Dear Friends,

We at Ormco are proud of the fact that so many of the advanced technologies utilized in orthodontic practices around the globe today originated through the research and development efforts of our engineering staff along with guidance from many fine clinicians. We can also boast about leading the profession in the ongoing development of innovative products. Of course, we continue to be excited about the ease and quality of results of the Damon System appliance, which in the last three years alone has sold nearly one million cases. Along with having maximized the functionality of the Damon appliance and made it a fully integrated system, we recently celebrated the 10th anniversary of the Damon System by introducing the much-anticipated metal version – Damon 3MX.

Self-ligation, however, represents only one treatment option. With highly regarded clinicians around the world continuing to garner excellent results from conventionally ligated appliances, Ormco’s forward-thinking R&D professionals maintain preeminence in that arena as well, applying the most advanced technologies to appliances that allow you to treat the full range of orthodontic challenges.

ICE, the only completely clear bracket on the market today, now offers functionality that rivals its metal counterparts. The investment made in developing and refining the complex technology of this superior esthetic appliance is unprecedented. The process starts by culturing synthetic sapphire in a lab and concludes with an extensive and sophisticated heat-treatment process. And that’s just one of the engineering marvels on which we’ve been working for your benefit.

To Titanium Orthos, still the only appliance developed using 3-D laser scanning from research on human dental anatomy, we’ve added titanium buccal tubes (making TiOrthos a complete 7-7 system) and a full complement of differential torques that will make tailoring treatment simple.

Slated for release in 2006 comes Insignia, the first custom-designed bracket system in orthodontics that represents the ultimate in patient-specific treatment. Virtual 3-D treatment planning (which you co-direct) drives the machining of this totally individualized appliance with torque, tip and rotation cut precisely for each patient. Such advanced technology results in more-efficient tooth movement that results from a treatment plan customized to the needs of you and your patient.

The latest addition to our non-appliance line is Blugloo, a color-on-demand adhesive that will greatly ease the once onerous task of bracketing and banding cleanup.

As Dr. Tagawa mentions in his article, Ormco is also committed to professional development; for example, the Damon Forum slated for January 12 to 14, 2006, in Palm Springs and the Gorman Institute which will be held in November 2006. To keep abreast of Ormco’s many continuing education opportunities, visit www.ormco.com.

Indeed, Ormco has a distinguished history of innovation – all focused on increasing patient comfort and simplifying treatment protocols while maximizing efficiency and the quality of your treatment results. As we work diligently to improve the armamentarium at your disposal, you continue to improve patient care and the health and self-esteem of patients worldwide. This partnership has advanced the orthodontic profession for more than 45 years. Here’s to 45 more.

Best regards,

Dan Even
President, Ormco Corporation

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Clinical Impressions Welcomes Articles

Articles written by clinicians around the globe have been the lifeblood of Clinical Impressions for the last 12 years. Through these years the profession has witnessed tremendous advances in materials and appliance design. Clinical Impressions has been an important avenue for documenting and supporting those advances.

If you’re interested in having an article you’ve written considered for publication, simply E-mail us at ci@sybrondental.com. If you have a concept for an article, you may use this means to submit an outline of that concept. Someone from Clinical Impressions’ editorial staff will then contact you about taking the process further, providing writing and editorial support as needed.

We look forward to partnering with you to continue the important tradition of this clinician-driven publication.
A Patient-Centered Practice

Larry W. White, DMD, MSD
Editor, Clinical Impressions
Dallas, Texas

In 1997, Derick started using the Damon System and happily discovered that he could space patient appointments out as far as 8 weeks – a plus for everyone. This allowed him to see 38% fewer patients each day while making scheduling more convenient for them. This benefit reduced overbooking problems, the after-school rush and simultaneously reduced the stress on the doctor, staff and patients. It also gave him scheduling flexibility to adjust for unforeseen personnel changes and more opportunity for seeing new patients. Moreover, Dr. Tagawa has been able to keep patients on schedule and reduce their treatment visits by nearly 50%. The Damon System has also led to fewer extraction therapies, improved patient oral hygiene, better treatment results and reduced post-adjustment discomfort for patients.

While the average orthodontic practice in the U.S. has shown decline, Dr. Tagawa’s practice has grown over 14% and a great deal of credit must be given to the increased satisfaction his patients have received over the past few years. His adoption of the Damon System interferes less with his patients’ lives, gives them predictable, satisfying outcomes and discomforts them less during treatment. I can’t think of a more patient-centered approach than this. Now that Derick has experienced the benefits of the Damon System for himself, his staff and his patients, he has been heard to say that if he had to go back to a conventional twin appliance that he would retire instead.

Most orthodontists, by training and tradition, have a product-oriented viewpoint that prevents them from looking beyond their own needs. But if they expect to have success in the future, they will need to change this traditional approach and become totally patient-centered or learn to be happy with smaller practices and incomes.
I began using the Damon System in 1997 and initiated a detailed study soon thereafter to compare a number of key treatment indicators with the conventional straight-wire appliance I had been using up to that time. I felt that if I were going to transition to this passive self-ligating appliance, I owed it to myself, my staff and my patients to be able to quantify improvements in treatment time and quality of results, if any. I had originally thought that I would start two months’ worth of patients in Damon, return to my original appliance for the duration of the study and then make a judgment about the difference between the two systems. The initial results of the study were so impressive that I made the decision to transition fully to the Damon System immediately and never resumed treatment with conventional braces.

Without doubt, orthodontists can and do achieve excellent results using a variety of techniques; however, my use of the Damon System has resulted in achieving consistently excellent results with relative ease and speed and with greater patient comfort and convenience. The Damon System has also helped me reduce my daily patient load while simultaneously enhancing the bottom line of my practice. In fact, the Damon System has made such a dramatic difference in my practice and the quality of care I provide for my patients, I can state unequivocally that if I were forced to go back to using traditional braces, I’d probably retire.

Sharing My Study and Experience
My staff and I completed the study that we started with the Damon System and, quite pleased with the results, filed it away. Then, in reviewing the 2003 biennial practice management survey results of the Journal of Clinical Orthodontics (JCO),1 I referred to the study again (along with my latest practice statistics) and was surprised to see just how well my practice had fared versus the survey’s “high net income practices” over the same period. While the survey practices showed a decline in growth or no growth, my practice experienced 14.2% growth during the same period. (In fact, practice growth in that survey was reported to be its lowest since 1991.) Along with the double-digit growth we enjoyed, we simultaneously reduced our appointment load by 38% (Figure 1).

Although Damon brackets cost more than conventional brackets, such costs are more than offset by the significant increase in productivity and the significant decrease in the number of ancillary appliances (headgear, RPEs, etc.) required. With the Damon System, our practice is far more profitable due to the fact that we’re now finishing cases an

<p>| Figure 1. Damon Productivity Increases |
|------------------|------------------|------------------|------------------|</p>
<table>
<thead>
<tr>
<th>Patients Per Day</th>
<th>Before Damon</th>
<th>With Damon</th>
<th>Diff.</th>
<th>Practice Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>78</td>
<td>48</td>
<td>-38%</td>
<td>+14.2%</td>
</tr>
</tbody>
</table>
average of seven months faster and with far fewer appointments. In addition, our no-shows and cancellations dropped by 44% – no small feat.

The JCO survey also indicated that median case starts had declined for the first time since the survey began in 1981 with clinicians reporting that they were less optimistic about the prospects for future growth than in any study since 1987. My staff and I had obviously had a different experience and felt extremely positive about the future. I commented on these ideas to some of my study club colleagues, citing my transition to the Damon System as the basis for the favorable comparisons and mentioning the study statistics I had garnered a few years earlier. One thing led to another and I was asked to speak at the annual meeting of the Pacific Coast Society of Orthodontists (PCSO) and then the Damon Forum. It was at the Damon Forum that Dr. Larry White asked me to document my study for this article in Clinical Impressions. While the study is a few years old and done with the original Damon SL appliance, the benefits of transitioning from a conventional appliance to the Damon System are clear. Given the improvements to the Damon System over the last few years and my increased proficiency, were I to be making the change today, the study results might be even more impressive.

**Study Methodology**

The objectives of the study were to compare a number of key treatment indicators of conventional brackets with the Damon System. The study included 66 consecutively treated Damon patients (my first 66) and 66 consecutive patients I had just started in treatment with conventional brackets. I made no distinction regarding the difficulty of the malocclusion, the Angle classification, whether the treatment plan included extractions or any other consideration besides the fact that all patients included in the study were fully bonded cases. Patients were surveyed and evaluated at each appointment and at the completion of treatment.

The collected data determined total treatment time, total number of treatment appointments and intervals required, arch-leveling time, patient discomfort, and quality of results. Figure 2 provides an overview of the scope of the study and the results, which is followed by a discussion of each of them.

**Figure 2. Tagawa Comparative Study**

<table>
<thead>
<tr>
<th></th>
<th>Damon System N=66</th>
<th>Conventional Brackets N=66</th>
<th>Change No.</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Total Treatment Time (Months)</td>
<td>20.3</td>
<td>27.5</td>
<td>-7.2</td>
<td>-26.2</td>
</tr>
<tr>
<td>B. Number of Tx Appointments</td>
<td>16.2</td>
<td>31</td>
<td>-14.8</td>
<td>-47.7</td>
</tr>
<tr>
<td>C. Appointment Intervals (Weeks)</td>
<td>6-8</td>
<td>4-6</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>D. Arch-Leveling Time (Months)</td>
<td>3.2</td>
<td>6</td>
<td>-2.8</td>
<td>-46.7</td>
</tr>
<tr>
<td>E. Patient Discomfort (0 = Low, 10 = High)</td>
<td>1.3</td>
<td>4</td>
<td>-2.7</td>
<td>-67.5</td>
</tr>
</tbody>
</table>

**A. TOTAL TREATMENT TIME. Defined as the time from the initial bonding until the fixed appliances are removed.**

Total treatment time for the Damon System patients averaged 7.2 months less than those patients who were treated with conventional braces. The Damon cases took an average of 20.3 months versus 27.5 months for the conventional cases, a difference of 26.2% (Figure 3). Eight years later with greater trust and proficiency in the Damon System, improved bracket design and an ever-increasing number of Damon-specific tools at my disposal, not only has overall treatment time benefited but cases requiring extractions are also down considerably. Because of the posterior transverse arch adaptation afforded through the Damon System, patients whose crowded arches would previously have dictated extractions can now be treated maintaining their full dentition.

Jim Collins writes in his book, Good to Great, that “Good is the enemy of great. We don’t have great schools, principally because we have good schools. Few people attain great lives because it is just so easy to settle for a good life. The vast majority of companies never become great because the vast majority become quite good – and that is their main problem.” Dr. Tagawa always had a good practice. Now he has a great practice. His is an interesting story of good to great.

— Dr. Larry White
B. NUMBER OF TREATMENT APPOINTMENTS. Defined as all appointments from bonding to appliance removal, including emergency appointments.

Patients treated with the Damon System required an average of 14.8 fewer appointments than patients treated with conventional braces. The Damon cases required an average of 16.2 appointments versus 31 for the cases treated with conventionally ligated appliances, a difference of 47.7%.

Incorporating treatment protocols specific to a passive self-ligating system and doctor-time scheduling have continued to reduce the number of treatment appointments required without sacrificing treatment quality or patient service. Some of the protocols I have found most helpful for eliminating appointments are these:

- Educating patients to eliminate nonemergency appointments that they perceive as crises (i.e., wire pokes).
- Bonding maxillary and mandibular second molars at the bonding appointment.
- Using .013 or .014 Copper Ni-Ti® for initial leveling.
- Taking a progress panoramic radiograph after the last Copper Ni-Ti wire and repositioning brackets as needed before progressing to the first stainless steel archwires.

Versus the years when I used conventional brackets, my staff and I:

- See 38% fewer patients each day, which makes scheduling more convenient for everyone
- Stay on schedule more easily and still meet formidable practice goals
- Have fewer overbooking problems
- Have significantly reduced stress
- Have fun-time to spend with each patient
- Can communicate the schedule to the entire staff at any moment during the day
- Accommodate personnel changes from increased scheduling flexibility
- Experience a smoother, faster and easier new-staff training period
- Accommodate new patients and long appointments after school, when appropriate
- Have dramatically reduced the after-school rush

D. ARCH-LEVELING TIME. Defined as when all rotations have been corrected and the first rectangular wire is ready to be placed.

It took an average of 6 months for patients with conventional brackets to level while Damon System patients took 3.2 months (Figure 5). In fact, 90% of the Damon System patients leveled in 4 months or fewer (Figure 6). Reducing the time to level the
arch and correct rotations by over 40% as we were able to do with the Damon System is important on a number of levels. From a clinical standpoint, the earlier we correct the more gross aspects of a case, the more time we have to address the finer points of tooth positioning and major mechanics.

In terms of patient satisfaction and marketing via patient referrals, the advantage of reduced leveling time with greater patient comfort is also significant. Practice management consultants will confirm the fact that patients are most likely to refer friends and family during two critical periods – during the first few months of treatment and for a period soon after their braces are removed. When patients see their teeth unraveling so quickly with little or no discomfort, they become excited and eagerly share their positive experiences with family and friends, which naturally leads to a significant increase in patient-generated referrals – to me, the best kind of referral there is. Patients drive by the offices of other orthodontists to receive their treatment from our practice, which is certainly a testament to the benefits of treatment with the Damon System.

I surmise that the dramatic difference in reported pain by the Damon System patients is due to:

- The use of lighter forces
- The use of thermally activated Copper Ni-Ti archwires that function over longer activation periods
- Vastly reduced friction between the archwire and the bracket slots, which distributes pressure more evenly throughout the entire arch and less on individual teeth
- Ease of archwire insertion, which requires less force to place archwires into the bracket slots

As opposed to the open face of a typical twin bracket (with steel ties when required), I saw less frictional irritation on the lips and cheeks of Damon System patients because of the bracket’s smooth covering. Although I did not measure it in this study, the oral hygiene of the Damon System patients seemed to improve throughout treatment as well.

Damon Provides Exceptional Treatment Quality

Being in practice for over 30 years, I felt that my experience in having treated thousands of patients with conventionally ligated appliances served as a strong basis for comparing those results with the results of the patients treated with the Damon System.

I graded the results of the Damon System patients on a 4-point scale (4 = excellent, 3 = good, 2 = fair, 1 = poor), taking into consideration the following factors: occlusion, alignment, facial esthetics, dental esthetics, TMJ condition and periodontal health. I did not compensate scores for variables such as poor patient cooperation, skeletal complications, etc.

One of the things that intrigues me most about Damon System treatment is that each patient’s result is unique to them. We shape the final archwire according to the arch adaptation achieved from the initial nickel-titanium wires so each arch form is patient-specific. It’s a truly remarkable concept.

– Debbie Thomas, Office Manager, former clinical assistant, 31 years in dentistry/orthodontics.
severity of the malocclusion, patient age, refusal to accept the recommended treatment plan or the cessation of therapy before completion, etc. With this 4-point scale, 90% of the Damon System patients’ scores ranged from 3 to 4, which averaged 3.6 (Figure 8). I had such a favorable experience with the low-force Damon System therapy for nonextraction treatments that many more patients now receive this nonextraction therapy despite the increased severity of the crowding and/or malocclusion.

We change your smile...You change the world!

Orthodontists the world over pride themselves in the care they offer patients and we are no exception. Having strict standards for high-quality results, a friendly, capable staff and flexibility in meeting patients’ needs are only part of the equation. With the Damon System, I feel that I can provide high-quality results consistently and predictably and do so easily and comfortably. I have elevated the standard of care I provide beyond anything I could ever accomplish using a conventional bracket system. Overall, it’s a simple change and the rewards are extremely gratifying for me, my staff and my patients.

Figure 8. Damon System Quality

<table>
<thead>
<tr>
<th>POOR</th>
<th>FAIR</th>
<th>GOOD</th>
<th>EXCELLENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Dr. Tagawa poses with his former patient Marissa Elkin whose beautiful new smile will take her a long way in making his vision statement – We change your smile, you change the world – a reality.

Turning Emergencies into a Positive Experience

Many of the emergency appointments that we experienced during the initial study with the Damon System were due to a lack of clinician experience with the system and failure of the original Damon bracket slide coverings. The new Damon appliance configuration is vastly more dependable.

Currently, our rate of emergencies stands at a mere 2.09% and the majority of them derive from distal wire ends poking the mucosa, and we’ve even turned wire pokes into a positive experience.

Part of our consultation during the bracket placement appointment includes creating the expectation that wire pokes mean rapid and successful tooth movement. Sometimes wire pokes require an additional trip to our office and we turn those unscheduled appointments into little mini celebrations.

Clinicians can reduce emergency appointments by adhering to these recommendations:

• Follow the Damon System protocols precisely. Dr. Damon has spent appreciable time in determining Best Practices for the system, and with the latest ancillary products, treatment is efficient and predictable and results are consistent.
• Effectively educate patients about archwire sliding that can make archwires protrude from the tubes, turning an emergency into a positive experience.
• Use Damon archwires with preloaded stops.
• Pay careful attention to the placement of archwire stops, following the Damon protocol.
• Tie back all stainless steel archwires.

When I saw how quickly rotations worked out with the Damon, I was convinced to learn what the Damon System was all about.

– Erin Rudnt, Clinical Assistant 30 years in orthodontics
Unparalleled Clinical Support for Damon System Users

Orthodontists who are considering making the change to the Damon System will find unparalleled support in terms of learning the simplified protocols and pearls specific to this low-friction, low-force concept. My experience with the Damon System has been incredibly positive and is due in no small part to the ongoing assistance fromOrmco and Damon Study Clubs that are available for practitioners of this philosophy of treatment. The Damon Forum, now held every January in Palm Springs, has grown to be a large, focused gathering of like-minded clinicians who get together informally to share case challenges and solutions between formal presentations and again late in the day over convivial refreshments. Damon Study Clubs abound worldwide. There is a plethora of seminars that Drs. Damon and Bagden give each year (with six additional planned in the U.S. and Canada in 2006), and IntelliDENT’s Damon Training Center in Athens, Georgia, offers a number of practical, hands-on courses annually. In my tenure as an orthodontist, I have never felt so much opportunity for collaboration and learning.

Conclusion

The Damon System has increased the efficiency, effectiveness and comfort of my orthodontic therapy. Treatment times have decreased dramatically and initial leveling of the arches occurs with exceptional speed and comfort. These efficiencies, combined with the convenience of 10-week appointment intervals and the reduced need for extraction therapy, compel patients to travel long distances to receive the benefits of the Damon System from my practice. Additional evidence of enthusiastic patient acceptance is the substantial increase in the number of patient referrals. The Damon System has also made staff training easier and reduced the number of in-depth skills that employees need to succeed. It has dramatically reduced the number of patients we see each day while simultaneously improving the quality of our results and the profitability of our practice. In short, the Damon System has provided me with the tools necessary to take my practice from good to great.

Reference

Richard Eastham, DDS, MSD
Bellingham, Washington

A beautiful and esthetic orthodontic treatment is exemplified by a balanced face. Accomplishing such balance requires treatment planning that considers both soft and hard tissues. This article emphasizes correct positioning of the maxillary central incisors as the foundation of treatment planning from three main aspects:
1. AP position of the dentition and hard-tissue convexity as it relates to the facial soft tissue
2. Inclination of the maxillary incisors as they relate to the soft-tissue facial plane
3. Arch form as it relates to the soft-tissue profile

The above three features have particular relevance in the decision to extract or not extract teeth. In two articles of the American Journal of Orthodontics, Holdaway1, 2 wrote extensively about facial balance. He said, “Orthodontic treatment goals based solely on hard-tissue analysis may require excessive retraction of the upper incisors in many cases.” Obviously, excellent occlusions often resulted when clinicians used hard-tissue analyses exclusively, but compromised profiles resulted so often that Holdaway felt an approach that emphasized soft tissue would benefit patients and doctors more.1, 2

Holdaway links hard- and soft-tissue analysis in his comment, “Observations indicate that as the skeletal convexity increases, so also does the convexity of the soft-tissue profile...” He warns that, “Hard-tissue analysis alone is inadequate in treatment planning.” As a former teacher of Tweed analysis and treatment, he writes, “Neither the Tweed approach nor the APo line gave any warning of possible disastrous effects of retracting the upper anterior teeth.”1, 2

Figure 1 illustrates the H angle, a measurement in degrees of the H line (Po to maxillary lip) to the soft-tissue facial plane (Po to soft-tissue nasion). Ideally 10°, it ranges from 7° to 15° [sic]. However, as the hard-tissue convexity increases or decreases in millimeters from a hard-tissue facial plane of 0 mm at A point, the H angle will increase or decrease from 10°. Therefore, no single ideal H angle exists; i.e., it will vary as required for individual patients.1

Holdaway also points out the importance of the soft-tissue facial angle; i.e., the angle of the soft-tissue facial plane (NaPo to Frankfort Horizontal. He considered this angle more diagnostic than the hard-tissue facial plane angle (NaPo to FH) because of the variability in thickness of the soft-tissue chin. He considered the ideal soft-tissue angle as 90° to 92°.
In June 2002, I presented a paper to the Northwest Angle Society on the relationship of the maxillary incisor to the soft-tissue facial plane. I identified the labial surface of the maxillary incisor as a way to identify proper inclination and how to relate it to soft tissue.3

Figure 2 shows the relatively flat surface of the maxillary central incisor at its incisal 2/3 and illustrates the LaU1 line. Figure 3 identifies the process/objective of the Eastham study, and Figure 4 shows the collected sample used. All of the measurements in this study came from the head films of satisfactorily treated orthodontic and orthodontic/surgical patients. Figure 5 illustrates the findings and the angles measured and shows a nearly parallel relationship of LaU1 to the soft-tissue facial plane (NaPo) with a mean of -0.8° plus or minus 1.8° and soft-tissue NaPo to FH of nearly 90° (89.9° plus or minus 1.4°) as stated by Holdaway. Of the nearly 250 patients from six different groups, none showed any statistically significant difference relative to the soft-tissue facial plane angle or of the maxillary incisor angle to soft-tissue facial plane.

The three patients on pages 12-15 show different facial types and their treatments planned around the maxillary incisors and midface. With these patients, I want to emphasize:

1. The value of using the Holdaway angle as it relates to hard-tissue convexity
2. The importance of the maxillary central incisor inclination relative to the soft-tissue facial plane
3. The effect of transverse adaptation on arch length and the resultant profile

The increased transverse widths of these patients occurred through soft-tissue adaptation by using low forces with nickel-titanium superelastic wires and Damon 2 passive self-ligation brackets. Treatment plans based on the three features enumerated above may help create better balanced faces and dentitions that will age more gracefully than those treatment plans considering only hard-tissue analyses. 4

REFERENCES
PATIENT 1 – EASTHAM

Pretreatment/Treatment Plan
Patient 1 is a female, 12 years 4 months old, who presented with slight facial procumbency, crowding and narrow maxillary and mandibular arches. The cephalometric tracing shows that she had an H angle of 16° with 4 mm of convexity. Her ideal H angle would be 14°. Her maxillary incisors showed good inclination by being parallel to soft-tissue NaPo. I treated her non-extraction with the Damon System appliance.

Transverse Adaptation with Three Wires
Her maxillary transverse adaptation occurred primarily with the first three wires; i.e., .014, .018 and .014 x .025 Damon Align SE Ni-Ti wires. With the exception of the initial .014 wire, she had photos taken at the beginning of each appointment before wire changes. The maxillary and mandibular arch forms established with Ni-Ti wires at 22 weeks were maintained with Damon arch form finishing wires.

Posttreatment
Posttreatment records demonstrate the balanced facial and dental results. The final cephalometric tracing illustrates the ideal H angle of 14°. The occlusal photographs tracing the buccal cusp tips at the initial bonding and at debonding reveal the resultant changes in arch form in both arches. With the lateral adaptation in the posterior segments, the incisors stayed relatively stable and maintained excellent inclination as shown in the final head film. The labial surface of the maxillary central incisor lies parallel to the soft-tissue facial plane. The pre- and posttreatment lateral photographs demonstrate that her non-extraction treatment actually resulted in a slight reduction in profile procumbency with a nicely balanced face.
AT 22 WEEKS: .014 X .025 DAMON ALIGN SE NI-TI

PRE- AND POSTTREATMENT CEPH TRACINGS

PRE- AND POSTTREATMENT LATERAL FACIALS

POSTTREATMENT CEPH
PATIENT 2 – EASTHAM

Pretreatment/Treatment Plan
Patient 2 is a female, 14 years 7 months, who presented with a retrusive mandible. The ceph tracing shows a soft-tissue facial plane angle of 88° with the maxillary central incisors showing an excessive proclination of 18° to the soft-tissue facial plane, which magnifies the procumbency of the maxillary lip and emphasizes the retrusive appearance of the profile. She had an H angle of 15°, which varied from the ideal of 10° and related to the hard-tissue convexity of 0 mm. I treated her with a Herbst® appliance for 15 months, followed by the Damon System appliance.

Posttreatment
Posttreatment photographs show a well-balanced face and dentition. The final ceph tracing shows that the posttreatment Holdaway angle of 10° related closely to the hard-tissue facial convexity of 0 mm. The soft-tissue facial angle changed 2° (from 88° to 90°) with a 5° change in H angle (from 15° to 10°). The maxillary incisor inclination changed dramatically (18° to 0°), resulting in the labial surface of the maxillary incisors nearly parallel to the soft-tissue plane. The pre- and posttreatment profile photograph comparisons demonstrate the horizontal and vertical changes that resulted in a well-balanced face. Her total treatment time was 26 months.

PATIENT 3 – EASTHAM

Pretreatment/Treatment Plan
Patient 3 is a female, 14 years 9 months old, who presented with double protrusion, arch-length discrepancies and maxillary and mandibular arches with adequate widths. The ceph tracing demonstrates that she had an H angle of 20° with 5 mm of hard-tissue facial convexity. She also showed a soft-tissue facial angle of 89° and the LaU1 had excessive inclination of 8° to the soft-tissue NaPo line.

I treated this patient with extractions of the maxillary second and mandibular first premolars and with the Damon System appliance. A transpalatal bar maintained anchorage in the maxillary arch during initial space closure.

Posttreatment
Her final ceph film tracing shows the ideal H angle of 14° with the pre- and posttreatment profile photographs demonstrating a resultant reduction of soft-tissue procumbency and a slight reduction at point A. She also displayed ideal incisor inclination with the maxillary incisors nearly parallel to soft-tissue NaPo. Her posttreatment photographs and X-rays show the balanced dental and facial results. Pre- and posttreatment lateral photographs illustrate the procumbency reduction.

*Herbst is a registered trademark of Dentaurum, Inc.
POSTTREATMENT CEPH TRACING

PRE- AND POSTTREATMENT LATERAL FACIALS

A pt 0mm

LaU1-NaPo 0°

H=10°

POSTTREATMENT CEPH TRACING

PRE- AND POSTTREATMENT LATERAL FACIALS

A pt 4mm

LaU1-NaPo -2°

H=14°

90°
A principal benefit of the Damon System is the ability to gain arch width without rapid palatal expansion. The benefits of eliminating RPEs – to the orthodontist in terms of time and cost savings and to the patient in terms of reduced trauma – are self-evident. The question is whether the light-force approach of the Damon System is stable.

The following case is intended to illustrate that with the Damon System:
• Clinicians can gain significant transverse arch width without rapid palatal expansion.
• Gains in posterior arch width result primarily from bodily movement.
• Bone displays remodeling.
• The Damon approach in this case appears to be very stable after over 4 years of no posterior retention.

Patient: 15-year-old female
Diagnosis: Severe crowding in both maxillary and mandibular arches. Very thin bone on the mandibular canines. Very poor hygiene. Extractions and surgery are not options due to a family history of a rare blood disorder.

Treatment Objectives: Achieve excellent esthetic and functional results without extractions, headgear, an RPE or surgery.

Treatment Plan: Utilize Damon passive self-ligating appliances along with very light forces, minimal anchorage preparation and minimally invasive Damon System treatment protocols.

Treatment Results: All crowding was resolved without extractions, an RPE or surgical assistance. Posttreatment photos show a beautiful and functional result. Close examination of the tissue reveals an excellent periodontal response.

Retention Protocol: Bonded lingual retainers were placed on the maxilla 2-2 and mandible 3-3. The patient was provided with a Damon splint/tongue trainer and asked to wear the appliance every night for an indefinite period of time. The splint was worn for only one year. No other posterior retention was used.

5 Years 3 Months Posttreatment: Measurements taken at debonding and 5 years 3 months posttreatment confirm no relapse or narrowing of the arches and a visual assessment confirms very little if any dental relapse.

Conclusion: This case demonstrates that:
• The Damon System is capable of facilitating significant transverse arch development and may thus negate the need for rapid palatal expansion.
• Maxillary posterior transverse arch gain is primarily bodily tooth movement with minimal tipping.
• Bone around the roots of the teeth remodels.
• This treatment modality can be stable, even in very challenging cases.

The arch width-change numbers shown are actual measurements taken from the working models. The lines shown are approximations of these measurements.
Before and after composite ceph tracings show the incisors in a normal final position.

Horizontal computed tomography (CT) scans taken four years, eight months posttreatment confirm: (1) the transverse gain in the maxilla was bodily movement with minimal tipping and (2) the presence of bone on the labial and lingual surfaces of all teeth.

“The Damon approach to arch development is simple and effective and offers an excellent alternative to rapid palatal expansion.”

– Stephen Bradford, DMD
The Damon System of low-force mechanics and minimally invasive treatment protocols provides remarkable advantages over traditional orthodontic approaches. Attend a Damon seminar and learn how to treat all of your cases to a higher quality end result, in less time than you’ve imagined possible and with minimal need for extraction, headgear or rapid palatal expansion.

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**DAMON SEMINAR REGISTRATION**

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<td>San Antonio, TX</td>
<td>Sheraton Gunter San Antonio, 210.227.3241 or 888.999.2089</td>
<td>Dr. Alan Bagden</td>
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<tr>
<td>Mar 3-4, 2006</td>
<td>Washington, DC</td>
<td>Four Points Sheraton, 202.289.7600 or 888.627.8681</td>
<td>Dr. Dwight Damon</td>
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<td>Mar 3-4, 2006</td>
<td>Vancouver, CAN</td>
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<td>Mar 24-25, 2006</td>
<td>Detroit, MI (Southfield)</td>
<td>The Westin Southfield Detroit, 248.827.4000 or 800.937.8461</td>
<td>Dr. Alan Bagden</td>
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<td>Apr 7-8, 2006</td>
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<td>Raleigh, NC</td>
<td>Embassy Suites, 919.677.1840 or 800.362.2779</td>
<td>Dr. Alan Bagden</td>
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<tr>
<td>Jun 2-3, 2006</td>
<td>Toronto, CAN</td>
<td>Sheraton Centre Toronto, 416.361.1000 or 888.627.7175</td>
<td>Dr. Dwight Damon</td>
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<td>Jun 9-13, 2006</td>
<td>Monte-Carlo, Monaco</td>
<td>The 2006 International Damon Symposium</td>
<td>Dr. Damon &amp; various speakers</td>
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<td>Jun 23-24, 2006</td>
<td>Chicago, IL</td>
<td>Wyndham Northwest Chicago, 630.773.4000 or 800.996.3426</td>
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<td>Aug 18-19, 2006</td>
<td>San Diego, CA</td>
<td>The Westin Horton Plaza, 619.239.2200 or 800.937.8461</td>
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<td>Philadelphia, PA</td>
<td>Park Hyatt Philadelphia, 215.893.1234 or 800.233.1234</td>
<td>Dr. Alan Bagden</td>
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**Damon Seminar Schedule**

Day one: 8:00 am – 5:00 pm
(Registration begins at 7:30 am)

Day two: 8:00 am – 1:00 pm

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Orthodontists: $ 495 each*
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**Low-profile lower anterior brackets with compensated-slot cuspids and a coordinated arch form** for reduced occlusal interference and greater patient comfort

**Improved cuspid-to-lateral and bicuspid-to-molar transitions** eliminate the need for common first-order bends
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*Measures shown are averages as compared to conventionally ligated twin brackets and treatment protocols. Visit www.damonsystem.com to view clinical abstracts.

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* 100 patients surveyed. Data on file.
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- Patented slide mechanism for easy opening and closing, and an audible click to let you know it's closed

**Experience the extraordinary...**

available now from Ormco
Dr. White: At 12 lbs and 1,213 pages, with more authors and more extensive bibliographies, you have produced the largest, most colorful and most wide-ranging textbook ever published in orthodontics. When you started this new edition, did you have any idea it would turn out this all-embracing?

Dr. Graber: The book is, indeed, heavy and extensive and more than I envisaged in the beginning. But part of it is the high-quality paper used. In retrospect, would it have been better to divide the book into two volumes – clinical and basic science? A case could be made for this, but our thought was to keep it all together as a cross-reference for our clinicians and residents. We planned the table of contents, which we did not change, but the length of each chapter was left to the authors and then heavily edited by us and the Elsevier editors. Each of the coeditors had a selected number of chapters to edit – teamwork!

Dr. White: In this edition, you have added another editor, Dr. Katherine Vig. What special expertise has she brought to this publication?

Dr. Graber: Dr. Vig has a superb background in orthodontics and orthognathic surgery as well as craniofacial anomalies. We ascribe to the maxim, “From studying the abnormal, we learn much about the normal.” The cleft lip and palate material is up-to-date for our readers. Nobody knows more about what orthodontists should know about these problems than Kate Vig and her coauthor, Dr. Ana Mercado. Together they produced Chapter 26, “The Orthodontist’s Role in a Cleft Palate-Craniofacial Team.” She suggested asking Drs. James Mah and David Hatcher for their important contribution on craniofacial imaging, and we were delighted with the result.

Dr. White: How did you keep 40 authors focused enough to meet the publisher’s deadline?

Dr. Graber: Keeping 40 busy authors focused enough to meet the publisher’s deadline was not actually accomplished. The publisher extended deadlines and then had super-editors assigned to work with authors directly, as needed, to complete their assignments. I cannot say enough about the great Elsevier team – true womanpower! Frankly, this was part of the reason I personally asked Dr. Vig to join Dr. Robert Vanarsdall and me – the male sex has dominated orthodontic literature, excluding talented female authors, for too long. Dr. Vig is joined by Dr. Mercado. And Dr. Ellen BeGole has the chapter on “Statistics for the Orthodontist.” Other countries around the world have long
recognized the talented females in their midst – we in America are still behind.

**Dr. White:** What is your secret for accumulating contributions from such an impressive group of world-class researchers and clinicians?

**Dr. Graber:** Actually, getting such a team was not difficult because our authors wanted to be part of the latest and best by a world-class publisher. Vanarsdall, Vig and I met with Ms. Penny Rudolph, chief of dental publications at Elsevier/Mosby, and together we chose those we wanted to invite based on stature, expertise, etc. Not one invitation was refused! No secret. I guess nothing succeeds like success – and this was the stature of the previous editions.

**Dr. White:** How did you select the topics covered in the fourth edition?

**Dr. Graber:** The selection of topics was again a team effort, and we surveyed the current periodical literature for the latest developments and the best contributors. We chose very busy people, and they gave time that they really didn’t have in their schedules to complete this important project. Multiple foreign-language editions are planned, and it is satisfying for each of us to know that our words of wisdom are helping others in the “one world of orthodontics.” We asked advisors, including you, Dr. Lee Graber, Dr. Björn Zachrisson and Dr. Thanos Athanasiou, for their suggestions, and even for a little help in twisting arms, if needed. Teamwork!

**Dr. White:** Several authors are repeat contributors to the 4th edition, and it impressed me how current some of them made their chapters. Did you have any general suggestions for the authors on their updating?

**Dr. Graber:** Updating of chapters is always a problem. A classic article cannot be disturbed too much. The contributions of Drs. Birgit Thilander, Jack Dale, Jim Vaden, Herb Klontz, Ron Roth and others that could have been deleted did concern us. The net result is a compromise of the three editors. Some editing of these was done in the interest of balance and available space for a myriad of illustrations.

**Dr. White:** In the preface you mention that one of your intentions was to balance the basic science chapter with those about therapy. Did you have any kind of formula that helped you achieve this?

**Dr. Graber:** Modestly, considering the wide array of possibilities to achieve a balance, I think we were successful with our mix of basic science and clinical topics. Not everyone will agree with our choices, but we satisfied our severest critics – ourselves!

**Dr. White:** “Computer Applications in Orthodontics” from the third edition, was replaced with the chapter “Craniofacial Imaging in Orthodontics.” What was your rationale for this?

**Dr. Graber:** Replacing “Computer Applications in Orthodontics” with “Craniofacial Imaging” was largely decided by the rapidly changing field of computerized diagnosis, computerized records, and the sheer number of such programs available via literature and courses.
It seemed to us that any chapter on computerized diagnosis would be dated almost as soon as printed and might not reflect what the majority of clinicians and researchers were using and really wanted and needed. We already had a basic statistics chapter by Dr. BeGole primarily for residents. The fresh new chapter by Drs. Mah and Hatcher excited us, and we felt we simply did not have the space needed to handle “Computer Applications in Orthodontics.” Are we right? Time and experience will tell. As you indicate in your questions, providing all the attractive and exciting aspects of orthodontic diagnosis and treatment would demand an encyclopedic series of volumes.

Dr. White: One of your early mentors was Dr. Harry Sicher, author of the quintessential text *Bone and Bones.* How do you think he would react to the osseous distraction and micro-screw anchorage that orthodontists are using today?

Dr. Graber: A fascinating question about Harry Sicher – the indomitable giant of craniofacial anatomy. How would he react to distraction osteogenesis and micro-screw anchorage? When I look at Harry Sicher’s photograph in my office, I think I discern a slight smile of approval for these developments. He was always a leader, and his book, *Bone and Bones,* with co-author Dr. Joseph Weinman, is still a classic. I have seen enough of the results of these techniques to feel that Dr. Sicher would approve of much of the concepts and results, with the Greek proviso, “Everything in moderation!” Have the techniques been misused by some? Overdone? Improperly managed by some? Yes, but the chapter on “Craniofacial Distraction Osteogenesis: Basic Principles and Clinical Applications,” by Drs. Jason Cope and Mikhail Samchukov, is a good introduction to the distraction osteogenesis concept, as well as the superb discussion of micro-implants (stationary anchorage) by the master Dr. Eugene Roberts – a true scientist as well as a master clinician – to justify our coverage of these new-millennium techniques.

Dr. White: You have a new chapter, “Precise Bracket Placement: Effective and Efficient Indirect Bonding,” by Dr. Anoop Sondhi. Does the indirect technique really offer orthodontists and their auxiliaries major advantages?

Dr. Graber: My information indicates that more and more assistants are playing a larger role in the indirect bonding technique. Is this greater office efficiency as well as more-precise placement of attachments? If you ask those who use the indirect bonding technique, I think, the answer would be “yes.” But we’ll know better in five years.
**Dr. White:** You have devoted three new chapters to self-ligation (Figure 1). How important is this new development to orthodontic armamentarium?

**Dr. Graber:** The increasing popularity of self-ligating brackets with reduced-friction archwire engagement speaks for itself. It would be interesting to see what the manufacturers themselves say, but I suspect this is a definite step upward and forward, and that there are less iatrogenic sequelae, particularly with the use of light, flexible archwires. Which technique is better? Ask me this again in five years. The authors here, however, are world class, honest and dedicated. Will there be changes before the next edition of this book is published? Sure enough!

**Dr. White:** Dr. Dwight Damon shows in his chapter some nonextraction treatments that rely on extensive arch development. Can clinicians expect such therapies to endure?

**Dr. Graber:** I partly addressed this question in my previous answer. My concepts have always been expressed by the axiom: “The middle of the road is a healthy place to be.” I still feel that way. And I think indefinite retention, via appliances like those that Drs. Jack Sheridan and Paul Armbruster show in their chapter, “Clear Plastic Appliances for Retention and Tooth Movement,” will be part of the answer. So many factors are involved in the diagnostic decision, not the least being predominance of the morphogenetic pattern, how much expansion was achieved, how long the result was retained, etc. Ask me this again in five years.

**Dr. White:** Were they to return today, is there any of the orthodontists’ armamentarium that would perplex or confuse Dr. Calvin Case or Dr. Edward H. Angle?

**Dr. Graber:** Knowing the history intimately and semi-personally because of my association with Drs. Fred Noyes, Charlie Baker, etc., I feel I can answer your question about Dr. Case and Dr. Angle. I would hazard a guess that Calvin Case would not be confused at all and would be open minded and excited. As for Dr. Angle, who himself changed appliances over time, I think he would be much more critical. Who would be right? I would bet my bottom buck on Calvin Case. But then, my office in Kenilworth, Illinois, was two blocks away from where Calvin Case lived, and Charlie Baker used to tell me in great detail what a fantastic clinician, diagnostician and leader Case was – with no commercial interest in his career at any time. I respect Dr. Angle highly and was associated for five years with Dr. Frederick B. Noyes, one of his faculty members, but there is no place for absolute dogma like “always” and “never” in orthodontics.

**Dr. White:** What do you consider the most significant and beneficial improvement in orthodontics over the past 50 years?

**Dr. Graber:** There are many improvements in both diagnostic and therapeutic aids. I may seem like I am wimping out in my answer, but I think that diagnosis is the name of the game. This means therapeutic diagnosis – while treating – and having the armamentaria to make changes in mechanics and treatment plans as needed. I just saw a new three-dimensional diagnostic X-ray machine that blows my mind – if only I had access to this while working with cleft lip and palate deformities and skeletal problems. Not that I am not impressed with modern orthodontic appliances – I am. So it is not either/or but both, depending on that diagnostic acumen. I am still not sure of my answer, however. Nor will I be surer five years from now.

**Dr. White:** What type of chapters would you anticipate adding to the 5th edition of *Orthodontics: Current Principles & Techniques*?

**Dr. Graber:** For the next edition of this text, in four to five years, I anticipate more growth-guidance approaches that emulate the orthopedic surgeons, more long-term follow-up of patients, and better choice of optimal treatment time based on what the patient needs – not the income and office efficiency. I am an eternal optimist and feel that orthodontics will still be the most exciting, professionally rewarding dental specialty. Am I biased? You better believe it! ☺
The MARA
A Noncompliance Solution

Frank A. Bogdan, DMD, Bayonne, New Jersey

Over the years, I have used many functional appliances for correction of Class II malocclusions (i.e.; bionator, twin block and Kussick). The combination of the bionator with headgear was my principal choice. Of course, as with any removable appliance, patient compliance remained the biggest problem.

After reading the 1998 Clinical Impressions* article by Dr. James Eckhart1, “Introducing the MARA,” I tried the MARA and have used it ever since. The MARA positively affected my practice and made correction of Class II malocclusions easier for patients, parents, staff and me. In this article I describe the MARA, with its advantages and modifications, and my approach to MARA treatment.

MARA Description

The MARA (Mandibular Anterior Repositioning Appliance) offers a unique noncompliance Class II corrector that doesn't directly connect maxillary and mandibular arches. Similar to other Class II functional appliances, it advances the mandible so that the patient functions in a new forward position. Over time, growth and remodeling changes occur to correct the Class II skeletal malocclusion. Dr. Douglas Toll developed the MARA in the early 1990s. Later, Dr. James Eckhart worked with Dr. Toll along with Ormco and AOA laboratory to improve the original design.

Advantages

- Well-tolerated by patients
- More hygienic
- More freedom of mandibular movement
- Less anchorage strain, therefore fewer side effects

Design Modifications

The following modifications can be added to the MARA for patient-specific treatment.

A maxillary expansion device with NiTi Springs to give a gentle, consistent dentoalveolar force while in the MARA.

Soldered occlusal rests extending to the erupted second molars when an increased vertical is undesirable (high-angle case).

Soldered extension arms with rests on first or second premolars to increase anchorage when maxillary spacing is unwanted (e.g.; patients who have maxillary spacing, deep bite, and low mandibular angles, and patients with high-torque requirements with little or no crowding).

Buccal shields on the mandibular cams to reduce cheek irritation (Figure 1).

Posts for ties on elbows are now standard. Use .012 doubled-over and twisted stainless steel ties over the posts rather than elastic ties. They hold up better over a 10-week interval and allow better hygiene.

General Approach to MARA Treatment

Select a Class II patient who has a deficient mandible for MARA treatment. Use diagnostic records such as the cephalometric tracing to confirm this clinical assessment. After choosing the MARA, design a two-stage approach. Stage I involves an orthopedic emphasis, while Stage II uses a fixed, self-ligating edgewise appliance (Damon System).

* For past copies of Clinical Impressions, visit www.ormco.com.
Stage I Treatment
Correcting Transverse Discrepancies
Maxilla – Slowly expand the maxilla, if needed, with an expander that uses gentle pressure from NiTi Springs. This will mimic the dentoalveolar expansion obtained with the Damon appliance. Partial fixed appliances are useful to flare retroclined maxillary incisors, unravel crowding, etc., prior to MARA placement.
Mandible – Upright severely constricted mandibular molars when needed. Cross-bite elastics, expanded lingual arches, or a lip bumper can also help prepare the mandibular arch for the MARA.

Impression-Taking – Place separators prior to the impression visit and remove them before taking the impressions. Visible interproximal spaces help the lab fit the crowns. Along with maxillary and mandibular impressions, take a wax bite registration with the mandible advanced to the desired position. Pour the models in yellow stone, occlude with the wax bite and mark the desired advance with a pencil.

MARA Placement – I prefer placing the MARA independent of any other fixed appliance but obviously this depends on each patient’s needs. Without highly visible appliances, patients don’t feel they’re wearing braces as long.
MARA Advancement – For moderate to severe Class II malocclusions, advance the MARA incrementally to Class I occlusion every 10 weeks. For mild Class II patients, fully advance them to Class I occlusion at the initial visit and advance as needed to maintain Class I occlusion.

Stage II Treatment
Fixed Appliance Placement – After approximately 12 months of MARA treatment, take records.
• Correct scripting greatly increases efficiency. Use high-torque brackets (+17°) on the maxillary anterior teeth and low-torque brackets (-6°) on the mandibular anterior teeth to counteract the side effects of the MARA. Scripting the canines is patient specific.
• Bond fixed appliances on the maxillary teeth lateral to lateral and the mandibular teeth canine to canine. To allow elbow removal and adjustment, do not bond the maxillary second premolars.
• Typically the MARA remains an additional 4 to 6 months while leveling and aligning the teeth with rectangular archwires (Copper Ni-Ti® .018 x .025 or TMA® .019 x .025).
MARA Removal – Schedule the patient for MARA removal after 4 to 6 months of fixed appliance therapy.
• Take a panoramic radiograph or tomogram in occlusion (without bite stick) to evaluate the condylar position.
• If in doubt as to the orthopedic response and condylar position, remove the elbows and allow the patient to function freely for 8 weeks. Evaluate the mandibular position for any posterior slide.
• Bond molars and maxillary second premolars, place bite turbos if needed and place .016 Copper Ni-Ti archwires to level the molars, which have intruded from the crown occlusion.
Case Completion – Stage II treatment with fixed appliances takes 15 to 18 months.

Typical Clinical Responses
With no rigid or semi-rigid connection between the arches, the mandible has considerably more freedom of movement and postures forward passively in contrast to a forced forward position by a telescoping mechanism or spring-loaded device. One might surmise that the MARA has a kinder effect on the temporomandibular joint. In the rest position, the mandible postures forward naturally. The elbows simply interfere with the patient’s ability to retract the mandible into a Class II position. The MARA encourages and trains the patient to keep the mandible forward.

The following are typical clinical responses:
• Immediate downward and forward movement of the chin, which decreases during treatment as dentoalveolar changes allow the mandible to drift backward from its initial advancement.
• Maxillary incisors retrocline from their original position while mandibular incisors procline. These side effects seem considerably less than those caused by the Herbst** and other intermaxillary Class II correctors.

(Continued on page 32)

** Herbst is a registered trademark of Dentaurum, Inc.
PRETREATMENT
Female, 14 years 3 months, with Class II, division 1, deep bite malocclusion, maxillary protrusion and diastema, mandibular retrognathia, and horizontal/low-angle growth pattern. Treatment included a frenectomy.

STAGE I
The MARA was placed along with a mandibular lingual arch. This MARA has standard cams, but I now use buccal shields to minimize cheek irritation. Two months later, the elbows of the MARA were inserted and the mandible was advanced.

STAGE II
With the MARA still activated, the Damon brackets were bonded.

Wire Sequence
.014 Align SE (max./mand.)
.016 x .025 (max.) and .014 x .025 (mand.) Align SE

The MARA was removed (18 months after advancement) and Damon brackets were bonded on the molars and maxillary second premolars. Bite Turbos were bonded lingually on the maxillary centrals. The overlap of MARA and fixed appliances was 3 months.

Wire Sequence
.016 Align SE (max./mand.)
.018 x .025 Align SE (max./mand.)
.019 x .025 Align SE (+20° torque) (max.)
.016 x .025 (mand.) and .019 x .025 (max.) stainless steel with Class II elastics

POSTTREATMENT
Fixed appliances were removed 19 months after placement (the patient broke 5 appointments in Stage I and 4 more in Stage II). The case was retained with wires bonded lingually on the maxillary central to central and on the mandibular cuspid to cuspid, and a maxillary invisible retainer (Essex 040) was used.

Since the patient was 17 years old and through growing at completion of treatment, splinted retention (Damon Splint) was not used. Normally I have patients use splinted retention at night until major growth has ceased or at least 1 year posttreatment if they were nongrowing adults at the beginning of treatment, in order to retain the dentoalveolar changes that occurred with MARA Class II correction.

The cephalometric findings were as expected. The maxillary incisor was retruded, the mandibular incisor was proclined, while the mandibular molar moved forward and vertically. The maxillary molar position was virtually unchanged.

There was a mild orthopedic effect on the maxilla while the mandible exhibited significant condylar growth. The ANB change was 2°.
• Spaces develop in the maxillary arch.
• After MARA removal, the molars have an open bite because of the long-standing occlusal coverage (if crowns were used), which easily closes when leveled with a low-friction fixed appliance system. Previously, when using conventional appliances, I needed to use vertical elastics to close the posterior open bite.

My son, Dr. Mark Bogdan, graduated from the University of Medicine and Dentistry of New Jersey in May 2005 and has joined me in the practice of orthodontics. As part of his thesis for graduation from his residency, he studied the cephalometric response of 24 patients treated with the MARA appliance in my office. Data on the skeletal, dental and dentoalveolar response have been published by Drs. Eckhart and White and by Drs. Kulbersh, Berger, Chermark et al. The data from his study was similar to the above studies with regard to insignificant maxillary headgear affect and lower facial height changes. Less molar distalization was observed in cases that were cross-arch stabilized with a palatal bar or NiTi expansion screw.

**My Approach and Philosophy**

I haven’t used rapid palatal expansion since the early 1980s because I no longer consider it necessary to open sutures of the palate and face. I noticed this years ago when I began using functional appliances like the Frankel and lip bumper that allowed arches to expand without any direct force. I’ve observed a similar dentoalveolar response from the low-friction, low-force Damon System that allows the dentition to adjust without overpowering forces.

**REFERENCES**


**MARA Kit Now Available to U.S and International Markets**

The versatile 13-patient standard MARA kit allows you to diagnose, size and deliver the appliance the same day. With all the popular crown sizes on hand, you can ensure the best possible fit. MARA kits and replacement units are available in the U.S. from Allessee Orthodontic Appliances (AOA) at 800.262.5221 and to international doctors exclusively through their Ormco distributor. The MARA-U modification is not available in kit form.

(Continued from page 29)
Blügloo is the first and only adhesive that provides color contrast at bonding and debonding but is clear throughout treatment. Bracket placement and cleanup have never been easier! Blügloo’s advanced formulation is optimized for aesthetic brackets such as Damon™3, but it’s also excellent for metal brackets.

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WORLD SOCIETY OF LINGUAL ORTHODONTICS

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“The interest in lingual orthodontics in the U.S. is exploding. Don’t miss this opportunity to learn more about the exciting new products and techniques now available that make lingual orthodontics a must for every contemporary orthodontic practice.”

– Mario Paz, ALOA President

Didier Fillion
WSLO President

Kyoto Takeimoto
Chairman WSLO meeting
While we develop clinical skills in orthodontic school, we don’t receive adequate practical instruction in educating consumers about our services. Nor do we learn how to market our practices effectively. The commonly held notion that a good orthodontist doesn’t need to market is no longer valid. Like any other business, our practices are susceptible to changes in the marketplace, and we currently face two significant challenges, one from dentists and one from consumers.

There is an increasing number of dentists offering braces, aligners and “straight teeth” with veneers. Moreover, with the extent of direct-to-consumer aligner technology advertising and “Extreme Makeover”-type shows that promote “instant orthodontics,” prospective patients are now more keenly aware of their choices than ever before. With Internet access, consumers also actively seek information to help them make decisions well before coming into our practices.

A well-planned and well-executed multiphase marketing plan can capture a prospective patient’s awareness, stimulate interest and positively impact their purchasing decision well before the consultation. Successful practices know the needs of their market and strive to meet those expectations. Listed below are some steps to help you construct a solid marketing plan.

Key 1: Know Your Target Market

Consumer marketing firms spend millions on surveys and focus groups to define an ideal target and fit for a given product or service. You can’t compete with the Madison Avenue, but you can garner some basic information about your target markets. If you’ve lived in the target community yourself for a while, you’ll be able to make some educated estimates on your own. Analyzing this information will not only help you craft the most effective message and determine the best means of reaching potential patients, but it will also help you attract the right type of clientele. Figure 1 lists some basic data to accumulate, some of it available from the U.S. census.

Now that you know who your target is, you need to ascertain what they want. With all the national ads touting clear aligners, instant orthodontics with veneers, etc., the offer of straight teeth is no longer enough to attract a steady and growing clientele. To stimulate your target, you need to focus on what they want more than just what they need. That means offering cutting-edge solutions that deliver shorter treatment, greater comfort, enhanced esthetics and a better overall result.

Key 2: Define Your Practice

Orthodontics is like any product on the market. In order to gain and maintain awareness, you need to

Figure 1. Basic Data to Accumulate

- Specific zip codes of your target market
- Number and median age of eligible patients, children and adults
- Median household income of your target market
  - Whether this income is growing or diminishing and at what rate
  - What the level of expendable income is in these households (how leveraged)
- Of the eligible adults, who is more likely to seek treatment
  - Males, females and in what age and income ranges
- Number and types of schools in your target area
  - Elementary, junior high and high schools
  - Private and public
  - Accessibility to your practice
  - Percentage of stay-at-home parents or nannies for office transport
- How technologically savvy your target market is
  - Percentage of DSL lines
generate a perception or feeling in the mind of the consumer that represents your unique strengths and how you differ from your competitors. Positioning your product can help you to define your niche in the market (Figure 2).

Once you’ve determined your practice identity, brand your identity with a logo and a specific and memorable positioning statement to accompany it. Avoid generic statements like “Quality Orthodontics,” which are so common as to be meaningless. Make your identifying logo and positioning statement high-tech, fun, classic or elegant, but more importantly, make sure they define you and that you can consistently deliver on your message in everything you do.

**Key 3: Establish Your Goals**

Set goals for the upcoming year in the following categories and track your results monthly to see how well you are performing and notice the trends. Review your case acceptance versus performance and other practice indicators (e.g., emergencies) with your staff so that they are invested in the overall goals of the practice.

- Number of new-patient exams per month
- Number of new case starts
- Case acceptance rate
- Practice income
- Expenses: fixed and variable

**Key 4: Know Your Competition**

You need to keep continually abreast of your five nearest competitors. Know what is working for them and determine what you can do to differentiate yourself. Knowing your competition not only helps you develop marketing strategies but also allows you to be innovative in your approach. Note: Never compete on price alone; it will only devalue your treatment, making it a commodity.

**Key 5: Build Your Campaign**

For our purposes, there are two types of marketing activities: internal and external. Internal marketing focuses directly on targets in your practice to stimulate them to begin treatment or to refer others to your practice. External marketing focuses on stimulating your target market to come into your practice to purchase your services.

**Internal campaign.** The key to effective internal marketing is to make new patients and their parents feel as if they are taking an active part in the treatment process. Doing so creates “raving fans,” which translates to higher conversion rates, loyal patients and increased referrals. Here are a few options for an internal marketing campaign:

- Patient surveys: new patients, those who declined treatment and outgoing
- Brochures, counter displays and posters
- Practice information packets (including practice brochures)
- Patient newsletters
- Follow-up care calls, birthday and accomplishment cards
- Giveaways and contests
- Convenient hours of operation

**External campaign.** The key to an effective external marketing campaign is variety and sustainability. No one ad or brochure will make a difference. Your target must receive several impressions of your practice before you can create awareness and stimulate interest, so don’t engage in any marketing activity you can’t sustain for up to 6 months at a time. Make a quarterly or annual marketing plan, track your various activities and keep progress visible to the entire staff. Here are a few options for an external marketing campaign:

- GP marketing and presentations
- Targeted direct mail
- A Web site and E-mail advertising
- Print advertising (local newspaper, magazines, billboards, mall kiosks)
- Local mass-media advertising (radio/cable television, movie theaters)

**Key 6: Measure Your Success**

The most important aspect of choosing the specific marketing media to use in your campaign is how well you can track each one in terms of responses. If you cannot measure the success of a given activity, don’t do it. Make it routine for your front office staff and Treatment Coordinator to ask how a prospective patient heard about your practice and record that information in a database where it can be analyzed later for future campaigns. At the end of each quarter, count the number of patients who responded to each marketing activity and determine how many of those started treatment. You may find that some of the activities that bring in the most calls also have a poor conversion rate, whereas others may not bring volume but pack a good punch.
When AOA lab first released the Red, White and Blue alignment system as an esthetic solution for minor malocclusions, I enthusiastically endorsed it and began to average over five patients a month. I enjoyed the concept because I could use the appliances to regain alignment for patients who had relapsed after poor retainer wear. I also treated many mothers of patients who desired simple alignment of their incisors. I even treated some patients who were seeking Invisalign but didn’t need the intensity of that system.

Nevertheless, as I gained confidence in the system, I simultaneously developed an unhealthy greed. By making these aligners in-house, I could avoid the commercial lab costs and increase the profit. After selecting the polymer I wanted to use, the staff began to fabricate the aligners.

Unfortunately, every patient who used our in-house aligners required more than three appliances; and many required several more. On average, the in-house aligners took over seven appointments to complete after the initial records. Many patients never finished well with the in-house aligners, and I sometimes reverted to brackets and wires to achieve the desired alignment. Economically, the in-house fabrication of aligners turned out disastrously. A year passed before I concluded that several nuances of fabrication AOA had systematized were absent in our appliances, and that our staff could simply not duplicate what the AOA Red, White and Blue routinely did.

Now that I have started using AOA again, each patient typically finishes with three aligners. If the patient requires more-aggressive treatment, AOA will let me know if it will take more than three aligners, and I can adjust my fee as needed. Since switching back to the Red, White and Blue system, profitability has returned to my aligner treatments. AOA’s fabrication fee exceeds that of an in-house attempt, but the value and predictability delivered by the commercial lab allows a more relaxed, profitable and tranquil practice.

**Summary**

The Red, White and Blue system of aligners from AOA provides an ideal solution for patients who want a cost-effective and truly esthetic option for mild malocclusions. The results that we’ve seen in our office, combined with the ease of ordering and certainly the cost savings (versus other aligners), have convinced us to make this treatment option a regular part of our armamentarium. As with other clear aligners, clinicians should bear in mind a few caveats regarding the Red, White and Blue:

- Patients should have a full commitment to their use.
- Doctors should avoid trying to do heroic movements with these aligners.
- Vital construction nuances of these aligners are difficult to duplicate in-house.
- Attempting to duplicate these aligners in-house has more pitfalls than people would expect at first glance.

Orthodontists provide specialized, professional services for their patients and, when necessary, should avail themselves of professional laboratory services. This guarantees high-quality products that will do the job.
This patient came to the office because of a desire to align the maxillary and mandibular teeth without ordinary braces. After the initial exam, I felt the Red, White and Blue system of aligners would work well. AOA lab made the aligners and advised where I would need to reduce the enamel interproximally to accommodate the rotated teeth. Once the aligners had worked a few weeks, I retested the reduced proximal contacts and determined if more reduction on them or other teeth was needed to allow the necessary rotations. This patient finished in a minimum of time, had no problem adjusting to the appliances and should have no problem retaining the result in the future.

This patient had seen television advertisements about invisible braces and called our office to see if we provided those services. After the examination I felt the Red, White and Blue system could easily correct the malocclusion, and I suggested this route, which the patient eagerly supported. AOA made the aligners and suggested where interproximal enamel reduction should occur. I made the necessary clinical adjustments and began therapy with the appliances. The patient wore the aligners faithfully and within 2½ months, the teeth had aligned nicely. The patient should have no problem retaining this result.
There are two systems of aligners from AOA: Red, White and Blue and RWII. Both are cost-effective esthetic options.

Designed to address minor to intermediate malalignments, Red, White and Blue (RWB) is the original system of active aligners, except they have no order-of-use markings and are packaged differently. RWB is made of DuraClear, AOA’s proprietary polymeric material. DuraClear is thin (.030”), flexible and durable, providing consistent, predictable treatment results.

RWII is a dynamic combination of DuraClear and Duraliner (Figure 1), another AOA proprietary material. Duraliner is a soft, flexible elastic inner liner that works in combination with DuraClear to foster greater tooth correction with fewer aligners than RWB. It also addresses problems associated with short clinical crowns or specific tooth rotations that require more-aggressive grip to correct.

**RWB Delivery**
AOA sends Red, White and Blue in a box containing two aligners. When you remove the aligner that rests at the box opening (Figure 2), the second aligner remains in the box for future use. AOA will ship the final aligner to your office 28 days after sending the initial aligners.

**RWII Delivery**
For RWII, AOA sends both aligners together.

**What to Send**
What to send to AOA lab for RWB or RWII aligners:
- Upper and lower models poured in quality orthodontic plaster or stone (or, if you prefer, PVS impressions along with a wax bite).
- Either a wax bite or draw vertical lines on the right and left posterior quadrants of the models and note the midline to indicate occlusion.

If you would like a case consultation, call Jim Kottke, the technical team leader for RWB and RWII, or one of his team members, who are always available to discuss options with you.

**Solutions to Your AOA Needs... Just One Call Away**

AOA Centralized Communications Center
In the U.S. – 800.262.5221
Outside the U.S. – 262.886.1050
Why Red, White and Blue or RW II?

- 2 - 3 Weeks turnaround time
- You control materials, number of appliances, duration of treatment and amount of correction
- Knowledgeable staff and technical support
- Made in the USA
- Superior Material – DuraClear & DuraLiner
- No Certification Fees
- Models produced from quality Alginate impressions acceptable

Our knowledgeable technical staff is available to discuss any case you forward to our Communication Center. We can assist in choosing the most effective system and even the number of appliances to fit the patient's needs. **REMEMBER** – Both RWB and RW II can be scaled up to as many as 10 appliances or just one single. Lab cost reflects the exact number of appliances used.

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**Red, White and Blue**

Our RWB provides an initial series of three appliances (or you can specify just one or two) in our unique and exclusive DuraClear material for normal post Orthodontic relapse or patients that simply want to avoid fixed treatment for anterior teeth.

- $225 for 3 appliances
- $150 for 2 appliances
- $75 for 1 appliance

Up to two refinement appliances, $35 each.

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**RW II**

Our RW II is a two appliance system – each with the addition of AOA's exclusive DuraLiner. This combination adds flexibility, durability and retention. The combination allows for a longer active individual appliance wear time by reducing the number of appliances the patient may require.

- $180 for 2 appliances
- $90 for 1 appliance

Up to two refinement appliances, $40 each.

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*Refinement appliances applicable if final setup provided an “ideal” incisal alignment and was not obtained with prescribed wearing time.*
### ORMCO Around the World • Course Schedule at a Glance

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**Typodonts and/or Participation**

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