JUNE 2023 VOL. 16, ISSUE 5

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INSIDE: 2 CE COURSES

- Rethinking interceptive treatment of preadolescent patients
- Preparing your practice website for Google Analytics 4

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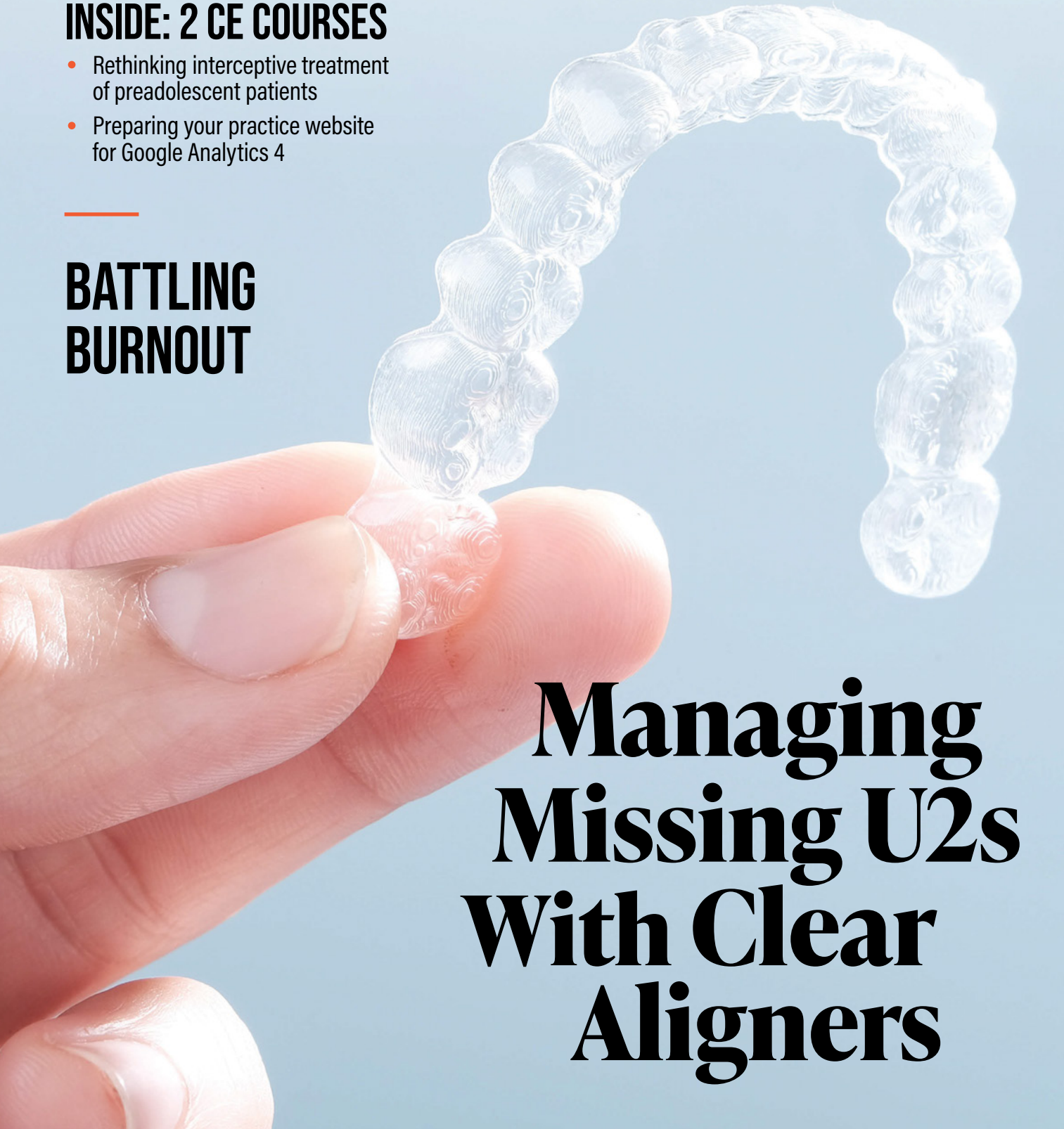

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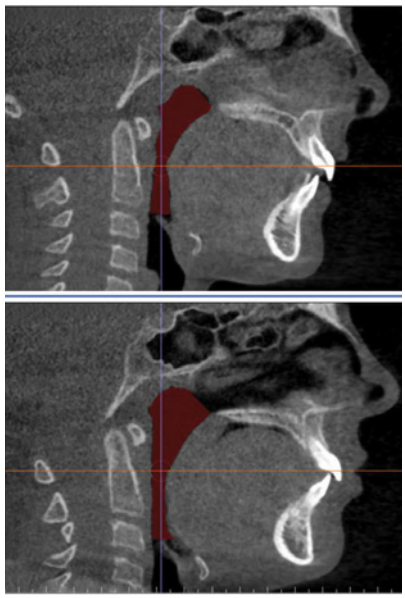
Inside



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CONTINUING EDUCATION

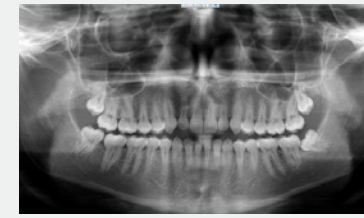
Permission To Intercept

In Part 1 of a two-part CE series, Dr. Michael K. DeLuke contrasts the current symptom-driven approach to interceptive orthodontic treatment with a new approach that focuses on diagnosing and treating the etiology of the malocclusion.

Column

Departments

Message Boards



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Contributors

BY SAM MITTELSTEADT

In his article "Heat Advisory" (p. 34), **Dr. Christos Papadopoulos** discusses how before he even opened his startup practice in Saint John, New Brunswick, he already had visited every dental clinic in town, in person, to meet with doctors at their teams. "I didn't find this intimidating, because I genuinely wanted to meet them and be able to answer any questions they had about me or my practice philosophy," Papadopoulos recalls. "But at one clinic, I sat down in an older kitchen chair at the table in their staff room and about 10 minutes into our discussion, I heard cracking and the chair gave way and broke—I flew backward, with my back hitting the ground and legs flying up in the air! We all had a good laugh and they continue to refer their patients to my office."

Dr. David A. Wank ("Google Analytics 4: What Orthodontists Need To Know Now," p. 44) works four days a week as a general dentist at a large health center in New York City, and roughly two days "and multiple evenings" managing Short Hills Design, the agency he founded in 2008. A member of Dentaltown's editorial advisory board since 2018, he also has written *The Web Design Workbook for Dentists*, which later morphed into *The Small Business Web Design Workbook*. (It's available as a free download at shorthillsdesign.com/himb-book.)

"It had always been my goal to retire from clinical practice before I turned 50 and devote the remainder of my career to teaching," says **Dr. Michael K. DeLuke** ("Permission To Intercept," p. 54). "I'm proud to say I beat that mark by four years!" In addition to coaching, DeLuke has developed more than 30 hours of CE courses for his website, theorthocoach.com. Now that he has retired from practice, DeLuke is able to trade his clinical gloves for boxing ones. "I started boxing when I was 14 and continued during my college and professional schooling years, but stepped away after opening my practice because I didn't want to risk injuring my hands. Now, I've fallen back in love with the sport."

"The newest editions to my website—Motivational Mondays and *The DOC Podcast*—just launched a couple of weeks ago. I have some amazing guests and content lined up."

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Board Profiles

3 QUESTIONS WITH

Dr. Jonathan Nicozisis

This Philadelphia-area orthodontist has helped Invisalign develop and refine its product offerings almost since the company's clear aligners were introduced to doctors—he was a pilot tester for aligners for teens, optimized attachments, the iTero Element 1 scanner, SmartTrack material and more. (His article about his approach to using clear aligners to treat patients missing U2s begins on p. 26.)

Each month this year, Orthotown will spotlight a member of its editorial advisory board—the doctors who've agreed to help our staff determine whether an article is a great fit for publication, vet those articles for accuracy and clarity, and suggest ideas and sources for content that will run in future issues.

1. How did your relationship with Invisalign develop?

When I graduated in the fall of 1999, Invisalign was not yet commercially available for doctors in private practice. I took my first Invisalign certification course in January 2000 and for the first few years, I was part of a group of six to eight doctors in the greater Philadelphia area who would share best practices and approaches to treating patients with this new appliance.

My first official Invisalign speaking engagement was in Boston in 2003, and my first splash was suggesting that attachments should be beveled gingivally to better engage and allow for tolerance for improved tracking, making extrusion of anterior teeth effective and predictable. This was the opposite of what was being done at the time and was rather provocative, but the 2009 first generations of optimized attachments validated my idea. Shortly thereafter, I was asked to be a member of the Align Tech faculty. I think it was a mutual calling, where we approached and challenged each other at different points along the developmental journey to get each of us to where we are today. Still lots of innovation and impact to come! I truly believe that five to 10 years from now, how we use, design and deliver Invisalign will be completely different than what we're doing now.

2. Based on your interactions with the doctors who've taken the Aligner Intensive Fellowship you co-developed, which aspects of aligner treatment do orthodontists seem to have the most trouble with?

Translating the action of fixed appliances that orthodontists take for granted everyday to aligner therapy—and by that, I mean how much movement is needed to really accomplish what is desired clinically. Factors such as age of the patient, type of movement, type of perio, etc., all play into the mix, making it difficult for doctors to take what they've learned in our course and put it into effect when they're in front of their computer treatment-planning a case. The real challenge and benefit for doctors is to commit to review the cases when they're scanning for additional aligners, to see what was designed originally and what was actually expressed clinically. Only then—after such a commitment to reviewing cases, over a period of years—will a doctor gain confidence and acumen in doing orthodontics with aligners effectively and efficiently.

3. What is the most interesting case you've presented as a member of the Edward H. Angle Society of Orthodontists?

One case that sparked much debate was a Class 3, four-bicuspid extraction case with a 3 mm CR/CO slip. The final occlusion was fine but the controversy occurred when I presented my superimpositions because I had used centric relation, rather than centric occlusion, for my initial ceph image, so the patient was biting edge to edge with a posterior open bite. There was much debate about proper reference points when comparing movements during treatment, because the initial and final ceph may have not been with the mandible in the same positions, so some thought was a less-than-ideal comparison while others thought it was perfectly OK. Right there was a microcosm of eternal debates we have—and will forever have—about any- and everything that orthodontists do. I still chuckle about it to this day. **OT**

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Orthotown

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1. American Dental Association Health and Policy Institute. Dentists see increased prevalence of stress-related oral health conditions. March 2, 2021.

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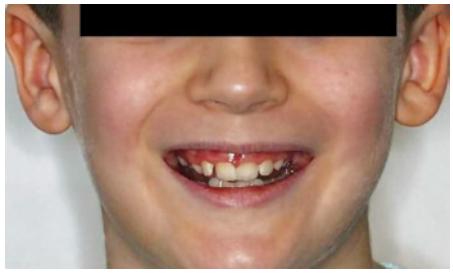
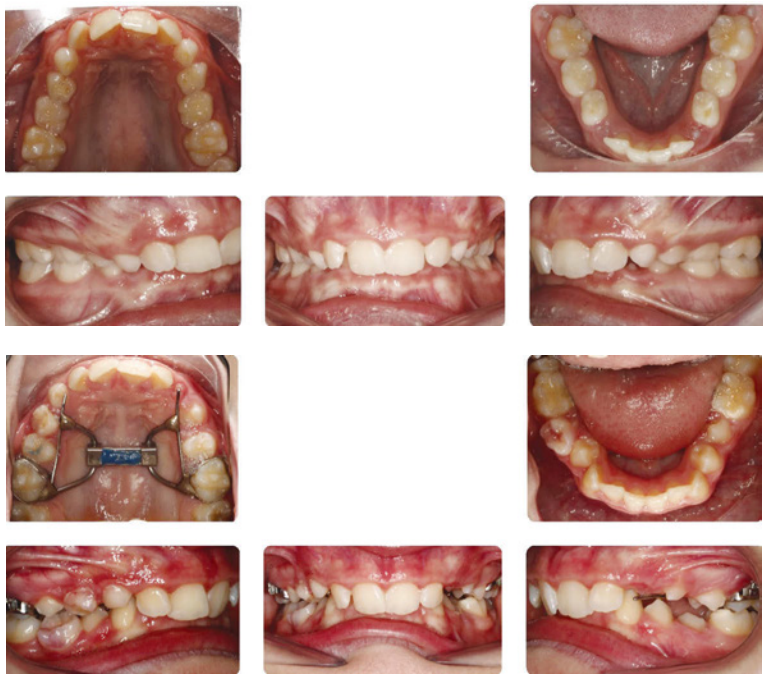
CASE 1





RPE, Caplin Hooks and Nighttime Elastics

Orthopedic maxillary expansion with a rapid palatal expander (RPE) has long been an effective tool in orthodontics. While there are a variety of scenarios where an RPE is indicated, the most common is a mixed-dentition patient with a unilateral or bilateral posterior crossbite. In these situations where the maxillary arch is narrow/constricted relative to the mandibular arch, an RPE alone is very effective in correcting the maxillary transverse deficiency.

There are times, however, where the maxilla is clearly narrow/constricted but there is no posterior crossbite. Often these cases show a true maxillary transverse deficiency paired with a matching/compensated lower arch that shows posterior teeth in excessive lingual inclination. This malocclusion has been previously termed "bimaxillary transverse constriction." In such cases I have found that effective use of an RPE alone can be challenging. As the RPE expands the maxilla, sometimes the mandibular first molars naturally expand/upright (or "track") with the expanding maxillary molars as you would hope, but many times they don't. When they don't track well, the amount of maxillary expansion is limited. Expanding the maxillary arch in this scenario poses a risk of relative over-expansion of the maxillary molars into a buccal crossbite (Brodie/scissor) position. Effectively, in these bimaxillary transverse constriction cases, mandibular dental expansion via uprighting of the excessively lingually inclined lower first molars can be the rate-limiting step in proper maxillary expansion.

There are different orthodontic strategies aimed at dental expansion of the mandibular posterior teeth in these types of mixed dentition patients. Schwarz expanders, expanded lower lingual holding arches, and two-by-four limited braces with archwire expansion are some common approaches. About seven years ago, I started using a different approach that I've found to be simple, inexpensive and effective in influencing uprighting/expansion of the lower first molars in these cases.

The use of Caplin hooks

For mixed-dentition cases where maxillary expansion is indicated, where there is no posterior crossbite and where the lower molars show a high degree of lingual inclination, in addition

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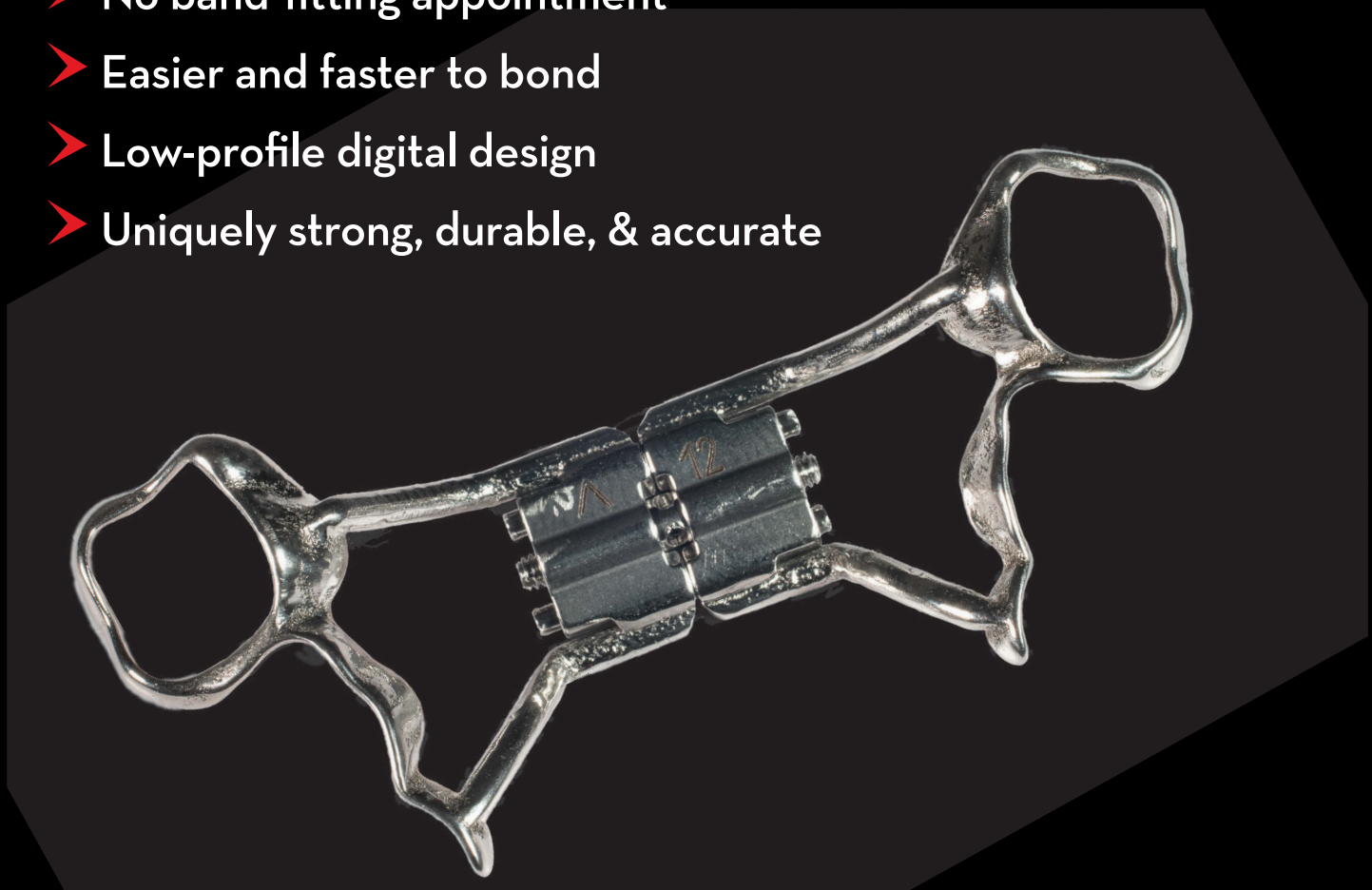

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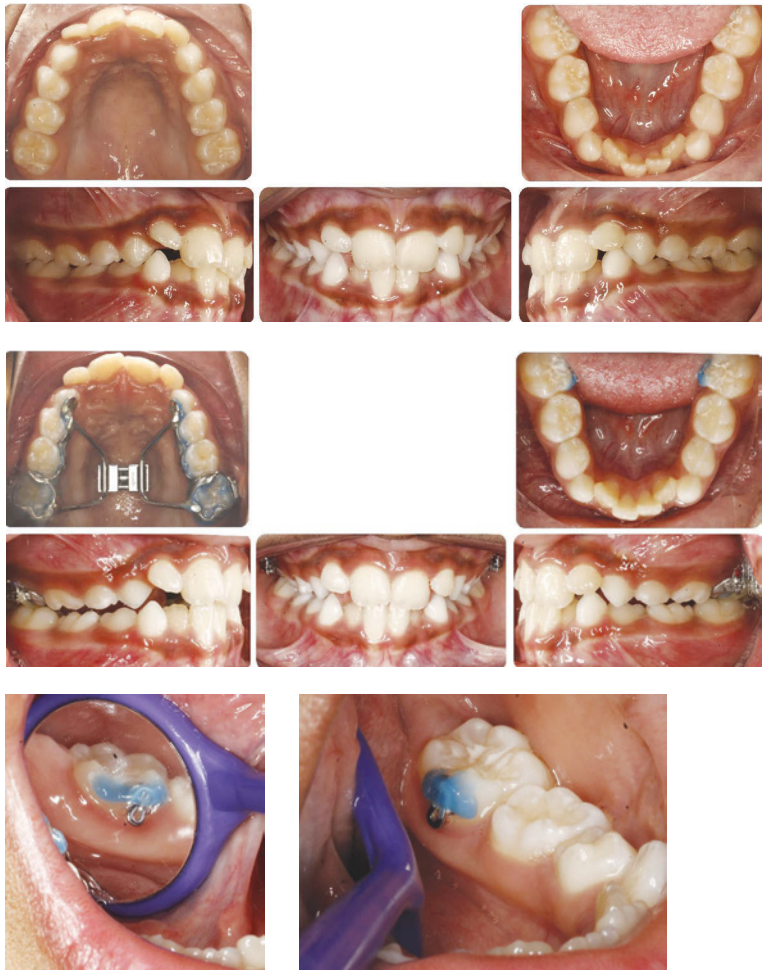

to standard use of an RPE, I will bond Caplin hooks to the lingual surface of the lower first molars and instruct the patient to (at night only) wear 3/16-inch, 6-ounce elastics from the buccal hooks on the upper first molar RPE bands to the Caplin hooks on the lingual of the lower first molars. In doing so, I almost never run into issues with the lower molars failing to "track" with the expanding upper molars. Case 1 (p. 10) is an example of this. (The Caplin hooks on the lingual of the L6s are difficult to see in the "after" photos because they're hidden a bit by the tongue.)

A few tips are warranted:

- Parents can be frustrated if the Caplin hooks are debonding and causing unforeseen extra visits to rebond. Bonding the hooks on the lingual surface of the lower first molars is challenging because of the difficulty in isolating that area from saliva contamination, particularly in a squirmy young mixed-dentition patient. For that reason, this bonding procedure is best done with four hands (an assistant helping).
- I like to maximize the total area of the bonding surface, so I will etch and prime the whole lingual surface of the lower molars and flow composite over a large surface of the enamel, over and beyond the base of the Caplin hook mesiodistally. Case 2 shows an initial case setup just before expansion; notice the elastics in buccal photos. Just make sure the composite does not cover the hook portion of the Caplin hook. Also make sure the composite does not extend at all occlusally above the lingual surface, which could lead to the upper molars contacting it when chewing and causing debonding of the composite and the hook.

When expansion is complete, I like to section the mesial lingual arms of the RPE, flow composite into the turning component to prevent spontaneous back-turning, and remove the Caplin hooks. The lower molars that have expanded/uprighted require no supplementary retention at that point because their buccal cusps are functionally retained within the cusps of the upper molars. I typically aim to maintain the sectioned RPE for 12 months after the last turn. Another tip for high-angle or dolichofacial patients who could be sensitive to the vertical component of the nighttime crossbite elastics is to flow the composite from the lingual of the lower first molars up and across their whole occlusal surface. The now heavier vertical force of occlusion on these lower molars will act to mitigate the unwanted vertical/eruptive influence of the elastics.

Conservative Phase I treatment

I am very conservative with Phase I treatment and was honored to share some of my thoughts on that subject at the 2023 AAO Annual Session in Chicago with a lecture titled "Wants

vs. Needs: Conservative Early Treatment Strategies." My preference is not to do Phase I at all but when it is needed, I try to make use of the most conservative means possible. More than 80% of my mixed-dentition exam patients will receive no treatment at all, 10%–15% will receive some type of simple appliance-only treatment, and less than 5% will have what I consider to be true Phase I treatment involving appliances plus limited braces.

Expansion in mixed dentition is a controversial topic, particularly lately in the online forums. I want to express clearly that I am strongly opposed to the idea that every kid who comes in the door needs an expander, that expansion is a cure-all for any and all airway issues, that expansion in 3-year-olds is great idea, or any other such quackery. However, I am also strongly opposed to defining and treating maxillary transverse deficiency only when it happens to be accompanied by a posterior crossbite. In cases of bimaxillary transverse constriction, I hope you will find this technique as simple and effective as I have! **OT**

Orthotown makes it easy to share an opinion with your peers!

We encourage verified members of the Orthotown community to share their thoughts, suggestions and opinions in the Comments section under this column—and every other article!—online at **orthotown.com/magazine**. If you're not a verified member yet, sign up and begin the process at **orthotown.com/register**.

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AAO Announces Winners of New Product Showcase

This year's AAO Annual Session included the debut of the New Products Showcase Award competition for products that became commercially available at any time since the 2022 session.

All orthodontists at this year's session were eligible to judge in the competition and cast votes for their top picks among 17 entries.

Winners were announced April 24 at the Innovation Pavilion in the exhibit hall. Top prize went to DM Insights from DentalMonitoring; second place went to Spark Aligner's Integrated Hooks from Ormco; and third place was awarded to The Slate Electric Flosser from Slate Dental.

For more information on products, visit **dentalmonitoring.com**, **sparkaligners.com** and **slateflosser.com**.

FDA Clears OrthoFX NiTime Aligners

OrthoFX has announced the FDA clearance of the company's NiTime Aligners. The aligner system is explicitly designed for overnight wear.

The OrthoFX system reduces daily wear time to 9–12 hours without increasing the number of stages in the treatment. The hyperelastic polymer of the aligners maintains biologically favored force levels, which allows predictable tooth movement with less wear time. Also, the aligners' multishell construction delivers optimal forces and a broad fit range to compensate for daytime movements.

For more information visit, **orthofx.com**.

Ormco Introduces New Resource for Damon Ultima Users

Ormco recently announced the launch of Ultima Journey, an orthodontic resource for the Damon Ultima users community. The unveiling took place at this year's AAO Annual Session in Chicago.

The Ultima Journey includes on-demand educational modules led by key experts, staff training for Damon Ultima proficiency, and additional tips and insights to grow a practice. Additionally, members receive preview access to overview videos, tools and before-and-after clinical images.

For more information, visit **ultimajourney.com**.

NEW PRODUCTS

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I-Max 3D Pro

The I-Max 3D Pro from Owandy Radiology is a four-in-one wall-mounted CBCT unit that includes 2D, 3D and CAD/CAM capabilities. The unit features a higher resolution and smaller footprint than the original model and includes a new-generation CMOS sensor for exceptional image quality and simple face-to-face patient positioning. An optional AI-powered integrated software module for accurate ceph analysis and automatic file matching is also available.

For more information, visit **owandy.com**.

ProEZ Gel Spray

ProEZ Gel Spray is a pretreatment spray that helps prevent the drying of soils on dental instruments during extended holding times or when transferred to sterile processing.

The spray has a wide distribution, which reduces the precision and the need for handling required to completely cover instruments and keep soil moist. The spray features a unique biogenerated enzymatic action formula, is fragrance-free and does not have sticky residue while retaining moisture for easy rinsing and fewer applications.

For more information, visit **microcare.com**.

Midmark Intraoral Digital Sensor System

The new Midmark Intraoral Digital Sensor System is designed with enhanced triggering to ensure reliable image capture, boasting 35.7 lines per millimeter for superior image quality.

The sensor has a thin profile, rounded corners and contoured surfaces to increase patient comfort and includes advanced technology to optimize resolution while reducing noise for sharp, detailed images. The system also features a direct USB 2.0 connection for simplified practice integration.

The sensors are available in two sizes to accommodate patient needs and exam requirements. They come with a standard five-year manufacturer's limited warranty and five years of the Midmark-exclusive Sensor Safe extended care and priority replacement plan.

For more information, visit **midmark.com/dental**.

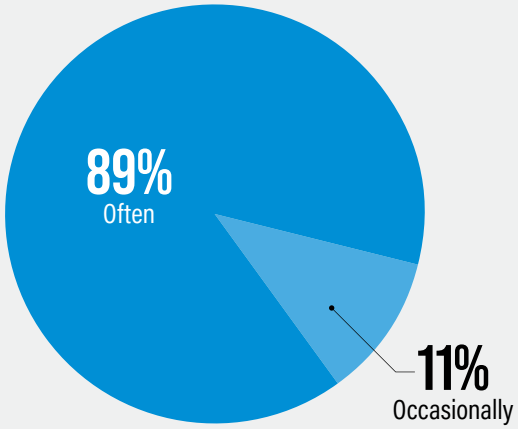
Aligners and Aesthetics

Orthotown's monthly poll helps you see how other practices operate—what's working, what isn't—and how orthodontics is evolving. This poll was conducted from April 23 to May 23 on Orthotown.com.

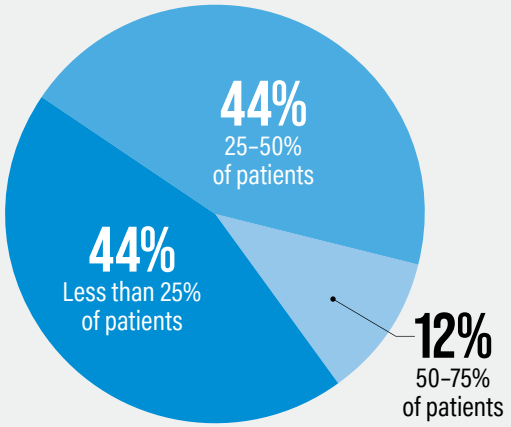
Scan here to take this month's poll!

Hold your phone's camera over the QR code at left to go straight to this month's poll questions about HR and staffing. The final tallies will appear in the July/August issue of *Orthotown* magazine.

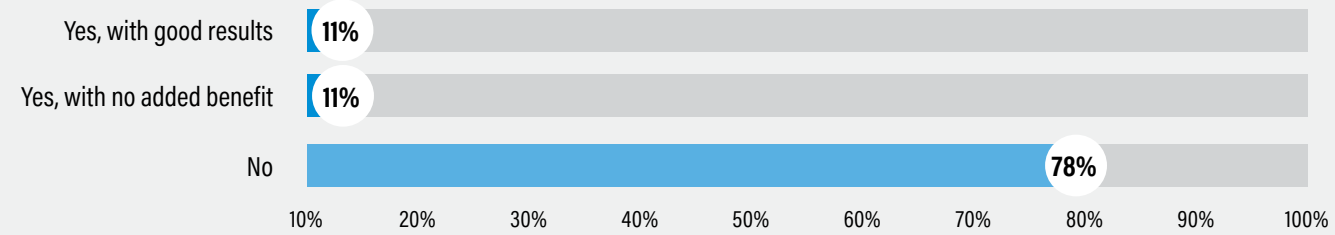
How often do you suggest veneers or bonding to patients with tooth size discrepancies?



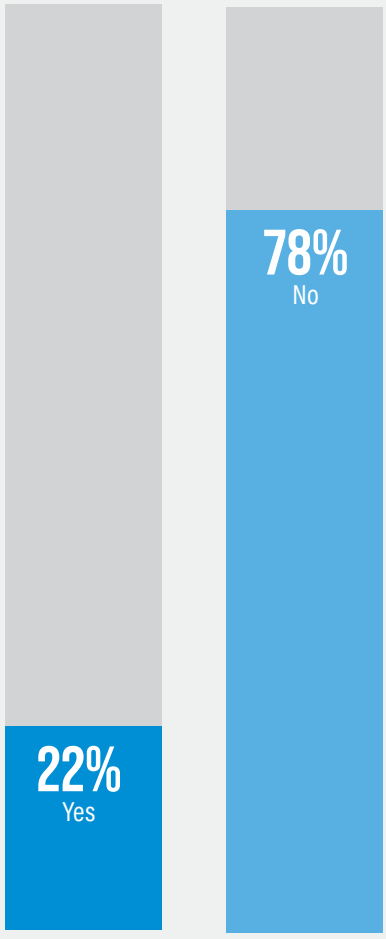
What percentage of your patients are clear aligners?



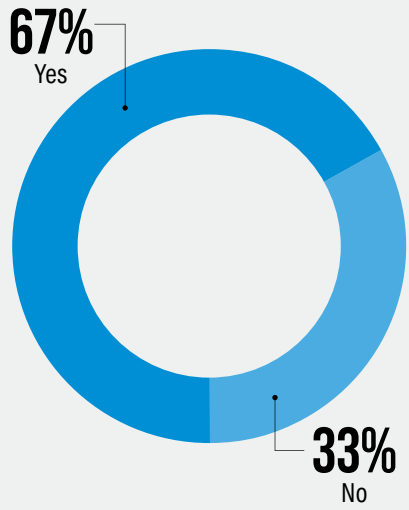
Have you tried any form of accelerated treatment options for aligner patients?



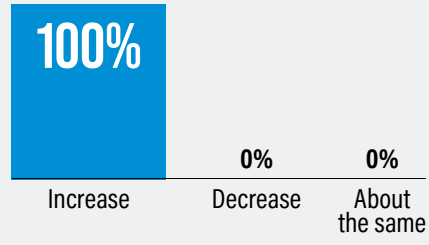
Have you seen fewer referrals as a result of more general dentists offering clear aligner therapy?



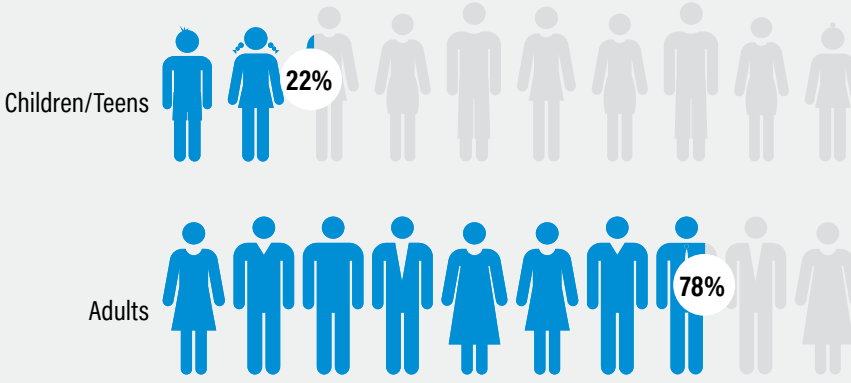
Do you expect printing clear aligners in-office to be a standard procedure within the next 10 years?



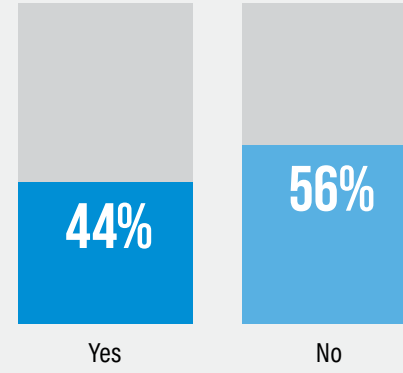
Have you seen an increase or decrease in the number of adult patients in the past 5–10 years?



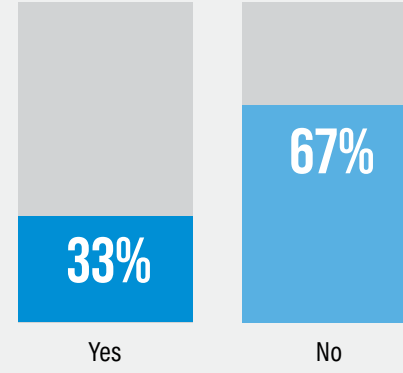
When it comes to clear aligner patient compliance, who seems to do better?



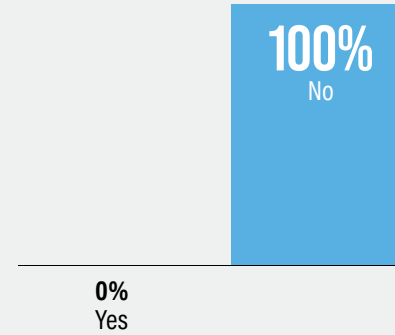
Do you have a specific cosmetic dentist you refer patients to?



Have you taken any CE on aesthetic alternatives in the past year?



Are you a member of a cosmetic or aesthetic-related study club?



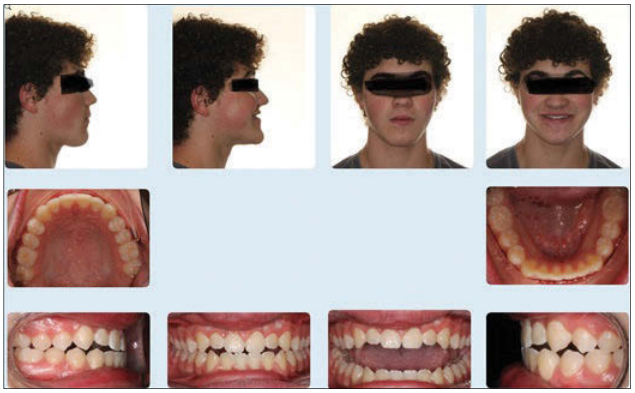
Class 3 Growing Patient

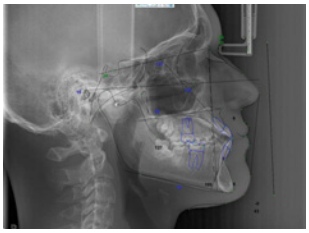
A doc aims to offer treatment to a patient going through a growth spurt, but first asks for Townie feedback

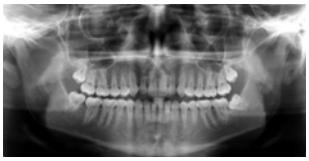
SNP15 *Post: 1 of 8* 4/12/2023

Hi, everyone. This 16-year-old patient has been on recall with me since 2020. The initial pics are from 2020 and the second set of records are from yesterday. He has clearly grown in three years. We have discussed surgical treatment, which is why I have kept him on recall. He is very particular, though, and quite unhappy about U2s and has asked me at every appointment if anything can be done to improve those now. I believe the right thing is to keep him on recall until growth is complete for final treatment options, but he is adamant about doing something now. Would anyone consider exo U/L 5s to improve proclination and overbite/overjet? A part of me was even thinking to bond upper arch only to extrude U2s, warn that the bite will not improve and plan for surgery when growth is done. Will I regret all this when he outgrows all of this? Thank you! ■

2020







2023

danbraces *Post: 2 of 8* 4/14/2023

You might want to consider buccal shelf TADs. ■

socoortho *Post: 3 of 8* 4/14/2023

Are you saying that molar intrusion will offset the mandibular growth? ■

danbraces *Post: 4 of 8* 4/14/2023

Yes, I would get mounted casts and simulate distalization of lower molars and see how the bite closes. ■

Chad Foster *Post: 8 of 8* 4/30/2023

It sounds like his only immediate concern is the upper laterals. I would consider simply lengthening them via composite bonding. You could do it in less than 10 minutes chairside. He will be happier and likely more apt to wait until he is done growing to determine the proper treatment, which is the best call here. ■

Follow this ongoing case online!

Are you curious to see how this one plays out? This work in progress may have an update just waiting for you online. Head to **orthotown.com/magazine** to check out the latest posts, updates and more. Don't forget to post a comment and share how you'd approach this case!

Maxillary Midline Shift

Townies discuss treatment mechanics to help the OP get things moving

Colorado108 *Post: 1 of 8* 4/18/2023

Townies, I would like your input on moving the maxillary four incisors en masse to correct a maxillary midline that is not coincident with the facial midline. I find the most "predictable" way is using a power chain one incisor at a time (centrals as one unit).

This does prolong treatment completion. I have tried using a closing loop on the side, which the midline needs to move toward, and an opening loop on the contralateral side. A very accomplished professor during my ortho residency told me that a power strap one tooth at a time will be the most predictable method to center upper midline. His experience was that a closing arch would close space distal to the lateral incisor, but end up with the maxillary midline still off-center once space is closed.

Any better and more efficient treatment mechanics or techniques would be welcomed. My clinical finding is that most off-center midlines are off to the patient's right. Tilt of the Earth? ■

Fenrisúlfr *Post: 2 of 8* 4/18/2023

Do you have pics? I'd PC from the molar on that side that needs moving and back it up with Class II els on that side and Class III on the other side. ■

socoortho *Post: 3 of 8* 4/18/2023

Fen, I have a question for you. When I extract one premolar to move the maxillary midline, I always fight a maxillary transverse constriction on the extraction side. Besides using a full-size archwire, do you have a suggestion to offset narrowing the anterior buccal area? I've tried to add an "active" TPA but found it cumbersome and not really helpful. Thanks. ■

Fenrisúlfr *Post: 4 of 8* 4/18/2023

It may have to do with what's happening in the lower arch as well. Some expansion in the lower and narrowing of the upper can create this issue. I very early exo one bi. Either 2, 3 or 4. Some lower IPR should help the fit. ■

Colorado108 *Post: 5 of 8* 4/18/2023

The type of cases I was referring to with maxillary midline shift are not premolar extraction cases but ones that have developed 2 mm of space distal to the upper left lateral after initial alignment and mild archwire expansion.

The midline has shifted to the patient's right or was there before ortho. How do you prefer to make the maxillary dental midline coincident with the facial midline? (Biomechanics.) ■

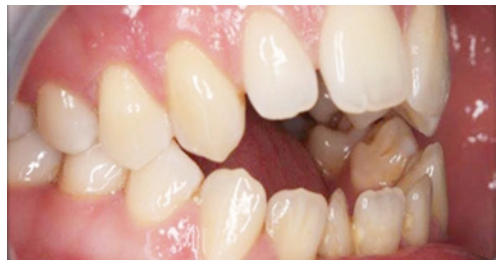
Fenrisúlfr *Post: 6 of 8* 4/18/2023

I'd use a unilateral CLAW with Class II els on one side and Class III els on the other. Once space is closed, nighttime midline els as needed. I think I had a pic of it someplace. ■

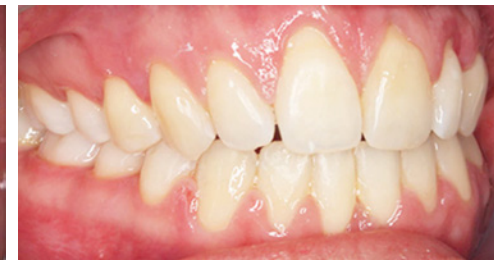
Colorado108 *Post: 7 of 8* 4/18/2023

Fenrisulfr, that sounds logical. I had seen a technique years ago using an open-coil spring between UR2 and UR3 where the maxillary midline required a shift to the patient's left. They had used a unilateral CLAW with a loop between UL2 and 3 as you suggested. I was hoping for some quick magical biomechanics. Thanks for your advice. ■

BEFORE



AFTER (*152 DAYS*)



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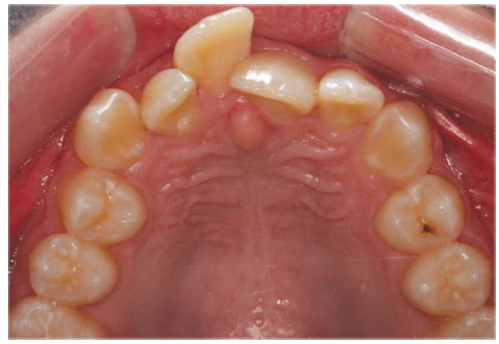

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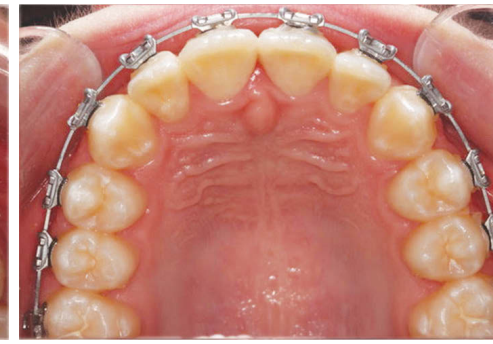

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This technology, invented and founded by orthodontist Dr. Anthony Viazis of Dallas, works in a similar process to that of natural eruption. Called "orthoeruption," this patented method of alveolar bone restoration can be related to the way natural eruption remodels and grows alveolar bone. As a result, retainer wear is minimal and tooth extractions (or sometimes even jaw surgery) can now be avoided. In addition, spaces for implants can now be ready in about 100 days.

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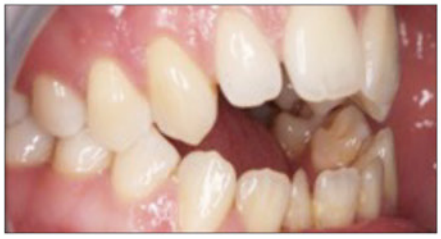
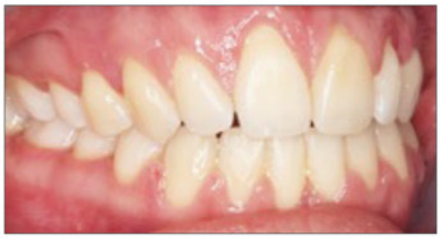
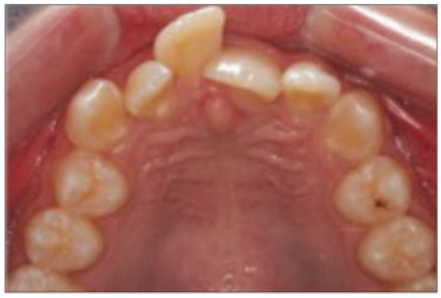
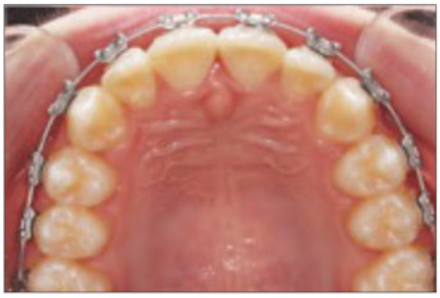




Treated by Dr. Melissa Goddard, UK

69 days





Treated by Dr. Terry Wong, Australia

Hard Cases Made Easy

Dr. Anthony Viazis
Orthodontist, Texas, USA
Fastbraces® Founder

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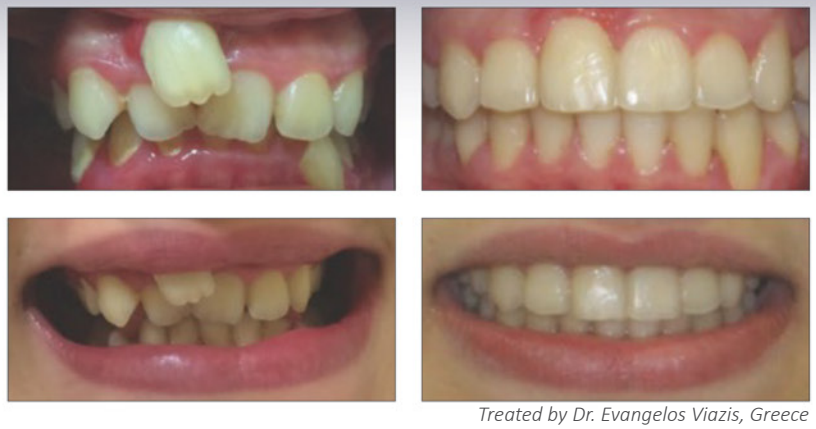

Treated by Dr. Evangelos Viazis, Greece

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The DentalMonitoring app also improves direct communication between patients and the practice staff by eliminating the problems of missed calls and voice messages. Instead, patients text the practice and the staff knows how to respond because they have real-time observations about what's happening inside the patient's mouth.

The simplicity of remote scanning—which works for all orthodontic treatment types, phases and appliance brands—helps doctors and staff streamline their schedules. Regular scanning makes treatment more convenient for patients while providing even more clinical control for orthodontists.

Every piece of data from remote monitoring flows into DM Insights, a data hub orthodontists can use to discover patterns and trends in their practice. For example, doctors can utilize DM Insights' real-time data analytics to identify recurring bracket bond failure and take action, retrain staff or improve procedures, or compare the effectiveness of certain appliances over time.

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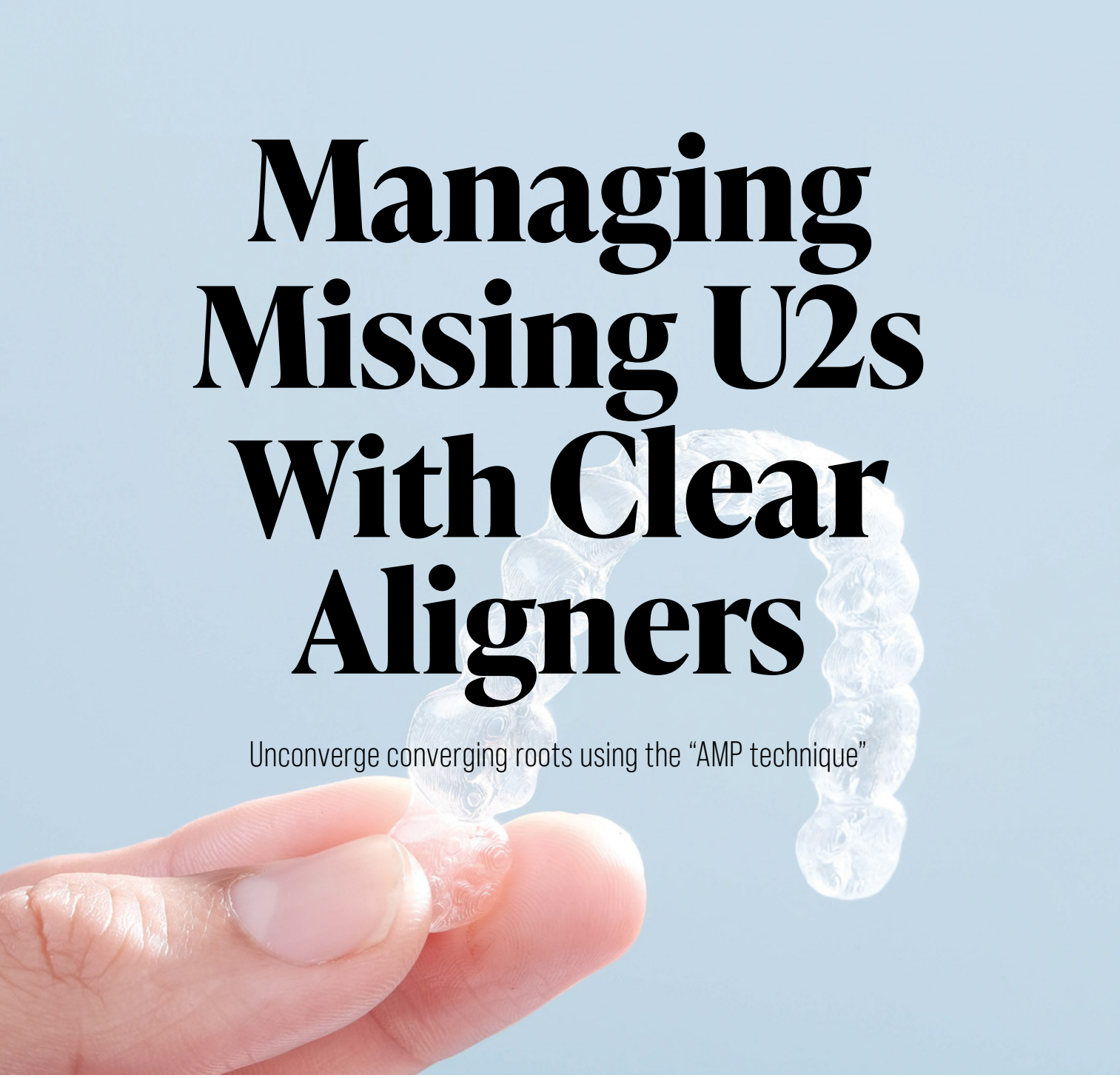


Managing Missing U2s With Clear Aligners

Unconverge converging roots using the "AMP technique"

BY DR. JONATHAN NICOZISIS

Managing missing U2s (upper laterals) is a challenge on many levels. Concern for cosmetics is a foremost worry, with potential breakage of a crafted pontic as a close second. When thinking about using aligners for such cases, the logistics of managing a pontic with a removable orthodontic aligner appliance can make one's head hurt.

Historically, approaches and techniques for clear aligner patients have involved tooth-colored paint or PVS material to be placed in each aligner. These procedures are labor-intensive for the doctor or staff, and color match is technique-sensitive because mixing stock colors to match a patient's tooth shade can yield inconsistent results. Current paint options are often opaque and irreversible once placed. PVS material is porous and eventually stains. Tooth-colored wax is practical, but still the patient must be edentulous when removing aligners to eat or drink.

As orthodontists, we often feel responsible for providing a cosmetic, good-performing solution.

We feel tremendous guilt when size, shape and color is less than ideal, and often have uncomfortable conversations with patients and parents who aren't pleased with our attempts.

We have to ask: Are orthodontists really able to provide the best cosmetic solution for patients who are missing U2s but want to use clear aligners for their treatment? I think the honest answer is that we are not.

After years of trials, tribulations and titration, I would like to introduce a protocol I have been successfully using to best manage missing U2s with aligners. I have named this the AMP technique, which is an acronym for "Ain't My Problem." (When you say the phrase out loud, you can feel immediate relief as the burden and guilt rolls off your shoulders.)

The AMP technique is all about delegation to the patient and the restorative dentist or prosthodontist, and has practical and biomechanical advantages that are superlative to historical approaches. Here, I'll review a few clinical presentations and the AMP technique solutions that were incorporated into each treatment.

Case 1 (Figs. 1–4): Existing bridge

When a patient presents with an existing Maryland bridge, refer them back to the dentist to section off one abutment, leaving a cantilever pontic. In addition, instruct the dentist to reduce the proximal surface of the pontic, leaving 0.5–1 mm space between the pontic and the tooth that was the previous abutment, because it "ain't my problem!"

AMP Pearl #1: When designing the digital treatment plan, have the cantilever pontic and abutment move as a single unit.

AMP Pearl #2: Maintain space between the pontic and the adjacent tooth.

AMP Pearl #3: Extend the aligner only halfway up the buccal and lingual of the pontic crown, to minimize any forces upon insertion and removal of the aligner and help mitigate bond failure of the pontic.

FIG. 1: Initial.

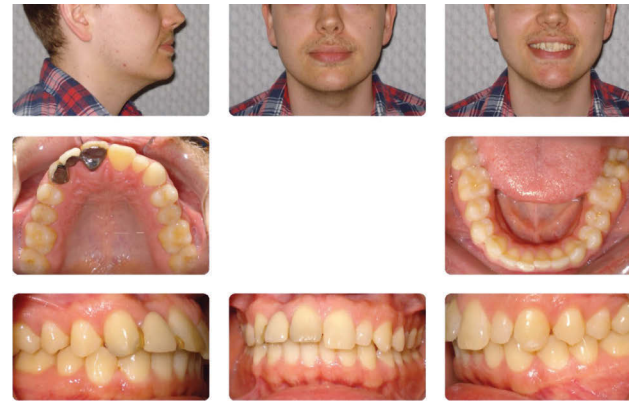


FIG. 2: Final 8.5 months, aligners in. Note aligner is trimmed buccal and lingual to the pontic.

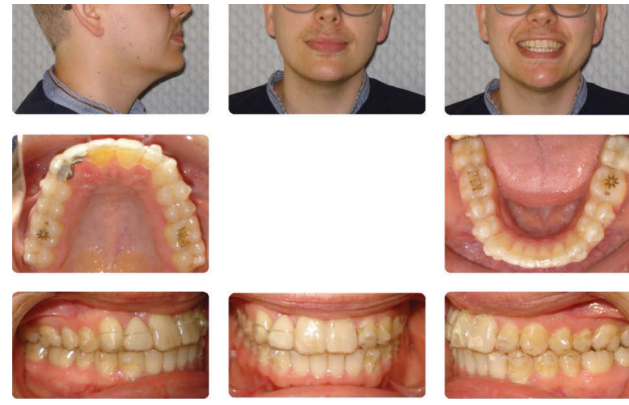


FIG. 3: Final 8.5 months, aligners out.

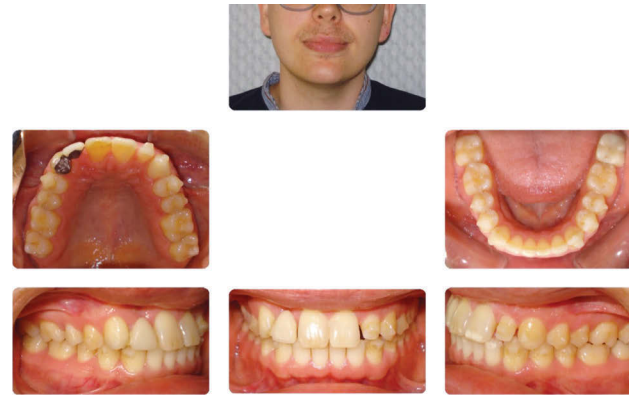
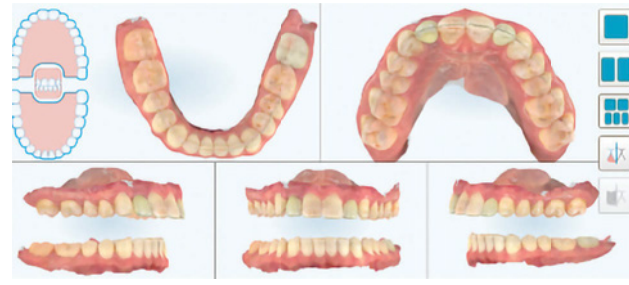


FIG. 4: Final restorations, implant #7 and crown #10.



Case 2 (Figs. 5–16): Opening a previously closed space for a missing U2

Give the patient tooth-colored wax to place in each aligner because it "ain't my problem." This is advantageous because the space of the missing laterals is constantly changing and increasing, which makes it impossible to use an acrylic pontic that would be transferred from one aligner to another. It also negates the labor-intensive painting a pontic in each aligner that would be time-consuming for staff or doctor.

FIG. 5: Initial.

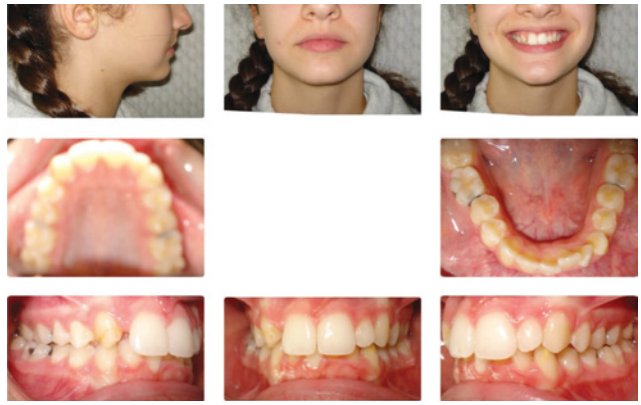


FIG. 6: 18 months progress, TAD-assisted expander aligners and Class 2 elastics.

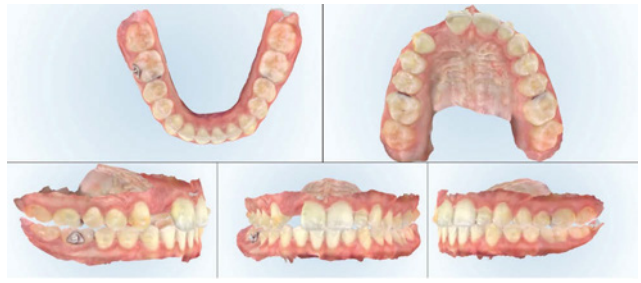
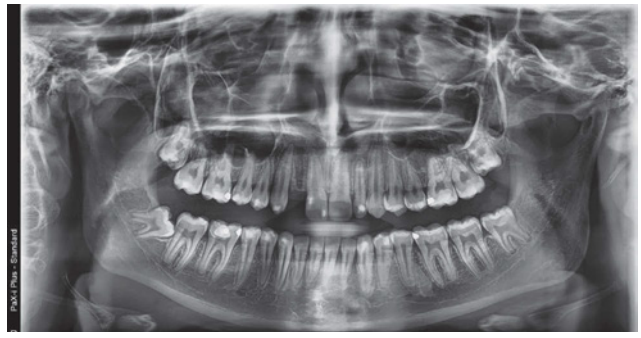


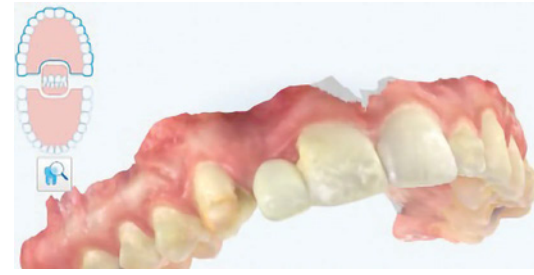
FIG. 7: 18 months progress; UR1 needs mesial root tip.

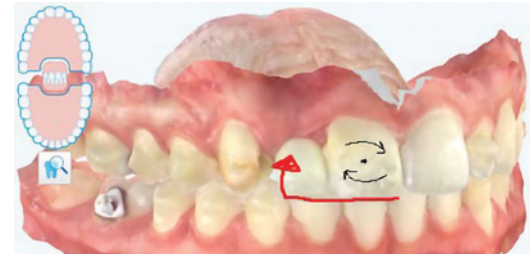


AMP Pearl #4: After pontic space is created and will no longer be changing, refer to restorative dentist to create a cantilever pontic before scanning for additional aligners. Ask for there to be 1 mm space between the pontic and adjacent tooth and if there is any remaining second order root tip of the abutment necessary, make the pontic 1.5 mm off the gingiva so it is shorter vertically. This will allow space for the pontic to move into the gingiva during the second-order movement, creating an ovate pontic.

AMP Pearl #5: Assess which tooth adjacent to the space needs more second-order root movement and make that tooth the abutment tooth because of the biomechanical advantage of the extended lever arm created by the incisal edge of the pontic. This biomechanical advantage is why managing missing U2s is even better than the real thing. You can't do that with braces!

FIGS. 8 AND 9





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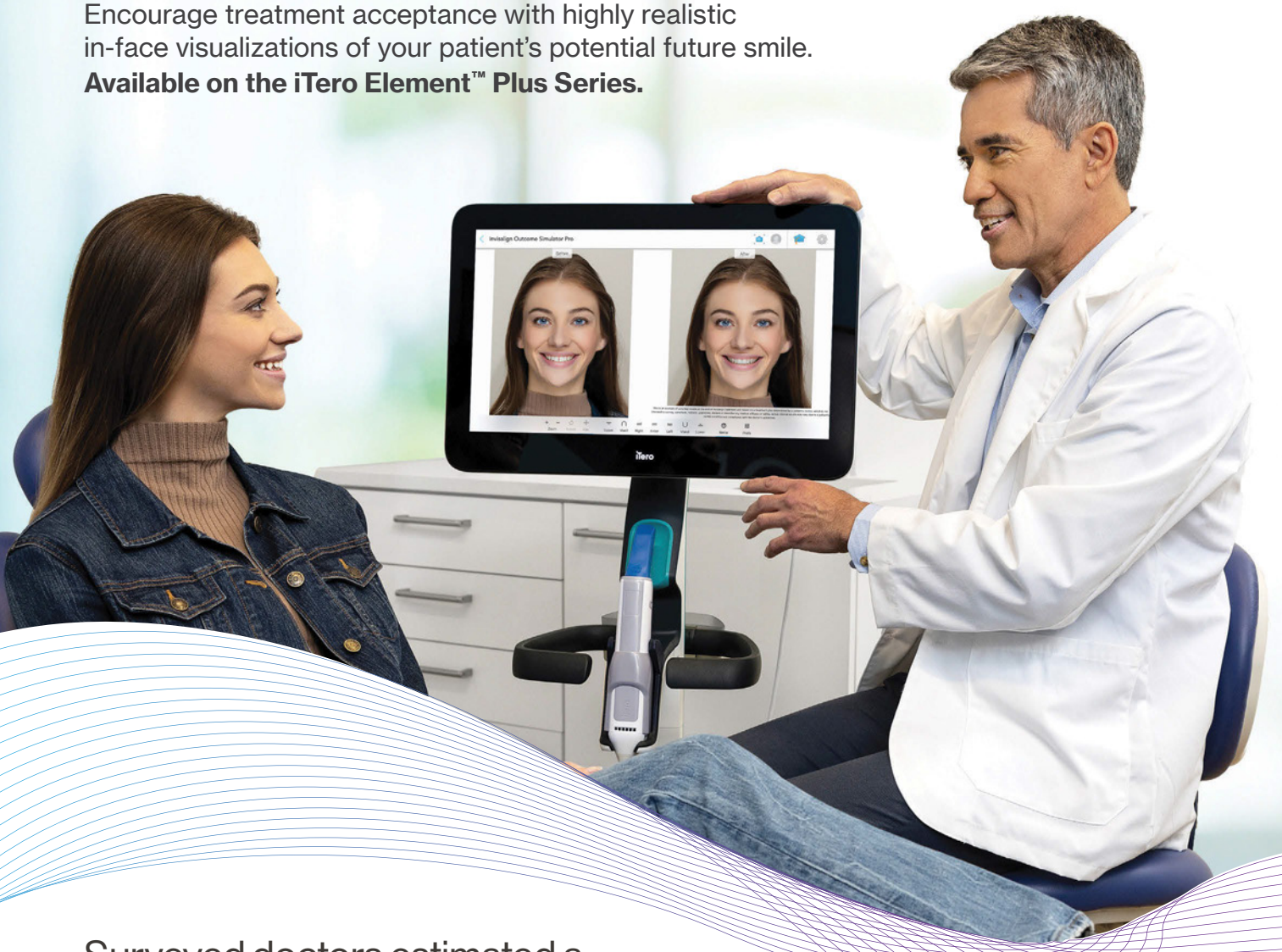

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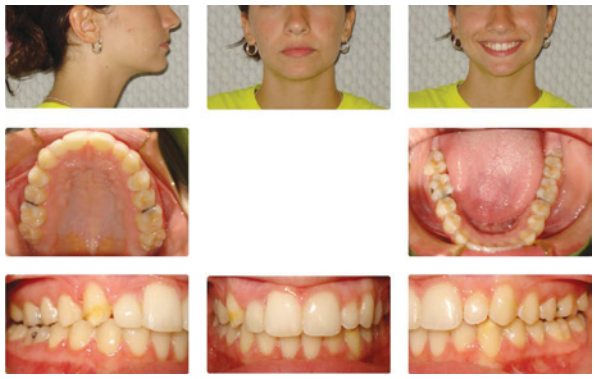
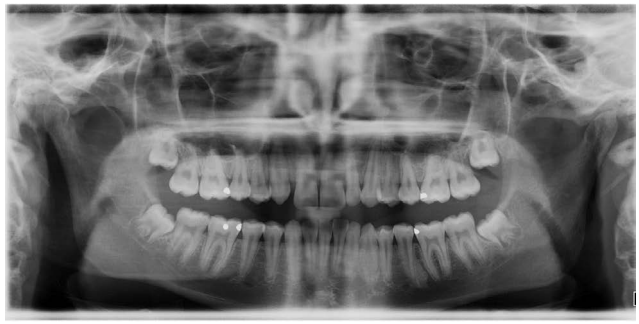
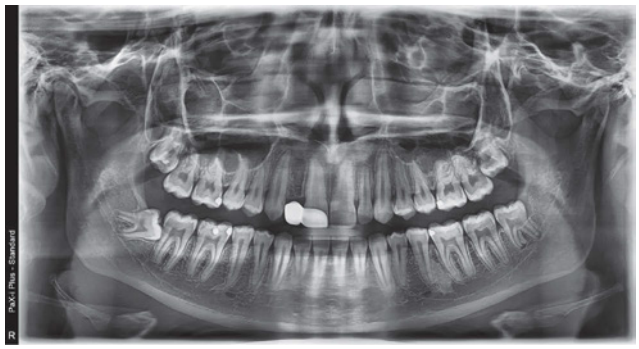
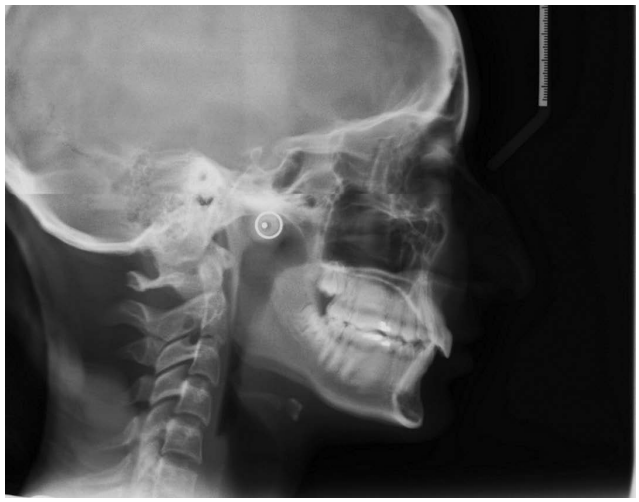
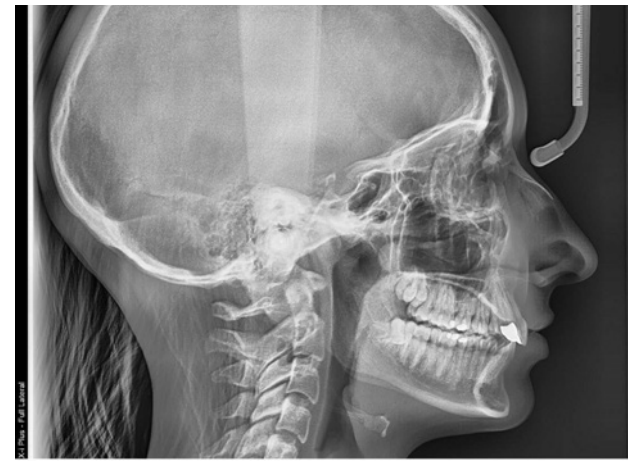
FIG. 10-16: Final 24 months.

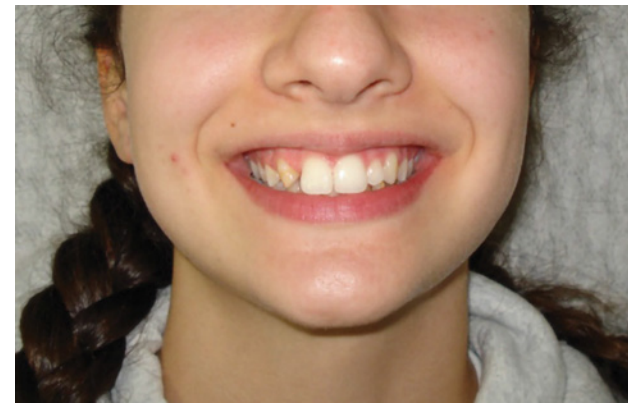


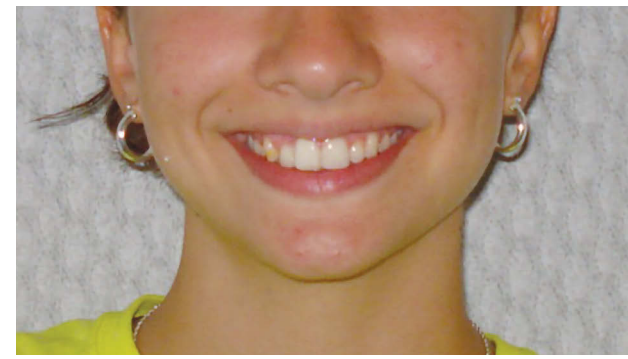












> Are orthodontists really able to provide the best cosmetic solution for patients who are missing U2s but want to use clear aligners for their treatment? I think the honest answer is that we are not.

Case 3 (Figs. 17–21): Patient presents with bilateral bonded bridges

Send back to the dentist to section them because it "ain't my problem!"

FIG. 17: Initial.

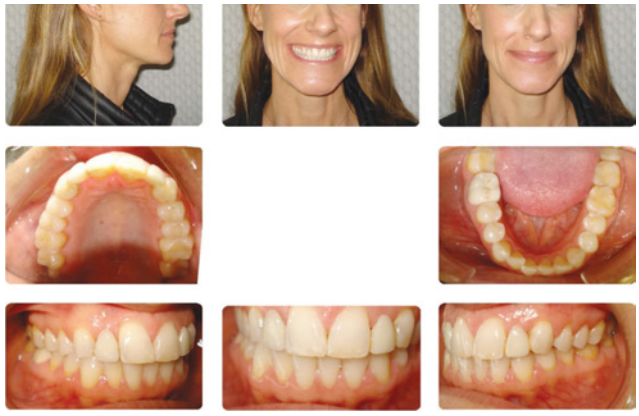
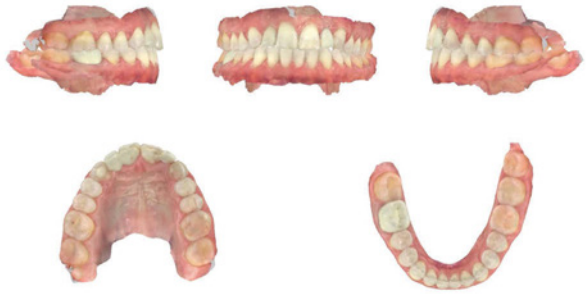
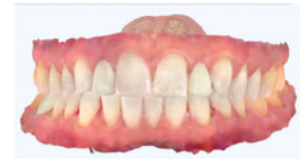
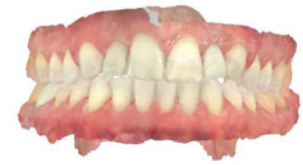
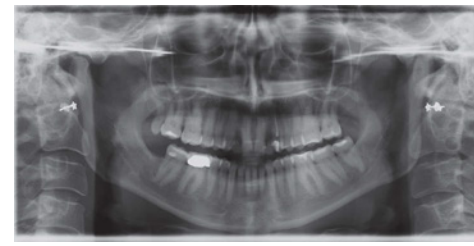


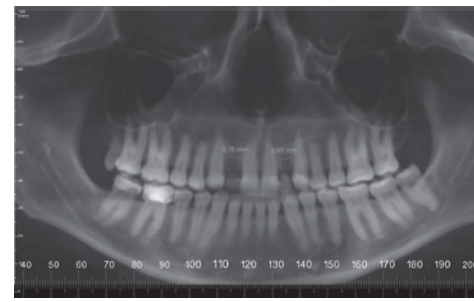
FIG. 18–21: 16 months of treatment.











Conclusion

The AMP technique addresses the stress, burden and guilty feeling of creating chairside pontics or using aligner pontic techniques that produce poor results. It allows for the best cosmetic solution in the hands of practitioners who are most adept to handle it.

Upon learning about the AMP technique, orthodontic colleagues often retort, "But that's an extra expense for the patient." My response is that … "ain't my problem." What *is* my problem is how to give my patients the best result using the best cosmetic and biomechanic approaches available, and that is why the AMP technique is even better than the real thing! **OT**

Dr. Jonathan Nicozisis completed his dental education at the University of Pennsylvania before attending Temple University for his orthodontic residency. During his training, he also completed an externship at the Lancaster Cleft Palate Clinic in Lancaster, Pennsylvania, where he was involved with the care of patients with craniofacial syndromes.

Nicozisis is a member of the Angle Society and an Align Technology faculty member. As part of Align Technology's clinical research network, he has helped conduct research and development of new improvements. He has given more than 400 lectures globally on advanced techniques with the Invisalign system and is the co-founder of The Aligner Intensive Fellowship course.

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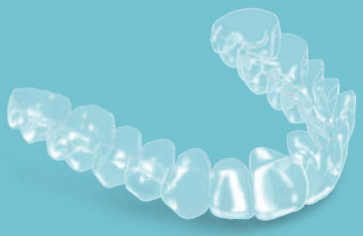

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*Data on file

"After 25 years of aligner Tx OrthoFX offers polymers that are true market disruptors"

Dr. Neil Warshawsky

Compare our patented hyperelastic multi-shell aligner polymers to other aligners

	OrthoFX - Hyperelastic Polymer			Leading Company A	Leading Company B
Brand Name	TetraFX	TetraFX Bright	NiTime		
Polymer Construction & Design	Multi shell progressive torus composite	Multi shell semi crystalline progressive torus composite	Multi shell torus composite	Single shell, soft-hard-soft laminated composite	Single shell, hard-soft-hard laminated composite
Daily Patient Wear	22 Hours	22 Hours	9-12 Hours	22 Hours	22 Hours
Aligner Loading Force Level*	200 to 400 gm	200 to 400 gm	50 to 200 gm	700+ gm	900+ gm
Comparison to wire forces	NiTi Like	NiTi Like	NiTi Like	SS Like	SS Like

OrthoFX Hyperelastic aligners move teeth with unloading forces similar to heat activated round NiTi wires

Documented on track performance of 80%

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*Data on file independent laboratory analysis using transducer

Heat Advisory

6 tips to help ensure your startup practice success even before it opens

BY DR. CHRISTOS PAPADOPOULOS

"Well, team, it looks like the first day of PapadopSmiles Orthodontics will have to be tomorrow, unfortunately, and not today," I said one cold January morning last year. That day was supposed to be our first day in my newly built clinic.

Our startup team was excited to meet each other. I was ready to lead. We had been counting down the days until we could open our doors in my hometown of Saint John, New Brunswick. However, even though my startup is in Canada, an office temperature of 45 degrees was still too cold for us to be working! The heat in my newly built practice wouldn't turn on, so my team members went back home and I stayed at the clinic, waiting for the contractor.

I had received some great advice from mentors and colleagues about the ups and downs of practice ownership, but I certainly didn't anticipate encountering this issue on our first day. Fast-forward a year later and I'm happy to say I can look back on that day and laugh … but you can imagine the disappointment I felt at the time.

Becoming an orthodontist and opening a practice in my hometown had been a dream of mine ever since I received orthodontic treatment as a teenager. After five years of associating at an orthodontic service organization, where I gained tremendous experience both clinically and from a practice management perspective, I finally made the move to turn that dream into reality. Shortly before I made this decision, I was advised by one of my friends and mentors, who said, "You will never feel truly ready, and if you wait until you feel 100% ready, you will never do it."

I am grateful for that advice and a subsequent nudge that helped me make the decision to go forward. I started my practice in 2022.

My goal for this article is to provide insight, encouragement and advice to those considering a scratch practice, although the information can easily be applied to existing practices too.

Although I'm still learning, 18 or so months into my startup journey, I can share many pearls with my colleagues both north and south of the Canadian border—the least of which is to ensure the heat is working the night before your opening day.

Be prepared to adjust your sails

Failing to plan is planning to fail. I've carried that piece of advice with me since high school, and it certainly applies to starting a practice from scratch. Although it's important to make a detailed and methodical plan when opening a new practice, it is of paramount importance that you remain flexible along the way.

You need to be ready to correct the course of your ship at a moment's notice. The changing winds and challenges of entrepreneurship can be suddenly strong or persistently subtle, but you need to be ready for them and adjust your sails accordingly.

For example, I had interviewed candidates in the summer of 2021 to begin work later that fall, but because of construction delays, we could not open our doors until January 2022. This changed the timing of my hires, my marketing strategy and purchasing office equipment, among many other things. Adaptability is your greatest ability, especially in a startup.

Make a list and check it twice … and then check it again

The difference between something good and something great is attention to detail. Paying attention to the little things will produce the big

things necessary for a startup to succeed.

- If you build a website for your practice and check it off your to-do list once it's complete without thoroughly evaluating it multiple times, is it really complete?
- Did you also check off "Visit dentists in the community" if you spent time at their office but forgot to bring referral pads?
- Did you complete "Announce office opening on social media" if you didn't include a link on how patients can self-refer?

These are examples of how little things can inhibit your practice growth without you even realizing it. Make a list of each item that needs to be done, but make a subsequent list under each item of what is necessary for it to be considered done well.

When I decided to do a new build-out for my startup, the list seemed endless and exhausting. However, it only seemed exhausting because of the amount of time and level of detail I put into it. The list was getting longer even as time went on and progress was made, but it was because I was constantly adding more little things to it as they came to mind. Focus and become fixated on adding more little things to your list.

Build your brand before you open

In 2019, I was fortunate to be invited by the Northeastern Society of Orthodontists to a leadership event for emerging leaders at the Disney Institute in Orlando, Florida. One of the most impactful lessons I learned from that course was how important the little things can be to building a brand.

What makes Disney's brand so unique and iconic lies in its ability to create an exceptional experience and produce quality products and results, and how it differentiates itself from others in the marketplace.

I remember getting a coffee in the banquet room during the course, and as I looked to add sugar to my coffee, I saw the sugar cubes were in the shape of Mickey Mouse's head. It put a smile on my face and made me appreciate just how much emphasis Disney placed on incorporating its brand into even the smallest aspects of my experience there. Do the same for your startup.

Before I opened PapadopSmiles, I had visited every dental clinic in the city to meet with dentists and their teams, did a continuing education presentation for the dental hygienists and assistants in the province, sponsored community events and maintained a strong social media presence. There is no reason to wait until your clinic doors are open before you start telling your community who you are and what your new clinic is all about.

Hire the right people at the right time

Perhaps one of the most difficult aspects of doing a startup is deciding on who and what types of team members you require. This can

be difficult to gauge, because you have no idea just how busy you will be from the onset. Rather than providing advice on how many people you should hire and their positions within the office, my advice is that you need to hire the right people at the right time.

I began my practice by hiring an administrative lead, who would also serve as my treatment coordinator, and an orthodontic assistant and a dental assistant who both worked in reception and also helped in the clinic.

I certainly did not *need* to start with three new hires, but I'm very happy I did. As the practice grew, I didn't have to scramble and could time my additional hires with patience. This allowed me to make additional hires well in advance of when I felt the office truly required them, and as such allowed my team to integrate them into our office systems slowly and steadily. Hire *in preparation for* growth, not *in reaction to* growth.

Although one could argue not to overhire initially, a critical benefit was that it allowed me to cross-train my team. All my team members were trained on how to handle incoming patient phone calls, schedule consultations, do sterilization, open and close the office, etc. This has proven to be invaluable. Now, any new hires can be trained well by several team members instead of just one or two.

The other aspect of hiring is hiring the right people and not just the right skill. Hire go-getters who are also learners and you'll see how your practice grows as a byproduct of their individual growth. Knowledge is an asset that compounds over time. Good habits will rub off on your other employees and produce a fundamentally sound team. You will then start to see how this becomes representative of your practice as a whole. Those who keep learning will keep rising. And if your team members are rising, so will your new practice.

Office culture begins on Day One

Establishing an office culture is critical for growth. *Culture* is another term that's thrown around many ways and can have many different meanings; for me, office culture encompasses a wide array of practice attributes that need to consistently be upheld by every member of your team. These include team collegiality, spirit, proficiency with office systems and practice forms, open communication with one another, and dedication to the patient experience.

This requires an exceptional amount of work and time from you before Day One, so it can be

successfully implemented then. Create internal office systems and clearly defined roles and expectations for each team member, with a plan to regularly review these aspects before your new hires show up on their first day. Without this structure clearly defined and in place before you begin your startup journey, individual team members will not grow in the same direction toward the same practice goals. Direction, consistent review and endless communication are required during the early phases of growth.

It's also important for you to be a leading example of the office culture you want to cultivate. Your team will watch what you do, not just listen to what you say.

In my office, we recently hired an orthodontic assistant who had many years of experience. In the middle of her first day with us, a patient came in with very muddy boots and brought a lot of dirt into the clinic. As she was sweeping up the dirt, I grabbed the dustpan and helped her clean it. I could tell she was a bit taken aback that I had decided to help her. I later found out that she later commented, "I've never seen a dentist or orthodontist help sweep the floor." Be an example to your team.

Patience, as well as patients

When you open a practice from scratch, it goes without saying that much of the advice you seek will be on how to bring more patients to your practice. Although patients are critical for practice growth, it's also important to remember that patience is essential during a startup.

During times that your practice is not as busy as you would like, look to be generous. Be generous with your team, your peers, your community and your profession: Treat your team to lunch, organize a continuing education event for your peers, give back to your local community through sponsorships, and give back to your profession through volunteering your time with the American (or Canadian!) Association of Orthodontists.

The most rewarding aspects of practice ownership have come through my ability to build strong relationships with my team, my patients, my community and my profession. Remember that in addition to envisioning practice growth with your startup, you should also strive for personal growth as well.

Opening a startup practice will present many challenges, but it also presents many opportunities for both personal and professional growth and satisfaction.

Although my journey is new and has been undoubtedly unpredictable, it has also been undoubtedly rewarding. If you feel a strong internal desire to start your practice, do your due diligence, create an action plan, seek the advice of mentors and colleagues whom you trust and go for it.

You will never feel 100% ready, but if you believe in yourself and are prepared to work extremely hard, you can't go wrong. Bet on yourself. **OT**

Dr. Christos Papadopoulos earned a Bachelor of Science degree with honors at the University of New Brunswick, a DDS at Dalhousie University and completed his orthodontic residency at Western University. He also did a one-year pediatric internship at British Columbia's Children's Hospital before his orthodontic residency. He opened his startup practice, PapadopSmiles, in his hometown of Saint John, New Brunswick, in 2022.

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Beating Burnout

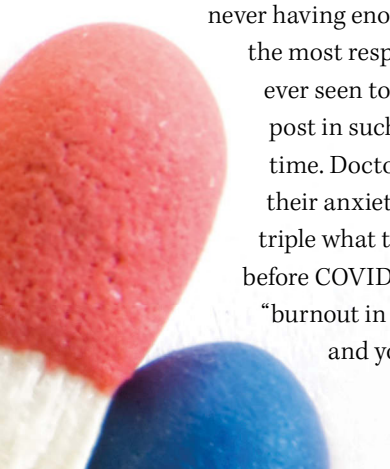
5 tips and tools to reinvigorate yourself and your practice

> Without a system in place and the discipline to stick to it, nothing will change—least of all, your results.

BY FLINT GEIER

Burnout is a cancer that seems to be affecting almost every independent practice owner. At best, you've heard and read a lot about it. At worst, you're deep in the burnout trap and feel there's no way out. Most of you are somewhere along the spectrum—experiencing some level of burnout, yet not understanding why or what to do about it.

As the saying goes, misery loves company. Industry publications, websites, social media, message boards, online communities, emails, you name it, have become a feeding frenzy of negativity—essentially, platforms for complaining to the masses. And everyone's listening! A recent message board post on Dentaltown garnered almost 500 responses about people feeling burned out, worn down or never having enough time—the most responses I've ever seen to a single post in such a short time. Doctors report their anxiety levels are triple what they were before COVID. Search "burnout in dentistry" and you'll see an onslaught of articles written over the past three years about how the profession has changed, how difficult running a profitable practice has become, how bad teams have gotten and why good people are impossible to find.



Following those conversations pulls you deeper into the burnout trap. Instead of further fueling the frenzy, I want to change the narrative by talking about what you as an individual practice owner can do to combat your own risk of burnout and get you out of the trap you may already be in.

Recognizing burnout

Before treatment must come diagnosis. For private orthodontic practice owners, there are three unmistakable signs of burnout, or indicators that you could be headed down that path in the near future:

"I'm so tired." How many times a week do you say, think or feel that way? The words may vary—"I'm tired," "I'm beat," "I'm exhausted"—but the symptoms are the same. You're going through the motions of your daily existence—going into the office, treating patients, interacting with your team—but with little energy or enthusiasm. You're just trying to get through the day.

Lack of engagement. This is a more palatable way of saying you just don't really care as much anymore. That's not to say you don't care about your patients, but you've become somewhat apathetic about running the business; you'd rather let the practice run on autopilot than take an active role in steering it the way you used to. When asked what makes your practice better than others, you may say all the right words but you won't be able to hide the nuance that you no longer really believe what you're saying.

Decreased sense of accomplishment. If you were surprised at April tax time to learn you had a great year in 2022, you obviously never celebrated the accomplishment with yourself and your team. Maybe you weren't tracking results so you didn't recognize the progress you were making throughout the year. Or, maybe even big successes no longer seem worth the effort that went into achieving them. Even if you're tired and less engaged lately, tracking progress toward goals should be satisfying and

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motivating; if not, you are deep into the burnout trap.

Be honest with yourself. If any of those signs of burnout are present, or just beginning to enter into your thoughts, begin applying these simple tools and concepts to divert yourself away from the burnout zone or get out of the burnout trap if it seems you're already caught in it.

Feed your mind healthier food.

The content you allow into your ears, eyes and brain is as important as the food you allow into your mouth. The relentless feed of distressing information and negativity bombarding us 24/7 can trap an already burned-out practice owner, send one close to burnout plummeting over the edge or drive the most enthusiastic young practice owner toward burnout before they ever get started.

Stop consuming a steady diet of no-can-do attitudes and feeds that would have you believe you can't do any better. Replace those feeds with ones that talk about how other independent practice owners have solved their challenges and are as successful as ever. Join communities of growth-minded doctors willing to share their knowledge and best practices for the good of their colleagues and profession overall. Avail yourself of information and tools, such as workshops and coaching, that create only positive feeds.

Reenergize through physical health and fitness.

Practicing orthodontics is tough on the body. Ignore that and you'll inevitably suffer from physical burnout. The longer you stay in shape, the longer you can continue to make a profitable living doing what you love. Moreover, research is well documented that physical activity and a healthy diet not only boost energy and stamina but also improve mental well-being—how clearly you think, how you feel about yourself, how you engage with others and your overall level of enthusiasm for all aspects of life.

Sustaining physical health and fitness requires structure, constant commitment and accountability. Don't just join a gym; hire a trainer. Don't just do a workout; commit to a regimented fitness plan. Join a local sports club that requires practices and games. Don't go on a diet; work with a dietitian on a total dietary plan. Doing something is better than doing nothing, so start small, if necessary. The initial sacrifices will be worth it and eventually become part of a healthier routine.

Stick to a time management system.

The stress caused by never having enough time to feel on top of your business, or life in general, is a huge driver of burnout. Be intentional about how you structure your time, what you spend your time on, and how you control and protect your time so you're always focused on what's most important. After all, you own the practice, so you should own your time as well.

We teach our coaching clients a highly regimented time management system. It does take time to set up and learn to use well, but the results are worth the effort. Whatever system you choose to use, start with a radical self-analysis of how you spend your time now. You'll quickly realize that without a system in place and the discipline to stick to it, nothing will change—least of all, your results. You'll discover how much of your time is spent on tasks that don't grow the business, develop your team, benefit your patients or improve your own personal well-being.

An important outcome of this analysis is that you should uncover opportunities for adjusting your time in beneficial ways you may not have thought of before. For example, you may come to the healthy conclusion that if you adjust your schedule to start 30 minutes later two days a week, you can fit in a morning workout and arrive at work as a more energized, positive business owner and practice leader. Unless you can make up for that time at the end of the day, though, you would adversely affect patient care and revenue. The solution? Add an associate.

Aggressively reduce debt.

Being in debt is mentally and emotionally exhausting and contributes to burnout. Debt negatively affects your cash flow and net worth, and the stress and anxiety can affect your personal life and relationships—unless you understand debt, how and when to use it to your advantage and how to aggressively decrease it.

Debt, as an investment that results in growth, is good for your business. As long as you're getting a positive return, debt is not an expense to be avoided. Examples include investing in additional treatment rooms and associate doctors to increase capacity of the practice to generate more revenue; investing in training so your team knows how to bring in new patients and deliver a patient experience that grows the practice; and buying your building so you're paying yourself instead of a bank.

A component of any return-on-investment decision is putting systems in place to track results so, if necessary, you can take steps to get the investment back on track. Then use the additional revenue to aggressively pay down the debt as quickly as possible, instead of spending in other ways.

Develop your people.

The emotional and mental energy it takes to lead and manage a team can be exhausting. So is trying to do everything yourself, which is a guaranteed recipe for burnout.

You probably already employ people who have the potential to share the burden, allowing you to produce at a higher level. Build your level of trust in delegation by putting them through development training so they're equipped with the necessary tools and resources. Invest in their development so they build additional skills and knowledge and learn to take ownership and accountability; give them opportunities to grow and demonstrate they care about the practice and its long-term success as much as you do. After all, it's their livelihood, too.

Team members are just as susceptible to burnout as you are. Reengage and reenergize their enthusiasm by providing growth opportunities and, in turn, a greater sense of accomplishment that comes with affecting the practice on a larger scale. You will also find this to be a highly effective retention strategy, thus helping to alleviate that burnout stressor.

Your practice is important!

Burned-out practice owners forget how important their businesses are to so many people. Your practice fuels everything you and your family enjoy in life, both short and long term. It fuels the lives of the people who work for you and their families. Your practice provides essential oral health care for patients and serves communities.

If you lose enthusiasm, energy, positivity, engagement or physical health—if you stop putting patients first, stop generating new patients and stop leading the team—your people will know it, your patients will feel it and even the community in which you used to be more active will see it.

Even if you don't recognize the symptoms in yourself, or won't admit it, you'll see the fallout in the results of your business. Your team will become as stressed and burned out as you, further spiraling you and the practice downward.

Whether you're trying to escape the burnout trap you're already caught in or trying to avoid it, the strategies are the same. Build them into your new management time system to ensure they get top priority. **OT**

Flint Geier is director of Scheduling Institute's 5-Star Certification Program and a keynote speaker who inspires independent practice doctors and team members to grow personally and professionally. With the company since its inception in 1997, Geier has followed in the footsteps of his father, Jay, to become a go-to expert and champion for new patient growth in the private practice industry. To take the Scheduling Institute's complimentary practice growth analysis, visit fivestarchallenge.com/otown.

The author declares that in the past 12 months, he has owned and operated a marketing agency, and has been paid as a consultant or lecturer within the field of dentistry or health care.

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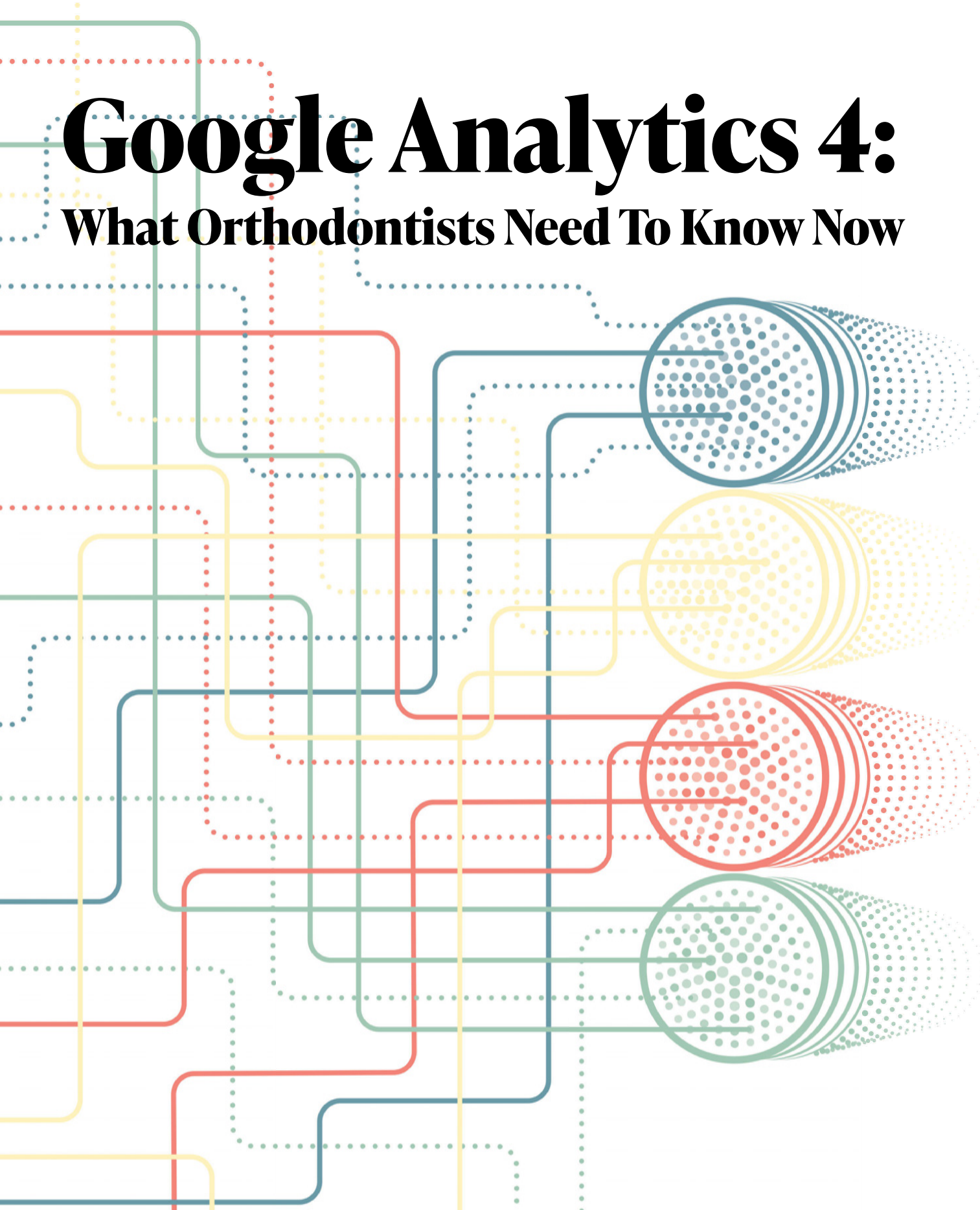

BY DR. DAVID A. WANK

Short course description

On July 1, Google will turn off Universal Analytics, its current Google Analytics product, which means website owners will need to start using the company's latest product, Google Analytics 4, if they want to access their website analytics data through Google. In this course, readers will learn why the company is making this change and what efforts website owners will need to make so they can continue to track and analyze their data. We'll also examine a few likely scenarios orthodontists might find themselves in regarding the update, and review some of the migration pearls and pitfalls.

Abstract

Google's Universal Analytics tracking software (UA) has long been the gold standard for gathering website data so owners can make better marketing decisions. UA has been around for more than a decade, and little has changed with the software other than incremental improvements to data collection and availability of reporting capabilities.

Because of increased concerns about privacy—plus the fact that many users disable or block the traditional code marketers use to track people's behavior across the web—Google needed a new analytics solution. As a result, the company is introducing Google Analytics 4 (GA4), a new model for gathering website analytics data.

About the only thing that Universal Analytics and Google Analytics 4 share is the word *analytics* in their product names, so users will need to "migrate" their data to the new platform—and it's not as easy as copy/paste.

Educational objectives

At the end of this course, you will be able to:

1. Understand why Google is requiring website owners to migrate to Google Analytics 4 (GA4).
2. Understand the different data collection methods used by Universal Analytics and GA4.
3. Be familiar with the general migration process, and what you can and cannot expect from a migration.
4. Know the difference between a GA4 *event* and a GA4 *conversion*.
5. Describe Google Signals and why it is important for Google Ads users.
6. Find key data in the new GA4 interface.

Introduction

"If we can't express what we know in the form of numbers, we really don't know much about it."
— *William Thompson, the first Baron Kelvin ("Lord Kelvin"), 1824–1907*

The data sets that measure how people interact with your practice's website can provide you with a treasure trove of information that

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can be used to make evidence-based decisions about your marketing efforts. When measured accurately and interpreted properly, the data can help you determine which marketing campaigns should be stopped because they're failing and costing you money, as well as which campaigns should be augmented because of their success.

Universal Analytics: Everyone's old friend!

For the past 15 years, 30 million website owners have relied upon Google's free product, Google Analytics, to collect and provide the above data. Also known as Google Analytics 3 and, more commonly, Universal Analytics (UA), this product has been the mainstay of website data tracking for a generation of website owners and marketers; UA provides information about how people interact with websites and how effectively paid advertising campaigns are performing. And while there are other analytics software packages available that provide a similar service, UA is dominant in much of the small-business sector because of its tight integration with other Google products such as its pay-per-click (PPC) program, Google Ads.

> *It's critical to use both Google Ads and Google Analytics together to fully understand how paid advertisements are performing and if their costs have a worthwhile return on investment.*

Google Analytics 4: Everyone's *new* friend?

Although it has its flaws—as does any other software package—UA is a reliable, thoroughly tested and well-understood product. Yet over the past few years, Google began to introduce the next generation of its analytics product, Google Analytics 4 (GA4). As GA4 has become more production-ready, Google announced in mid-2022 that it would be turning off UA on July 1, 2023, and that anyone who uses Google Analytics would need to migrate to GA4 to continue to receive the website data that Google Analytics provides.

Why do we need a new version of Google Analytics?

One of Google's major drivers of revenue, Google Ads, integrates directly with GA, and it's critical to use both products together to fully understand how paid advertisements are performing and if their costs have a worthwhile return on investment (ROI). And while users can use other analytics packages, most marketers and their clients use GA with Google Ads.

As you might imagine, one of Google's logical overriding goals with Google Ads is to make sure people who advertise on the platform are able to accurately track the money they're spending and their return on the investment.

With the increased focus we're seeing on how privacy is handled on the internet—where web browsers block tracking code for privacy purposes and smartphones let you tell apps "not to track" you—the mass of user behavior data that Google and other advertising companies rely on to help track the success of advertising campaigns is getting thinner every day.

Google needed a new approach to accurately track the way users interact with websites and advertisements, and the solution they came up with is Google Analytics 4. It may seem like GA4 is a product designed solely around making data more reliable for ecommerce providers

and advertisers, and that statement is accurate in part. However, in releasing GA4, Google also thought about its users and removed some of what it determined to be extraneous features and data points that clogged up the UA interface and website reports.

Migrating to Google Analytics 4

Now that we understand some of the reasons that motivated Google to modify its Google Analytics product, we have to look quickly at how it accomplished the change. Without getting into the technical weeds (which are interesting, for those of you who would like to learn more), Google Analytics 4 measures data in an entirely different manner than UA. UA uses a page-view model, which means data tracking is based on counting the number of times a page is viewed. In contrast, Google Analytics 4 uses an event-based model, which looks at the number of interactions a visitor has with a particular element on the website, not just how many times a specific page is loaded. Because the data collection models are so fundamentally different, GA4 is an entirely new product that needs to be set up alongside, or independent of, UA. So while you can upgrade from a high-speed air-turbine handpiece to an electric handpiece and use the same burs because the instruments are similar enough, UA and GA4 are so different that you cannot simply "throw a switch."

It's not really a "migration"

Because the two analytics systems are so different, there's no way to copy or move the data from an existing UA account to a GA4 account; thus, the terms *upgrade* and *migration* are misnomers. Your marketing company should be able to provide you with the best way to approach GA4 for your practice's marketing setup, but in actuality there are only a few situations you as the website owner will potentially face.

If you don't have an existing Google Analytics account: You can create a new GA4 account now and start recording data moving forward.

If you have an existing Google Analytics account but you've never looked at it, don't plan to look at it and are not running Google Ads: You can create a new GA4 account now and start recording data moving forward.

If you have an existing Google Analytics account and while you don't usually look at it (or can't find it), you'd like to hold onto it in case there's data in there (and you're not running Google Ads): Your best bet is to try to get access to the account to see what data you're recording, so you can re-create that information in the new GA4 account. For example, you might be tracking contact form submissions in your UA account, and it's important to set that measurement up in your new GA4 account. In UA, important website occurrences such as contact form submissions were marked as "Goals." GA4 has "Events," and marks important events as "Conversions." So while you may have dozens of website *events*, only business-relevant events (phone calls, form submissions, button clicks) are marked to track as *conversions*.

If you have an existing Google Analytics account and track events such as form submissions and phone calls: As above, you need to look at your UA property and make a list of the specific goals you're tracking so you can re-create them in GA4.

If you have an existing Google Analytics account and are using Google Ads: You'll need to discuss the migration with your web company or migration professional so the new

GA4 account can be properly connected to your Google Ads account. It's important to have both accounts running, so you can check to make sure the Google Ads data in your UA account matches the data in your GA4 account. Generally speaking, if you are using DNI (where you swap in a tracking number on your website for a marketing campaign), you will have to set up the conversion in that software.

Let's talk about data

Because UA and GA4 are different systems, you *can* run UA tracking and GA4 tracking on your website at the same time, and you will not record duplicate data. In fact, Google encourages this approach, so both products are recording data on the same site at the same time and so you can compare data between the two before the July shut-off date to help verify accuracy.

If you do run both products in parallel—and you should—much of the data you see in your new GA4 account will be different from the data you see in your UA account. And when this discrepancy occurs, don't panic—it's expected. However, data points that should be the same are your website conversion numbers, such as contact form submissions.

Thus, when you migrate a website from UA to GA4, one of the ways to verify the accuracy of the setup is to compare the conversion data on the UA account with the conversion data on the GA4 account and make sure they're the same, or at least very close.

How do I copy over my old data?

You don't. Because the two systems are different, there's no way to copy over UA data to a GA4 account. The first thing you should do is to configure GA4 to report on any of the data points you were tracking in UA—contact form submissions, Google Ads conversions, etc. And while you can pull data out of your UA account and download it to a spreadsheet or database, this approach is often overkill, because it makes more sense to work with your marketing company to look at the data that's important to you, and note it down or screenshot it for future reference.

Suggested data/reports to screenshot include:

- Organic traffic by channel, segmented by your practice's location: 2020, 2021, 2022.
- UA goal conversions by channel, segmented by your practice's location: 2020, 2021, 2022.
- Google Ads campaign conversion data (if applicable): 2020, 2021, 2022.

How will this change affect the typical orthodontist?

- If you don't migrate to GA4 by July 1, your current analytics account will stop receiving new data from that date on. Rest assured, however, that your website will continue to function normally! And while there's nothing wrong with not running Google Analytics, I strongly recommend you have

some analytics tracking in place so the data is there if you or a marketing company ever need to use it. And if you're running any Google Ads, having a Google Analytics account is simply a must.

- Google has integrated something called Google Signals with GA4 and per Google's explanation, enabling Google Signals will help improve the accuracy of website data tracking. Specifically, Google claims that Google Signals will be especially useful for people who use Google Ads because it will aggregate data from multiple sources, including a user's Google profile, which may in turn lead to better Google Ad performance for the advertiser. The idea is that the better Google knows a user, the better they can target ads at the ideal time and place.
- You should be migrating to GA4 now, so you have the ability to compare UA and GA4 conversion data as listed above. Once the cutoff occurs, you won't have any new data on the UA side to work with. And while this fact might not be relevant to everyone, it's an important consideration to be aware of.
- Use this mandatory update from Google as a reason to make sure that you have full, 100% ownership and access to your Google Analytics account and your Google Ads account. In my opinion as a dentist and as a marketing agency owner, there's no reason a client should not have the full access above. The reason you must have ownership is because if you ever want to change marketing agencies, you should be able to bring the data with you. Your Google Ads account might be trickier to own, depending upon your agreement with the vendor that runs your ads campaign. Some vendors give you full ownership, control and access to the account (recommended) while other agencies own the account assets they created on your behalf (ads, keyword research, etc.). And while you're in the process of getting access, you should have full administrator access to your website so you can pull backups or make changes as you see fit—again, this depends upon the specific agreement you have with your vendor.

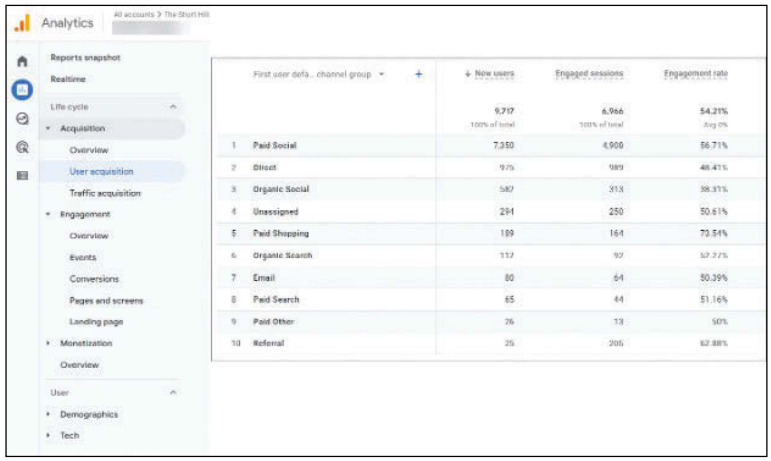
Should I do the migration myself?

GA4 is a completely different product from UA, and the setup, interface and tracking code are all different. If you're comfortable with adding code to your website and you have the time and inclination, there's no reason you can't migrate to GA4 on your own. There are tons of tutorials and training packages available to guide you through the process, including one I developed, but because GA4 is a new product, there will be changes to the product and hiccups along the way. If you do elect to take this route, make sure that you're noting any Goals you currently depend upon in UA so you can set up the same data as Conversions in GA4.

But Google will migrate me to GA4 for free!

Google has been sending out emails urging people to migrate their websites to GA4 and explaining that if you don't migrate by a certain date, Google will migrate for you. While this seems like a great service on its face, it's something you should avoid. If you look at Google's communications on the issue closely, you will see that Google states that the automatic migrations that it performs are limited in scope and there is no one-size-fits-all migration. The emails explain that the automatic migration might not bring

FIG. 1



over all of your important conversions, and that you'll still need to finish the migration on your own. Thus, I recommend you avoid the default path, because it's not a reliable approach to ensure accurate website data tracking.

Key report

A critical GA4 report that will show you the number of new users to your website from each of the different marketing channels can found here: Reports > Acquisition > User acquisition. As you can see in Fig. 1, the left column shows the sources of the visitors (channels) and the first column shows the number of new users to your website.

However, this report should be taken with a grain of salt because this data shows your website traffic for the entire world, so while the data is accurate, it isn't useful. To make the data actionable, you'll need to set the location to the area your practice serves.

Conclusion

Whether we like it or not, Google Analytics 4 is here, and as Google recommends, it's important to migrate as soon as possible so you can compare any existing UA data with your new GA4 data. Because GA4 measures data differently than UA, you can't simply push a button and migrate the account. When you do create your GA4 account, make sure any important information you tracked in UA is also tracked in GA4 so you don't miss out on key data. And while you can migrate to GA4 yourself, it can be a hassle and it might make sense for you to have your marketing company or a third-party professional perform the migration for you. **OT**

Editor's note:

For more information about Google Analytics 4 and things small businesses need to know about migrating their content, we've embedded four links inside the opening page of this CE course online at ***orthotown.com/magazine****.*

Dr. David A. Wank earned his DMD from Harvard in 2003 and is a practicing general dentist in New York. He's been at the helm of Short Hills Design, a marketing agency for dentists, since its founding in 2008 and has worked with more than 100 Townies on their website, hosting, analytics and SEO needs. Wank holds a Google Analytics individual qualification and Google Analytics 4 and Google Display Ads certifications, and is the author of a *Google Analytics 4 Migration Process Training* course. He also runs a Facebook group, a YouTube channel and his company's YouTube With the Dentist marketing program.

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1. **Which of the following correctly describes how Universal Analytics (UA) and Google Analytics 4 (GA4) collect data?**
   A. UA and GA4 both use an event-based model.
   B. UA uses a page-view model, while GA4 uses an event-based model.
   C. UA and GA4 both use a page-view model.
   D. UA uses a click-based model, while GA4 uses an event-based model.

2. **Why did Google develop Google Analytics 4?**
   A. The company was bored with Universal Analytics.
   B. It can charge more money for Google Analytics 4.
   C. It needed a more accurate way to report data because attempts to improve user privacy blocks some of the data that advertisers need.
   D. It needed to release a product before it rolls out Google Analytics 5.

3. **Which statement below accurately describes what UA and GA4 have in common?**
   A. Both measure Google Ads data in exactly the same manner.
   B. Only people with a yahoo.com email address can access the programs.
   C. They are software tools designed to measure how users interact with a website.
   D. They both have "Universal" in the name of the product.

4. **When does Google turn off Universal Analytics?**
   A. Jan. 1, 2024.
   B. Dec. 25, 2023.
   C. Sept. 14, 2023.
   D. July 1, 2023.

5. **True or false: You can migrate to GA4 with the click of one button.**
   A. True.
   B. False.

6. **True or false: There's no good way to back up your current UA data, so if you want historical data, it makes sense to look at your current GA account and take screenshots of the information that's most important to you.**
   A. True.
   B. False.

7. **Why does Google recommend you migrate to GA4 as soon as possible?**
   A. It wants to charge you for the subscription as soon as possible.
   B. It is shutting down UA on Jan. 1, 2024.
   C. So you can run UA and GA4 at the same time and compare the data.
   D. So you can run UA and GA4 and GA5 and GA6 at the same time and compare the data.

8. **Which of the following statements about migrating data from UA to GA4 is true?**
   A. All of your data will migrate over automatically.
   B. You need to evaluate the goals you have in UA and re-create them in GA4 if you'd like to keep tracking the same information.
   C. If you don't migrate to GA4 by July 1, 2023, your website will shut down.
   D. Google's automatic migration is comprehensive and reliable.

9. **Which of the following statements about Google Signals is false?**
   A. Google Signals is designed in part to help advertisers get better returns on their ad spend.
   B. Google Signals is available only in Google Analytics 4.
   C. Google Signals gathers information from many sources, including Google profile data.
   D. Google Signals has been around as long as Universal Analytics.

10. **Why should every business migrate from UA to GA4? Select the best answer.**
    A. GA4 is the newest version of Google's analytics product and as of July 1, 2023, website owners who want to keep using Google Analytics must migrate.
    B. It's exciting to look at website analytics data.
    C. Only people who use GA4 can run Bing ads.
    D. Your website won't work without GA4 tracking installed.

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Google Analytics 4: What Orthodontists Need To Know Now

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7.	A	B	C	D
8.	A	B	C	D
9.	A	B	C	D
10.	A	B	C	D

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5.	Course objective #4 was adequately addressed and achieved.	5	4	3	2	1
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10.	Overall, I would rate this course (5 = Excellent to 1 = Poor).	5	4	3	2	1
11.	Overall, I would rate this instructor (5 = Excellent to 1 = Poor).	5	4	3	2	1
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PART 1 OF A 2-PART SERIES

Permission To Intercept

An etiology-based approach to the interceptive treatment of preadolescent patients

BY DR. MICHAEL K. DELUKE

Short description

This course contrasts the current symptom-driven approach to interceptive orthodontic treatment with a new approach that focuses on diagnosing and treating the etiology of the malocclusion. The presented clinical case study demonstrates the results that can be achieved with an etiology-based approach to the interceptive treatment of preadolescent patients.

Synopsis

For more than 100 years, orthodontists have debated the value of interceptive treatment, especially as it pertains to the management of crowding in preadolescent patients who present in the early mixed dentition. The existing, antiquated paradigm is one that focuses on treating the *symptom*, but it is time to shift that paradigm to one that is more proactive and less

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reactive—one that focuses on the diagnosis and treatment of the *etiology* of the malocclusion.

From an evolutionary perspective, dental crowding is a relatively new phenomenon that has largely emerged over the past 300 years. The dramatic increase in the prevalence and severity of dental crowding in preadolescent patients is the result not of increases in tooth size but the narrowing of the dental arches, secondary to environmental factors such as airway obstruction and a soft diet. As such, when we focus solely on addressing the crowding, we are incorrectly taking a symptom-based approach to treatment. Instead, we must first determine the underlying etiology of the malocclusion and then develop a treatment plan to address it. When we do, we can have a profound, life-changing impact on the physical and psychological health and well-being of our patients.

Learning objectives

At the end of this course, you should be able to:

1. Recognize the paradigm shift occurring in the diagnosis and treatment of malocclusion in preadolescent patients.
2. Describe the interconnectivity of the structures of the craniofacial complex as it pertains to the development of malocclusion.
3. Correctly identify the etiology of dental crowding in preadolescent patients.
4. Explain how airway obstruction can contribute to the development of malocclusion.
5. Recognize the clinical signs of airway obstruction in preadolescent patients.
6. Develop an etiology-based treatment plan for a preadolescent patient who presents with dental crowding in the early mixed dentition.

Introduction

Thomas Kuhn, an American philosopher of science and historian, stated that science does not evolve gradually toward the truth. Instead, it has a paradigm that remains constant before going through a shift when current theories can't explain some phenomenon and someone proposes a new theory. Kuhn defined a paradigm as a universally recognizable scientific achievement that, for a time, provides model problems and solutions to a community of practitioners. He argued that the masses will continue to follow the paradigm and do what they think is true while refusing to admit that what they're doing does not work. Further, it takes someone to come along and show that the old approach is no longer valid to shift the paradigm.[1]

The current approach to the interceptive treatment of crowding in the early mixed dentition (i.e., extracting teeth, rapid maxillary expansion, space maintenance or observation) is a paradigm that has remained constant for decades and continues to be followed, even though it neglects to address the etiology of the malocclusion and often yields less-than-ideal results.

As scientists and physicians of the oral cavity, it is incumbent upon us to break free from the existing symptom-based paradigm as it relates to the interceptive treatment of preadolescent patients. Further, we must shift the paradigm to one that focuses on diagnosing and proactively treating the etiology of the malocclusion.

Big teeth vs. small jaws

Dental crowding is one of the most common issues seen in our preadolescent patients. While crowding is technically defined as an inconsistency between tooth size and arch dimension, that simple definition says nothing about the etiology of the condition. In other words, is the crowding the result of teeth that are too big for the dental arch, or a dental arch that is too small to accommodate the teeth? Numerous studies have been published over the past 60 years in support of the latter.

In 1964, Mills concluded that the etiology of crowding was most often narrow arches, because little variation exists between crown diameters of persons with and without malalignment.[2] In 1981, McKeown reported that arch width and

crowding are strongly correlated and concluded that a narrow arch predisposes one to crowding of the teeth.[3]

In 1983, Howe, McNamara and O'Connor found no significant differences in tooth sizes between crowded and noncrowded groups, regardless of whether tooth size was compared individually or the mesiodistal sums of all the teeth in the arch were used.[4] Additionally, in 2018, Indriyanti and colleagues found the primary predisposing factors of crowding to be intercanine width, first primary intermolar width and alveolar arch width.[5]

It's all connected

The interconnectivity of structures of the craniofacial complex was recognized in the early 20th century. In an article published in 1928, Holtzman acknowledged the important roles the tongue and cheeks play in the development of normal arch width. Holtzman stated: "The normal action of the tongue and cheeks is in a great measure responsible for the shape of the arch. When the mouth is closed, the tongue lies in the floor of the mouth and the force of the atmospheric pressure sucks the dorsum of the tongue against the hard palate. This flattens the roof of the mouth. As the teeth erupt, the pressure of the sides of the tongue pushes them outward until the force is equaled by the inward pressure of the lips and cheeks."[6]

Research on craniofacial growth and development published in the 1960s further substantiated this concept. In 1962, Melvin Moss introduced the Functional Matrix Theory, which states that form follows function and, as such, the functional demands determine the final shape of osseous structures in the head and neck. This has also been referred to as "compensatory growth."[7]

In 1966, Enlow declared that the growth of the facial region is linked to that of other structural components and any alteration of one part of the craniofacial complex produces an equal alteration in another part, which in turn creates a functional imbalance.[8]

It is essential that orthodontists be aware of the environmental factors that contribute to this functional imbalance and subsequent compensatory growth in our preadolescent patients.

The role of the airway in the development of malocclusion

In the late 1970s and early 1980s, Harvold studied the impact of nasal passageway obstruction on the facial growth and development of rhesus monkeys.[9,10] Harvold found that monkeys who had silicone stuffed deep into their nasal cavities for six months developed narrower dental arches and more vertical facial growth than monkeys without obstruction. He then extended the trial period to two years and the results were even more profound, which led him to conclude that patients who are mouth breathers have more severe malocclusions, especially as it relates to transverse discrepancies and dental crowding.

While kids don't typically have silicone stuffed in their noses, many children do suffer from obstruction of the nasal passageways secondary to allergic rhinitis (AR). AR is the most common immune-mediated disorder in childhood, and it's estimated that AR affects up to 40% of children.[11] AR causes turbinate hypertrophy (TH), which can obstruct the nasal passageways; in fact, a 2019 study of 544 children between the ages of 3 and 10 found that the prevalence of TH in children with AR was 81%![12] If AR affects 40% of children and 81% of those affected have TH, we can assume that approximately one out of every three of our preadolescent patients is experiencing some degree of nasal obstruction from turbinate hypertrophy.

Furthermore, in school-age children, the prevalence of adenoid hypertrophy was reported to be 34.46%[13] and the prevalence of tonsillar hypertrophy was found to be 11%.[14] This hypertrophy of the lymphoid tissue often leads to upper airway obstruction with sleep-disordered breathing that ranges from mouth breathing, snoring and upper airway resistance syndrome to severe obstructive sleep apnea.[15]

When nasal breathing is obstructed, the nasal passageways and sinuses become underused and underdeveloped, leading to increased mouth breathing, further restriction of transverse development of the dental arches, and insufficient space for the tongue. The tongue is then forced inferiorly and posteriorly, where it can constrict the oropharyngeal airway and worsen the mouth breathing, especially when the patient is lying in a supine position.[16]

As the mouth breathing and snoring worsen, the transverse development of the arches continues to restrict. The modern soft diet and resulting weak tongue further exacerbate this negative cycle of aberrant facial growth (often referred to as "masticatory adaptation"),[17–23] exemplifying the interconnectivity described by Moss and Enlow many decades ago. We see this every day in our practices when young patients present with narrow arches and significant dental crowding.

The solution

Our traditional approach to the treatment of the aforementioned patient is one where treatment decisions are based upon the symptom (i.e., crowded teeth). Instead, we need to shift to a treatment approach that focuses on the etiology (i.e., narrow arches secondary to environmental factors). As such, our priority must be to address the environmental factors contributing to the malocclusion and normalize arch width, especially in the anterior and middle thirds of the arch.

Sample case

Let's look at this patient, 8 years and 10 months, who presented with the mother's chief complaint of "crowded teeth." The patient is Class I with a relatively normal OB/OJ and no posterior crossbite, yet she has moderate-severe anterior crowding and the maxillary canines are erupting toward the roots of the lateral incisors (Figs. 1–4). Our airway questions confirmed that she is a mouth breather and snorer, but the adenoids appear normal on the ceph and the palatine tonsils are not enlarged.

FIG. 1

FIG. 2

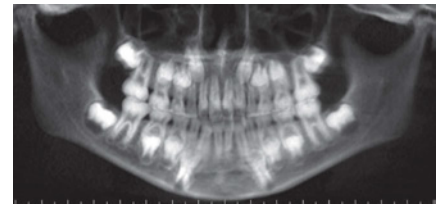


FIG. 3

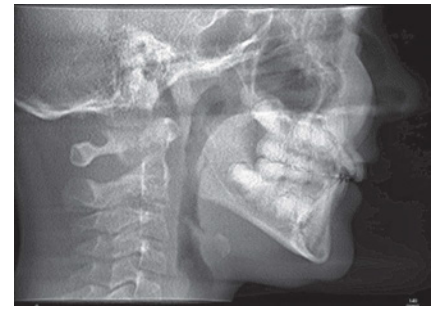
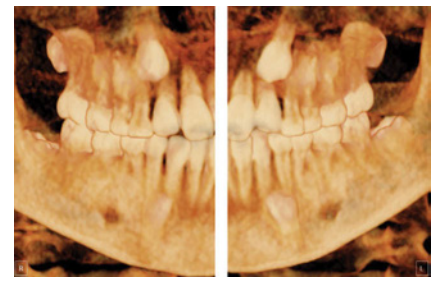


FIG. 4



The existing paradigm says to base your treatment decisions on the management of the crowding/symptom. As a result, a common treatment plan would look something like this:

- Immediately send patient for extraction of all C's.

- Monitor the patient periodically until she is in late-mixed dentition.
- If she "grows well" and you think you can preserve enough arch length to accommodate the permanent teeth, insert space maintainers in the late mixed dentition in an effort to preserve the e-space and treat the case non-extraction.
- If she doesn't "grow well" and crowding becomes severe, extract four premolars.

Yet does preserving e-space or extracting premolars address the actual etiology? In other words, is the etiology of her crowding loss of arch length and/or large teeth? As you look past the teeth, you'll notice that she has narrow, V-shaped arches, large buccal corridors, a high/vaulted palate, a vertical growth pattern, insufficient space for the tongue, "tired eyes" with allergic shiners (indicative of atopy), erythematous gingival margins in the maxillary anterior sextant (or "chapped gums," as I like to say), and adherent plaque on the incisors—the latter two being symptoms of mouth breathing/snoring.

A low-dose CBCT is an invaluable diagnostic tool that allows us to obtain significantly more information than traditional 2D imaging. While it confirms that there is no obstruction of the nasopharynx (Fig. 5), we detect moderate turbinate hypertrophy in the nasal passageways (Fig. 6) and significant restriction of the oropharyngeal airway space (Fig. 7), providing us with a better understanding of the etiology of the presenting malocclusion.

Using this information, we can develop a treatment approach that addresses the etiology:

- Refer patient to the allergist for evaluation of turbinate hypertrophy and atopy.
- Place bite ramps and full braces with broad archwires to develop the arches, normalize arch width and create space for the tongue and the permanent teeth (Fig. 8).
- Retain with Essix C+.

Figs. 9–13 show the results that were achieved in just 14 months after only six adjustment visits (eight total visits including bond and debond). Notice the resolution of the crowding as well as the redirection of teeth #6 and #11 away from the roots of the permanent lateral incisors. Further, notice the improvement in both the interincisal angle and lip fullness relative to Rickett's E-plane. Amazing changes were also achieved in her facial aesthetics, tongue space, tired eyes, and allergic shiners (Fig. 14). Which child do you believe looks healthier?

FIG. 5

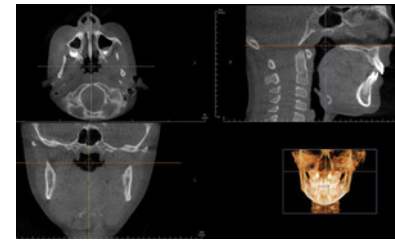


FIG. 6

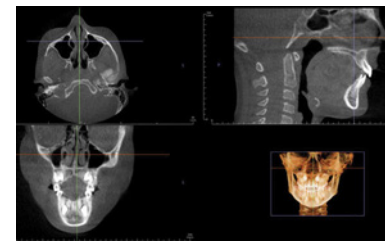


FIG. 7

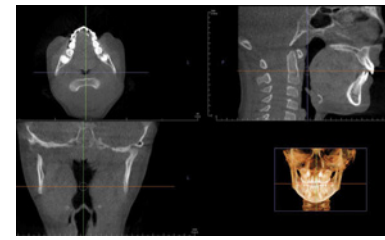


FIG. 8

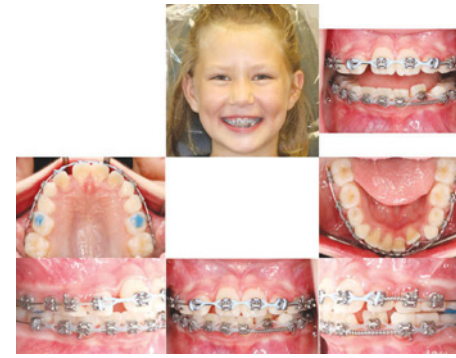


FIG. 9

FIG. 10

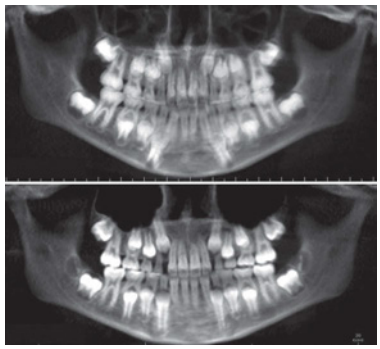


FIG. 11

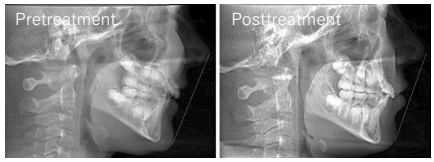


FIG. 12

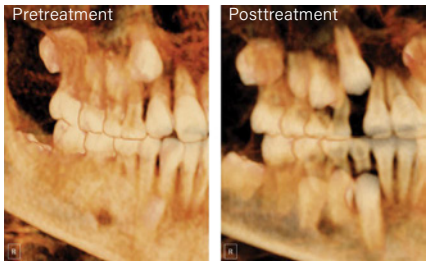


FIG. 13

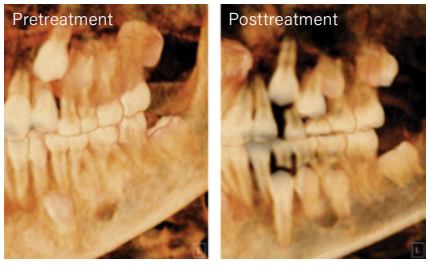
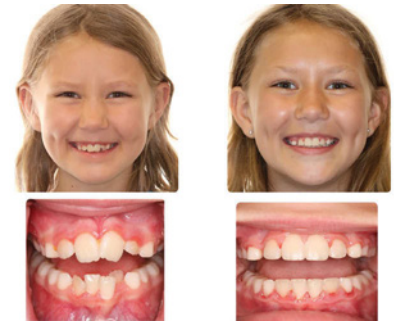


FIG. 14



The occlusal pictures (Figs. 15 and 16) demonstrate that the braces and wires achieved our objective of minimal expansion across the posterior teeth and significant expansion in the middle and anterior thirds of the arch, and the coronal CBCT slices (Figs. 17–21) show the magnitude of those changes. Furthermore, Fig. 18

FIGS. 15 AND 16

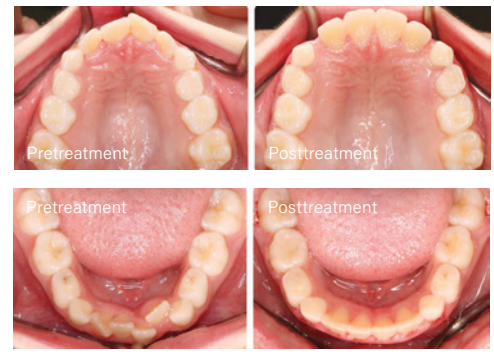


FIG. 17

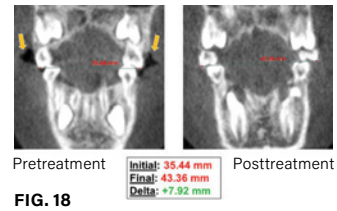


FIG. 18

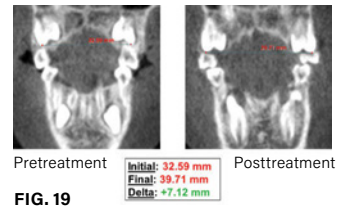


FIG. 19

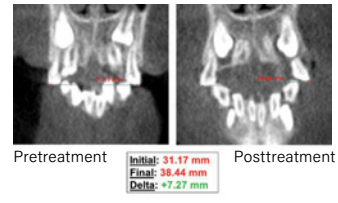


FIG. 20

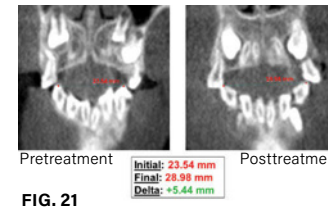
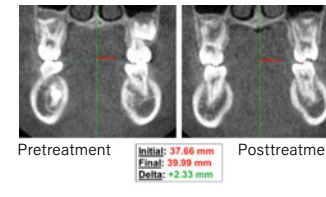


FIG. 21



demonstrates the reduction in the height of the palatal vault, the increase in tongue volume and the reduction of the buccal corridors.

Regarding the airway, the allergist diagnosed her with seasonal allergies and placed her on a steroid nasal spray and Zyrtec taken as needed. You can see the improvement in the nasal passageways in the posttreatment CBCT slice (Fig. 22) and the significant increases in total airway volume and minimum area (Fig. 23). The combination of managing the allergies and creating space for the tongue caused the mouth breathing and snoring to completely resolve. That's the power of treating the etiology versus managing the symptoms. We truly changed this little girl's life!

Lastly, the Phase I retention photos (Fig. 24), taken more than a year after the debond, demonstrate that the orthodontic results are beautifully stable when maintained with only Essix C+ retainers. Further, the mouth breathing and snoring have not returned.

In reviewing this case, it is important to consider the following questions: Which if any of the changes we made would have been achieved had we treated her in accordance with the existing paradigm described above? Would

FIG. 22

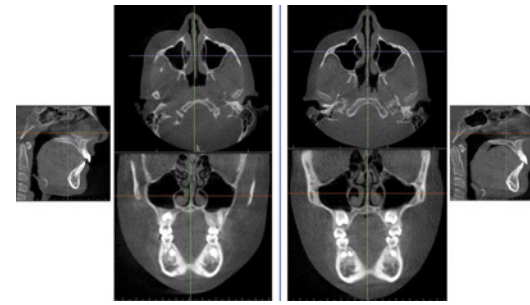


FIG. 23

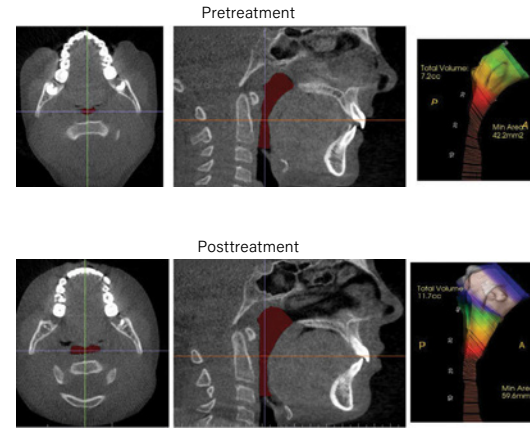
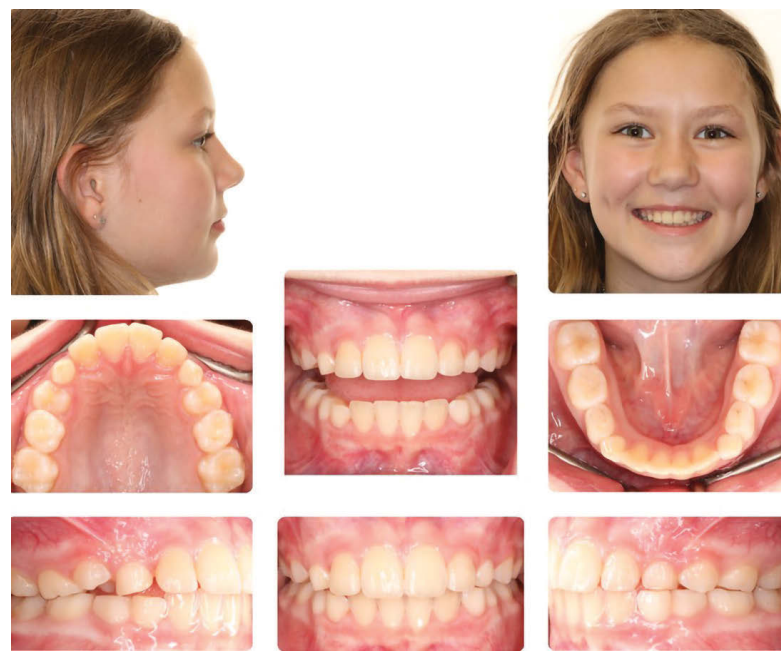


FIG. 24



she have stopped mouth breathing and snoring? Would her allergies have improved? Would her tongue space have increased? Would her canine eruption pattern have normalized? Would her soft-tissue profile have improved? Would her smile aesthetics have improved so significantly? Would her self-confidence have improved? I contend that the answer to all these questions is a resounding "no."

Patients, parents, team members and doctors love this approach, and incorporating it into your practice will allow you to change more lives and find more joy in the treatment of preadolescent patients than you imagined possible. It is time to embrace the new paradigm!

In the next course, we'll explore why slow expansion with braces and wires is a superior approach to RME in preadolescent patients, as well as present additional cases treated with this approach. **OT**

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Stay tuned for Part 2

In Part 2 of this series, Dr. Michael K. DeLuke will explain the drawbacks to some of the typical approaches many orthodontists would take to treat cases similar to the one in this article, and share additional case studies that illustrate a more effective way of treatment.

Dr. Michael K. DeLuke is a board-certified orthodontist who received his specialty training at the University of Connecticut. DeLuke practiced for 18 years at DeLuke Orthodontics before retiring from private practice to teach full time. He has served as a faculty member at several hospitals and orthodontic residencies, including as the cleft-craniofacial orthodontist at Albany Medical Center in New York.

DeLuke recently founded DeLuke Orthodontic Coaching (DOC), an ADA-CERP-recognized provider. He also created *The DOC Podcast* to help his colleagues attain the highest level of personal, professional and financial success. DeLuke is a fitness enthusiast and former boxer who still actively trains. He resides in Naples, Florida, with his wife and two teenage daughters.

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1. **Thomas Kuhn hypothesized that a paradigm shift in science occurs when someone comes along and demonstrates that the old approach is no longer valid.**
   A. True.
   B. False.

2. **Dental crowding can best be defined as when:**
   A. The teeth are too big for the jaws.
   B. The jaws are too small to accommodate the teeth.
   C. There is an inconsistency between tooth size and arch dimension.
   D. Both A and B.

3. **A 1983 article by Howe, McNamara and O'Connor found:**
   A. Tooth widths were larger in patients with crowding.
   B. Tooth widths were smaller in patients without crowding.
   C. No significant differences in tooth sizes between crowded and noncrowded groups.
   D. Differences in crowding when tooth size was compared individually or mesiodistal sums of all teeth in the arch were used.

4. **In which decade did Holtzman recognize the important role that the tongue and cheeks play in the development of normal arch widths?**
   A. 1920s.
   B. 1950s.
   C. 1970s.
   D. 1990s.

5. **The Functional Matrix Theory states that:**
   A. Function follows form.
   B. Small dental arches are the primary cause of dental crowding.
   C. Form follows function.
   D. The tongue has weakened as a result of the modern soft diet.

6. **Who stated that growth of the facial region is linked to that of other structural components and any alteration of one part of the craniofacial complex produces an equal alteration in another part which, in turn, creates a functional imbalance?**
   A. Moss.
   B. Enlow.
   C. Harvold.
   D. Corruccini.

7. **Harvold's studies in the late 1970s and early 1980s demonstrated that blocking the nasal passageways of rhesus monkeys led to:**
   A. No change in dental arch width.
   B. Broader dental arches and more vertical facial growth.
   C. Narrower dental arches and more vertical facial growth.
   D. Narrower dental arches and less vertical facial growth.

8. **The most common immune-mediated disorder in childhood is:**
   A. Allergic rhinitis.
   B. Tonsillar hypertrophy.
   C. Turbinate hypertrophy.
   D. Chronic sinusitis.

9. **The prevalence of turbinate hypertrophy in patients with allergic rhinitis is estimated to be:**
   A. 21%.
   B. 41%.
   C. 61%.
   D. 81%.

10. **The new paradigm in the interceptive orthodontic treatment of preadolescent patients is one that focuses on treating:**
    A. The airway.
    B. The symptom.
    C. The etiology.
    D. All of the above.

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