Material Matters

A roundtable of top orthodontists discusses **Reva**—a new, thinner, stronger aligner material from uLab Systems

Small movement over time creates things of beauty: Glaciers carve stone, rivers create canyons and orthodontic plastics create stunning smiles. Gentle, sustained aligner forces exerted properly and efficiently can align teeth to the specialist's desired position. How much does the aligner material matter to treatment? What impact can it have on movement, and why?

Over the past year, uLab Systems introduced Reva, a new aligner material, to the orthodontic market. Early bench studies suggested the material could be made with a much thinner profile than traditional industry standards while maintaining appropriate strength and force characteristics for efficient tooth movement. But how would this plastic perform when used in clinical practice? Would patients notice and appreciate the thinner profile? Would changes be needed to attachment protocols? At the completion of two consecutive premarket pilots, evidence shows that a thinner aligner can be a better choice.

Why does thinner matter?

The Reva material is 17% thinner per aligner compared with leading competitors' materials, yet offers superior force retention over time. There is less occlusal interference and reduced overall bulk—34% less when an upper and lower aligner are worn simultaneously. Our studies have shown that a thinner profile enables tight interproximal fit and excellent attachment engagement. We also found high patient satisfaction for comfort, compliance and impact on speech when patients who had tried other aligners were switched to the Reva material.

How many patients have been treated with this material?

More than 600 patients from more than 50 orthodontists' practices were treated and surveyed during premarket pilots in 2023 and 2024. Owing to the positive responses during the pilots, use of the Reva material was expanded beyond the pilots to a limited launch phase, in which more than 70 orthodontists treated 2,700-plus patients with more than 55,000 aligners, 2,600 templates and 900 retainers.

More than 90% of patients surveyed in the premarket phase indicated the material was as comfortable as or more comfortable than their previous aligners. One hundred percent of orthodontists surveyed indicated they supported the uSmile transition to the Reva material, and eight out of 10 said they would recommend the product to their colleagues.

Clinicians roundtable

The following questions were posed to orthodontists regarding their experience with Reva during the premarket pilots and continued commercial use with patients.

What do you like about uLab's new Reva aligner material?

Dr. Jeremy Manuele: They are thin, snug and track great.

Dr. Bill Layman: The material is thinner and allows for a smaller attachment footprint without compromising tooth movement.

Dr. Andrew Trosien: It's so thin, it's nearly invisible. That thinness seems to give it more resiliency as well, which means I can get away with a bit more movement per aligner.

Dr. Melanie Wang: It's so much more comfortable for patients and much more aesthetic than other brands.

THICKNESSES OF REVA ALIGNER PRODUCTS

PRODUCT	REVA	COMPETITIVE BRANDS
Aligner	0.025 inch (0.63 mm)	0.030 inch (0.76 mm)
Retainer	0.027 in (0.68 mm)	0.030 in (0.76 mm)
Template	0.014 in (0.35 mm)	0.015 in (0.38 mm)

When first providing aligners to a patient, which aligner characteristics are the most important?

Manuele: Comfort, fit, ease of insertion and removal.

Layman: Clarity is excellent with Reva, and that's the first thing a patient reviews when they look in the mirror for the first time. The second thing a patient evaluates is the effect on their first words uttered while wearing the trays. Reva passes both of these tests in the first moments and instills confidence in the process.

Trosien: Hands down the most important thing is that they fit well. What originally attracted me to uLab is that the aligners fit remarkably well. On kids, with shorter clinical crowns, this is huge because it prevents them from needing a bunch of attachments just to keep them engaged.

Wang: Clarity and aesthetics, ease of removal. Some patients have a hard time taking aligners in and out, but it's much easier with Reva.

How does the reduced bite stack affect the initial and long-term comfort of aligners?

Manuele: It's more comfortable both short and long term.

Layman: Reports from the many patients who moved from traditional aligner material to Reva were that the Reva material was less obtrusive and easier to wear.

Trosien: Patients like that they can bite nearly all the way together. It feels about as close to natural teeth as possible. It's hard to know, but long term I'm hoping this removes that occasional TMD flareup we sometimes see with people wearing aligners.

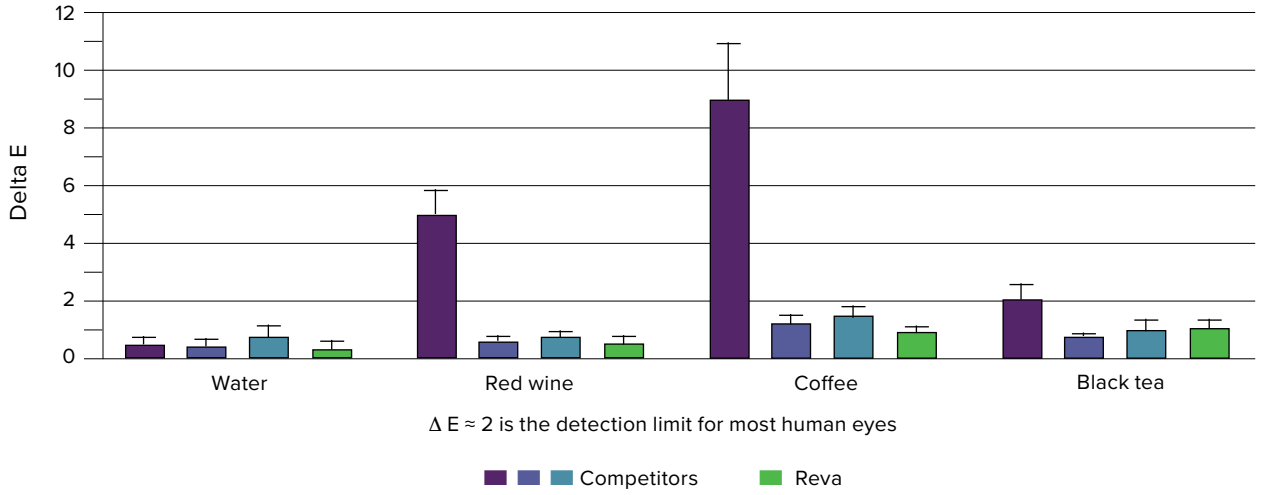
How does compliance affect aligner case tracking? How did the compliance with Reva aligners compare with others?

Manuele: Compliance is the #1 factor in case tracking. Compliance with Reva was higher in most cases and tracking was more precise.

Layman: Patients who are compliant and follow the instructions see a tremendous improvement in the results created with aligner therapy. Because the patients showed less speech issues and discomfort with the Reva aligners, compliance was improved and therefore results improved.

Trosien: I didn't find a difference between Reva and other uLab aligners. Reva (and all uLab aligners) have

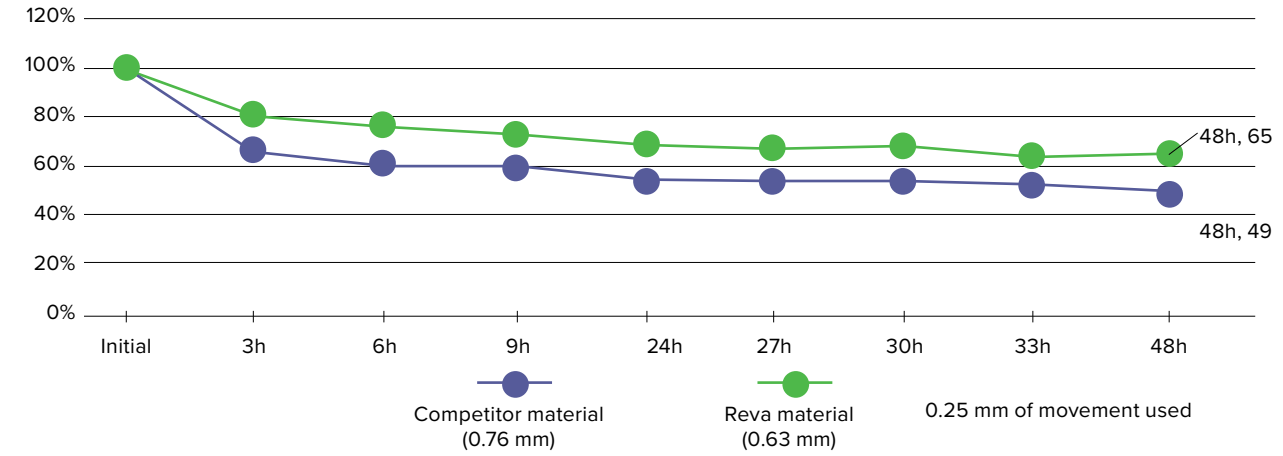
Good Stain Resistance*



*Bench studies showed Reva demonstrated very good stain resistance for common beverages.

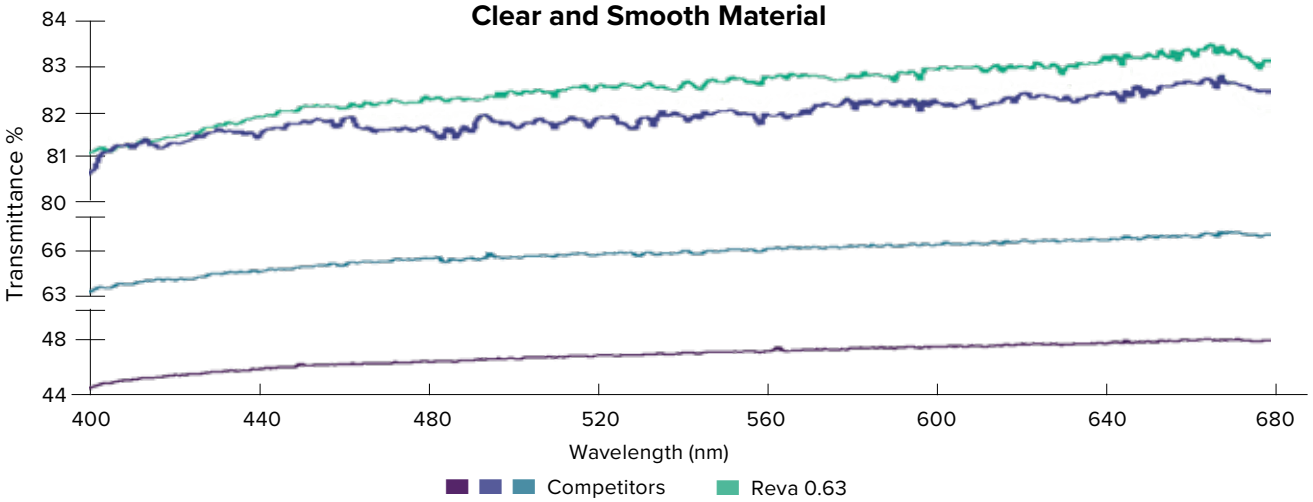
Good Force Retention Over Time*

Percentage of retained force over time



*Bench studies showed Reva retained more force over time, compared with a leading competitor material.

Clear and Smooth Material



higher compliance than other aligners because patients report they stay on the teeth better. This seems to affect teens and people with short clinical crowns, mostly, because those patients often have aligners that want to lift off the teeth—especially when elastics are used.

How do you feel about the predictability of the Reva aligner treatments?

Manuele: Great! I prefer it over their previous material.

Layman: In the cases I've treated so far, the predictability of tooth movement is what I expect from aligner therapy.

Trosien: It's hard to say whether Reva (or uLab aligners in general) are more predictable than other aligner brands, because I haven't done any serious analysis of them. Anecdotally, it does feel like they are delivering more predictable movements, likely because they're an excellent fit.

Which types of tooth movements respond well to the Reva material?

Manuele: Most anterior rotations, even without attachments.

Layman: I have found that extrusion movements are working better overall with Reva. I believe this is because of the material engagement with the attachments.

Why do patients wear aligners for seven-, 10- or 14-day cycles when the force retention shows all brands decline after just a few days?

Manuele: The physiology around the teeth needs time to catch up.

Wang: In my practice, this is only determined by gauging their compliance.

Trosien: It's unclear how fast we can actually cycle through aligners. The holy grail of tooth movement is to have enough pressure to stimulate osteoclastic activity to move the socket, but not so much pressure that creates undermining resorption. Too long between aligner changes and the biologic process stops because of a lack of pressure. Too-frequent aligner changes mean not enough time has been given for the socket to move, and the excess pressure will either create this undermining resorption or simply flex the plastic rather than move the teeth. I'm not sure there is an actual number of days of change that would work for every person, of every age, every week. But I think seven days per aligner seems to work well. I've done less and I've done longer, but changing other than seven or 14 days can confuse patients, because they can't depend on a consistent day of the week.

Is there a minimum and a maximum velocity recommended in each stage?

Manuele: I use 0.25 mm and 2.5 degrees per stage or less in most cases.

Wang: When there are rotations, I will increase velocity. With space closure and opening a bite, I'll increase the stages.

Trosien: I think this is a measure more of the type of movement—torque vs. rotation, etc. But because we know that the PDL is generally 0.25 mm wide, plus or minus 0.1 mm, anything that gives about that amount of movement will hit that sweet spot of osteoclastic activity but not undermine resorption. However, that doesn't mean an aligner can't have more than 0.25 mm of movement; it just means that that amount cannot be expressed at the PDL. In other words, in fixed appliances, a superelastic nickel titanium wire will create a consistent force, even at greater and greater deflections. If the aligner is able to flex and "store" this force until the socket moves, then greater velocities can be used. I'm not sure what that number is, but certainly a flexible aligner is better than a rigid one in that regard.

Has Reva changed your approach to attachment protocols? What if anything has had to change as a result of the material being more retentive?

Manuele: I have reduced the overall number and size of the attachments I use.

Layman: I'm experimenting with using fewer attachments for movements. The size of the attachments being smaller is a must. The traditional larger attachments needed to engage the thicker plastics don't work well with the Reva material for the same ease of insertion and removal.

Trosien: I'm using fewer attachments. I don't need "retention" attachments any longer for the vast majority of patients. Generally, that means I need attachments only for eruption or rotations. That means an easier appointment in the office, and a happier patient as well.

To learn more about Reva, visit ulabsystems.com.