

# Advantages of Invisalign First aligners for Phase 1 Orthodontic Treatment

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Having provided numerous treatments and seminars on Phase 1 orthodontics with Invisalign aligners since 2011, I had high expectations when I was asked to participate in the Invisalign First limited market release in 2017, where new aligner features specifically designed for Phase 1 orthodontic treatment were introduced. During this period, our offices started 14 Phase 1 orthodontic treatments with Invisalign First aligners (7 males and 7 females). The average age of the 7 female patients treated was 8 years 6 months. The average age of the 7 male patients was 9 years 11 months. Average treatment time was 44 weeks, including refinements and 7 day aligner wear time.

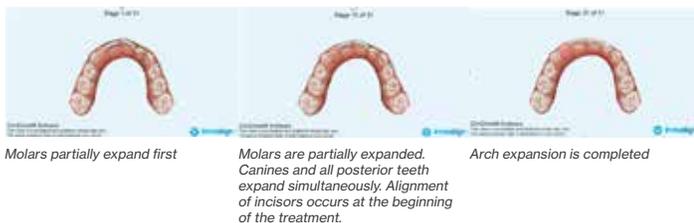
The table on the right summarizes the types of problems being addressed in our 14 Invisalign First patients.

Malocclusion	N
Crowding	13
Spacing	4
Narrow arches	10
Protrusion	8
Anterior cross bite	2
Space recapture	4
Deep bite	12

The key features currently available with Invisalign First aligners include the following:

1. The new Eruption Compensation features make it possible to treat patients with aligners in both early and mixed dentition. Invisalign First is currently the only aligner product that provides upper and lower incisor eruption compensation. The spaces provided in the aligner allow the permanent teeth to erupt unobstructed, and they conveniently serve as a vertical stop once the teeth reach their desired position.
2. SmartStage™ technology applies newly-designed staging patterns to maximize dental arch expansion predictability. The staging patterns generated are very convenient because they are applied consistently to every Invisalign First case. This technology maximizes treatment efficiency by producing orthodontic forces that support the tooth movement needed for arch expansion. Targeted forces are applied to each segment of the arch with anchorage taken into consideration, and molars start moving first, followed by simultaneous expansion of the canines and all the posterior teeth. While this is happening, simultaneous alignment of the incisors occurs from the very beginning of treatment, so that young patients and their parents can begin to see their treatment results early on.

**Figure 1:** Visual representation of the molars move first staging pattern (default in clinical preferences)



3. For patients where anchorage control is less of a concern, the simultaneous staging pattern is also still available by request.

With simultaneous staging, all of the teeth move together.

**Figure 2:** Visual representation of the simultaneous staging pattern



4. As a complement to SmartStage technology for Phase 1 treatment, new Optimized Expansion Support attachments are now available. These attachments are automatically placed and sized for maximum biomechanical advantage during dental expansion. Arch expansion devices will usually tip the crowns buccally, so counter-moments for buccal root torque are needed to create bodily movement without tipping. With the new Expansion Support Attachments, the surface area needed to create a proper counter-moment is calculated for each individual tooth and automatically built into the attachment design.
5. To improve aligner retention on short clinical crowns, new Optimized Retention attachments are also available. These attachments are automatically sized and positioned based on the available buccal crown surface of the patient's teeth. Doctors who prefer using traditional round or rectangular attachments for aligner retention can still request them, but the new Optimized Retention attachments are much more convenient and consistent with regards to the orientation of the desired undercut.

**Figure 3:** Visual representation of the optimized expansion support and retention attachments demonstrating variable size based on the buccal surface area



# Little Smiles Deserve the Invisalign First Experience with weekly aligner wear!



As the before and after pictures above demonstrate, the clinical results so far have been very successful. Here is some of the initial feedback we have received from our patients so far, which has convinced us that Invisalign First is a winning approach for Phase 1 treatment:

1. We change into a fresh new aligner **every week** (usually on Sunday night).
2. We can brush better when there is nothing in our mouth.
3. We can eat anything we want without the fear of knocking something loose.
4. We can speak just fine when the aligners are on.
5. If we ever lose an aligner, we just go to the next one.
6. The aligners help protect our teeth during sports.
7. We convinced our moms that we could do it...and WE DID IT!
8. We didn't have to go through the pain that our friends go through with regular braces.
9. My new teeth are now growing into the right place.
10. My teeth look great and now I love to smile!

## Discussion

Were it not for the new anterior eruption compensation feature of Invisalign First aligners, most of these 14 patients could not have started with aligner treatment at the time, due to the lack of eruption of the permanent lateral incisors. In the past, the primary canines were often times removed to allow the permanent laterals to erupt before initiating Phase 1 treatment. Our preference now is to leave the primary canines in place in most cases, for the following reasons:

1. The primary canine can help facilitate arch expansion. The crowns provide an extra point of aligner contact and the roots provide for additional anchorage, even if only temporarily.
2. Preserving the primary canine is more esthetic and avoids the appearance of a gap after the tooth is removed.
3. Preserving the primary canine makes the aligner structurally stronger and less vulnerable to breakage.
4. The typical cost of removing all the primary canines in our area is around \$800. Not having to spend this amount of money goes a long way towards paying for Phase 1 aligner treatment.
5. Avoiding an extraction procedure means one less unpleasant experience for the growing child.

Having adequate space provided in the aligners for tooth eruption enables us to offer yet another clinical solution in my quest to treat all of our patients with clear aligners.

Our Phase 1 orthodontic treatments with Invisalign First have also been similar to our teenage aligner treatments in that, we rarely have aligner issues such as emergency appointments inherent with wires and braces. From a patient convenience and practice management perspective, this aspect is a tremendous advantage. However, a few notable differences in the aligner products exist and are worth mentioning, when comparing Invisalign First treatment in the mixed dentition to comprehensive Invisalign treatment for teens:

		Invisalign First	Comprehensive Teen
Treatment Timing	Ideal dentition for starting treatment	Early Mixed	Permanent
Aligners	SmartTrack™ aligner material	Yes	Yes
	Weekly aligner changes recommended?	Yes	Yes
Staging	New staging (Molars move first pattern) specifically designed for dental arch expansion	Yes	No
	Simultaneous staging pattern (low anchorage)	Yes	Yes
	SmartStage technology is applied to staging patterns	Yes	No
Attachments	Attachments designed specifically for expansion support	Yes	No
	Optimized retention attachments	Yes	No
	Basic retention attachments (ellipsoid or rectangular)	Yes	Yes
Eruption Compensation	Eruption Compensation for incisors	Yes	No
	Eruption Compensation for canines and premolars	Yes	Yes

So when might one choose to treat a patient with a single-phase comprehensive aligner treatment instead of with 2-phase treatment beginning with Invisalign First aligners?

1. When the child only has a few primary teeth remaining and treatment will take longer than 18 months. In this situation, there may be little to no transition period between the first and second phase, so a single-phase aligner product may be more practical.
2. When extraction of permanent teeth is indicated. Invisalign First currently does not support permanent tooth extraction space closure.
3. When an insurance company dictates a specific time period during which they will provide coverage, such as 36 months, for example.

The current lab fee for two-phase aligner treatment includes a lower-priced entry point for the Invisalign First aligners, plus a reduced fee for the second phase (in comparison to the single-phase comprehensive treatment lab fee). This fee structure means that families with multiple children who need treatment at or around the same time can benefit from Phase 1 treatment with aligners without carrying an excessive financial burden.

In summary, incorporating Invisalign First into our practice has been a tremendous blessing. We can begin treatment with aligners earlier than before, which fills in a previous void in our early-treatment workflow. Initiating arch development in these patients before the permanent lateral incisors erupt lets us create adequate room so that the permanent teeth come in faster and straighter, without having to take detours or erupt ectopically.



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