Drs. Epstein
Dual Slot Treatment

Dr. Swartz
Aesthetic Brackets

Dr. Eversoll
Ensure the Future

Drs. Dischinger
Brachycephalic Patients

Ms. Bray
Performance Reviews

DR. MARTIN EPSTEIN
This being Ormco’s 40th anniversary, I called Frank Miller, founder and former president of Ormco, to get his story about how it all began. Here’s what he told me.

In 1959, orthodontists were clamoring for preformed bands. Unsuccessful attempts to manufacture them had made doctors even more impatient for a timesaving banding method. Banding one patient often took two or three appointments, each lasting up to four hours.

It was with an idea to address this issue that Frank Miller left that era’s leading orthodontic company and in 1960 founded Ormco (Orthodontists’ Research and Manufacturing Company), where he proceeded to shake up the entire industry with the introduction of preformed bands and preassembled brackets. The first time Ormco’s preformed bands were displayed at the annual AAO meeting, Dr. Robert M. Ricketts, a member of the Ormco Research Advisory Committee, promised to band a patient in less than one hour on stage. With a packed hall and while being televised, Dr. Ricketts successfully banded each arch in 20 minutes. Mr. Miller noted, “After that, the attendees headed for the Ormco booth and placed order after order after order!”

Our second major breakthrough was the introduction of the mesh pad for direct bonding, which we launched in the mid ’70s. It’s rumored that Frank Miller and Dr. Craig Andreiko, the Ormco engineer who developed Orthos, wore mesh pads for a year to test them for effectiveness. By introducing Ormesh when we did, Ormco enjoyed a one-year jump on the competition and now, with Optimesh XRT, Ormco continues to set the industry standard for mesh pads, even 25 years later.

From one employee working in a garage in Covina, California, with a card table, folding chair and telephone to seven manufacturing facilities today. From a single idea for preformed bands to named appliances such as Orthos, Straight-Wire, the Damon System and Copper Ni-Ti, Ormco stands as a reflection of the orthodontic profession, continually evolving, continually seeking to make high-quality results, clinical efficiency and patient comfort translate into healthy patients with great smiles.

Happy birthday, Ormco.

Jan DeCarlo, CI Editor
Differential Slot Size (D.S.S.) uses two different slot sizes within the same setup and is the foundation of bi-dimensional treatment\(^1\). Specifically with the Orthos\(^\text{TM}\)* system, D.S.S. treatment capitalizes on the benefits designed into this system. The result of using the combination of .018 and .022 slot sizes is efficiency, predictability, reduced stress and excellent treatment results. The amalgamation of two different slot sizes within an individual case was first proposed by Schudy and Schudy\(^1\) with their bimetric system and later by Gianelly\(^2\) et al with a bi-dimensional technique.

In a previous article\(^3\), I discussed the advantages of the D.S.S. appliance setup (Figure 1). I believe the philosophy behind D.S.S. merits review. Using the .018 slot on central and lateral incisors allows us to fill the slot easily, taking full advantage of the prescription incorporated into the bracket. Considerations for labiolingual positioning (in-out), mesiodistal angulation (tip) and labiolingual inclination (torque) can be precisely regulated early in treatment. Early torque control prevents lingual tipping of anterior crowns during the retraction phase. This treatment efficiency translates into minimal to no anterior undertorquing. Incisor control is also beneficial in the lower arch, resulting in superior overbite and overjet management during treatment.

* Distributed in Europe as Ortho-CIS.

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**DIFFERENTIAL SLOT SIZE TECHNIQUE USING THE ORTHOS SYSTEM**

Martin B. Epstein, DDS  
Joshua Z. Epstein, DMD  
New York, New York

Figure 1. Typical D.S.S. setup showing .018 slot size on anterior teeth and .022 slot size on posterior teeth.

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Dr. Martin Epstein is an associate clinical professor of postgraduate orthodontics at New York University. He is in private practice in Manhattan and Staten Island, New York. Dr. Epstein lectures internationally and has courses scheduled in Portugal and Mexico for the upcoming year. He received his dental and orthodontic degrees at New York University, where he was elected to Omicron Kappa Upsilon. In their off time, Dr. Epstein and his wife, Marti, enjoy getting away to their lake cabin in New Jersey.

Dr. Joshua Epstein received his D.M.D. from the University of Medicine and Dentistry of New Jersey, where he was also elected to Omicron Kappa Upsilon. Upon completing the orthodontic program at New York University, he received the Theodore L. Jerrold award for orthodontic excellence. Dr. Epstein will be joining the orthodontic practices of Kessler, Morganstern and Sargiss in New Jersey. He is involved in research and publishing articles and hopes to teach in the future.
Using the .022 slot for canines and posterior teeth facilitates the use of undersized archwires in the posterior segment for better sliding mechanics. You can use rectangular steel archwires to control the anterior dentition and also benefit from free sliding in the posteriors. Free sliding establishes the added benefit of less frictional resistance. This treatment efficiency results in predictable retraction and space closure while maintaining teeth upright.

Using the D.S.S. philosophy of filling the slot anteriorly, you can take full advantage of the computer-designed Orthos system. It is a fully coordinated and integrated system of brackets, molar tubes and archwires, resulting in efficient and predictable treatment. Orthos provides a dramatic reduction in the profile of lower anterior brackets. This allows the archwire to be placed in closer proximity to the tooth surface, affording superior control of tooth movement. Placement difficulties in cases with crowding or rotations are easier to manage and most occlusal interferences are eliminated. The computerized design eliminates the necessity of placing offset bends for canine positioning with rotation cut into the slot of lower canine brackets. Progressive distal tip is placed into the lower anterior brackets to create improved stability in root spacing.

I arrange D.S.S. with Orthos mechanotherapy into seven treatment phases. The process of categorizing treatment into phases increases efficiency and reduces stress.

**Phase One: Preparation**

The Preparation Phase is fundamental to treatment success and begins with a written treatment plan. Its goal establishes control from the onset and involves the consideration of various banding, bonding and ancillary appliance options and anchorage requirements.

Treatment is often initiated with only upper appliances. In extraction cases, crowded lower anterior teeth are allowed to partially align without appliances for several months (Figures 2a–2d). Using fewer appliances translates into reduced problems and less breakage and occlusal interference. Dr. Wick Alexander aptly coined the term “Driftodontics” when referring to this lower arch treatment, which is usually as effective as bracketing.

Preparation also involves determining anchorage requirements. Anchorage loss is an inherent problem in all preadjusted bracket systems. Because tip and torque are built into the bracket prescription, anterior teeth have a tendency to move forward. When maximum anchorage is necessary, I prefer to use what I have termed the all-in-one anchorage appliance, which provides superior anchorage, versatility and numerous options for posterior control (Figure 3). The all-in-one anchorage appliance offers a way to maximize anchorage by using a double-wire transpalatal bar to hold maxillary molars in position, three separate solder joints on the lingual surface of the first molar bands to prevent rotation and tipping of the molars, and a Nance-style acrylic button on the palatal surface for additional anchorage. You can remove the acrylic button to reduce anterior anchorage and allow incisor retraction to occur effectively.
Phase Two: Initial Leveling and Aligning

The Initial Leveling and Aligning Phase is essential for treatment to result in optimal leveling via free sliding to reduce frictional resistance and anchorage strain. If completed too quickly, you’ll sacrifice predictable and efficient retraction and space closure because ideal posterior free sliding has not been implemented. At the same time, you’re establishing early torque control of the anterior segment.

Ideal leveling may require bracket repositioning. If there are any brackets not in the ideal position at the completion of this phase, they should be removed and rebonded immediately. It is much more efficient to rebond in the early stages of treatment.

Establishing and maintaining upright canine positioning is an essential part of the leveling phase and is accomplished with canine laceback ties (Figures 4a–4d). The laceback ties also impart a minimal retraction force on the canines.

Phase Three: Class 1 and Midline Attainment

The Class I and Midline Attainment Phase should be accomplished early. Starting treatment with Class I molars is a gift. Do not lose it! Several options are available with Class II molar positions. The maxillary options include correcting mesially rotated molars, arch expansion, maxillary molar distalization, holding maxillary molars and allowing mandibular molars to come forward or a combination of these modalities. Mandibular options include molar uprighting, mesial movement of molars, arch expansion to match maxillary expansion or functional movements. The goal is to achieve a solid Class I canine and molar position in all four quadrants and coincident midlines, then progress toward a controlled outcome.

All too frequently, space closure is completed before attaining coincident midlines. In extraction cases, the timely use of available space to establish proper midlines produces balanced and symmetrical four-quadrant retraction. It is important to examine the patient from a full frontal facial view to determine if midline correction is required in the upper arch, lower arch or both (Figures 5a–5e).

During this phase, continue to fill the bracket slots anteriorly in order to maintain the torque control established earlier in the treatment. The ultimate goal is to complete this phase with coordinated upper and lower .016 x .022 stainless steel archwires, making transition to the subsequent space management stage easier.

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### ARCHWIRE OPTIONS FOR INITIAL LEVELING AND ALIGNMENT

<table>
<thead>
<tr>
<th>Wire Option</th>
<th>Degree of Initial Malalignment</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round Copper Ni-Ti®</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.016 27°C</td>
<td>Severe</td>
<td>Low load to deflection</td>
</tr>
<tr>
<td>.018 27°C</td>
<td>Moderate</td>
<td>Low load to deflection</td>
</tr>
<tr>
<td>Rectangular Copper Ni-Ti</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.016 x .022 35° C</td>
<td>Minor</td>
<td>Establish early torque control</td>
</tr>
<tr>
<td>.017 x .025 35° C</td>
<td>Minor</td>
<td>Round followed by rectangular to complete phase</td>
</tr>
<tr>
<td>Rectangular Braided Stainless Steel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>.017 x .025 D-Rect® or Force 9®</td>
<td>Severe</td>
<td>Low load to deflection</td>
</tr>
<tr>
<td>.018 x .025 D-Rect or Force 9</td>
<td>Severe</td>
<td>Low load to deflection</td>
</tr>
</tbody>
</table>

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### CANINE LACEBACKS

**Don’t:**

- Rush this stage.
- Use elastics, power chain and coils when using flexible archwire.

**Phase: Class 1 and Midline Attainment**

**Don’t:**

- Leave any brackets that prevent free sliding.
- Expect Class I and midline positions to “just work out later” in treatment.

**Patient C**

Figures 4a–4b. Laceback ties were used during leveling phase to keep canines upright and apply a light retraction force.

Figures 4c–4d. Modified laceback ties may provide a more efficient and secure force as compared to the standard laceback.
**Phase Four: Vertical and Transverse Correction**

Vertical and transverse correction are not independent or isolated steps but represent ongoing, inter-dependent considerations during treatment. They should be part of the treatment plan from the onset. Begin vertical and transverse correction as early as possible. An excellent vertical control method in deep-bite patterns involves the selective use of Bite Turbos (Figures 6a–6i). Correcting deep bites involves differentiation between those caused by reduced lower facial height and insufficient eruption of posterior dentition and those caused by supereruption of anterior teeth.

Bite Turbos are extremely effective for deep-bite patterns caused by insufficient eruption of posterior teeth. They eliminate the cooperation factor required for removable bite plates and the two-visit fabrication of laboratory appliances. They also function 24 hours a day.

Transverse correction should be completed as soon as possible using ancillary appliances such as a palate expander or with piggy-backed arches, if required.

**Phase Five: Space Management**

The Space Management Phase encompasses distributing the remaining space through canine retraction, anterior retraction and/or posterior protraction. This phase of treatment becomes extremely predictable and efficient when you’ve followed the initial steps to establish anterior torque control and posterior free sliding. Canine and anterior retraction have been covered extensively in my previous article.

Posterior protraction is a challenging procedure in other techniques. When we attempt to move posterior teeth forward or in a mesial direction, equal and opposite vectors exert forces to try to bring the anterior teeth posteriorly or lingualize the anterior crowns. This may result in under-torqued anterior teeth. In D.S.S., the anterior bracket slots are filled with a full-sized stainless steel archwire, which prevents anterior crown tipping by placing labial crown torque in the anterior segment. Since posterior teeth are free to slide forward more easily with the undersized archwire, the anterior teeth are held in position (Figures 7a–7b).

** ARCHWIRE OPTIONS FOR CLASS 1 AND MIDLINE ATTAINMENT **

<table>
<thead>
<tr>
<th>Archwire Option</th>
<th>Treatment Option</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Round Stainless Steel</td>
<td>Nonextraction</td>
<td>Use if initial leveling/aligning did not progress to full-sized rectangular Copper Ni-Ti wire, then go to .016 x .022 stainless steel</td>
</tr>
<tr>
<td>Rectangular Stainless Steel</td>
<td>Extraction or cases requiring space closure</td>
<td>Use if leveling/aligning completed with rectangular Copper Ni-Ti</td>
</tr>
</tbody>
</table>

**Figure 5a.** Patient requires upper and lower midline correction. Steel ligature tie was used toward the distal side of the lateral incisor bracket to prevent rotation.

**Figure 5b.** Power chain was added to both arches extending from the lateral incisor to the opposite first molar to correct both midlines.

**Figure 5c.** Elastics were engaged to add force in the direction of the midline correction.

**Figure 5d.** Additional anterior cross elastic was worn overnight.

**Figure 5e.** Both midline corrections were completed after 10 weeks.

**Phase: Space Management**

Don’t:
- Round trip teeth.
- Lose Class I canine relationship.
Figures 6a - 6c. Upper brackets were placed on patient with a deep bite and large overjet.

Figures 6d - 6f. Bite Turbos, bonded linguually to upper central incisors, postures the mandible forward. Note the amount of posterior vertical clearance.

Figure 6g. After 5 months with Bite Turbos, the posterior teeth erupted into full occlusion.

Figure 6h. Bite Turbos were removed and lower brackets and archwire were added.

Figure 6i. The patient’s profile improved with vertical correction and mandibular repositioning over 10 months.

Take the Uncomplicated Approach to Bite Opening

Bite Turbos are modifications of lingual incisor brackets - slotless, with modified contour and broader incisal surface - that brings a new level of efficiency to bite opening. Bite Turbos function as a built-in biteplate, eliminating the compliance issue.

One to four Bite Turbos can be placed on the lingual side of the upper or lower incisors. Their bite planes are horizontal to the occlusal plane to avoid creating a distal force on the mandible or maxilla. The flat surface and deeper anteroposterior dimension of the bite plane generate faster bite opening and allow earlier placement of lower incisor brackets without danger of dislodgment.

Since there are no slots or tie-wings, Bite Turbos are even easier to remove and cleaner than conventional lingual brackets. Use the ETM Lingual Debonding Plier for fast and easy removal. For more information, contact your Ormco sales representative.
Phase Six: Pre-Finishing

The Pre-Finishing Phase is a time for review and analysis. Begin the finishing phase six months before the anticipated completion of treatment. Use a pre-finishing checklist like the one on the next page to plan the balance of the treatment. This will show a comparison between the completed initial treatment goals and those remaining.

ARCHWIRE OPTIONS FOR SPACE MANAGEMENT

<table>
<thead>
<tr>
<th>Archwire Option</th>
<th>Treatment Option</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Canine Retraction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rectangular Stainless Steel</td>
<td>Standard</td>
<td>Less friction</td>
</tr>
<tr>
<td>.016 x .022</td>
<td>Minimal space closure</td>
<td>More friction; easier transition to anterior retraction</td>
</tr>
<tr>
<td>.018 x .022</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rectangular TMA</strong></td>
<td>Vertical correction or recently bonded/banded 2nd molars</td>
<td>Alignment of 2nd molars without reduction of archwire dimension</td>
</tr>
<tr>
<td>.017 x .025</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Anterior Retraction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rectangular Stainless Steel</td>
<td>Standard</td>
<td>Keeps teeth upright</td>
</tr>
<tr>
<td>.018 x .022</td>
<td>Minimal space closure</td>
<td>Additional torque control</td>
</tr>
<tr>
<td>.018 x .025</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Rectangular TMA</strong></td>
<td>Continued vertical correction or second molar influences</td>
<td>More flexibility; easier bracket engagement</td>
</tr>
<tr>
<td>.017 x .025</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Posterior Protraction</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rectangular Stainless Steel</td>
<td>Standard</td>
<td>Keeps teeth upright</td>
</tr>
<tr>
<td>.018 x .022</td>
<td>Minimal protraction required</td>
<td>Additional torque control</td>
</tr>
<tr>
<td>.018 x .025</td>
<td></td>
<td></td>
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</tbody>
</table>

Phase Seven: Finishing

The Finishing Phase can be very frustrating if not planned properly. When earlier treatment steps are rushed or not fully completed, the finishing phase may take longer to produce a successful outcome. Patient anxiety over extended treatment time may limit our ability to finish properly if not planned correctly. Finishing options include thoughtful archwire selection, creative wire bending, strategic rebracketing and clever elastic systems.

Archwire selection is based on the factors that we need to consider in our finishing requirements. The determination of the finishing archwire is based on its need to fulfill specific demands.

- Is final torque control needed?
- Is final vertical movement of teeth required?
- Is bracket engagement a consideration because of recent rebracketing?
- Is it necessary to detail individual tooth positions with wire-bending?
- Is there any residual space closure that requires maintaining upright teeth?

Figure 7a. The lower arch displays a D.S.S. setup. An .018 x .022 stainless steel archwire and Ni-Ti extension coils were used for posterior protraction.

Figure 7b. Space closed after 12 weeks of protraction.

Phase: Pre-Finishing

Don’t:
- Forget initial treatment plan goals.
- Forget to start pre-finishing early to keep treatment time on schedule.

Patient F
**Pre-Finishing Checklist**

<table>
<thead>
<tr>
<th>Item</th>
<th>Completed</th>
<th>To Be Completed</th>
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<tr>
<td>1. Sagittal control</td>
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<td>Class I molars</td>
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<tr>
<td>Class I canines</td>
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<tr>
<td>2. Vertical control</td>
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<tr>
<td>Anteriorly</td>
<td></td>
<td></td>
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<tr>
<td>Posteriorly</td>
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<td>3. Transverse control</td>
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<td>Intermolar width</td>
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<tr>
<td>Intercanine width</td>
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<tr>
<td>4. Torque control</td>
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<tr>
<td>Anteriors</td>
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<tr>
<td>Posteriors</td>
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<td>5. Axial inclinations</td>
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<td>Crown positions</td>
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<td>Root parallelism</td>
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<td>6. Arch form</td>
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<td>Mandibular arch</td>
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<td>7. Contact points</td>
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<td>Marginal ridges</td>
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<td>8. Midline control</td>
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<td>Facial midline</td>
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<tr>
<td>Dental midlines</td>
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<tr>
<td>9. Individual tooth control</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotations</td>
<td></td>
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<tr>
<td>Spacing</td>
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<td>10. Mandibular plane</td>
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<td>Level curve of Spee</td>
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<tr>
<td>11. Envelope of motion</td>
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<td>Protrusive</td>
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<td>Lateral excursions</td>
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<td>Balancing side contacts</td>
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<td>Working side contacts</td>
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<tr>
<td>12. Soft tissue profile</td>
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<td>13. Cephalometric objectives</td>
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<td>Anchorage control</td>
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<td>Mandibular plane angle</td>
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<td>14. Molar positioning</td>
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<tr>
<td>First molars</td>
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<td>Second molars</td>
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<tr>
<td>Third molars</td>
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<td>15. Dental health</td>
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<tr>
<td>Periodontal health</td>
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<tr>
<td>Decalcification</td>
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<td>Root resorption</td>
<td></td>
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<tr>
<td>Alveolar bone</td>
<td></td>
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<td>16. Aesthetic finishing</td>
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<tr>
<td>Recontouring teeth</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bonding/buildups</td>
<td></td>
<td></td>
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</tbody>
</table>

- **Round Stainless Steel**
  
  .016 or .018
  
  **Advantages**: wire-bending precision, bracket engagement
  
  **Disadvantages**: compromised torque control; difficult vertical movement

- **Full-Sized Rectangular TMA**
  
  .017 x .025
  
  **Advantages**: maintain torque control, bracket engagement, wire-bending precision or teeth upright in final space closure
  
  **Disadvantages**: difficult vertical movement

- **Full-Sized Rectangular Braided Steel**
  
  .017 x .025 or .018 x .025 Force-9
  
  .017 x .025 or .018 x .025 D-Rect
  
  **Advantages**: final vertical movement of teeth is greatly facilitated, bracket engagement
  
  **Disadvantages**: difficult wire-bending or maintaining upright teeth in final space closure

Final vertical movement of teeth can be accomplished efficiently using full-sized braided steel Force-9 or D-Rect archwires (Figures 8a – 8b).

In many instances, treatment cannot be completed with only “straight-wire” appliances and will require some degree of wire bending. First-, second- or third-order bends may frequently be used to fine-tune occlusion and make up for inconsistencies in tooth size or morphology. In addition to wire bending, bracket repositioning can also facilitate final tooth positioning.

In addition, vertical Class II and Class III vectors can be supplied in numerous ways with elastics to give proper force direction.

The objectives of D.S.S. treatment with the Orthos system are to produce the highest quality of predictable results with an efficient, non-stressful treatment system. The Differential Slot Size technique allows us to accomplish our goals. 🥳

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**Patient G**

Figure 8a. An .018 x .025 flexible braided stainless steel D-Rect upper archwire was used to complete vertical correction.

Figure 8b. Triangle elastics were added to correct the posterior discrepancy (shown here after 6 weeks).
CASE STUDY

PRETREATMENT RECORDS

Patient prior to treatment at 11 years, 2 months.
Initial cephalometric tracing and values as follows:

<table>
<thead>
<tr>
<th>Angle</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNA</td>
<td>82</td>
</tr>
<tr>
<td>SNB</td>
<td>77</td>
</tr>
<tr>
<td>ANB</td>
<td>5</td>
</tr>
<tr>
<td>1 TO 1</td>
<td>130</td>
</tr>
<tr>
<td>1 TO SN</td>
<td>96</td>
</tr>
<tr>
<td>1 TO GOGN</td>
<td>100</td>
</tr>
<tr>
<td>WITS</td>
<td>-1mm</td>
</tr>
<tr>
<td>1 TO 1</td>
<td>31</td>
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</table>

PRETREATMENT

Patient is Class I with moderately deep overbite, upper and lower crowding, rotated lower laterals, lower left first premolar in lingual crossbite and incisal edge irregularities. Treatment plan: Extraction of upper and lower first premolars, use of D.S.S. with Orthos setup and palatal anchorage.

PROGRESS

During the initial leveling and aligning phase, an all-in-one anchorage appliance with a Nance button was affixed for anchorage and laceback ties were added to keep the canines upright. The lower first molars were banded and the lower anterior were allowed to drift after extractions.

At seven months into treatment, the lower brackets were placed.

During canine retraction, medium-force Ni-Ti extension springs (150 gms) were added to the upper and lower arches. Anterior retraction followed, using heavy-force Ni-Ti springs (250 gms) and removing the Nance button (top row).

Pre-finishing and finishing stages included final detailing of occlusion and aesthetic recontouring of the incisal edges of the upper anterior teeth (bottom row).
### TREATMENT PLAN

<table>
<thead>
<tr>
<th>Archwire Sequence</th>
<th>Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Upper:</strong></td>
<td></td>
</tr>
<tr>
<td>.016 27°C Copper Ni-Ti</td>
<td>Leveling and aligning (initial)</td>
</tr>
<tr>
<td>.017 x .025 35°C Copper Ni-Ti</td>
<td>Leveling and aligning (final)</td>
</tr>
<tr>
<td>.016 x .022 Stainless Steel</td>
<td>Space management: canine retraction</td>
</tr>
<tr>
<td>.018 x .022 Stainless Steel</td>
<td>Space management: anterior retraction</td>
</tr>
<tr>
<td>.017 x .025 TMA</td>
<td>Finishing</td>
</tr>
<tr>
<td><strong>Lower:</strong></td>
<td></td>
</tr>
<tr>
<td>.016 27°C Copper Ni-Ti</td>
<td>Leveling and aligning</td>
</tr>
<tr>
<td>.016 x .022 Stainless Steel</td>
<td>Space management: canine retraction</td>
</tr>
<tr>
<td>.018 x .022 Stainless Steel</td>
<td>Space management: anterior retraction</td>
</tr>
<tr>
<td>.017 x .025 TMA</td>
<td>Finishing</td>
</tr>
</tbody>
</table>
POSTTREATMENT

After 30 months of treatment, the Orthos brackets were removed and a bonded canine-to-canine retainer was placed.

POSTTREATMENT RECORDS

Patient after treatment at 13 years 8 months. Superimposition of initial and final tracings. Final panoramic radiograph. Cephalometric tracing and values as follows:

<table>
<thead>
<tr>
<th></th>
<th>Final</th>
<th>Initial</th>
<th>Final</th>
<th>Initial</th>
</tr>
</thead>
<tbody>
<tr>
<td>SNA</td>
<td>82</td>
<td>82</td>
<td>1 TO</td>
<td>91</td>
</tr>
<tr>
<td>SNB</td>
<td>80</td>
<td>77</td>
<td>1 TO</td>
<td>95</td>
</tr>
<tr>
<td>ANB</td>
<td>2</td>
<td>5</td>
<td>WITS</td>
<td>1mm</td>
</tr>
<tr>
<td>1 TO 1</td>
<td>145</td>
<td>130</td>
<td>SN-GOGN</td>
<td>31</td>
</tr>
</tbody>
</table>

Patient displays well-balanced occlusion with healthy gingival tissue at one year into retention with addition of cosmetic restoration of anterior teeth.

References:

4. Ibid.

* Past issues of Clinical Impressions can be found at ormco.com/ci.
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Ormco’s *inspire!*™ aesthetic bracket represents an evolution in technology that dates back to the mid ’80s. It is the culmination of 15 plus years in a learning process, capitalizing on the mistakes and progress in ceramic and orthodontic bracket technology.

Since 1984, we have seen polycrystalline and single-crystal aluminum oxide brackets of several designs. The profession witnessed a period of enamel damage from ceramic brackets, ranging from enamel attrition to outright enamel fractures. This unfortunate experience provided a valuable lesson about controlling the bond strengths of these rigid materials and recognizing that the clinician cannot treat ceramic brackets the same as metal.

When “A” Company produced the Starfire® sapphire bracket (a single-crystal aluminum oxide), clinicians appreciated the clarity of the single-crystal material but experienced high fracture rates due to design and manufacturing flaws. Ormco also dabbled for a short time with a single-crystal bracket called Dr. Michael Swartz, DDS
Encino, California

Gem. Unitek’s original polycrystalline Transcend™ bracket evolved to a mechanical retention base design, the Transcend™ 2000, and then into the Clarity™ design with a metal slot insert.

After the merger with “A” Company, Ormco ceramists and engineers totally redesigned the Starfire bracket based on the lessons from the past, resulting in the *inspire!* bracket (Figure 1). It has retained the water-clear attributes of single-crystal sapphire and eliminated the high fracture rate of its predecessor. A mechanical retention ball base was added for more reliable bonding and debonding. Ormco’s Face Paint™ was also added for ease in bracket identification and visibility for accurate bracket placement.

When handled properly, my first-hand experience indicates that bracket fractures are now rare.

---

**Dr. Michael Swartz** is currently the Clinical Director for Orthodontic Training and Seminars at Ormco where he organizes and conducts continuing education programs. He began in the dental field as a laboratory technician and then became involved in dental materials research and development. He received his dental degree from the University of Southern California. In 1975 he joined Ormco as director of research and development while maintaining a private, general practice. Dr. Swartz received his post-doctoral orthodontic education at the University of California, San Francisco. He maintained a private specialty practice from 1985 to 1998 in Encino, California. He is now actively lecturing worldwide while treating a limited number of patients at the Sybron headquarters in Orange, California.
Multiple Factors Contribute to Bonding Success

The rhomboid design, mechanical retention ball base and Face Paint features of *inspire!* make bonding routine and reliable. You can use any bonding material with its mechanical ball base, but I prefer a light-initiated resin system because light-cured materials tend to discolor less than self-cured materials. I have been successful in bonding *inspire!* using Enlight™ adhesive with a five-second exposure from the Optilux 501 curing light.

The facial surface of the *inspire!* bracket is coated with Face Paint, a water-soluble dye in a different color for each tooth in the arch. Face Paint greatly aids in visually positioning the bracket during bonding. Immediately after bonding, Face Paint easily rinses off. The size and rhomboid shape of the bracket is identical to the popular Diamond™ and Mini Diamond™ brackets so that bracket placement criteria doesn’t require any change or additional familiarization time.

The *inspire!* bracket base is coated with a glass binder on which small, hollow zirconia balls (approximately 40 microns in diameter) are evenly distributed and fused (Figure 7). The glass binder
melts at a lower temperature than the zirconia balls, fusing them to the aluminum oxide bracket base. This fusion produces fillets where the balls meet the bracket base to create the desired undercuts for the interlock of the bonding resin (Figure 8).

Brackets Have Distinct Properties
One possible mistake orthodontists made in the past was failure to treat ceramic brackets differently from metal brackets. Ceramics are rigid, brittle materials. Rough handling can increase the risk of bracket fracture. Fortunately, we now have titanium wires that deliver lower forces than stainless steel, are far kinder to ceramic brackets and can be used throughout treatment. I would certainly encourage the use of nickel titanium, copper nickel-titanium and beta-titanium (TMA’) wires with any ceramic brackets. In contrast with the polycrystalline ceramics that are more opaque, the inspire! brackets are water-clear. While this is aesthetically pleasing, the bracket slot can be difficult to see. If you attempt to engage a stiff, large rectangular wire in a hard-to-see slot, you could apply too much force and possibly stress the bracket. By using titanium alloy wires, you can greatly reduce this risk.

All ceramic brackets are composed of aluminum oxide, which is second in hardness only to diamond and significantly harder than enamel. Placing ceramic brackets on the lower arch can lead to rapid and severe enamel wear of the opposing dentition. When explaining the potential risk, I find that most patients will accept metal brackets on the lower arch, particularly when shown that they’ll display little if any of the lower brackets during normal speech.

The dimensions of the tie-wing areas of the inspire! bracket have been made comparable to metal (Mini Diamond) brackets and are easily ligated. The Teflon-coated steel ligatures seem to be a better, more aesthetic alternative to stainless steel ligatures and may be more acceptable to the patient who experiences discoloration of their clear elastic ligatures. The elastomeric ligatures (all of which are polyurethane) are excellent for ligation with ceramic brackets but, as we have all experienced, can discolor with some foods (mustard and curry dishes in particular) and with poor hygiene. Usually, if you remind the patient about what foods to avoid and reinforce good oral hygiene, the ligatures will maintain an acceptable appearance between visits.

Improved Bonding Base Aids in Debonding
Rigid ceramic brackets present a debonding challenge different from metal brackets. The more pliable metal bracket assemblies allow easy distortion and safe, atraumatic removal. Earlier ceramic bracket designs, with their chemically bonded bases, resulted in enamel fractures and shattered brackets during the debonding procedure. The lesson history teaches us is to produce a bonding base design that will routinely fail between the bracket base and the bonding material without applying excessive stress to the resin/enamel interface. The solution was development of the mechanical ball base design and a special debonding plier.

If you compress a ceramic bracket mesiodistally as you would a pliable metal bracket, it will shatter and can often leave the ceramic bracket base still attached to the tooth. This procedure leaves you with a difficult, time-consuming debonding process.

The inspire! debonding method focuses on using a plastic debonding plier that absorbs and distributes the forces of debonding such that it causes a bracket/resin interface failure without shattering the bracket. To debond, engage the tips of the inspire! plastic debonding plier under the incisal/occlusal and gingival tie-wings (Figure 9) and squeeze the plier handles together firmly. It is important that the plier handles are compressed together firmly and touch before any force is exerted to debond (Figure 10). Firmly grip the bracket with the plier and pivot in either the gingival or occlusal direction in a steady, confident motion until the bracket separates from the bonding resin. The pliers are designed to be used to debond one case, then discard.
With proper technique, the *inspire!* brackets come off in one piece, leaving resin (and some zirconia balls) still on the enamel. You can remove any resin and zirconia balls with a multi-fluted carbide bur followed by sanding discs and a fine abrasive rubber cup. My patients have not experienced any unusual discomfort with this debonding procedure; however, my normal wire sequence ends with a braided stainless steel D-Rect® archwire. With this archwire, there is little to no tooth mobility at the time of debonding. If there is any tooth mobility or sensitivity at the time of debonding, it may be desirable to have the patient bite on a wax wafer or cotton roll.

We have all experienced the trials and tribulations of ceramic brackets. Hopefully, we have learned from our past. The *inspire!* bracket seems to have capitalized on these trials and now yields a fully functional and truly aesthetic bracket.

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**Figure 9.** The tips of the debonding plier are engaged under the incisal/occlusal and gingival tie-wings of the bracket.

**Figure 10.** The plier handles are squeezed together firmly until they touch.

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**CASE STUDY**

**INITIAL TREATMENT**

Adult female has *inspire!* brackets placed on the maxillary arch with an .017 x .025 35°C Copper Ni-Ti® archwire.

**PROGRESS**

Seven months into treatment.

An .019 x .025 TMA archwire was placed on the maxillary arch and Mini Diamond brackets were added to the mandibular arch with an .018 Ni-Ti archwire at 3 months.

Fourteen months into treatment.

An .021 x .025 braided stainless steel D-Rect archwire was used on both arches for the last few months of treatment. Total treatment time was 15 months.

**POSTTREATMENT**

Eighteen months into retention.
“Everybody line up at arm’s length,” the scoutmaster yelled out to the troop. “Police the campsite and pick it up if it isn’t green or growing.” The exercise always brought out a collective groan from the weekend campers because it signaled the end of the weekend. As a group we would sweep the area to ensure that future visitors would enjoy and benefit from it as much as we had. In much the same way, we should view the orthodontic landscape to see how we can enhance it for future generations.

It is truly a fantastic time to be an orthodontist. In response to positive public appeal and overall favorable economic conditions, demands for our services are peaking to new highs. The American Association of Orthodontists (AAO) has served us well by getting the “see an orthodontist by age seven” message across to our target audience. Thanks to positive media profiles, more and more potential patients are motivated to seek out orthodontic treatment from privately owned practices and publicly owned managed-care offices.

Despite the rosy outlook for the orthodontic profession, we are in the midst of a crisis that will greatly effect all currently practicing orthodontists—specifically, a crisis in orthodontic education.

**Current Conditions Require Increased Maintenance**

Recent studies published in the *American Journal of Orthodontics and Dentofacial Orthopedics (AJODO)* and the *Journal of Clinical Orthodontics (JCO)* point out a developing decrease in the number of orthodontic resident program graduates and faculty. The recent closure of several orthodontic programs has for the moment reduced the number of resident program graduates. In addition, a larger proportion of graduates are electing not to practice full-time or not to practice in the United States or Canada, which also decreases the full-time equivalency of today’s graduating class.

Meanwhile, a survey from the JCO Orthodontic Practice Studies also shows a gradual rise in the median age of practicing orthodontists over the last 20 years. As this number rises, it will become increasingly difficult to replace the growing number of retiring orthodontists with newly graduated residents. Think of it as a baby-boomer effect in the orthodontic profession that will have the greatest impact 20 to 25 years from today. When you do the math, it becomes apparent that a large number of orthodontists will not have an available buyer when the time to sell their practice arrives. Several orthodontic consultants and advisors are already warning
their clients about the diminishing possibility of being able to depend upon the sale of their practice as a source of financial security.

Another concern lies in the decreasing level of clinical experience demonstrated by incoming orthodontic program faculty. It is not unusual to find programs where the current residents are being trained by faculty that have recently graduated from the same program. When compared to private practice opportunities, it is becoming increasingly difficult for most orthodontic residency programs to promote faculty positions as a feasible economic practice alternative. The average tenure of orthodontic program chairs is dropping while the full-time position vacancy of orthodontic programs has doubled in the last decade.

The popular historical solution to these shortages would be to increase the number of graduating residents to fill the demands and needs of both the academic and private practice sectors. Unfortunately, it would not be feasible to deliver this larger workload to an already strained orthodontic residency program faculty. The knee-jerk reaction of throwing more resident bodies at the problem will not serve as an effective solution to the problem at hand. A more successful approach would be to concentrate our focus upon the type of education that is provided. The quality of the orthodontic education received must take precedence over the quantity of residents produced. The solution to this educational shortage lies within the ranks of currently practicing orthodontists. The quality of the orthodontic education received must take precedence over the quantity of residents produced.

Every Orthodontist Can Assist in the Cleanup

Private practice AAO members must switch to a proactive stance in response to this solvable problem. Many opportunities are available for us to give back to the very same profession that has enabled us all to lead successful and fulfilling professional lives. If you happen to practice in an area where there is an orthodontic residency program, the most effective opportunity would be to become a part-time faculty member. Is long distance from a residency program a problem? Put your business expertise to work by serving as a trainer or mentor for the AAO-sponsored Practice Alternatives Program, which is designed to educate current orthodontic residents to the benefits of various practice opportunities in the orthodontic field. Are you considering the sale of your practice in the near future? Take advantage of the AAO Matching Program to increase the visibility of your practice to recent graduates. Is time a scarce commodity? Put your wallet to work and become a contributor to the American Association of Orthodontists Foundation (AAOF) to directly effect and contribute to orthodontic research. In addition to educational research grants, each year the AAOF distributes $225,000 in Orthodontic Faculty Developmental Fellowship Awards to promote careers in orthodontic education.

Finally, a wealth of information and assistance is readily available to all AAO members to further explore various opportunities. The best pay-roll value that dues-paying members currently have can be found in the 46 full- and part-time AAO staff that work in St. Louis, Missouri. The staff at the AAO is there to serve and help you. Take advantage of these valuable services.

The time is now for us to stand in a line together, sweep the campsite, view the current health and condition of our own profession with a critical eye, and volunteer to help remedy any discrepancies in our own geographic areas. The scoutmaster is blowing his whistle and calling out to the entire orthodontic troop as a challenge to each and every member. Let’s do our best to leave this orthodontic legacy in better shape than it was when we ourselves were fortunate enough to find it!
On June 29, 2001, over 700 doctors and staff convened in 13 cities around the U.S. and Canada to participate in the first Ormco videoconference, which featured Dr. Dwight Damon discussing the low-force, low-friction system that bears his name. We’ve chosen a sample of frames from the videoconference, specifically addressing archwires, to share with those who missed it or who want a chance to review some highlights. Let’s peek over Dr. Damon’s shoulder as he reviews the use of archwires with the Damon System 2.

CI: Why don’t you ever start a case with a Ni-Ti wire larger than .014?
Dr. Damon: Let me first mention something that most of us recognize. We have traditionally based our wire selections on what we could get in; that is, what force the patient could tolerate. The philosophy behind the Damon System is threefold: One, it capitalizes on the lack of friction that allows us to keep the forces as low as possible throughout treatment so that we don’t impair the oxygen flow to the tissue. Staying within what I call the “optimal force zone” keeps a good supply of oxygen going to the teeth and surrounding periodontium, which encourages better tooth movement and bone and tissue health. Two, it’s important to start with a light force wire (an .012 or .014 Ni-Ti Align™ SE) that won’t overpower the muscles of the face, which works like a lip bumper to control torque in the lower anteriors. Three, using extremely low-force wires also allows the teeth to follow the path of least resistance, which encourages posterior expansion. Couple these reasons with patient comfort and you have a good case for starting every case with a low-force wire.

CI: What do you want to accomplish with the first wire in the sequence, the .014 Ni-Ti Align SE?
Dr. Damon: The object of the first wire is to get to the second wire. We want to bring the teeth into a plane of space so they’ll accept the second wire, the .016 x .025 Ni-Ti Align SE. With the .014, we’re beginning the leveling and alignment. We’re beginning to work out rotations. We’re beginning to develop the arch form. The key word here is beginning.

CI: What is so important about having a small dimension wire in such a large lumen slot?
Dr. Damon: Let me use a visual. Think about driving a 1959 Cadillac on a winding road in Monte Carlo and having to keep the car entirely on one side of the road. Visualize how you’d have to work your way around each of the curves with the car continually hugging the outer berms to keep in the lines. Now visualize driving that same road at the wheel of an agile BMW where you’re allowed to use both sides of the road. To the extent possible, you are straightening out the drive somewhat by taking the middle of the road, touching many fewer of the berms. Placing a small dimension archwire in a large lumen slot is like driving the BMW down the middle of the curving highway. Doing so diminishes the divergence of angles, which, in the orthodontic world, greatly diminishes the friction and binding for more comfortable and efficient tooth movement.
CI: Could you explain the criteria for transitioning from one wire to the next, particularly from the .014 to the .016 x .025 Ni-Ti Align SE?

Dr. Damon: Fundamentally, the Damon System 2 is a three-wire system. With children, I can often transition from an .014 to an .016 x .025 Ni-Ti Align SE after one appointment (10-week interval). In many adult cases, however, I would run the risk of going way out of the optimal force zone if I were to go from an .014 to an .016 x .025 too quickly. If the .014 Ni-Ti has done its job, it will have begun the leveling and aligning, begun to work out the rotations and begun to develop the arch form.

When to transition to the next wire is always a judgment call, but the Damon System itself can help. If you have trouble getting the next wire size in, it’s probably too early for that wire. In such cases, I evaluate how much force I’m going to get from the wire, then select the wire that will progress the case yet keep it in the optimal force zone. Once you get the wire in, let it work. Unless the Ni-Ti wire has taken a set, it needs appreciable time to do its job. And in some adults, that can mean a number of appointments.

CI: What do you want to accomplish with the .016 x .025 Ni-Ti?

Dr. Damon: This wire is the heart and soul of the system. It is with this wire that we want to work out the rotations almost entirely. We also want to continue to level, develop the arch form and begin torque control. The objective of the .016 x .025 Ni-Ti Align SE is to get the teeth to a plane of space that will allow the .019 x .025 stainless steel finishing wire to slide in almost passively.

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**2nd Wire**

**.016 x .025 Ni-Ti Align SE**

- Continue Working On
  - Rotations
  - Leveling
  - Arch form
  - Begin torque control

---

Initial archwires placed were .014 Ni-Ti Align SE.

Progress at 6 months, 1 week. Patient shown at third appointment with the initial archwire and ready to transition to an .014 x .025 Ni-Ti Align SE. In this case, I was not able to transition from the .014 to the next wire for three appointments. We transitioned to a .014 x .025 Ni-Ti Align SE to keep the case in the optimal force zone.

Progress at 8 months, 3 weeks. During the fourth appointment, an .018 x .025 Ni-Ti Align SE was inserted to stay in the optimal force zone.
I would like to remind everyone that in the next appointment after placing the .016 x .025 stainless steel archwire (10 weeks in my practice), you should take a panorex and check the root positions. Don’t be afraid to take brackets off and reposition them. This step is crucial to ensuring that the teeth are properly aligned to accept the .019 x .025 stainless steel wire when you’re ready to transition. Remember, the Damon System is a true straight-wire appliance. You can’t straighten the teeth if the brackets are on crooked. If you cannot engage the .019 x .025 stainless steel wire, try dropping down to an .018 x .025 stainless steel. Don’t try to force the wire. Stay in the optimal force zone.

CI: Explain how you work out rotations in a low-friction system.
Dr. Damon: In a nearly friction-free system, you don’t get rotations out by seating the archwire against the back of the slot. In passive self-ligation, rotational control is affected by three things: (1) the depth of the bracket slot, (2) the usable width of the bracket and (3) the horizontal archwire dimension. The .025 wire dimension of the .016 x .025 Ni-Ti wire fits in the .027 slot with only .002” of play, which gives the necessary control to work out the rotations.

CI: Why do you use posted stainless steel archwires instead of hooks on cuspids?
Dr. Damon: This system eliminates all hooks on brackets except on the lower first bicuspids. We have two goals in using posted archwires: to keep the appliance clean and the tissue as healthy as possible and to distribute the forces from elastic wear over the entire arch. It’s very important to use a stainless steel archwire with Class II elastics, particularly in the upper arch. I find that when the friction and binding is removed from the system, that the pull of the Class II elastics from hooks can extrude the upper anteriors very quickly. By using stainless steel archwires with posts, you distribute the force over all the teeth rather than on one tooth.

CI: With a friction-free system, the wire tends to slide. Where do you place the crimpable stop?
Dr. Damon: We always put the stop on the archwire between the brackets that are closest together. This is usually between the first and second bicuspids and we usually need only one stop.

As you can see from the freeze-frames, the archwire sequence and transitioning from one archwire to the next are fundamental to the success of the Damon System 2. The next Clinical Impressions will have another installment from the Damon videoconference with topics such as bracket placement and the use of elastics, C-chain and Ni-Ti coil springs. If you’d like more information on the system, refer to the Damon Web site at DamonSystem.com.
Orthodontics and Dentofacial Orthopedics

By James A. McNamara, Jr., and William L. Brudon

Dr. James A. McNamara, one of the foremost authorities in orthodontics today, has collaborated with artist William L. Brudon to publish a comprehensive and detailed account of the latest advances in contemporary orthodontics and orthopedic treatment and patient management protocols. This 555-page volume with 750 illustrations is based largely on Dr. McNamara's 35 years of clinical experience. With highly readable text, it is intended for the orthodontist and staff members in private practice.

The first eight chapters of Orthodontics and Dentofacial Orthopedics provide a synopsis of the wide variety of treatments currently available for addressing malocclusions in the sagittal, transverse and vertical dimensions. The subsequent chapters describe the details of clinical management of fixed appliance therapy, including:

- Fixed appliance design options, including self-ligation
- Precision bonding and bracket placement
- Archwire sequencing for routine treatment
- Transpalatal and utility arch management
- Dentofacial orthopedics, such as
  - Rapid maxillary expansion
  - Extraoral traction
  - Functional jaw orthopedics, using Herbst, Twin Block, FR-2 of Fränkel, Bionator
  - Molar distalizing appliances such as Pendulum, Distal Jet, Wilson distalizing arch
  - Class III management using orthopedic facial mask, chin cup and the FR-3 of Fränkel

The book also includes two extensive chapters on interdisciplinary treatment from Dr. Vincent G. Kokich, as well as chapters on finishing and retention protocols. Clinical and cephalometric evaluation and the relationship of orthodontic treatment to occlusion and temporomandibular disorders are also presented.

This book offers an extensive continuing education experience for practicing orthodontists and their staff members. Clear, well-documented clinical protocols and numerous case examples are beautifully supported by Mr. Brudon's precise technical drawings.

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treating the class II low-angle brachycephalic patient

Brachycephalic patients frequently present with the lower incisors behind the A-pogonion line, a strong chin and strong musculature, thus making Class II and overbite correction difficult with traditional orthodontic appliances. With the hybrid Herbst*, you can treat these patients with a noncompliance appliance, moving the lower dentition into Class I occlusion with proper relation to the A-pogonion line with little change in chin position. It also allows the molars to erupt for better overbite correction. This hybrid Herbst (Figure 1) is effective for Class II, division 2 patients in repositioning the mandible, correcting overbite and mandibular asymmetry, while controlling the vertical dimension.

Why a Standard Cantilever Herbst Cannot Be Used
The standard cantilever Herbst appliance uses crowns on the upper and lower molars. It is contraindicated in Class II low-angle brachycephalic cases because 1) chin advancement is not warranted; 2) the strong musculature tends to tip the cantilever arms into the vestibular tissue; 3) advancing lower incisors is not very effective; and 4) the lower molars are prevented from erupting (which would aid in overbite correction).

Why a Hybrid Works for Brachycephalic Cases
The hybrid Herbst (Figures 2a–2c) uses crowns on the upper first molars and lower first bicuspids with a lower lingual arch from bicuspid to bicuspid, allowing the lower molars to erupt and aiding in overbite correction. Lower lingual wires put considerable force on the lower incisors in an anterior direction. To counteract this force, it is extremely important to place negative torque lower anterior brackets at the first appointment following Herbst delivery to control the torque of the lower incisors.
The brachycephalic patient usually has a strong A-pogonion, providing the needed bone support to intrude and advance the lower dentition. The hybrid Herbst design uses archwire tubes under its axles similar to the standard cantilever design. The tubes are positioned more gingivally due to the contour of the lower bicuspid crowns. This position provides better anchorage with a more vertical direction of force to intrude the lower incisors into the wider portion of bone, allowing incisor advancement.

The patient in the case shown is Class II with his lower incisors behind the A-pogonion line and a strong chin. We used the hybrid Herbst design to correct the mandibular asymmetry and advance his lower dentition, creating a Class I occlusion, correcting his overbite and improving the profile of his lower lip (Figure 3).

The Herbst appliance is a predictable way to treat Class II patients and, as with the hybrid Herbst, can be modified for use in a variety of ways.

* Herbst is a registered trademark of Dentaurum.
Pretreatment

16-year 2-month-old male, Class II, division 2 malocclusion with deep overbite, distal position of mandibular incisors in relation to the A-pogonion line and mandibular asymmetry.

Treatment Plan

Correct deep bite, Class II malocclusion and mandibular asymmetry by intruding and advancing the mandibular incisors and repositioning the mandible.

Progress

Plaster models were made of the patient’s upper and lower arches. The hybrid Herbst appliance was fabricated on the models indirectly in the lab.

After the hybrid Herbst was in place for two months, the maxillary 5-5 were bonded and an .020 square 35°C Copper Ni-Ti archwire was placed. The mandibular incisors were also bracketed with -10° torque brackets and an .018 round 35°C Copper Ni-Ti archwire was placed.

At three months, the upper archwire was changed to an .018 35°C Copper Ni-Ti and the lower archwire to an .019 x .025 35°C Copper Ni-Ti.

Posttreatment

After 11 months of treatment, the brackets were removed and the patient was instructed to wear upper and lower retainers.

Patient after one year of retention.
There is no doubt that the Herbst appliance reigns as the number one functional appliance for Class II correction. Available in a myriad of multifunctional designs, this versatile appliance is also used as anchorage to obtain a number of treatment goals, from space closure to intrusion. When you send a case to AOA/Pro, it is very important to provide detailed instructions on the patient’s prescription, outlining desired modifications. For example, indicate “brachycephalic Herbst” on the prescription form. In many instances, the clinician and our Herbst technical support team will discuss design options after the case reaches the laboratory. For more information, contact Dave Nelson in Sturtevant, Wisconsin, at (800) 262-5221 or (262) 886-1050 and Joe Wilson in Enfield, Connecticut, at (800) 826-2224 or (860) 741-3745.

Dave Nelson joined AOA/Pro 13 years ago and has been supervisor for the Herbst Fabrication Department for ten years. He communicates daily with doctors and staff to fulfill their Herbst requirements. Dave also keeps the AOA/Pro team abreast of the latest changes and modifications advocated by leading clinicians using the Herbst.

Joe Wilson is the lead Technician of the Herbst and MARA departments at AOA/Pro in the Enfield, Connecticut, laboratory. He has nearly ten years of experience focusing on the fabrication of Class II correctors and is always available to answer questions regarding the performance of various appliance designs.
Regardless of the name – performance evaluation, job review or one-on-one – this extremely important interaction between doctor and staff member is not only *advisable* for improved job performance but *critical* to ensure communication for an optimal employer/employee relationship. In many practices, review time tends to rank low on the office priority list because it can be uncomfortable or confrontational. A regular one-on-one meeting should be scheduled each and every year, without fail and regardless of tenure. When scheduled on a regular basis, it can develop into a positive and motivating force for both the staff and doctor.

**Applying Basic Principles for a Successful One-on-One Review**

The process is designed to review past performance, not to provide feedback for the first time. There should be no surprises in the information provided. The doctor’s management style will determine the format for the review; however, the following three principles should be used as a guide.

1. **Consistency.** Choose a standard time length for the review and give each employee the same allotted time. Remember, it may cause friction if one person has a 15-minute review and another has a 60-minute review. Schedule it on or near each employee’s anniversary date every year to review their performance over the last 12 months. You’ll find this date easier to remember, and it’s a good opportunity to recognize the employee’s increased tenure. Always allow yourself enough planning time prior to the meeting so you’ll be well prepared. Keeping a schedule and sticking to it shows your commitment to your staff.

2. **Written format.** When you conduct an employee review, always use a performance review form. While providing continuity for the staff, it also gives written documentation or a historical record to build an employee file. Forms are available online via the Internet. You can find them by doing a search for “Performance Review Forms” using any of the major search engines (i.e., Yahoo or AOL). You can customize these forms or develop your own to suit your practice personality and goals. It is beneficial for the doctor and employee to complete individual forms and then compare the numerical values of your responses. It is interesting to see how your opinion varies from the staff members. Focus on both where you agree and where you differ. Ensure the ratings and comments are based on objective, observable behavior rather than subjective opinions or personality assessments. The doctor and employee should each retain a signed copy of both evaluations. The signatures confirm that the review has been completed and provides a sense of ownership to the agreed-upon terms. A sample form is shown that may help you develop your own.
Pointers on how to conclude the review session.

- Summarize the key points: strengths, improvement areas and action items.
- Thank the staff member for their contributions and assure them that they are a valued member of your team.
- Allow the employee to talk about anything else on their mind such as long-term career opportunities or concerns about their current position. By listening, you become more aware of their motivation and could be alerted to areas of dissatisfaction.

Discuss scores when they differ more than one point. Your staff member ranks herself as a “5” on “Cooperation” and you rank her as a “3.”

Example: “Cindy, looking at the description of Cooperation, your attitude and ability to follow directions are clearly up to standard. However, I have higher expectations for your interaction with peers. You have a tendency to interrupt your coworkers and not let them finish their thoughts. You’re quick to provide your view and criticize their attempt at problem solving. A recent example of this was at our last staff meeting. Karen was ‘thinking out loud’ and suggested a team effort to address the scheduling problem. You interrupted her and said you would fix the problem yourself. This was a real opportunity for teamwork, which you rejected.”

Give your staff feedback, citing positive behavior.

Example: “You’ve demonstrated a strong ability to reassure shy or nervous patients. Just last week, you helped a new patient coming in for his first appointment. You had him smiling and relaxed by the time I got to him. This is an important skill in our office and I encourage you to continue to develop that strength.”

Stay away from subjective opinions and use examples of objective behavior.

Example: Instead of, “Mary, you seem to have a difficult time getting started in the morning,” try, “Mary, you have a pattern of not being ready for your first patient in the morning. You arrive on time but don’t allow yourself enough time to prepare. It’s critical that you’re ready for work when your first patient arrives. Plan to arrive 10 minutes early so you can make the necessary preparations for the day.”

Motivate staff members with positive behavioral responses.

Example: “I’d like to see you take the initiative at the front desk more often. I’m confident that you know what to do, but you have a tendency to wait until the office manager or I am available to answer your question. By developing your confidence level, I know you can make these routine decisions. If you make a mistake, we’ll talk about it and learn from it.”

Employee Performance Review

Employee Name ________________________ Review Date _______________________
Job Title ________________________ Next Review _______________________

Rank performance on a scale of 1 to 5 (5 being the highest). Circle one.

Doctor Employee

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<th>1 2 3 4 5</th>
<th></th>
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<tr>
<td>Quality of Work: Exhibits thoroughness, accuracy, dependability</td>
<td>1 2 3 4 5</td>
<td>Productivity: Adheres to schedule, uses time efficiently, prioritizes and organizes</td>
<td>1 2 3 4 5</td>
</tr>
<tr>
<td>Communication: Exhibits effective verbal skills, participates in team meetings, provides and gives feedback, shares information, builds patient rapport</td>
<td>1 2 3 4 5</td>
<td>Cooperation: Demonstrates positive attitude, follows directions, respects others’ opinions, promotes teamwork</td>
<td>1 2 3 4 5</td>
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<tr>
<td>Professionalism: Demonstrates high level of integrity, pleasant demeanor and patient commitment</td>
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<td>1 2 3 4 5</td>
<td>Comments:</td>
<td>1 2 3 4 5</td>
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List employee’s strengths:

List areas requiring improvement:

Prioritize areas of improvement and set goals:

Action required by employee to meet goals:

Action required by doctor to assist employee:

Date to review goals:

Comments:

Employee Signature ________________________

Doctor Signature ________________________
Begin the discussion by focusing on the positives and areas of agreement. These are the areas in which the employee is doing well, including strengths, tasks they enjoy, skills they’ve gained or in which they’ve improved. Always remember to compliment and praise. You’ll be able to make an easier transition to the areas that may require improvement or change by reinforcing the positive first. As the discussion turns toward improvement, remember that the intent of this performance review is to motivate the employee. Both you and your staff member should set goals—whether to expand roles and duties or make improvements. Goals should be specific, measurable and reachable. Schedule a follow-up meeting within a reasonable amount of time to review these goals together, especially if the goals are designed to improve performance such as technical ability or to address a specific behavior problem.

3. Confidentiality. The one-on-one meeting should always be private and never shared with any other team member. This rule applies to both doctor and staff member. If confidences are compromised, you and your staff member will be reluctant to meet for the next review. A quiet and interruption-free environment can positively influence the mood as well as the confidentiality of the meeting. Communication will flow more easily if there are no interruptions. Lunch at a restaurant is a nice touch but not effective or private for open, honest communications, which carries with it the possibility of turning confrontational. If you schedule the meeting at the office, plan it on a non-patient day or at a time when other staff members are not present. Each person deserves the undivided attention of the doctor/supervisor.

Because you are performing these meetings on a yearly basis, employees may think a performance review means a salary review or raise time. While a performance review will certainly affect the outcome of a salary review, they should be separate. Salary increases should be based on the performance of the staff member, not tied to a calendar date.

Communication remains the most critical aspect of good orthodontic business and, unfortunately, the most difficult to master. Two books that I recommend and give away during lectures are Leadership by the Book by Ken Blanchard and 1001 Ways to Energize Employees by Bob Nelson. These books can provide valuable reading prior to instituting the one-on-one review in your practice.

Incorporating this annual communication opportunity into your practice routine will keep your team on the road to ortho success. It has proved to be a valuable way for the doctor to get to know employees better, encouraging their growth and interest in the profession. An insightful employer will also be able to discern symptoms of “ortho burn-out” during these discussions, which could provide early warning for a staff member considering a job change.

Symptoms of ortho burn-out might include careless mistakes, not helping newer team members, sarcasm or lack of initiative. The review is an opportunity to reenergize team members toward a renewed commitment—to the team, to the practice and to the orthodontic profession. Finally, it shows that you truly care about their career, and contributions and that you want them around for next year’s review.

Note: The information provided in this article is intended to be used as a guideline for general business practices in your office. It is not intended to be used as legal reference. For federal or state labor law issues, we recommend you contact a local labor law practitioner for specific guidance. In addition, keep in mind that any written review becomes a legal document, which could be subpoenaed.
Now available from Ormco. Titanium Orthos2™, combining two proven performers – titanium, the 21st century alloy, and Orthos, the only orthodontic appliance system whose geometries and arch form are anatomically based.

For some of the same reasons that it has improved golf swings and tennis lobs all around the planet, titanium is going to have a powerful influence on orthodontics. As strong as stainless steel with equivalent frictional properties, titanium has twice its resiliency. Titanium Orthos2 acts as a shock absorber, insulating the adhesive bond from torque and occlusal forces for greater bond reliability and patient comfort. Titanium is also highly corrosion resistant and well documented in the medical literature for its biocompatibility. All this adds up to a bio-friendly, bio-durable bracket in the proven Orthos prescription, now with new anatomically designed pad configurations.

In the material world, the material that’s setting new standards is titanium. In the orthodontic world, that standard is Titanium Orthos2.
Creating a Web site can be a daunting task. Use the following checklist of typical site topics to develop the content. Many are obvious, but the obvious can often be overlooked. Start with the basics then include information that conveys your office’s strengths and uniqueness.

**Basic Content Checklist**

- **First Visit.** New patients will visit your Web site the most often. Describe how they’ll be greeted; what records will be taken, if any; whether there’s a charge; when you’ll give a diagnosis; whether treatment will be described and payment options.
- **Location.** Show a location map. Highlight landmarks and street names. Add a link to mapping services such as MapQuest (www.mapquest.com).
- **Before and After Photos.** Show photos of typical cases. Describe the method of treatment used. Give this critical area adequate emphasis.
- **Services.** Describe any ancillary services such as TMJ diagnosis and treatment, orthognathic surgery, bleaching, radiography and whether you specialize in children and/or adults.
- **Facility Highlights.** Show photos of the people in the waiting room, consultation office, clinic, and sterilization areas. Highlight your office theme.
- **Appliances/Treatment Methods.** List bracket choices, including aesthetic brackets or Invisalign. Cover Herbst therapy and other functionals.
- **Credentials.** List academic degrees, special training and professional memberships. Even more important is who you are as a person, your professional philosophies and your family and civic life.
- **Payment Options.** Describe a typical contract, an orthodontic fee plan or local bank arrangements, including credit cards you accept, if any. List any third-party plans.
- **Contact.** List all numbers such as phone, fax and e-mail address and your office hours.

After you’ve covered the basics, use additional elements to show off the personality of your practice such as a team photo of staff, reasons to use an orthodontic specialist rather than a general dentist, local school **brag board**, community involvement, list of **most asked questions** from patients, and so on.

**ISOLATION TECHNIQUE FOR BONDING MOLARS**

Imagine bonding a patient’s upper and lower 2nd molar to 2nd molar in fewer than ten minutes. Is it possible to imagine a day without the hassles of spacers, fitting and cementing and re-cementing bands? Yes, it is. There are numerous advantages to bonding molars, including patient comfort and less gingival irritation, not to mention the monetary savings in inventory and efficiency. So why aren’t more orthodontists bonding molars? Maybe they don’t believe it’s possible.

Most orthodontists would probably prefer to bond molars if the failure rates could be reduced. Our office decided to make the change and has been successful in maintaining a bond failure rate of less than 5%. That equates to approximately one bracket failure per day.

**Steps to Success**

1. Read “Achieving a 95% Bonding Success Rate” by Dr. Michael Swartz, *Clinical Impressions*, Vol. 4, No. 3.
2. Train, train and retrain staff to follow protocol exactly. Be as precise as possible in isolation and tooth preparation techniques.
3. Isolate using a NOLA retractor and Dri-Angles®.
4. Use a quality appliance with Optimesh® XRT, which increases bond strength 35%.
5. After placing the adhesive, position the bracket then leave it alone. **Note:** Light-cure adhesive begins to set under ambient light, so it’s advisable to light-cure each tooth immediately after placing the bracket, again with minimal repositioning.
6. Use a lower force system of archwires. Instruct the patient to eat a soft diet for a few days after bonding to enable the cement to reach its maximum strength.
7. Set up a system to track all bond failures. See “Loose Brackets” by Dr. Randall K. Bennett, *Clinical Impressions*, Vol. 10, No. 2.

With today’s adhesive and bracket systems, bonding molars successfully is possible. The numerous benefits discussed can be implemented in your practice by deciding to change and following the basic scientific rules of bonding.
**Andrews Orthodontic Philosophy Courses**

**November 14–17, 2001**
Holiday Inn on the Bay
San Diego, California

**February 8–11, 2002**
University of Pennsylvania
Philadelphia, Pennsylvania

In this four-day course, you will learn a complete orthodontic philosophy that uses defendable principles, methods and materials to achieve the Six Elements of Orofacial Harmony™ as efficiently as biology and the patient will permit. They include:

- The Three-Archline Concept
- The Symmetry Concept
- The 10-Hour-Force Theory
- The Tooth-Unit Concept
- The Parallel Growth Theory
- The Rebound Concept
- Built-In Countermoments
- The Six Elements Classification System™
- The Mandibular-Incisor-Energy Concept
- The Six Elements of Orofacial Harmony™
- Cast Mounting Relative to the Head’s Planes
- Slot-Siting Relative to the Crown’s Planes
- The Useful (and not useful) Wire Forming Side Effects

Drs. Lawrence and Will Andrews will also explain how to use and evaluate methods and materials that have been specifically designed for Six Element Orthodontists. These are the Andrews Straight-Wire Appliance® System, the Andrews Occlusofacial Simulator™ Articulator System, and the Andrews Six Elements Computerized Diagnostic and Imaging System.

**Fees**: $1,500 for orthodontists; $300 for students enrolled in, or full-time staff of a 2- to 3-year accredited U.S. or Canadian orthodontic residency program; $700 for students enrolled in a 1-year ADA accredited U.S. or Canadian orthodontic program; and $700 for visiting foreign professors. 26 CE units.

For more information or to register, contact Beth Andrews at the Andrews Foundation.

Phone: (800) 799-8952 or (619) 224-0866
Fax: (619) 224-6979
www.andrewsfoundation.org

*Fees are in US dollars.*
On August 9, 2001, Dr. Curtis Menard was killed when his Cessna 185 floatplane crashed as he was flying to Beluga Lake, Alaska. During my 15 years with Ormco many customers have become friends and some, like Curtis Menard, are like family. I have watched his practice grow over the past 10 years from a small start-up to a state-of-the-art facility, as he wanted nothing but the best for his patients and staff.

Curtis was born in Milwaukee, Wisconsin, in 1964 and moved with his family to Wasilla, Alaska, in 1968. After high school, he completed his undergraduate education at the University of Santa Clara and received his doctor of dental science degree from the University of the Pacific in 1988. He practiced as a general dentist before returning to the University of Iowa to complete his degree in orthodontics in 1991. He married Dr. Carole Brodeur in 1992. They moved back to Alaska to continue their dental careers and raise a family. Curtis was father to their four children—Gabrielle, 8; Tanner, 6; Harrison, 4; and Sullivan, 11 months.

He was currently serving as president of his local Rotary Club and an active board member of the Valley Crisis Pregnancy Center. Curtis was a member of the American Association of Orthodontists, Pacific Coast Society of Orthodontists and a past president of the Alaska State Society of Orthodontists.

With a love for flying, hunting and fishing, Curtis has given me wonderful memories. Curtis showed me the true Alaska. I can still hear his voice filled with excitement when I caught my first King Salmon and his tears of laughter as I became stuck in the mud while duck hunting. But his greatest passion was his family. It wasn’t unusual to see Curtis at a convention with the whole Menard family in tow.

In closing I would like to share the words from a song at Curtis’ memorial service, “I’m running with the angels now, I know it’s hard to conceive. I’m seeing things no eye has ever seen. Now I know why I believed.”

Dave Nasharr
Ormco Sales Representative
Suisun, California

Contributions can be made in his memory to:
Valley Crisis Center
2650 Broadview Avenue, Suite 102, Wasilla, Alaska 99654
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<td>Ormco Norway; Per Ivar Westbyste 47 67 54 00 23; Basic Orthodontics</td>
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<td>11/25</td>
<td>Dirk Wiechmann</td>
<td>St. Petersburg, Russia</td>
<td>Ormco Russia; Raissa Voronina 7 812 311 01 77; ECO Lingual Technique</td>
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<td>11/27-28</td>
<td>Mike Swartz</td>
<td>Oslo, Norway</td>
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<td>11/30-12/1</td>
<td>Kokich, Spear,</td>
<td>Barcelona, Spain</td>
<td>Ormco Europe; SCO/ACMCB 34-93-188-98-87; Ortho, Implants &amp; Prosthodontics</td>
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<td>11/30-12/2</td>
<td>Mike Swartz</td>
<td>Warsaw, Poland</td>
<td>Ormco Poland; Tomasz Stefanyczky 48 34 32 47 812; Basic Orthodontics</td>
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<td>11/30-12/2</td>
<td>Decker &amp; Polacco</td>
<td>Trouville, France</td>
<td>Ormmondent France; Josiane Koskas 33 1 49 88 60 60; T.M.J. Dysfunctions</td>
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<td>12/4-7</td>
<td>Mike Swartz</td>
<td>Morocco</td>
<td>Ormmondent Morocco; Bennis Taoufick 212 37 77 77 61; Optimizing Titanium Archiwales</td>
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<td>12/10</td>
<td>Jerry Clark</td>
<td>Scottsdale, AZ</td>
<td>Arizona Assoc. of Orthodontists; Dr. Walton (520) 421-1441; Work Smarter–Not Harder</td>
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<td>12/10-14</td>
<td>Didier Fillion</td>
<td>Paris, France</td>
<td>Emilie 33 1 47 04 27 93; Third Session of One-Year Program</td>
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<td>12/11-12</td>
<td>Didier Fillion</td>
<td>Paris, France</td>
<td>Emilie 33 1 47 04 27 93; Advanced Lingual Ortho Course</td>
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<td>12/14-15</td>
<td>Dirk Wiechmann</td>
<td>Leipzig, Germany</td>
<td>Ormco Europe; Top Service 49-54-72-50-62; ECO Lingual Technique</td>
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* Typodonts and/or Participation

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