal visualization of the buccal segment relationship, the focus should be on the canine–premolar area.

The last two shots in the sequence, the **upper and lower occlusal** images (**Figures 7, 8**), should be executed using both an occlusal mirror and retractors. The patient should be reclined to the photographer's waist level.

Upper occlusal image

The maxillary photos should be captured with the clinician standing behind the patient, operating the camera from above. For proper visualization of both the anterior and posterior teeth, the clinician should retract the upper lips sideways and away from the teeth, while the patient should lift his or her chin as high as possible to prevent the tongue from obstructing the view.



Figure 4: anterior: retracted smile.



Figure 7: upper occlusal.



Figure 5: Buccal: right.



Figure 8: lower occlusal.



Figure 6: Buccal: left.

Once the patient is appropriately positioned, the photographer should insert the mirror, with its wider end inward, to capture maximum width of the arch posteriorly, and pull it slightly downward so that the whole upper arch up to the last present molar will be visible. The goal, again, is to capture all maxillary teeth. It is recommended that the midpalatal ridge be used as a guide for the orientation of the shot to get it optimally leveled.

Lower occlusal image

The final shot in the series, the mandibular occlusal view, is accomplished with patient-operator positioning similar to that used for the maxillary occlusal view. Standing in front of the patient, the clinician or the assistant should lift the occlusal mirror upward to visualize maximum width of the arch. The remaining procedures are similar to those used in capturing the maxillary occlusal images.

The ABO mandates that occlusal photographs be free of distractions and exhibit no retractors, fingers, or labels. Fogging of the mirror can be a challenge. A good preventive strategy may include bathing the mirror in warm water.

Common errors associated with achieving the occlusal photographs include inadequate framing, capturing images at angles that result in portraying unreflected teeth, allowing the tongue to obscure the view of the teeth, and working with foggy mirrors or unclean teeth.

Closing Comment

Using good technique and positioning for the basic views discussed in this article will help the clinician or dental assistant improve the quality of the images captured, and provide a solid foundation for adding additional views during future orthodontic record-taking.

Disclosure

The author is an employee of Shofu Dental Corporation. All Images were taken with the Shofu EyeSpecial C-II, a new digital camera designed exclusively for dentistry. Courtesy: Shannon Pace Brinker, CDA, CDD. ■

For more information on the EyeSpecial C-II, visit <http://www.shofu.com/en/products/cameras/camera/eyespecial-c-ii/>

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