Dr. Douglas K. Eversoll
1959-2002
Born in Purcell, Oklahoma, in 1959 to Duane and Deanna Eversoll, Doug completed his undergraduate education at the University of Nebraska – Lincoln and received his doctor of dental science and master of science degree in orthodontics at the University of Nebraska Medical Center, College of Dentistry. Raised and educated in the center of Husker country, Doug served his patients in both his Lincoln and York, Nebraska, practices. He was father to two daughters: Mallory, 14, and Madeline, 12. Doug had been serving as president of the Midwestern Society of Orthodontists (MSO) since being installed October 20, 2001. He was the MSO representative to the American Association of Orthodontists Council on Communication and an MSO delegate to the 2002 AAO House of Delegates. He contributed his enthusiasm and leadership skills to many professional organizations in which he was involved.

On June 29, a special friend to so many was taken from us. Doug Eversoll was a bright light to those he met. He was a people guy with a wide and diverse circle of friends. As a young sales rep for Ormco, I quickly developed a big brother, little brother relationship with Doug. He had a great passion for orthodontics as well as the finer things in life. Those who knew him well know that meant he could talk for hours about the technical details of a clinical trial or the advantages of a well-rolled cigar. It was an honor to have been his friend.

-- Brenton Lively, Product Manager, SybronEndo

As I attempt to come to grips personally with Doug's passing, my heart is stirred by a quotation by William Wordsworth upon the death of his son in 1812. “I loved the Bay with the utmost love of which my soul is capable, and he is taken from me – yet in the agony of my spirit in surrendering such a treasure, I feel a thousand times richer than if I had never possessed it.” Doug will cherish and honor your memory forever.

-- Dr. Tom Stark, Ames, Iowa

Doug was active in music his entire life, including the University of Nebraska Marching Band – a position deeply coveted in our state. I was fortunate to play with Doug and four other dentists in an all-dental rock band we named “Raw Nerve.” This was a very important part of Doug’s life, as evidenced by the unspoken bond that was displayed when he performed. Perhaps the most moving part of Doug’s memorial service came when his daughter Mallary gathered the strength to play an unaccompanied violin solo to honor her father. It was an exceptional tribute to an exceptional man.

-- Dr. Bob Schuettger, Lincoln, Nebraska

Memorial donations may be sent to a scholarship fund in Dr. Eversoll’s name at the UNMC College of Dentistry, 45th and Holdridge, Lincoln, Nebraska 68503.
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We were very pleased to welcome residents from across the United States and Canada back to the University of Michigan campus for the annual GORP meeting. When this program first started in 1989, there was no budget, no plan, and no precedent for a meeting of this kind – one that brought together residents of a dental or medical specialty program. It’s sponsored by donations from orthodontic vendors and from the American Association of Orthodontists (AAO), some of its constituent associations and the AAO Foundation (AAOF). The first meeting drew 170 residents; the attendance at subsequent meetings has more than doubled, with an all-time high of 360 participants this year.

GORP continues to be successful because it benefits residents in four distinct areas. First, it provides a unique setting in which residents can meet fellow residents to build relationships that can develop into lifelong professional friendships. Second, the attendees learn from the living legends in orthodontics. The format of the program allows them to hear formal presentations by leading clinicians and academicians, and it also offers opportunities for interaction with those doctors on an informal basis. Third, residents get to meet the leaders of organized orthodontics, including the presidents of the AAO and American Board of Orthodontics (ABO) plus a representative from the AAOF, in an informal setting. This gives them the opportunity to interact one-on-one in situations that couldn't be duplicated at other national meetings. And fourth, because of the popularity of the AAOF presentations by leading clinicians, the residents have the incentive to mingle with the vendors in attendance and to become better acquainted with appliances and technologies not employed at their schools. To be included in the raffle, each resident must meet with vendors – anything from a curing light to a digital camera to a valuable copy of an imaging program. And for the vendors, it’s a wonderful opportunity to meet residents in an informal setting.

It also must be recognized that the residents at GORP continue to support the AAOF in a tangible manner. This year the residents pledged over $240,000 to support the Foundation, bringing the total donations in the past five years to over $1 million. This amount is amazing in that the average resident has incurred a personal debt of $100,000 to $150,000 during his or her dental and orthodontic education.

The GORP program is put on by residents and for residents who do an extraordinary job of combining an incredible lecture schedule with a host of fun events. We look forward to 2003 in Boston.

– Dr. James McNamara, GORP Faculty Advisor, University of Michigan

Why Orthodontics?

Does this profile sound familiar?

• Made career choice in early to mid adolescence
• Had an orthodontist as role model
• Likes hands-on activities
• Wants to be involved in the community
• Has an interest in giving back socially/civically
• Wants to mentor and build relationships with youth

There are common threads such as those listed in this profile that run through interviews conducted with six orthodontic residents chosen from programs around the country who attended the GORP. These residents are part of the generation that has grown up with fast-paced, continually evolving technology. They don’t find clicking a mouse intimidating; it’s second nature. Many of their responses to questions about the profession center on technology. We’re going to take a look at what excites these doctors about orthodontics, their concerns about starting a practice, what they think will set their generation apart and what they feel are some of their biggest challenges will be.
2002 GORP SPEAKERS

Dr. James Vaden, orthodontic department chair, University of Tennessee, Memphis; “Balancing Personal and Professional Aspects of an Orthodontist’s Life.”

Dr. Thomas Graber, editor of the World Journal of Orthodontics and editor emeritus of the AJOD; “Nobel Prize Research and Its Impact on TMJ Metabolism and Growth Guidance for the New Millennium.”

Dr. Vincent Kokich, affiliate professor, University of Washington; “The Soft Tissue Paradigm: A New Approach to Orthodontic Enhancing Difficult Tooth Movement: The Use of Implants for

Dr. Dr. Thomas Graber Tennessee, Memphis; “Balancing Personal and Professional Aspects for educators, and this generation needs to step up to the plate in order to see that the profession remains viable and dynamic. In addition to hiring a good staff and running an effective practice, it will be challenging to keep up with the latest research and the newest products and techniques.

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DR. MARK BERKMAN
University of Michigan
What excites me the most about being an orthodontist is the potential for a lifetime of learning. Advancing technology is what will set our generation apart. It’s growing at an incredibly fast rate and since we use it to diagnose, treat and educate our patients and their parents, it’s important for us to keep up to date. I hope to make teaching a big component of my practice. There’s a tremendous need for educators, and this generation needs to step up to the plate in order to see that the profession remains viable and dynamic. In addition to hiring a good staff and running an effective practice, it will be challenging to keep up with the latest research and the newest products and techniques.

DR. JESSICA DOWNS
Baylor College of Dentistry
I think the most wonderful aspect of being an orthodontist is the positive impact we have on kids and their self-esteem at such an impressionable age. Orthodontics also provides a great profession for women because its flexibility allows us to combine career and family. I recently spoke with a female orthodontist who had only positive things to say about opening her own practice. She felt that being a mother helped her to be better equipped to identify with patients’ moms and recognize their concerns and busy schedules. One particular challenge we face, though, is staff management. It’s important to hire the attitude. We can teach new staff what we want them to do but we can’t teach them to have a great attitude. Motivating our staff and keeping things from getting monotonous will help create a good environment for longevity.

DR. DUNIA GAILANI
New York University
Orthodontics is the hidden jewel of the medical profession. The opportunity we have to mentor and be role models to children makes orthodontics special and unique. Since our society is so aesthetics oriented, children often get teased about their appearance and we can enjoy the satisfaction of making them feel better about themselves and helping them blossom. On the other hand, we’ve been trained as scientists and doctors for the last ten years but we don’t know much about running a business. We’re confident in our skills to move teeth, but global questions among residents are, “Can I run a business? How successful am I going to be as a business owner and manager?”

DR. CHRISS HARRIS
University of North Carolina
My generation has grown up during a technological revolution, and we expect technology to do more than it really can right now. We know we’ve come this far – so we’re certain there’s always going to be a better way to be more efficient and more effective. As we move from school into a practice, one area that can cause anxiety is the financial risk involved in opening a practice. While I think I’ll attain success, there’s a balance between achieving excellent clinical skills and gaining exceptional business skills to ensure that success. And when I envision my practice and being established in a community, I feel I have a responsibility to be a leader – an advocate of oral health.

DR. JENNIFER MIRABELLI
University of Washington
One area that is changing and will continue to do so is patients and parents who want to be better informed. We spend more and more time explaining to patients what we’re doing and why. Increased communications is becoming so integral that practices are physically making room for parents to come back and sit while the child is in the chair. Being young and female, we have specific concerns about joining a practice. How do we gain the trust and respect of both patients and staff? I enjoy being friends with the people I work with – where do you draw the line in up with the latest? These are hard questions to answer at this point. My husband, a pediatric dental resident, and I want to open a pedo/ortho practice eventually, which will offer us an instant cross-referal base but will also pose some interesting challenges.

DR. MIKE ZETZ
St. Louis University
I was a general dentist for four years before going into orthodontics. Once I started interacting with patients about orthodontics, I realized what a totally different experience it is. It’s one I prefer and feel suits me better because patients are so appreciative of what you can do for them. I want my practice to be a vital part of a community. I’d like to do all the things that are involved in school programs and developing relationships with civic groups. I think an ideal program to start would be a college scholarship fund because it could have such a tremendous impact on an individual’s life. When I look to the future, it’s technology that will set our generation apart, increasing our pace for learning and understanding in an evolving profession.

What’s your outlook for the future of orthodontics?
There’s no doubt it’s still the golden age of orthodontics. The practice of the future may incorporate a Web-based virtual patient so that the orthodontist can work more closely and efficiently with a variety of specialists to develop, modify and implement an interdisciplinary treatment plan. – Dr. Berkman

Orthodontics has a very promising future as technology evolves, enhancing our practices and the patient care we provide. I think the demand for our services will continue to grow, after all, Tom Cruise has braces. As our generation ages, I think we’ll see patients who already had braces seeking retreatment for stability and other aesthetic issues. – Dr. Harris

GORP Faculty and Resident Leadership
From its inception, the faculty advisor of GORP has been Dr. James A. McNamara, the Thomas M. and Doris Graber Endowed Professor of Dentistry in the Department of Orthodontics and Pediatric Dentistry at the University of Michigan. The resident liaisons for this year’s meeting were Drs. Scott Schulz (GORP Coordinator) and Toby VanLandschoot (Web site coordinator). Dr. Scott Schulz, from the University of Michigan, spearheaded the resident leadership team that successfully organized the 2002 GORP meeting with more than 360 participants in attendance.

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In case you haven’t noticed, there’s been a revolution in orthodontics in the past five years. Here in the land down-under, it’s taken some time to filter through, like many previous changes such as straight-wire brackets, bonding and flexible wires. Similarly, we suspect that the revolution is quietly taking place in other countries around the world.

All revolutions begin with the question, “Why…?” The challenge to the status quo leads to the overthrow of long-cherished beliefs, practices and traditions. Over the past five years, we’ve applied this question to many aspects of our practice, and the answers have led to some astounding changes. One of the questions we asked was, “Why do we need monthly visits?” Answering this led us to extending appointment intervals. One common element of postgraduate education in orthodontics is encouraging students to see their patients at frequent intervals in order to receive the necessary cognitive feedback for learning. For the fledgling orthodontist, moving away from monthly checks is like letting go of the side of the pool while learning to swim. The deep water looks interesting but how do you stay afloat? Furthermore, in our discussions with more-experienced orthodontists, they’ve expressed fears that their cases would get out of control and run overtime if they practiced at extended appointment intervals.

Yet, it’s possible to let go of the side of the pool and not only see your patients less frequently but also complete their treatment faster without losing control of their treatment. To practice extended appointment intervals successfully requires changing many of our long-cherished practices, the sum of which we call the simplicity revolution. This article reviews parts of this revolution that are relevant to the working phase of treatment.

Simplifying the Space-Closure Phase
You can almost bet on when a patient will ask you the question, “When am I getting my braces off?” It’s usually after initial alignment has been achieved, when the crooked teeth are in line, never mind that there are extraction spaces posteriorly and the occlusion isn’t Class I? Do you answer realistically and admit to another 12 months or do you fudge?

Initial alignment is simple to achieve and in most cases, all it takes is accurate bracket placement and gradual increases of nickel-titanium archwire size. (In our practice, this is typically achieved in two visits, particularly now that we’re using Damon System 2™ with Copper Ni-Ti® or other superelastic wires.)

On the other hand, we’ve found closing space to be a challenge, particularly where premolars have been extracted. Close attention is needed to avoid unwanted tipping, loss of anchorage, loss of incisor torque, rotation of canines and premolars, overbite deepening, and so forth, while simultaneously maintaining the initial alignment and directing the teeth to a Class I relationship. (Little wonder the simplicity and appeal of nonextraction therapy!)

Does it really have to take 6 to 12 monthly visits to close premolar extraction spaces? If you follow conventional mechanics, the answer is yes.1 Conventional space closure typically involves the fitting of .019 x .025 stainless steel archwires with a force system of elastic tie-backs, nickel-titanium coil springs or chain modules. These are checked and renewed if necessary every four to six weeks, closing the space at a rate of 0.5 to 1.0 mm per month with sliding mechanics.1 Stainless steel is chosen for its rigidity and smooth surface, but it brings further inherent delay because the rigidity of the stainless steel archwire requires complete bracket alignment before it can be employed. Once fitted, it is recommended leaving the archwires in place for one to three months to allow leveling and aligning to continue before space closure is permitted. This avoids binding between archwire and bracket slot when it’s time to close space with sliding mechanics.1

In our practice, we simplify this effort and significantly shorten the overall treatment time. With the Damon System, space closure now typically takes two to three visits at right- to ten-week intervals. By the tenth month of treatment (visit six), we’re usually ready to begin finishing a case where premolars have been extracted. Compared with four or five years ago, our statistics indicate that we’ve reduced the number of archwire changes, length of treatment time and number of visits by almost 50%.

Simplicity Revolution

Simplicity Revolution

Hygiene Control
Extending treatment intervals doesn’t rely solely on good mechanical systems, it also requires effective patient control systems. One of the orthodontist’s greatest fears with extended appointment intervals is loss of control over treatment, and oral hygiene management is critical for maintaining this control. Our practice has carefully integrated the use of dental hygienists and a formal strategy for managing patients and their oral hygiene. At the initial examination, we assess and classify the patient’s oral hygiene and they must reach a certain level of periodontal health before active treatment begins. Two weeks after bonding, the patient visits one of our hygienists and she continues to monitor those patients who have strayed off the path of righteousness, bringing them back into the fold. It also gives us an opportunity to trim long wires and attend to other minor problems. Throughout treatment, our hygienists continue to monitor and assess our patient’s oral hygiene, and if it slips below a set level, treatment is suspended until the patient brings it back to an acceptable level.

A Passive Bracket System
There’s no doubt that moving to self-ligation is a “leap of faith” because in some ways it’s like starting orthodox orthodontics all over again. Over the years, we’ve treated well over 1,000 cases with various self-ligating bracket systems, including the Speed System19,20, TwinLock19, Damon SL® and Damon System 2 and we’ve made three significant observations from our experiences. First, teeth are easier to straighten with

Keys to Simplified Space Closure

Speed System is a trademark of Strite Industries Limited.
Navigating the

Simplicity Revolution

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Keys to Simplified Space Closure

Hygiene Control

Extending treatment intervals doesn’t rely solely on good mechanical systems; it also requires effective patient control systems. One of the orthodontist’s greatest fears with extended appointment intervals is loss of control over treatment, and oral hygiene management is critical for maintaining this control. Our practice has carefully integrated the use of dental hygienists and a formal system for managing patients and their oral hygiene. At the initial examination, we assess and classify the patient’s oral hygiene and they must reach a certain level of periodontal health before active treatment begins. Two weeks after bonding, the patient visits one of our hygienists and she continues to monitor those patients who have strayed off the path of righteousness, bringing them back into the fold. It also gives us an opportunity to trim long wires and attend to other minor problems. Throughout treatment, our hygienists continue to monitor and assess our patient’s oral hygiene, and if it slips below a set level, treatment is suspended until the patient brings it back to an acceptable level.

A Passive Bracket System

There’s no doubt that moving to self-ligation is a “leap of faith” because in some ways it’s like starting orthodontics all over again. Over the years, we’ve treated well over 1,000 cases with various self-ligating bracket systems, including the Speed System™, TwinLock™, Damon SL® and Damon System 2 and we’ve made three significant observations from our experiences. First, teeth are easier to straighten with...
these brackets. Second, the elimina-
tion of modules and other elas-
tomers, which are magnets for plaque, improves oral hygiene. Third, passive self-ligation is supe-
rior to the active. (We're also supe-
redious in In-Ovation®,* which is active.) It's truly astonishing to see how well teeth align with Damon brackets and .014 Ni-Ti Align™ SE wires (Figures 1a–d). It's when teeth slide along a wire that the passive self-ligating appliance comes into a class of its own. While there's frictional resistance with active self-ligating brackets, there's virtually zero frictional resistance with passive self-ligating brackets.

We've been using Damon 2 as our bracket of choice since August 2000 and currently have over 1,000 active cases. We're now absolutely convinced that these brackets not only align the teeth faster but also keep teeth aligned far better than ligature ties or modules during space closure.

They eliminate the need to go back to Ni-Ti wires to realign teeth after spaces have been closed, thus ensuring an efficient finishing phase of treatment.

Hi-Tech Archwires

Our goal is to complete treatment with just three archwires per arch. We've found a strong correlation between the length of treatment time, the number of visits and the number of archwire changes in our practice. Simplicity demands keeping wire changes to a minimum while keeping appointments short and demand an archwire that performs flawless-
ly over an extended period of time. Our typical wire sequence for both extraction and nonextraction cases is as follows:

- Alignment: .014 Ni-Ti Align SE or .018 Archwire
- .019 x .025 Copper Ni-Ti

Working/Finishing: .019 x .025 Purple TMA®

*In-Ovation is a trademark of Dentsply/CAC International, Inc.

Do we always manage with three wires per arch? Of course not, but our statistics show that we do achieve this goal in a large percentage of our recent cases. We're great fans of low-friction TMA (especially Purple) as our working and finishing archwire. Ion implantation hardens the surface of the TMA wire, decreasing friction by up to 70%! Some researchers have failed to find an improvement on the rate of space closure when they compared ion-impregnated TMA with stainless steel archwires and have argued that the reduction in friction is clinically nonsignificant! We see a very different result using Purple TMA with passive self-ligating Damon 2 brackets, which eliminate modules and ligature ties (the latter being a significant source of binding and frictional resis-
tance). Typically, we see spaces close at a rate of up to 2 mm per month.

Ion implantation also increases the resilience of low-friction TMA,* which helps to maintain any curves we form into the wire and reduces the need to replace the archwire during space closure. These curves are essential to maintain the arch form, pre-
vent tipping and dumping of the molars, maintain torque of the anterior teeth, and keep the overbite from deepening. Also, TMA has less than half the stiffness of stainless steel, enabling it to be fitted immediately after initial alignment at a time when a similar sized stainless steel archwire would be either too tight or impossible to fit. We feel purple TMA wire is an even easier wire to insert than standard TMA, especially when you're trying to replace second molar tubes. For us, any TMA is more gentle than stainless steel and a preferable choice of wire. It means space closure can start immediately, eliminat-
ing the need to spend one or more months trying in a rectangular steel wire passively before proceeding with space closure.

Ni-Ti Space-Closing Springs

Wherever possible we use Ni-Ti springs instead of chain modules to close space. Ni-Ti springs maintain a relatively constant force throughout the extended placement intervals. Yes, they'll permanently deform and lose force if overstretched or used for a prolonged time, but their performance in force deliv-
ery is far superior to that of chain modules. Compared with chain modules, they're also less plaque-retentive.

To attach the springs, create a posted wire system using a simple crimpable surgical hook secured on the archwire by creating a small inset immediately distal to upper or lower lateral incisors (Figures 2–6). This allows secure placement of the retraction springs and provides a hook for patients to attach intermaxillary elastics. In this example, the posted wire or our work-
ing wire can also be our ideal final archwire.

Figure 3. Attach crimpable ball hook to inset. The inset stops the hook from freely sliding along the archwire while maintaining correct initial arch dimension.

Attachment of lower incisors and extrac-
tion space closure was achieved with just the .019 x .025 Purple TMA® wire using binding hook pliers.

Figure 4a. Curve archwire to control overbite and arch form during space closure.

Figure 4b. Curve archwire to control overbite and arch form during space closure.

Figure 5. Fit the upper archwire and bend the ball hook medially with a plier.

Figure 6. Fit the Ni-Ti closing spring between the ball hook and first molar band hook. (Intermaxillary elastics can also be attached to the ball hook.)

First-Visit Molar Bonding

Bond the molar bands at the first visit if producible. Bonding second molars at the first visit adds at least five to ten minutes and requires great self-discipline to complete the procedure (particularly in a wet, wriggling adolescent just before your lunch break).

Yes, patients may come back with long and dis-
lodged wires but the benefits of including second molars at that first visit are enormous for treatment effi-
ciency and control. It greatly helps to avoid tipping, rotation and dumping of the molars and keeps the overbite from deepening during space closure because of the enhanced leveling of the full arch engagement. Don’t take the easy way out by planning to bond second molars at a later time. If you don’t bond second molars at the first visit, you’ll add at least two patient visits in regaining alignment. This has significant efficiency consequences when you’re trying to complete treat-
ment in six to seven visits.

We prefer to use mini second molar tubes that allow placement on the mesial cusps of the second molars, even when they’re partially erupted (Figures 7a–b). Visual access is the major problem. Bond second molars before using a lip retractor. We gener-
ally bond first and second molars on one side at a time using a single cotton roll in the floor of the lingual sulcus and a mirror to reflect the buccal mucosa away from the bonding area. Using light-cured bond-
ing cement is important for minimizing drift or dislodgement. Avoid bonding the maxillary second molars too gin-
gival, particularly at the distal, to avoid caus-
ing the archwire to pull. For us, it's far better to pull on the canines and incisors separately.

First-Visit Bonding

Bond the molar band in six to seven visits. The patient know how much longer is this going to take before I’m finished?

REFERENCES:


The Revolution Goes On

How you construct your own simplicity revolution is up to you. There are many benefits to reward your efforts toward simplifying treatment and making it more efficient. The benefits include less risk of decal-
cification, fewer instruments and supplies, reduced treatment cost, improved scheduling, happier patients and parents, and greater profits. Raising the standards that patients can expect, not only with the treatment result but also with its delivery, brings in a continual pool of patients whose response is, “Wow!” rather than a disappointing “meh.” Can’t I see any change? How much longer is this going to take before I’m finished?”

Figure 7a. Bonding second molars with mini molar tubes.

Figure 7b. Bonding second molars with mini molar tubes.
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**Alignment**: .014 Ni-Ti Align SE or .018 (.048") Copper Ni-Ti, .016 (.025") Ni-Ti Align SE or .019 x .025 (.048") Copper Ni-Ti.

**Working/Finishing**: .019 x .025 Purple TMA®

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To attach the springs, create a postwired system using a simple crimpable surgical hook secured on the archwire by creating a small inset immediately distal to upper or lower lateral incisors (Figures 2–6). This allows secure placement of the retainer spring and provides a hook for patients to attach intermaxillary elastics. In this example, the posted wire or our working wire can also be our ideal final archwire.

Attach the springs from the molar tube hook to the post on the archwire but not to the hooks on the canine brackets. Bypassing the canine and pre-
caninial brackets improves hygiene around these brackets and eliminates putting a force on the canines that would otherwise cause them to rotate. The anterior and posterior teeth pull together en masse, avoiding the need to retract canines and incisors separately.

First-Visit Molar Bonding
Bond the maxillary and mandibular second molars at the first visit if possi-
ble. Bonding second molars at the first visit adds at least five to ten minutes and requires great self-discipline to complete the procedure (particularly in a wet, wriggling adolescent just before your lunch break). Yes, patients may come back with long and dis-
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**REFERENCES**


CASE 1

PRETREATMENT
13-year 1-month-old female, Class I with moderate crowding and dental bimaxillary protrusion. Dolichofacial with moderate mandibular retrusion.

TREATMENT PLAN
Extract maxillary first bicuspids and mandibular second bicuspids and bond both arches with Damon 2 brackets and first molar bands. Fully retract maxillary anterior teeth and moderately retract mandibular anterior teeth.

PROGRESS
Initial archwires placed at bonding were an .016 Ni-Ti Align SE in the maxilla and an .014 Ni-Ti Align SE in the mandible. Second molars were bonded and archwires engaged at beginning of treatment.

At ten weeks, .016 x .025 Ni-Ti Align SE archwires were placed in both arches.

At 21 weeks into treatment (second visit), the wires were changed to .019 x .025 Purple TMA in both arches with 9 mm Ni-Ti closing springs and 4 oz, 3/16” Class II elastics.

Patient at 40 weeks into treatment (fourth visit). Extraction spaces were almost closed while the arch form was well maintained by curves in the archwires. When spaces fully close, only minor finishing will be required.

At 56 weeks, the final archwires, .019 x .025 TMA, were placed in both arches. Patient will have appliances removed at next visit.

POSTTREATMENT
Patient at debonding. Active treatment time was 58 weeks. A removable maxillary Essix 6-6 retainer and a mandibular lingual 3-3 bonded retainer were placed for retention. Patient experienced settling in the molar regions during early retention.
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CASE 2

PRETREATMENT
14-year-old male, Class II, division 1 with deep bite and crowding. Brachyfacial pattern. Clinically deficient mandibular profile.

TREATMENT PLAN
Phase 1: Employ Type II Herbst appliance with maxillary rapid expansion. Phase 2: Employ full fixed appliances using Damon 2. Nonextraction. Reduce the overjet and improve mandibular profile.

PROGRESS
Patient at 12 months of treatment (Phase 1) and four visits. Class II corrected to super Class I. Overjet reduced.
Cephalometric superimposition shows reduction in ANB of 5º and improved mandibular position.
At 26 weeks (fourth check visit), maxillary archwire was changed to .019 x .025 Purple TMA and mandibular archwire was changed to .019 x .025 TMA. Chain modules were placed to close final spaces in maxillary arch and 4 oz Class II elastics were used from upper posts to lower first molars.

ARCHWIRE SEQUENCE FOR PHASE 2:
Upper: .018 (40ºC) Copper Ni-Ti .019 x .025 (40ºC) Copper Ni-Ti .019 x .025 Purple TMA
Lower: .016 (40ºC) Copper Ni-Ti .019 x .025 (40ºC) Copper Ni-Ti .019 x .025 TMA

POSTTREATMENT
Patient debonded at 11 months (six check visits). Active treatment time was 23 months. A mandibular lingual 3-3 bonded retainer and maxillary Hawley retainer were placed for retention.
Superimposition showing incisor proclination during Herbst phase has been reversed during fixed phase. Facial profile is significantly improved.

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INITIAL TREATMENT SHADED PROFILE — MID TREATMENT
FINAL TREATMENT
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- .019 x .025 TMA

PRETREATMENT POSTTREATMENT POSTTREATMENT

END OF HERBST TYPE II APPLIANCE TREATMENT: 12 MONTHS/4 VISITS

FIXED APPLIANCE TREATMENT: 26 WEEKS/4 CHECK VISITS

POSTTREATMENT: 23 MONTHS/6 CHECK VISITS

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1 to GOGN: 97º, 109º, 105º

PRETREATMENT

POSTTREATMENT

POSTTREATMENT

INITIAL TREATMENT

SHADOWED PROFILE — MID TREATMENT

FINAL TREATMENT

12

13
Orthodontists are always looking for the magic bracket, the one that will solve all their clinical problems, and I thought I had found mine with Orthos. When Ormco introduced Titanium Orthos2, my first reaction to this change was like most people’s: to any change — a self-protective negative one. I didn’t think we needed a titanium bracket just because every other product in the world (except maybe panty hose) contains titanium. But now we’re about two thirds of the way to the finish with our first cases and I feel there are some valid reasons for fabricating a bracket in titanium (besides the fact that it sounds cool). When most people think of titanium, they think of biocompatibility. When combined with its wettability and adhesion properties, titanium may prove to be useful in orthodontics by translating into some practical clinical advantages. Since having started 30 cases, I want to share my initial reactions and experiences with the brackets and describe other features that helped me overcome major hurdles such as bracket placement and bond reliability, which we’ve all experienced.

Finally a Pad Shaped Like a Tooth

I’ve never understood why the base of a bracket couldn’t mimic the shape of the tooth on which it’s to be placed. My intuition tells me that aligning two similar shapes seems to make sense and will most likely increase accuracy. Ormco has now created tooth-shaped pads for Titanium Orthos2 that actually provide additional subtle but extremely useful reference points that visually aid bracket placement. When placed in the correct position, they just look right and feel right.

Feel the Fit of the Bracket on the Tooth

With any new bracket design, there’s always a learning curve, but with this one I experienced the shortest learning curve ever. The brackets don’t rock on the tooth like so many other prescriptions that I’ve used. They just seem to seat better. The compound contour hasn’t changed, so it’s a matter of improved placement resulting from the tooth-shaped pad. The more accurate the fit of the bracket to the tooth, the fewer problems with torque, tip, in/out and final tooth positioning that requires either midtreatment repositioning or wire bending in order to place the tooth in its final position. My sense is that the increased accuracy in seating these brackets will lead to more-accurate finishing.

Improved Bond Strength Reduces Failures

Inaccurately fitted brackets come loose more often, which costs orthodontists big dollars. Stainless steel Orthos brackets solved most of my loose bracket problems, and I thought that my clinical life couldn’t get any easier on that count. We bond brackets 7-7, rarely banding any teeth in full cases anymore. Our bicuspids brackets are gingivally offset, which has helped reduce our bond failure rates over the years. When I first started measuring bond failure, 22% of all our placed brackets fell off the teeth. With focused training and original Orthos (with G/O bicuspids), we reduced that failure rate to approximately 2%.

I was happy to discover that our current bond failure rate with our first 30 cases of titanium brackets was lowered even further. It’s important to note that true bond failure can’t really be measured until the case is complete. We have had titanium brackets for 12 months, so most of our cases are two thirds complete. In measuring the bond failure rate of these 30 cases during the first 12 months of use in our practice, we found that in 600 bonded brackets (upper and lower 5-5), only four brackets have come loose. That translates to a reduction from 2% down to .66%. It’s possible that more brackets may come loose in the last third of treatment in these cases, but nevertheless, this is a significant improvement.

Our bonding results are real and I feel that it’s a combination of factors – resiliency, chemical affinity, wettability of titanium and accurate fit of the bracket – that are responsible for this incredible improvement in bond strength. Bonding technique is critically important in bond retention success but our step-by-step technique, including the adhesive we use, hasn’t changed with these brackets; thus, the improvement is predominantly due to the physical characteristics of the titanium brackets. The net effect on our practice is tangible from the perspective of having happier patients, happier staff and a less-stressed doctor.

There are so many subtle yet potentially important characteristics of the titanium bracket that I have made the decision to use it exclusively in our practice. Why not use a bracket that’s easier to place, fits more accurately, stays on the tooth better and finishes positioning the tooth better while it’s more biocompatible and safe for my patients?

There is no ONE big advantage to using these brackets, but there are numerous small advantages that, when added together, combine to produce a lot of good reasons to use them, even if it means paying a little more. In my brief experience, the additional benefits far outweigh the additional costs. You’ll be hearing more as we cross the finish line with our first cases.

Dr. Randall Bennett received his M.S. in orthodontics from Loma Linda University and then practiced lingual orthodontics exclusively in Beverly Hills, California. During this time, he was heavily involved in lingual orthodontic research, writing and teaching. In 1988 Randall moved with his wife and four children to Utah, renowned for its worldwide family recreation. Currently Dr. Bennett practices in Salt Lake City and lectures nationally and internationally on practice management, clinical efficiency and effectiveness.
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Clinical Impressions invited Dr. Oles Drobocky and his staff, from Bowling Green, Kentucky, to comment on their transition to The CARD,Ormco’s new adhesive dispensing system. Three staff members joined Dr. Drobocky for this Q&A: Jamie Sears, clinical assistant; and Jamie Douglas and Linda Knight, orthodontic assistants.

CI: Dr. Drobocky, how do you feel about your transition to The CARD?

DR. DROBOCKY: As I journey through my orthodontic career, I find the most consistent theme is change. Change has been pervasive from the minutest detail to major technique alterations. Products such as The CARD provide the stimulus to continually pursue greater efficiencies in all areas from supplies to appliances to technologies used in patient care. My staff has been very supportive of the transition to The CARD. The consensus is that the procedure is easy to implement, the product is hygienic and it increases our efficiency. I feel The CARD has greatly improved our bonding procedure because of the manner of bracket preparation and transfer that has become consistent for every staff member.

My staff’s responses to the following questions will provide a glimpse of our adaptation to and implementation of The CARD into our bonding procedure.

CI: What was your initial impression of The CARD system?

JAMIE DOUGLAS: Our practice likes to stay on the cutting edge of technology to provide our patients with the most efficient techniques. Since Dr. Drobocky provided feedback during the product development cycle of The CARD, we felt this new method of dispensing adhesive had potential efficiencies such as less product waste and cleanup. When The CARD was introduced and our Ormco sales representative Roy Scolding brought it in, we were ready to give it a try.

JAMIE SEARS: When our patients come in, we want to convey that we’re giving them the highest quality of care. We thought that The CARD would make our tray setup look neater and nicer. Compared with our previous system, the tray is now less cluttered.

LINDA KNIGHT: When parents come back to the chair for the bonding appointment, they’re visually taking in the surroundings. We thought that The CARD would give a very visual impression and demonstrate our sterilization requirements.

CI: How did you train to use the new system?

JAMIE DOUGLAS: In addition to assisting, I also perform all the ordering duties for the practice, so I reviewed the step-by-step instructions and played with the product. After I felt comfortable with it, I met with the clinical staff to show them the procedure. I think everybody was a little nervous at first because it was totally different from what we’re used to. The entire clinical staff agreed there’s a short learning curve, and after the first bonding, it was easy for everyone to accept the new routine.

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CI: How has The CARD changed your bonding routine?

JAMIE DOUGLAS: In an effort to increase our efficiency with The CARD, we switched bracket holders. We were using a direct bond bracket holder for 3-3 placement and a positive positioner for bicusps. We changed to the Hu-Friedy direct bond bracket holder because of the shape of its head for 3-5 placement. It grips the bracket tightly while swiping it through the adhesive. We’ve also eliminated the use of a spatula, so it’s not on our tray setup.

JAMIE SEARS: The technique that we’re all using is to start from the edge of the adhesive closest to the white sticky circle, swiping the bracket halfway through the line of adhesive and stopping. Then we lift the bracket from the adhesive while rolling the bracket holder forward. This simple motion mashes the adhesive onto the bracket. Then we may use a scaler to remove any excess before handing it to the doctor.

LINDA KNIGHT: We pass one bracket holder back and forth to Dr. Drobocky. I intuitively know at what point he’ll be ready for the next bracket, so I then fold the foil back to expose the fresh adhesive for the next bracket. If I’ve loaded the bracket and for some reason he stays with the same tooth longer than I expected, I put the bracket in the drawer and close it so the adhesive isn’t exposed to the light, but this rarely happens. After Dr. Drobocky has positioned the brackets on the teeth, I come in with the curing light. We use the Demetron Optilux 501.

CI: What additional efficiencies have you found with the new dispensing system?

JAMIE SEARS: Now our trays are easier and faster to set up. We have a rotating schedule in our practice, so a team of two sets up the trays using The Card for all full bondings and every procedure with more than four brackets. We’ve found that using The Card instead of the adhesive syringe provides fresher adhesive and less product waste while reducing the mess. The configuration of the adhesive system combined with our new routine simply makes our time with our patients more efficient.

CI: You were using a self-cure adhesive before moving to The CARD’s Enlight light-cure system. How has this affected the practice?

LINDA KNIGHT: We’ve seen numerous positive changes that have increased our confidence in the bond. The change that has impressed me the most is our ability to tie-in ligature wires sooner. After we engage the archwire, we can immediately tie-in the ligature wires on the first visit. The patient now doesn’t have to wait six to eight weeks for complete tie-in, so it’s a big improvement at the beginning stage of treatment because the wires can start doing their job sooner. Another change that’s beneficial to the patient is being able to remove the cheek retractors sooner during the bonding. This change is a tremendous plus from the patients’ viewpoint, increasing their comfort and reducing the time they spend in the chair.

JAMIE SEARS: We also wanted to reduce the number of emergen- cies in the practice. With self-cure, we felt that when the patient left the office, the brackets may not be fully cured. Using The CARD, Ortho Solo and the Demetron Optilux 501 curing light is a step in the right direction in eliminating loose brackets. Now I don’t think twice about the bond because I feel confident with the procedure we’re using and know the brackets are secure.
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Finding ways to make our orthodontic practice more efficient has been an ongoing quest of my husband and partner, Dr. Jonathan Cooper, and me for quite some time. After exploring alternative curing light options for over a year, we realized that if we could cure each case more efficiently, we would free up clinical chair time and increase our productivity. Meeting these goals would easily warrant the added expense of purchasing new equipment. While we were prepared to incur the expense, we discovered that sometimes spending the most to remedy a situation isn’t a wise investment.

Initially we hoped the benefit claims made by the makers of laser and plasma arc (PAC) curing lights would justify their high cost; however, after looking at these bulky lights carefully, we became concerned about ease of portability. These units looked really cumbersome to move even when using a mobile cart. Wouldn’t it take longer for our clinical technician to move the light from chair to chair than to simply use the lights that we already had at each chair? We didn’t want to lose the valuable time.

Another issue we wanted to consider is bond strength. Our old standard curing light was producing weak bonds that weren’t fully cured. Even with multiple testing it proved to be inconsistent, so we wanted a new light that would give us confidence in our bonding procedure.

Factors Contributing to Purchase Decision

We really liked the ergonomics and user-friendliness of the Demetron Optilux 501 curing light. Its trigger is conveniently located within index finger reach so activating it is quick and easy. The trigger also automatically starts a fan, which means the handle remains cool – a big plus since the handles on our old lights would continually heat up. And, when we realized we could buy two 501s for the price of one PAC light, or four 501s for the price of one laser light, we were sold. The affordable cost enabled us to get a light for each of our clinical chairs.

Since the 501 has a built-in radiometer, we have instant reliable optical power readouts. Its Optibulb will burn out instead of gradually degrading like other halogen bulbs, so inadequate curing strength isn’t an issue. This one feature alone eliminates many of our emergency patient visits – a savings of up to $175 per visit as well as patients’ time and inconvenience.

We have since purchased five 501 curing lights and have been thrilled with their overall performance. We now cure metal brackets in eight seconds instead of 30 and clear brackets in five seconds. The reduced curing time has made an amazing difference in our efficiency whether we’re using the Optilux 501 for direct bonding, repositioning, rebonding or bonding late-erupting second molars.

While looking at a case, we sometimes place composite on the upper centrals to open a deep bite. The unit’s Ramp Mode has been very helpful in curing the composite for these bite props while reducing shrinkage. Preset times allow us to concentrate on the patient instead of the clock. We also use the Ramp Mode to cover occlusal rests on Herbst appliances and expanders. We’ve found the Ramp and Bleaching Modes on the 501 to be a welcome bonus.

Time is a valuable commodity in every practice. Looking for additional ways to be more productive and spend quality time with each patient without diminishing patient care is the ultimate goal. The Optilux 501 has helped us achieve that goal cost-effectively. This change has opened the door for us to find other ways to be more efficient, like developing treatment protocols for every procedure, installing computerized treatment cards at every chair and using digital radiography.
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Dr. Brenda Chockley received her dental degree from the University of Oklahoma College of Dentistry and her specialty degree in orthodontics from the University of Missouri at Kansas City. She established her practice in Tulsa, Oklahoma, in 1994 and was joined by her husband, Dr. Jonathan Cooper, in 1995. Dr. Chockley is president of the Tulsa County Dental Society, secretary-treasurer of the Oklahoma Association of Orthodontists, chairman of the new-member development committee for the Southwest Society of Orthodontists, in addition to being a member of the American Association of Orthodontists, American Dental Association and Oklahoma Dental Association. She is also involved in church activities, volunteers with several community agencies and is an avid water and snow skier in her spare time. Dr. Chockley and her husband have one son, Alec.

Dr. Brenda Chockley (left) demonstrates the Optilux 501 Curing Light to her technician, Brandy Dobelbower, as she light cures an upper anterior bracket.

Here are some helpful tips for maintaining your 501 curing light.

**LIGHT GUIDES**
- • Wipe, do not spray, plastic parts and housings with Metrex CaviCide®.
- • Do not use denatured alcohol, isopropyl alcohol, Lysol, phenol, ammonia complex or iodine complex solutions.
- • Prevent liquids from entering openings and switches on unit.

**HOUSINGS**
- • Reality Product of the Year 2001 and 2002
- • New Product of the Year 2000
- • Winner of Reality’s 5 Star Status

**OPTILUX 501 CURING LIGHT CARE AND MAINTENANCE**

**OPTICAL MAINTENANCE KIT**
- • Prevent liquids from entering openings and switches on unit.
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**Top Gun Awards**
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**OPTICAL MAINTENANCE KIT**

After numerous autoclave cycles, a brown discoloration may accumulate on the polished ends of the light guide. This residue (commonly called boiler scale) forms during the autoclave drying cycle. It’s recommended that light guides be polished every 50 autoclave cycles, following the instructions included in the kit. The Optical Maintenance Kit (Demetron Part No. 21042) includes a slow-speed handpiece, polishing discs and cleaning fluid. For more information on the kit, contact your local dental dealer.
Achieving
Ideal Bracket Placement

WITH IMMEDIATE INDIRECT BONDING

Regardless of bracket type, or even who’s placing it, the measure of its success depends on proper placement. I feel the most accurate bracket placement is performed indirectly. Compared with direct bonding, the ability that you have with indirect bonding to rotate the model and look at bracket position in all planes of space is unequalled. With immediate indirect bonding, I can complete an entire indirect bonding in a single appointment, reducing human- and time-related errors because fewer steps are needed to complete the process, making it more effective and efficient.

My treatment philosophy is to place brackets on only uncrowded Class I patients, so the brackets will be in place for the shortest time possible. I may use a CBL, an upper or lower expander or separators prior to bracket placement, removing the appliance once the required space is achieved for banding first and second molars.

Although self-curing adhesives are widely used, the most common method of curing brackets in the U.S. is by light activation. The energy source used to activate the initiator in the acrylic resin is full-spectrum light that is filtered to a blue light of approxi- mately 470 nanometers in wavelength. There are a variety of curing lights available ranging from the more conventional continuous output quartz-tungsten-halogen sources and the newer LEDs (light emitting diodes) to high-cost PAC (plasma arc) lights and argon-ion lasers. Slow and incomplete curing is the main drawback to the conventional curing light while cost is the main reason for the slow acceptance of PAC and laser curing lights. I use the Demetron Optilux 501 (quartz-tungsten-halogen source). Even if you bond brackets directly, the 501 curing light in Boost Mode offers a timesavings of approximately seven minutes in a second-bicuspid- to-second-bicuspid bonding. This timesavings may not seem like much; however, with the 501, you can bond both arches in less time than it takes to bond a single arch with another halogen curing light.

In preparation for indirect (or direct) bonding, make sure you have a current panoramic X-ray for reference to evaluate root position and occlusal anatomy and to assist in correct bracket placement. It’s convenient to have a light box along with all the instruments, gauges, curing light, bonding material and other items necessary for this procedure in an area that’s easily accessible. In my practice, it’s adja- cent to the lab technician’s main work area (Figure 1).

1. Pour Models
Remove any expander or separators from between a patient’s molars and take impressions. An excellent impression is imperative for successful indirect bonding. Bubbles or other inaccuracies will affect the final outcome. After taking the patient’s impression, pour it immediately in quickset Die-Kenn™ stone using slurry water for a more rapid set. Quick pouring maximizes the accuracy of the model by reducing the chance that the impression will undergo dimensional change.

2. Fit and Cement Bands
Fit the upper and lower bands and cement in place. I suggest the use of a high-quality glass ionomer cement such as Ormco Protech™ to help keep loose bands to a minimum. Cementing the bands at this time allows plenty of time to achieve a sufficient set before placing the archwire. Remove the excess cement once the ini- tial set is complete and then excise the patient to the reception area to wait while you fabricate the trays.

3. Prepare Models
The lab technician grinds the set model to a horseshoe shape on the model trimmer. It should be tall enough to offer accurate visual reference for bracket placement but short enough to prevent the tray material from stretching too thin, which can cause improper bracket placement in the mouth. Rinse and brush the model thoroughly to remove any particles from the grinding process, then dry it by blowing compressed air on the labial surfaces. The model will appear slightly chalky. The goal is to dry the surface only enough to allow the bonding resin to adhere to the model without desic- cating it.

4. Build Custom Bracket Base
At this point it’s important for the lab technician and the doctor to work together, load the bracket with Ormco’s Enlight® light-cure adhesive (yringe delivery) and place it on the model. I have the lab techni- cian use the Optilux 301 in the Ramp Mode, curing each bracket for 10 seconds from the occlusal side and 10 seconds from the gingival side (Figure 2). Note: I have the lab technician use the Ramp Mode (which ramps from 100 mW/cm² to 1,000 mW/cm² in the first 10 seconds) to reduce the rate that free radicals are formed – the process by which adhesive sets. The Ramp Mode slows the initial polymerization reaction rate and allows the composite to flow for a longer time to accommodate polymerization shrinkage (2-5%) prior to achieving the hardened gel state. The Ramp Mode is used primarily in composite resin restorations where there is a considerable depth of composite. There are no tests to support the idea that slowing the polymerization reaction rate for the small amount of composite used in orthodontics has merit, but I can’t help but think it affects my bond strength positively.

I also feel that because of the unreliability and opacity of the Die-Kenn stone model, the Enlight adhesive cures well enough to form a rigid custom base, but not completely, leaving the center of the custom base partially cured. I under- stand that some other clinicians advocate light curing the cus- tom base through the tray from the lingual side to ensure a more complete cure. I disagree. My thinking is that if the center of the custom base is partially cured, it can form a chemical bond with the bonding material for greater strength when it’s bonded to the tooth. This pro- cedure requires approximately two minutes of doctor time. After curing the brackets onto the model, any significant undercuts such as hooks should be blocked. I use Barricaid™ (Figure 3), which is a light- cured perlonodontal dressing that remains flexible when cured and removes easily after the tray is formed or at the time of bonding to the teeth.

Figure 1. A typical in-house lab setup for indirect bonding includes a light box, curing light, adhesive and all the instruments needed for bonding.

Figure 2. After cementing the patient’s bands and preparing the tray, load each bracket with adhesive and then place and cure from the occlusal and gingival sides.

Figure 3. Cover hooks (at last) with a light-cure block-out material.
Achieving Ideal Bracket Placement

WITH IMMEDIATE INDIRECT BONDING

Joe H. Mayes, DDS, MSD
Lubbock, Texas

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Dr. Joe H. Mayes, a native of Crane, Texas, received his B.S. from Texas Tech University, followed by his D.D.S., M.S.D. and certification in orthodontics from Baylor College of Dentistry. Dr. Mayes is engaged in the private practice of orthodontics in Lubbock, Texas, and has been actively involved in new product development.

Immediate Indirect Bonding Steps

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4. Build Custom Bracket Base

At this point it’s important for the lab technician and the doctor to work together. Load the bracket with Ormco’s Enlight® light-cure adhesive (syringe delivery) and place it on the model. I have the lab technician use the Optilux 501 in the Ramp Mode, curing each bracket for 10 seconds from the occlusal side and 10 seconds from the gingival side (Figure 2). Note: I have the lab technician use the Ramp Mode (which ramps from 100 mW/cm² to 1,000 mW/cm² in the first 10 seconds) to reduce the rate that free radicals are formed – the process by which adhesive sets. The Ramp Mode slows the initial polymerization reaction rate and allows the composite to flow for a longer time to accommodate polymerization shrinkage (2-5%) prior to achieving the hardened gel state. The Ramp Mode is used primarily in composite resin areas where there is a considerable depth of composite. There are no tests to support the idea that slowing the polymerization reaction rate for the small amount of composite used in orthodontics has merit, but I can’t help but think it affects my bond strength positively.

I also feel that because of the unreactiveness and opacity of the Die-Kern stone model, the Enlight adhesive cures well enough to form a rigid custom base, but not completely, leaving the center of the custom base partially cured. I understand that some other clinicians advocate light curing the custom base through the tray from the lingual side to ensure a more complete cure. I disagree. My thinking is that if the center of the custom base is partially cured, it can form a chemical bond with the bonding material for greater strength when it’s bonded to the tooth. This procedure requires approximately two minutes of doctor time.

After curing the brackets onto the model, any significant undercuts such as hooks should be blocked. I use Barricaid® (Figure 3), which is a light-cured pericoron dressing that remains flexible when cured and removes easily after the tray is formed or at the time of bonding to the teeth.

**Barricaid is a registered trademark of Dentsply Caulk.**

**Enlight is a registered trademark of Ormco Corporation.**

**Ormco Protech is a registered trademark of Ormco Corporation.**

Figure 1. A typical in-house lab setup for indirect bonding includes a light box, curing light, adhesive and all the instruments needed for bonding.

Figure 2. After cementing the patient’s bands and preparing the model, load each bracket with adhesive and then place and cure from the occlusal and gingival sides.

Figure 3. Cover hooks (if at all) with a light-cure block-out material.
6. Trim Trays
The lab technician trims the tray to the gingival wing of the brackets to allow easy removal and prevent wicking capillary moisture from the gingiva to the bonding area (Figure 5). Any uncurable bonding material will be completely cured when exposed to the Optilux 501 intraorally.

7. Microetch Custom Base
The lab technician microetches the custom base material very lightly so there is no contamination of the bonding base from the model. Rinse, blow-dry and treat the fresh material with a thin coat of Ormco’s Ortho Solo™ removing excess with a blast of air. Ortho Solo has low molecular weight monomers that act as a wetting agent to soften the custom base, making it more receptive to the bonding material.

8. Microetch and Acid Etch Patient’s Teeth
After asking the patient to return to the chair, isolate the teeth. Have the chairside assistant lightly microetch the teeth (using 50-micron particles) to clean the labial surface, which removes any plaque (Figure 6) and slightly roughens the surface of the teeth. Next, the assistant acid etches the teeth with Ortho Solo’s Gel Etch, allowing the gel to remain on the teeth for 15 seconds (Figure 7). The microetcher removes enamel by a physical (ablation) process. The Gel Etch chemically etches the enamel, resulting in calcium, phosphorous and other debris transferring to the gel. The subsequent rinse removes the gel with the debris and leaves the surface wet, chemically etched and clean. If the teeth don’t have a chalky surface after drying, re-etch them for another 15 seconds (Figure 8). We use the Gel Etch syringe because we find the dabbing technique required with liquid etch too technique-sensitive to be uniformly repeatable.

Immediate indirect bonding will help increase placement accuracy while simplifying a procedure most doctors agree has important benefits.

9. Apply Sealant
After rinsing and drying the teeth, brush on a thin layer of Ortho Solo to prime and seal, using only a small amount of liquid on a small sponge applicator from a well (Figure 9). The solvent evaporates in about five seconds, leaving a thin layer of sealant.

10. Prepare Custom Base
Place a small amount of Enlight LV™ (Ormco’s lower viscosity version of Enlight) on the custom bases in the bonding tray. Since custom bases are closely contoured to the teeth, only a small amount of Enlight LV is necessary. Enlight LV is thixotropic and will flow smoothly onto the bracket base so only a thin coat need be placed. Use the Unidose delivery for this step.

11. Deliver Indirect Tray to Patient
You can place the tray as a single unit or cut it into two or three segments. Two segments seem to work better; three segments are too many to manipulate. You can then place the archwires immediately following the bonding.

12. Remove Tray
Press a scaler against the labial surface of the bracket while peeling the tray away from the brackets and teeth. This reduces the tensile force from the removal process, which could dislodge the bracket.

With the brackets accurately placed and cured to nearly full strength, the bonding procedure is complete: Insert the appropriate archwire and ligate with Power “U” or steel ligatures (Figure 11). Immediate indirect bonding also works well with self-ligating appliances.

I hope these step-by-step instructions entice you to take a fresh look at light-cured immediate indirect bonding. It differs from other techniques because it offers four distinct bond interfaces: a mechanical bond between the etched porosities of the enamel and the Ortho Solo, a chemical bond between the Ortho Solo and Enlight LV adhesive, a mechanical and chemical bond between the Enlight LV and custom base, and a mechanical bond between the Enlight and the bracket mesh. Immediate indirect bonding will help increase placement accuracy while simplifying a procedure most doctors agree has important benefits.
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11. Deliver Indirect Tray to Patient
You can place the tray as a single unit or cut it into two or three segments. Two segments seem to work the best in my practice. The half-arch tray placement provides adequate control and close adaptation of the tray to the teeth. I use the Optilux 501 with the 8 mm tip. Note: Do not extend the edge of the tray onto the soft tissue.

12. Remove Tray
Press a scaler against the labial surface of the bracket while peeling the tray away from the brackets and teeth. This reduces the tensile force from the removal process, which could dislodge the bracket.

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Advanced Laser Welding Technology

MEETING THE DEMAND FOR NEW AND MODIFIED APPLIANCE CONCEPTS

With the proliferation of noncompliance Class II correctors and molar distalizing appliances, we at AOA/Pro realized the need to seek out advanced technologies that would allow us to meet the demands of these new and modified appliances. The challenge of attaching auxiliary items such as sheaths to TMA wire springs or archwire tubes and Herbst axles to stainless steel crowns and bands without compromising the part or its attachment meant that we needed a technology that combines robust design with intricate workmanship. Laser welding meets those demands and is now fully integrated as an important tool in our production. Reducing or even eliminating the amount of solder used to assemble such appliances as the Cantilever Rite Biter (CRB), the Hilgers/Tracey Mini-Distalizing Appliance (MDA), and the Paz Arch Developer (as well as the adjuncts available for these appliances) is essential for dependable performance. In many instances expanders, sheaths, archwire tubes and wire springs are situated in close proximity to each other (Figure 1). Laser welding has the unique ability to attach accessories to bands and crowns using high magnification and multiple power settings, eliminating the arduous task of controlling solder flow and finishing processes such as polishing that traditional soldering methods require. Another major unwanted side effect of soldering is the high temperature required to braze. The bodies of bands, stainless steel crowns and expansion screws present large heat sinks, which can result in annealing and degradation of the solder joint. Laser welding transfers little to no heat, which maintains the integrity of the alloys being joined, minimizing the bulk associated with traditional solder.

Here’s what a few clinicians have to say about the benefits of laser welding.

Dr. William M. Odom
San Mateo, California

“In mixed dentition cases, I routinely use a 10 mm rectangular tube instead of, or in addition to, the 4 mm tube that’s standard length for molar attachments. These longer tubes are laser-welded either directly to the bands and stainless steel crowns (Figure 2) or over the existing attachments when headgear or auxiliary tubes are desired. The additional length helps prevent the archwire from being pulled or displaced from the molar tube, particularly when using the more flexible Copper Ni-Ti® wires. The advantages are decreased emergency visits and longer intervals between appointments. The combination of laser-welded extensions plus an anterior crimpable stop has virtually eliminated displaced and poking archwires in my mixed dentition and Herbst cases.”

The beauty of laser welding is that little heat is transferred to the connection. Computer-driven laser welders offer numerous power settings (90+ joules with an average pulse power of 4.50 kw) and variable pulse lengths (0.5 to 20 milliseconds). An ideal power setting can be programmed into the unit for many different types of connections, whether the appliance is large or small. Traditional soldering of lingual bonded retainers, provides a prime example of its value. Some clinicians have suggested that springs be soldered directly to the screw housing. Soldering titanium springs to stainless steel screw housings is nearly impossible because the heat required to weld titanium would damage the stainless steel. Laser welding the sheaths to the screw housing provides a durable joint without imparting extreme heat to the screw mechanism and degrading it. Tack welding does not produce the strength needed to withstand the considerable forces associated with activating the appliance.

Dr. James J. Hilgers
Mission Viejo, California

“The advent of TMA wire fostered the development of such molar distalizing appliances as the Pendulum, T-Rex and PHD. Combining TMA, the compact screw and laser welding gave Steve Tracey and me the wherewithal to design the Hilgers/Tracey MDA (Mini-Distalizing Appliance) (Figures 5-6). While exerting low forces on the dentition, the MDA offers superb expansion and since the entire upper arch provides anchorage, it offers excellent molar distalization without the use of a Nance button. Laser welding also makes it possible to weld sheaths directly to the housing of the compact screw without adversely affecting its expanding capability. Traditional soldering won’t work because of the close proximity of the shank to the screw. Laser welding has also allowed us to eliminate the acrylic sheath common to other distalizing appliances (in which the wire is imbedded) and activate the MDA outside the patient’s mouth. Access to laser welding has afforded me unsurpassed flexibility in appliance design and with the $50,000 price tag on these machines, I know that AOA/Pro is committed to this new technology for the long term.”

Being able to attach TIMAP® or Ni-Ti® springs to an expansion screw housing via laser welding provides a prime example of its value. Some clinicians have suggested that springs be soldered directly to the screw housing. Soldering titanium springs to stainless steel screw housings is nearly impossible because the heat required to weld titanium would damage the stainless steel. Laser welding the sheaths to the screw housing provides a durable joint without imparting extreme heat to the screw mechanism and degrading it. Tack welding does not produce the strength needed to withstand the considerable forces associated with activating the appliance.

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Figure 1. Like other small appliances, the close proximity of the sheaths and keyhole on the Omnic Compact RPE require the precision and durability of laser welding that traditional task welding or soldering cannot consistently provide.

Figure 2. Special requests, such as welding extended archwire tubes to bands, require the accuracy and strength of laser welding – attributes not easily afforded through traditional soldering.

Figure 3. Small appliances, such as lingual bonded retainers, benefit from the fact that a laser welder’s power setting can be adjusted low enough to create welds that don’t interfere with the function of the appliance.

Figure 4. The computer automation of the laser welder offers precise repeatability for a particular weld option, regardless of the operator. Here Paula Allen-Nible demonstrates looking into the microscope of the laser welder to ensure accurate alignment of the targeting device.

Figure 5. Full view of Hilgers/Tracey Mini-Distalizing Appliance (MDA).

Figure 6. MDA after distalization.
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The addition of advanced laser welding technology has opened the door for AOA/Pro to meet the most demanding challenges of today’s appliance designs and modifications as well as unique auxiliary attachment welding projects. For more information about how AOA/Pro can help you take advantage of this excellent service or to discuss a special project, contact John Fuller, special projects manager, in Sturtevant, Wisconsin, at (800) 262-5221 or (262) 886-1050.

After completing a tour of duty for the United States Army in 1967, John Fuller joined Professional Positioners in Racine, Wisconsin, and served as the general manager of its Enfield, Connecticut, facility from 1979 to 1984. In 1984 John became a partner in Specialty Appliance and served as general manager there until 1992 when he sold his partnership to join the AOA team in Sturtevant, Wisconsin. His many years of experience and his knowledge of developing technologies, equipment, materials and appliance design make him especially qualified for his current responsibilities at AOA/Pro as special projects manager. John’s focus is on developing new products and additional applications for existing products.

Clinical Keynote Speaker
Dr. Vince Kokich is a professor in the Department of Orthodontics at the University of Washington with a private practice in orthodontics in Tacoma, Washington. He was awarded the Sicher Research Award by the AAO and has also received the Strang Award (1994), the Salzman Award (1996), the Schluger Award (2000), the Mershon Award (2001) and the Dewel Award (2002).

Dr. Kokich will present Interdisciplinary Management of Anterior Aesthetic Dilemmas: When, Why and How. Orthodontists often have predetermined goals regarding the aesthetic relationship of teeth. But these goals may differ from the patient. A recent study completed at the University of Washington, shows that lay persons may not notice certain problems that dentists and orthodontists strongly believe should be resolved. Clinical examples will be used to discuss these discrepancies.

Motivational Keynote Speaker
Ms. Amanda Gore appeared at the AAO in Philadelphia this year and received great reviews from the audience. She’s sure to do the same in Las Vegas as she presents Put the Zing Back in Your Fling, an entertaining expose of common scenarios that cause friction between men and women. Using her energetic style, Ms. Gore will explore these differences to help attendees build better personal and professional relationships.

DOCTOR PROGRAM
THURSDAY, FEBRUARY 20

Clinical Keynote Speaker
Dr. Vince Kokich – Interdisciplinary Management of Anterior Aesthetic Dilemmas: When, Why and How

Motivational Keynote Speaker
Ms. Amanda Gore – Put the Zing Back in Your Fling

STAFF PROGRAM
FRIDAY & SATURDAY, FEBRUARY 21 & 22

Ms. Rosemary Bray – Braces and Beyond
Dr. Dwight Damon – Energize Your Practice with New Technology
Ms. Joan Garbo – Get Over It!
Dr. Bruce McFarlane – The FUNdamentals of Orthodontics

Don’t miss the Customer Appreciation Party, Friday, February 21 at the Harley-Davidson Café.
Contact Brenda Perkins at (800) 854-1741, Ext. 7414 for more information.

Recharging Your Practice
February 20-22, 2003 Rio Suite Hotel & Casino Las Vegas, Nevada

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Soldering large distalizing appliances to attach a Nance button using conventional methods creates tremendous heat and is time-consuming. Again, the laser-welding method protects against damaging the turning properties of the screw.
## Lecture/Course Schedule at a Glance

<table>
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<tr>
<th>DATE</th>
<th>SPEAKER(S)</th>
<th>LOCATION</th>
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<td>10/3-5</td>
<td>Mario Paz</td>
<td>Marina Del Rey, CA</td>
<td>Ormco; Catherine Lence (310) 822-4324; Lingual In-Office Courses*</td>
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<td>10/4-5</td>
<td>Wick Alexander</td>
<td>Berlin, Germany</td>
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<td>10/4-5</td>
<td>Courtney Gorman</td>
<td>Indianapolis, IN</td>
<td>Ormco; Kristy Dobson (888) 373-4673; Lingual Typodont Course*</td>
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<td>Ormco Poland; Tomasz Stefanszczak 48 343247812; Practice Management</td>
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<td>10/11-12</td>
<td>Dwight Damon</td>
<td>Spokane, WA</td>
<td>Ormco; Sheila Dahl (509) 504-9860; Damon In-Office</td>
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<td>10/11-12</td>
<td>Larry Hutta</td>
<td>Worthington, OH</td>
<td>Ormco; Vicki Sickles (814) 885-2000; In-Office Hertst Course for Doctors &amp; Staff</td>
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<td>Jean Jacques De Jonge</td>
<td>Paris, France</td>
<td>Ormco France; Michele Marsinus 31 33 453 61 54; Orthodontics &amp; Dentofacial Orthopedics</td>
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<td>Gdansk, Poland</td>
<td>Ormco; Michèle Marinesco 31 33 453 61 54; Tx of Deep/Open-Bite Malocclusions</td>
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<td>Lake Oswego, OR</td>
<td>Ormco; Paul Allen-Noble (800) 890-3466; In-Office Comp. Hands-On Herbst Training*</td>
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<td>Sydney, Australia</td>
<td>Ormco Pty Limited; Jacqueline Doon – <a href="mailto:dorn@bybrondental.com">dorn@bybrondental.com</a>; The Simplicity Revolution</td>
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<td>Tokio, Japan</td>
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<td>Spokane, WA</td>
<td>Ormco; Sheila Dahl (509) 504-9860; Damon In-Office</td>
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<td>11/9-9</td>
<td>Dirk Wischmann</td>
<td>Aachen, Germany</td>
<td>Ormco Europe; Dr. Draschin 49 243 8688 731; ECO – Lingual Therapy</td>
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<td>11/10</td>
<td>Swaritz, Bennett,</td>
<td>Cabo San Lucas, Mexico</td>
<td>Ormco; June Myresco (800) 854-1741, Ext. 7846; Fourth Annual Cabo San Lucas Seminar</td>
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<td>11/10-11</td>
<td>Wick Alexander</td>
<td>Nisobinski, Russia</td>
<td>Ormco Europe; Michele Marsinus 31 33 453 61 54; Tx of Class III Malocclusions</td>
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<td>11/12-22</td>
<td>Didier Fillion</td>
<td>Osaka, Japan</td>
<td>JLOA; Takashi Kamiya – <a href="mailto:kamida@bybrondental.com">kamida@bybrondental.com</a>; Lingual Typodont Course*</td>
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<tr>
<td>11/12-23</td>
<td>Wick Alexander</td>
<td>Arlington, TX</td>
<td>Dr. Alexander, Resty Davis – <a href="mailto:tidaven@kent.edu">tidaven@kent.edu</a>; Alexander Study Club Meeting</td>
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<td>12/1-2</td>
<td>Vollo, Le Gu, Soule</td>
<td>Paris, France</td>
<td>Ormco France; Michele Marsinus 31 33 453 61 54; Optimized Sliding Technique</td>
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<td>12/8-9</td>
<td>Durand, Jeanlet</td>
<td>Paris, France</td>
<td>Ormco France; Michele Marsinus 31 33 453 61 54; TMJ Disorders (practical)</td>
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<td>12/16</td>
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<td>Paris, France</td>
<td>Ormco France; Michele Marsinus 31 33 453 61 54; Temporomandibular Disorders</td>
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<td>1/19-20</td>
<td>Attal, Hints, Muller</td>
<td>Paris, France</td>
<td>Ormco France; Michele Marsinus 31 33 453 61 54; Banding in Orthodontics</td>
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<td>1/23-24</td>
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<td>1/23-31</td>
<td>Rafi Romero, Silvia Geron</td>
<td>Zermatt, Switzerland</td>
<td><a href="http://www.lingualcourse.com">www.lingualcourse.com</a>; Lingual &amp; Adult Ortho Adventure</td>
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<td>1/26-27</td>
<td>Wick Alexander</td>
<td>Casalragna, Morocco</td>
<td>Ormco Morocco; Taurin Benini 212 376 963 26; The Alexander Discipline</td>
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<td>2/20-22</td>
<td>Garman Institute</td>
<td>Las Vegas, NV</td>
<td>Ormco; Brenda Perkins (800) 854-1741, Ext. 7414</td>
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<tr>
<td>3/6-7</td>
<td>Dwight Damon</td>
<td>Sydney, Australia</td>
<td>Ormco Pty Limited; Jacqueline Doon 61 2 998 70 744; Low-Force Mechanics</td>
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<td>3/10-11</td>
<td>Dwight Damon</td>
<td>Tokyo, Japan</td>
<td>Ormco Japan; Takashi Kamiya – <a href="mailto:kamida@bybrondental.com">kamida@bybrondental.com</a>; Low-Friction, Low-Force Ortho</td>
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<td>3/15-16</td>
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<td>Damon, Bagden</td>
<td>Orlando, FL</td>
<td>Ormco; June Myresco (800) 854-1741, Ext. 7846; Low-Force Mechanics</td>
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*Typodonts and/or Participation

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