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s respected author, speaker and consultant, Dr. Stephen Covey has noted, “The main thing is to keep the main thing the main thing.” Well folks, the main thing, as far as orthodontic patients are concerned, is aesthetics. Not efficiency, and not function. Don’t get me wrong, I’m not saying efficiency and function aren’t important. And I’m certainly not saying quality is not important – quite the contrary! What I am saying is that, more and more, we have become increasingly enamored with efficiency, often at the expense of what patients want more than anything else – quality orthodontics that places a premium on aesthetics.

What makes me so sure about this? Most patients do not understand the orthodontist’s functional and stability goals but are intimately aware of aesthetics. The fact is, patients want to look better – that’s it. Once I began to understand this perspective, the entire tenor of my practice began to change, bringing along with it increased patient satisfaction and unexpected practice growth. Curious about what was behind all this, I did a little research. Here’s what I found.

Orthodontics: Beneficiary of a Culture Obsessed with Aesthetics

Whether we like it or not, we are the beneficiaries of a culture obsessed with aesthetics. If you have any doubts at all, simply take a look at the facts: In the United States, more money is spent on beauty than on education or social services. The cosmetic industry alone does over $35 billion worth of business annually, with tons of makeup – 1,484 tubes of lipstick and 2,055 jars of skin care products – sold every minute. According to numbers provided by Datamonitor Cosmetic and Toiletries Database, over 1,700 new skin-care products were launched in 1996, all in the pursuit of beauty. And the U.S. is not alone. In Brazil, there are more Avon representatives than members of the army. In Africa, Kalahari bushmen continue to use animal fats to moisturize their skin, even in the midst of devastating famine. People do extreme things in the name of beauty. According to a report just released by the American Society of Plastic and Reconstructive Surgeons (ASPRS), over one million people had cosmetic surgery in 1998. Of the top five cosmetic procedures performed, eyelid surgery, facelift and chemical peel (all procedures involving facial aesthetics) trailed only liposuction and breast augmentation in number. Shockingly, teens are a fast-growing segment, with nearly 25,000 cosmetic procedures performed on children age 18 or under. Since 1992, cosmetic surgery has risen a dramatic 153%, with over a 50% increase in just the last two years (Figure 1). (Of particular interest to those of us who practice in the golden state, one out of every five cosmetic surgery patients resides in California.) And lest you think cosmetic surgery is only for the rich and famous, the ASPRS reports that 65% of those who undergo aesthetic plastic surgery have family incomes under $30,000 per year.

According to Dr. Nancy Etcoff, practicing psychologist and Harvard professor, people are spending billions of dollars on cosmetics and plastic surgery for a reason: looking good has survival value. From infancy to adulthood, beautiful people are treated preferentially and viewed more positively – true for both men and women. Beautiful people find sexual partners more easily, are more likely to find leniency in the courts, and can elicit cooperation from strangers. Beauty conveys real social and economic advantages; while equally important, unattractiveness leads to major social disadvantages and discrimination.

Believe it or not, people size up others within the first three or four seconds of an encounter. Within 30 seconds at least 11 assumptions are made about the other

“We expect attractive people to be better at everything – from relationships to jobs.”

Dr. Stephen Tracey believes in combining innovative yet prudent orthodontic mechanics with the seemingly limitless potential of the human spirit to create practice success through technology and teamwork. He manages an active practice in Upland, California, and serves as assistant professor at Loma Linda University, where he earned his D.D.S and M.S. in orthodontics and where he was named instructor of the year in 1995. He has written articles for numerous publications and has lectured in 13 countries. His interest in pursuing what’s possible led him to the blistering lava fields of the Ironman Triathlon, a climb to the summit of Mt. Rainier and a 110-mile trek in the Amazon.

Cover photo taken at Norton Simon Museum, Pasadena, CA. Bronze sculpture by Rodin.
Giving People What They Want

person, including social status, economic status, educational attainment, occupation, marital status, educational status, ancestry, trustworthiness, credibility, and likeliness to succeed.

The process is an unconscious one, yet the reason we do it is simple. Ellen Berscheid, in *Psychological Aspects of Facial Form*, explains, "In a society in which one cannot even count on having the same set of parents in our childhood for any length of time; the same marriage partner for any length of time; when one may be thrown into the dating and mating market at age 30, 40, 50, 60; when it becomes increasingly unlikely that one will have the same workmates, colleagues, or neighbors for any length of time – in sum, in a society in which social fragmentation has proceeded to an unprecedented point, people are constantly assessed very quickly by others simply on the basis of their appearance rather than their record of actual behavior and other characteristics." In the course of one day, we can encounter dozens of people and receive hundreds of verbal and visual messages. In order to process all this information quickly, we often form our reactions to people based on minimal knowledge – primarily appearance.

Appearance constitutes 55% of our first impressions of people. In job interviews, about 75% of the decision to hire is based on the applicant’s appearance. And for those who have recently been hired, there is likely to be an 8 to 20% variation in entry-level salary based on personal appearance. Even Aristotle said, “Beauty is a greater recommendation than any letter of introduction.”

We expect attractive people to be better at everything – from relationships to jobs. And these expectations start early in childhood. In one study, teachers in 400 classrooms in Missouri were given a report card of a fifth-grade student, including grades, evaluation of attitude, work habits and attendance. The only variant was the attached photograph of the child – an attractive or unattractive boy or girl. Despite the depth of information about behavior and performance, looks swayed opinions. The teachers expected the good-looking children to be more intelligent and more sociable and popular with their peers. Disturbingly, further research indicates good-looking students tend to get better grades, but when the subjective aspects of grading are removed and grades are based solely on standardized tests, the advantage disappears.

Preferences based upon looks turn up from Kansas City to Kuwait. In 1990, psychologist David Buss interviewed over 10,000 people from 37 cultures between the ages of 14 and 70 about their mating preferences. Around the world, kindness was a highly valued quality in a mate, but physical attractiveness and good looks were on everyone’s top-10 list of desirable qualities. Another study demonstrated that the best-looking girls in high school are more than 10 times as likely to get married as the least good looking. And better-looking girls tend to “marry up;” that is, marry men with more education and income than they have.

If we do our job correctly, we have the power to make a huge contribution to the facial aesthetics of an individual. Van Morrison sang, “I’m in heaven when you smile,” because without a doubt, a beautiful smile is a critical component of attractiveness. As a matter of fact, according to a survey released by the Academy of Cosmetic Surgery, since 1992 cosmetic surgery has risen a dramatic 153%, with over a 50% increase in just the last 2 years.

Figure 1. Since 1992 cosmetic surgery has risen a dramatic 153%, with over a 50% increase in just the last 2 years.
General Dentistry, a person’s smile – not their clothing, hair or eyes – is what others notice first.

So what does all this mean? What it means is that in this new millennium, orthodontists, along with dentists, cosmetic surgeons, cosmeticians and nutritionists, will continue to be in tremendous demand as purveyors of beauty. If we play our cards right and give our patients what they really want – the ultimate in aesthetics, both during and after treatment – we are sure to see unprecedented growth in our practices. But it also means something else – that we’ll have to be willing to look at what we do in a totally new and different light.

Managing an Aesthetic-Driven Practice – Seven Myths You Must Give Up to Capitalize on the Importance of Aesthetics in Today’s Culture

Myth #1: The practice of the future will be driven by efficiency. Let’s face it, with all the focus on efficiency the past few years, it would be easy to believe that the key driver to future practice growth will continue to be efficiency. It is my belief that the most successful orthodontic practices in the next decade will be driven by the public’s unquenchable thirst for enhanced aesthetics. Time-savings is, indeed, a commodity that people value highly, and our patients will continue to respond favorably to improved technologies that add convenience, but for practitioners who want to catapult the growth of their practices, the evidence that “looking good has survival value” would be foolhardy to ignore. It only makes sense that people who come to us to improve their looks (and thereby their self-image and a greater likelihood of acceptance in the world) would want to look good during treatment as well.

Bottom Line: The practice of the future will be driven by aesthetics.

Myth #2: We give something up when we focus on aesthetic treatment systems. I would agree that at some earlier point in time, this statement was more true than I would have liked, but things are different today. We now have available to us clear brackets that are clearer, stronger and more efficient than ever before. Gone are the days of tie-wing fractures and mission-impossible debonding. Today’s aesthetic brackets are a far cry from previous versions you may have tried just a few years ago.

With the introduction ofOrmco’s new aesthetic bracket, inspire!,™ we now have the ability to deliver efficient orthodontic treatment that is more aesthetic than ever before (Figure 2). First of all, unlike other ceramic brackets that are made of polycrystalline alumina, inspire! brackets are made from single crystal aluminum oxide and are the result of a totally new design and manufacturing process. Consequently, they’re not just translucent but crystal clear, with strength and aesthetics that are beyond compare. Bracket dimensions have shrunk (now nearly identical to metal) and reliability and fracture resistance have been dramatically enhanced, thanks to improved tie-wing geometry and a perfected heat-treatment process that relieves stress by altering the molecular structure of the bracket. And while bond strength is vastly improved due to a mechanical ball base, bracket removal is simple as a result of proven design features that allow fail-safe atraumatic debonding every time. Bottom Line: Today’s aesthetic appliances offer efficiency, effectiveness and more.

Myth #3: It makes sense to put a surcharge on aesthetic treatment. Ever since introduction of the first clear braces in the early eighties, it has been routine and customary for orthodontists to charge more for treatment utilizing aesthetic appliances. Of course, in the old days this made sense – the brackets cost more and treatment was truly more difficult. While aesthetic brackets still cost a little more, there is little difference in actual chairtime involved and, more importantly, consumers are weary of being nicked and dimed when they make big ticket-purchasing decisions.

Don’t get me wrong, people will pay almost any price for something they really want – even if they can’t afford it – but they don’t want to feel as if
they’re being sold up. Witness the instant success of Saturn, the United States automobile manufacturer that promises a quality product with no-hassle, one-price shopping.

For some time now, I have given patients the choice of any bracket they want. That includes clear, silver, gold and self-ligating. And I’ve offered the choice at no additional charge. Nearly 90% of my patients, regardless of age, choose clear brackets. So what’s the real cost to me? Not much, especially in light of the fact that I have adjusted all my fees ever-so-slightly to cover the increased product costs of treating so many patients with aesthetic brackets without additional surcharges. Throw in the fact that, as a result of this policy, my practice has grown significantly, and it’s not hard to see that I come out ahead...way ahead.

Myth #4: All aesthetic appliances are clear. For most of us, the terms aesthetic appliances and clear brackets are synonymous. But are they? In today’s world, far from it. When it comes to braces, beauty is truly in the eye of the beholder, particularly when put in the context of age, gender and cultural background. Adults seem to favor appliances that are as inconspicuous as possible, while kids favor braces that stand out, with rainbow-colored ligature ties being almost a given. While I can’t seem to give away gold braces, a good friend of mine only 25 miles away has a hard time keeping up with demand. So what gives?

What gives is that what’s aesthetic is not up to us – it’s up to our patients, every last one of them. And it’s about a lot more than just different kinds of brackets and colored ligatures. It’s about Pendulum appliances and Herbst appliances that allow postponement of bracket placement for a significant amount of time. It’s about appliances like Bite Fixers that, when combined with clear brackets, make Class II correction beautifully efficient. It’s about clear slipcover retainers and bonded lingual retainers or, if the patient chooses, brightly colored, custom-designed Hawley-style retainers. It’s about giving people what they want (Figure 3).

Bottom Line: Remember the first rule of aesthetics: Aesthetics is whatever the patient says it is...period, end of story.

Myth #5: Aesthetic orthodontic treatment is about helping patients look good during treatment and nothing more. All right, so patients want to look attractive during treatment and are willing to actively seek out those practitioners who are willing to give them what they want. Is there anything else? Absolutely!

One often-overlooked benefit of aesthetic orthodontic treatment is increased patient... continued on following page
compliance. “How’s that?” you ask.

Research has demonstrated that people who feel attractive tend to be more at ease socially, more confident and less likely to fear negative opinions than people who feel unattractive. They’re also more likely to think they are in control of their lives and not pawns of fate, and they’re more apt to be assertive. As Dr. Ken Blanchard noted in his best-selling book, *The One-Minute Manager*, people who feel good about themselves produce good results.

For example, I’m sure almost anyone who has used a Herbst appliance has noticed the almost instantaneous transformation that takes place in a child’s self-image as soon as the appliance is placed in a severe Class II case. Although permanent changes may require many months of appliance wear, changes in facial appearance are immediate, with significant improvements in profile and lip closure (Figure 4). Suddenly these ugly ducklings begin to see themselves as beautiful swans and behave as such with better cooperation and greater attention to hygiene.

Bottom Line: *Aesthetic orthodontic treatment has a positive effect on patient compliance and is good for both patient and orthodontist.*

Myth #6: Cuspid width is the key to a beautiful, broad smile. I think most practitioners today would agree that a broad smile is preferable to a narrow one. But, how exactly do we define the difference? If you look at some of the most beautiful smiles around – the Cindy Crawfords, the Claudia Schiffers, the Matt Damons, and the Val Kilmers of the world – you will find that the visible part of their smiles at fullest exposure spans a distance equal to the width – between the irises of their eyes, with prominent exposure of the first bicuspids (Figure 5). There are no black shadows present in the buccal corridor between the facial surfaces of the posterior teeth and the inner cheeks and lips. As orthodontists, our attention is too often unduly focused on cuspid width at the expense of bicuspid width. If these international icons constitute the current standard of beauty, then from an aesthetic standpoint the first bicuspid should be considered one of the “eight anterior teeth.” Additionally, the axial inclination of the upper first bicuspid crown should be parallel with the cuspid crown in front of it, with both appearing to be nearly vertical (Figure 6). With regards to aesthetics, lingual crown inclination of either of these teeth is typically undesirable.

All this brings up a point that is sure to be a bit controversial. In my opinion, upper and lower cuspid brackets should have positive lingual root torque. Why? Because nearly all our mechanics, including space closure and elastic wear, create moments of force that result in unaesthetic lingual tipping of these crowns. In fact, if you take into consideration that most practitioners detail their cases with wires that do not completely fill the bracket slots and often use vertical seating elastics, it’s easy to see that finishing mechanics alone can result in an unaesthetic lingual version of the cuspids. It only makes sense to utilize positive lingual root torque in the upper and lower cuspid brackets to counteract the negative effect of these force moments. Bottom Line: *First bicuspid width combined with vertical axial inclinations of both the upper cusps and upper first bicusps are two of the most critical components of a broad, beautiful smile.*

Myth #7: Straight teeth are what makes a beautiful smile. I don’t care how perfect an occlusion you create, if the patient has misshapen and discolored teeth, you will have fallen short in your efforts to create hyper-aesthetic orthodontic results. Aesthetic enamel recontouring should be part of every debanding procedure. And tooth bleaching shouldn’t be relegated to an afterthought (Figure 7a-c).

You can’t look anywhere on TV these days without noticing how brilliantly white...
and perfect the teeth of celebrities, movie stars and models have become. In addition to the more traditional method of home bleaching that uses carbamide peroxide gel placed into custom-fitted delivery trays, new techniques have recently been developed that allow you to whiten your patients’ teeth significantly in less than a one-hour visit. It’s my belief that post orthodontic tooth bleaching should be a standard recommendation for nearly all patients at their first visit. 

**Bottom Line:** The most beautiful smiles are composed of teeth that are not only straight but also artistically contoured and dazzlingly white.

**Aesthetics – The Future of Our Profession**

As the profession of orthodontics continues its journey into the new millennium, technology will continue to play an ever-increasing role, with a virtually untapped market of orthodontic patients being discovered as a result of efforts to give people what they really want – quality treatment that places a premium on aesthetics. Lingual orthodontics will make a resurgence, bracketless systems such as Invisalign will continue to be researched and developed, and delivery systems involving the Internet will become more commonplace. So, of course, simplify your treatment and be as efficient as possible, but never lose sight of what your patients want more than anything else – to look and feel their best, today and always.

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**Figure 5.** An accepted standard of beauty across many cultures implies that the fullest exposure of a patient’s smile should be equal to the width between the irises of their eyes, thus suggesting that the first bicuspids be considered one of the “eight anterior teeth.”

**Figure 6.** The axial inclination of the upper first bicuspids should be parallel with the cuspid crown in front of it, with both appearing to be nearly vertical.

**Figure 7a.** The most beautiful smiles are composed of teeth that are not only straight but also artistically contoured and dazzlingly white.

**Figure 7b.** Before recontouring and whitening.

**Figure 7c.** After recontouring and whitening.
In 1927 Charles Lindbergh flew the Spirit of St. Louis on the first solo nonstop transatlantic flight. The trip took over 33 hours. Today, the Concorde makes the same trip in 3 hours, a tenth the time. Amazingly, in the same time it takes the Concorde to cross the Atlantic, shuttle astronauts can orbit the globe several times.

Decades ago orthodontists were crimping and soldering their own bands, then cementing them onto every tooth. Archwires had to be adjusted at least every month. This protocol helped create a tradition of monthly visits for making adjustments, monitoring compliance and receiving the monthly payment.

From Charles Lindbergh’s time until now, orthodontic technology has changed almost as dramatically as aviation technology, yet many of us are resistant to capitalize on a key aspect of what technology has to offer—extending treatment intervals beyond the traditional monthly visit. While some doctors with whom I have spoken have pushed treatment intervals to 6 or 8 weeks, they are reluctant to capitalize on the full capabilities of the new technologies. They purchase all the advanced products but still use those products in the same old ways.

Like all of you, I was trained to see patients every 4 weeks in order to control treatment, monitor cooperation and facilitate the monthly orthodontic payment. Several years ago we challenged ourselves to explore the full capabilities of the new appliance technologies. We pushed our conventional 4-week cycle out to a 6-then 8-then 10-week cycle, and now we see most patients, after braces are placed, at 12- to 13-week intervals. Patients love the convenience and a more open schedule has lowered our stress. It's also given us time to grow the practice yet have more time to spend with each patient, especially the more complex cases.

I want to make something very clear. If patients in our office are cooperating and if treatment is going well, we will see them every 12 to 13 weeks. This does not mean that we see all of our patients every 3 months no matter how treatment is progressing. Technology has advanced to the point where seeing the patient less often is possible if you are careful. Treatment intervals should be selected that are specific to each patient's case. Can you render high-quality treatment and see patients less often than in the past? Yes. Can cooperative patients be placed on autopilot for several months at a time? Yes. Does this mean that every patient should be seen less frequently? No. With today's advanced bracket and wire systems, it is possible to maintain the highest standards of care without making most patients visit the office monthly.

Getting to 12-week intervals has been an evolution in our practice—not a revolution. We didn't go from 4- to 12-week intervals overnight nor would I advise anyone to do so. We transitioned cautiously. I had the same fears as anyone else in exploring such a break with common practice. My primary concern was quality of care—losing control of cases, compromising treatment results and extending overall treatment times. Then there were the A/R issues and the possibility of alienating referring dentists. Today, however, there are only a few situations in which I would ask a patient to visit every 4 or 6 weeks: an extremely difficult case, a noncooperative patient and, if needed, for finishing the case.

In making this change, we have neither lost control of cases (mechanically or compliance-wise) nor extended overall treatment times. We have not experienced additional A/R problems nor have we alienated patients or referring dentists. In fact, we are finishing with high-quality results and experiencing more referrals from patients and dentists as they learn about our current protocol.

The purpose of this article is to offer the appropriate rationale for implementing extended treatment intervals for the benefit of your patients and your staff members and to offer you ideas for making the transition a methodical one. Extending treatment intervals beyond 6 to 8 weeks requires: (1) a systematic application of the most advanced bracket and wire systems, (2) trust in that technology to do the job it was designed to do, (3) staff...
enrollment, (4) planned communications with patients, parents and referring dentists and, as importantly, (5) a letting go of the perceived link between quality of care and frequency of visits.

Skeptics may say that it is unethical or at least foolhardy to see patients every 12 to 13 weeks. I have found that carefully doing so benefits everyone involved and that patients are ardently enthusiastic about it.

Some of the most important objectives of orthodontic treatment are a functional, aesthetic, comfortable, stable occlusion. I am in no way advocating shortcuts in order to treat cases in less time or with fewer appointments. We should never compromise the quality of the clinical result or its long-term stability for the sake of efficiency. It is no longer clinically necessary nor is it respectful of our patients' time to make them come to the office more often than necessary. There is a better way.

My Catalyst for Change: Patient Need
A number of incidents occurred roughly at the same time, which dragged me kicking and screaming into our new treatment protocols. With the introduction of Orthos™* brackets, buccal tubes and archwire forms, I had made a change in my appliances and at the same time was intrigued with the idea that Copper Ni-Ti® archwires could be thermally reactivated intraorally without continual tweaking.

I had begun to use these new technologies, still keeping to the 4-week treatment interval, when the catalyst for change materialized. Parents of a girl who was moving to the Far East asked me to treat her on a schedule of 3- to 4-month intervals when she came to visit. The parents were confident this schedule would be often enough to treat her successfully. I was not! However, in response to the parents' contagious enthusiasm, I reframed the dilemma as an opportunity to put the new technologies to the test, although I still did not think I had an overwhelming chance of being successful. The parents signed a release and we placed brackets. The patient left for the Far East and returned 12 weeks later. I was amazed at the progress she had made. She was further ahead in treatment than she would have been had I made archwire adjustments every month and finished her treatment successfully in fewer visits and months than I generally would have expected (Case 1, on page 11). Interestingly, this patient's cousin, who lives close to the office, watched her treatment progress at these longer intervals and requested treatment for herself at 3-month intervals because of the convenience. Again, treatment progressed beautifully in fewer appointments at longer intervals (Case 2, on page 12). Having these patients force me into appropriate intervals gave me the confidence I needed to employ a similar protocol with more and more patients.

Less Can Actually Be More
What this globetrotting patient and her cousin helped me realize is this: When I see a patient, I feel compelled to do something. With only 4 to 6 weeks to work, many archwires (especially Copper Ni-Ti)

* Products identified as "Orthos" are distributed in Europe as "Ortho-CIS."
have not had the appropriate length of time to express themselves fully. In seeing the patient prematurely, I feel the need to tweak, step and/or replace the archwires when what I really need to do is to trust the technology to do its job. I think it is in our nature to feel guilty if we don’t do something to the patient each time.

All of us have had patients who have missed several appointments, returning to the office months later whereupon we find that they have progressed further in treatment without our supervision than we would have surmised. In disappearing, they had inadvertently allowed the technology to do what it was designed to do.

**Benefits of Extended Treatment Intervals**

The benefits of extending treatment adjustment intervals are numerous for all involved in the process, patient and parent as well as doctor and staff. These benefits include (1) enhanced convenience and reduced pain for patients, (2) less cost for patients in traveling to and from the office and in taking time off work, etc., (3) increased doctor availability that allows you to spend more time with each patient, (4) additional openings in the schedule for new patients, (5) reduced pace for the staff, which enhances their work satisfaction and gives them greater patience to deal with stressful and complex situations and (6) extracting the full value from Copper Ni-Ti, thus decreasing expenses and improving net income.

I divide the transition to extended treatment intervals into two categories: (1) going from 4- or 6-week to 8-week intervals, (2) extending from 8-week to 10- or 12-week intervals. I will address each globally and then deal with concerns related to both.

**Judicious 4- to 8-Week Transitioning: Overcoming Mechanical Control Fears**

The most common concern that doctors express when contemplating the extension of treatment intervals from 4 or 6 weeks to 8 weeks is that they will lose control of the case. If you have this fear, select several cooperative patients whose treatment is going well and extend their next treatment interval much longer than your norm. At the subsequent appointments, examine the patients carefully, evaluate their treatment progress and be prepared to be pleasantly surprised. To date, I have not met a doctor who has extended treatment intervals from 4 to 6 weeks or from 6 to 8 weeks who has had a negative experience.

My recommendation is to extend cooperative patients first, from 4 to 6 weeks, then from 6 to 8 weeks. When you become comfortable that you can maintain control within these time frames, begin transitioning other existing as well as new patients to the same schedule, keeping your few noncooperative patients on a separate, more frequent track, again bringing them in to address compliance issues but not making wire adjustments.

**Doctor Scripting at Adjustment Visit to Extend Appointment Intervals**

While looking at the assistant, the doctor says something such as: “Sally, this advanced wire needs about 12 weeks to do its work. That will be perfect timing to have Johnny and his mother come back for Johnny’s next adjustment.”

**Staff Scripting at Adjustment Visit to Extend Appointment Intervals**

“Mrs. Jones, the wire that Dr. Brown just placed is the latest technology. Dr. Brown wants to let the wire do its work for the next 12 weeks. Johnny’s treatment will progress better if we leave this wire alone for that time period so it can do what it was designed to do.”
Case 1.
Pretreatment – Female, age 13, moving to Asia, treated in Salt Lake City, Utah. Class I with anterior open bite, moderate crowding and tongue thrust. Appliances: Orthos brackets with Accent buccal tubes on bands. Initial wire: .018 Copper Ni-Ti (35°C) tied in with Power “O”s. Patient was instructed to wear 1/4” light vertical elastics (Owl).

First Adjustment Visit – 3 months into treatment.

Posttreatment – 6th visit. Photo taken day braces removed. Obviously, settling needs to occur in molar regions. Retention is critical.

Total treatment time: 16 months, 8 visits (6 adjustment visits). Patient seen every 12-16 weeks.
Case 2.

First Adjustment Visit – 3 months into treatment. Second archwire placed: .016 x .022 Copper Ni-Ti (35°C) for 2 adjustment visits (6 months).

Final archwire (not shown): .016 x .022 TMA for 8 months.

Posttreatment – Photos taken at end of 2 years of retention.

Total treatment time: 17 months, 8 visits (6 adjustment visits).
Judicious 8- to 12-Week Transitioning
Extending treatment intervals from 8 to 10 weeks and from 10 to 12 weeks is a different matter. Accurate diagnosis, appropriate treatment planning, effective adjustments at each appointment and a long-term vision for each case are always important. They become crucial at longer intervals. Some doctors have stated that they have encountered problems in going 12 weeks between visits but, upon examination, have found that an inaccurate diagnosis, inappropriate treatment plan, ineffective mechanics or lack of patient cooperation are to blame.

When you move from 8-week intervals to 10- or 12-week (or longer) intervals, it is imperative that you have a cooperative patient, that you know where you are going, that you carefully examine the patient at every visit and that you do all that needs to be done at each appointment. I also want to emphasize the importance of using high-quality products. My experience with first-generation nickel titanium wires would not have warranted 12-week intervals because the wires were inconsistent and therefore unreliable. With my current wires and bracket system, I see consistent performance and that performance has given me confidence to change my protocol. The same goes for elastomers. I’m continually asked to explain why we do not use steel ligatures. We tie in archwires using a figure-eight configuration that keeps the wire engaged in the slot. There is a vast difference in quality between brands of elastomeric products. We have no problems with missing or loose ties over longer intervals using high-quality elastomeric products.

Overcoming Cooperation Control Fears
Many of us have convinced ourselves that we get more cooperation from patients we see more often, but I question the validity of that assumption. I do not see better brushing or better elastic wear from patients whom we see monthly versus those we see quarterly. Effective patient education and committed parents are the key, no matter how often you see patients. The extra time spent before treatment clarifying expectations and getting agreement will pay off in the long run. When we begin treatment on a patient with hygiene concerns, we establish a schedule for hygiene monitoring separate from mechanics monitoring. When compliance issues arise, we deal with them separately from mechanics. We establish the schedule based on the requirements of the advanced appliance systems and the typical compliant patient. Since the majority of patients do cooperate, we don’t punish them by making them adhere to a more frequent appointment schedule.

I’ve had doctors tell me that patients would become enraged if they were told to come in only for a compliance check. We do not experience this. I ensure that patients understand that Copper Ni-Ti wires and patient cooperation make the 12-week appointment interval a possibility. Noncompliance is a choice that results in more frequent appointments. I feel confident that we actually impact compliance positively by offering fewer appointments as a reward for good compliance.

Script for Giving Compliance Ownership/Appointment Interval to Patient
“Mrs. Jones, the new titanium wires that we use require at least 12 weeks to work effectively, and if we were to change them any more often, we might actually slow down treatment. That’s why you’re given the opportunity to have Johnny come for adjustments only every 12 weeks. The only reason we would check Johnny more frequently would be if his hygiene were inadequate (or some other compliance issue), so the appointment frequency is really up to him.”

Overcoming A/R Problem Fears
Consumers are accustomed to making monthly payments without making monthly visits to the car dealership, the American Express office, the utility company, etc. We make the initial financial arrangements so that there is no association between the number of office visits and the monthly payments. The Treatment Coordinator believes in the process.
his technique for removing Herbst* crowns takes advantage of the morphology of a natural tooth versus a stainless steel crown. Although the Ormco custom-fit stainless steel crowns fit the tooth well and have good retention, there is space between the natural tooth and the inside of the crown. This space is normally filled with cement, and this technique takes full advantage of the buffer the cement provides. It will destroy the crown but is an easy and predictable way of removing the Herbst appliance. It does require a certain level of skill to control the depth of cuts using a high-speed handpiece. There is little if any discomfort to the patient and it takes only about 5 minutes of doctor chair time.

Our patients are always excited on the day we are to remove the Herbst appliance. Most of them have counted down the days for this highly anticipated appointment. I want to make this appointment as pleasant as I can for both the patient and me, so I have developed what I think is a fast, predictable and harmless way of removing a custom-fit stainless steel crown Herbst appliance. It requires little if any pressure to the first molars, which are often somewhat sensitive.

Removing the Lower Herbst Member
The first step is to remove the rods from the lower (mandibular) member of the appliance by removing the Hex-Head screws from the mesial extensions. I recommend leaving the upper member tubes attached. You will see why later. (If your Herbst appliance design has used rests and you’ve secured them with composite, remove the composite with a high-speed handpiece.) Using your high-speed handpiece (usually without water) with a 557 crosscut fissure bur, make a diagonal cut across the occlusal surface of the lower crown. The cut should extend from the distal lingual cusp to the mesial buccal cusp (Figure 1). (You can clearly delineate tooth structure from cement, especially if you have used a non-tooth-colored cement.) Extend this diagonal cut down the buccal surface of the crown to the gingiva and slightly below the tissue, if necessary, observing the tooth/cement interface (Figure 2). Place a small screwdriver into the occlusal slot that you cut. Wedge the flat blade of the screwdriver head under the crown from the occlusal edge (Figure 3) and twist the screwdriver 1/4 turn back and forth a few times. You can also place outward pressure on the mesial extension arm. The crown will lift easily off the tooth (Figure 4). If there is a lingual arch connecting the right and left sides of the lower Herbst member, you can section the arch and remove crowns individually or leave intact and remove together. Repeat the above steps for the opposite side.

Removing the Upper Herbst Member
Move to the upper member of the Herbst appliance. Again, using your high-speed handpiece and a 557 crosscut bur, make a cut through the crown, starting on the occlusal edge between the mesial and distal buccal cusps. Extend this groove (or cut) over the palatal cusp, connecting it to the vent hole you cut at delivery. Extend the cut palatally to the gingival tissue or just below (Figure 5). Rinse well with your air/water syringe and inspect the cuts, making sure they are

* Herbst is a registered trademark of Dentaurum.
complete. Once again, use a small screwdriver to wedge between the cut edges that extend palatally (Figure 6). Using a twisting motion back and forth with 1/4 turns, you will begin to feel the crown loosen. From an occlusal approach, wedge the screwdriver between the cuts and twist the screwdriver with 1/4 turns (Figure 7). Holding the Herbst tube arm that is still attached to the crown, you can lift the crown off the tooth. If you need more control, you can hold onto the Herbst axis on the buccal of the crown with a Weingart plier (Figure 8). Repeat this procedure on other side.

 Normally, after removing all four crowns, there is still some cement covering the tooth (Figure 9). Ultrasonic or conventional scalers can assist with cement cleanup prior to banding and bonding.

During this procedure small metal fragments may become airborne. I highly recommend that your patient and your assistant wear protective eyewear. I wear a clear full-face shield to protect my eyes as well as my face. High- and low-speed evacuation suction can minimize the amount of small metal airborne particles.

If you use the technique I described, I feel you will relieve the stress of Herbst removals. Let’s make this appointment a positive memory for our Herbst patients and for ourselves.

**Herbst Delivery Tips That Aid Removal**
- Cut small vent holes in cusp tips of crowns.
- Use a non-tooth-colored cement.
- Use non-tooth-colored composite for securing rests.

**Armamentarium**
- High-speed handpiece
- SSW FG-557 crosscut fissure bur (SS White order #155006)
- Clear face shield
- Eye protection for patient, orthodontic assistant and doctor
- 4142K Craftsman® flathead screwdriver
Improving Efficiency and Predictability with the Herbst

Intensive 3-Day Workshop
June 22-24, 2000
Office of Dr. Larry Hutta
Worthington, Ohio (just north of Columbus)

Overview
Thursday, June 22, 8 a.m.-1 p.m.
Lecture (includes continental breakfast and lunch)
(Afternoon golf can be coordinated through Dr. Hutta’s office)

Friday, June 23, 8 a.m.-5 p.m.
Lecture and Hands-on Patient Treatment
(includes continental breakfast and lunch)

Saturday, June 24, 8 a.m.-1:30 p.m.
Lecture (includes continental breakfast and lunch)
(Afternoon golf can be coordinated through Dr. Hutta’s office)

Topics
If you have yet to discover the many clinical advantages of Herbst therapy or would like to strengthen your knowledge to an intermediate level, join these two experienced practitioners for an intensive 3-day workshop. The hands-on clinical experience will include fitting a Herbst on a patient, troubleshooting cases in progress and removing the Herbst.

Topics include:
• Simplified Treatment Mechanics (STM), a triphasic system of treating orthodontic malocclusions through noncompliance therapy
• Clinical justification of Herbst therapy
• Case selection criteria
• Efficient delivery
• Communicating the value of Herbst to the patient
• How to fabricate in-house or use an outside lab
• How to integrate with fixed appliances
• Appointment sequencing
• Finishing

Cost: $1,200 per participant (doctor or staff). CEU credit: 17 hours.
To register, contact Paula Allen-Noble (800) 990-3485.

* Herbst is a registered trademark of Dentaurum.
Clinical Impressions

(CI): Dr. LeClerc, there has been a resurgence in interest in lingual orthodontics in the past few years. What role do you see the ESLO playing in this resurgence?

Jean Francois LeClerc (JFL): The annual meetings of the regional and national societies in Europe, Japan, Korea and the United States are vitally important to provide updates to its members about issues specific to those geographical regions. The role of the ESLO is broader in scope. Since its creation, the ESLO has always been admired for its innovative meetings in Paris, Venice, Monte Carlo and Rome. It provides an overview of what is occurring around the world and offers a central meeting place for the cross-pollination of philosophies and techniques from every corner of the planet. We had 65 doctors submit requests to make presentations from 13 countries, representing not only Europe but also Asia, Africa, South America and the United States, and at the time of printing, we already had over 400 inquiries from 35 countries about attending the congress. These responses indicate the importance of the ESLO as a forum for the global lingual community. Japan held its first international congress in Tokyo in March 1999 with 260 participants. Some of the most forward-thinking changes in appliance techniques are being generated from Asia and Europe. The European Congress provides a platform for sharing such information across many continents.

CI: What are your objectives for the Congress?

JFL: Our first objective is to ensure that each participant learns something new and of value. The second is to demonstrate the strength of the ESLO as a forum for the exchange of knowledge that furthers the technique. We invite every orthodontic specialist, regardless of prior experience with the lingual technique, as well as students, assistants and laboratory technicians. We have not only built a strong program with high standards for those making presentations, we have also arranged two courses from highly respected practitioners to be linked to the congress. Dr. Fillion will conduct a one-day course on May 31, and Drs. Scuzzo and Takemoto will conduct a full-day course entitled “Clinical Problems and Solutions” after the congress on June 4.

CI: As president, what is the direction you set for the Congress?

JFL: When one bears the honor of being Congress president, one has the duty of giving direction to the meeting so that its speakers are focused in their messages. With the opportunity of being the first president in the new millennium, I wanted to develop a theme that is both powerful and innovative. The direction is exemplified by the theme of the Congress: The Balance of the Smile® Balance in this instance refers to the link between philosophy and science, between aesthetics and function. Those of us who have opted to practice lingual orthodontics have the great privilege of being able to follow the evolution of each patient’s smile from the beginning to the end of treatment. That process allows us to keep the artistic element of dentistry prominent in our

Pre-Congress Course:
May 31, 2000
Didier Fillion, D.D.S.
“Lingual Orthodontic Advanced Course”

Post-Congress Course:
June 4, 2000
“Clinical Problems and Solutions in Lingual Orthodontics”

continued on page 29
opper Ni-Ti® has received tremendous attention since its introduction in 1997. It is a quaternary (nickel, titanium, copper and chromium) alloy with distinct advantages over traditional nickel titanium alloys. It can consistently generate a more constant force over longer activation periods than nickel titanium alloys. It is more resistant to permanent deformation than nickel titanium wire and exhibits better springback. For small activations, Copper Ni-Ti generates near-constant force, differentiating it from other alloys. And it exhibits a smaller drop in tooth-driving force than can be seen with nickel titanium alloys.

What is especially beneficial about Copper Ni-Ti is the fact that due to the manufacturing and thermal treatment processes, clinicians can select one of three types based on individual properties of these patented wires. These properties are related to the specific temperature at which each wire achieves ideal activation:

- **40°C Thermoactive Copper Ni-Ti** is the lightest of the three types. It provides intermittent light forces for patients with low pain thresholds and/or where periodontal health is an issue. Severely malaligned teeth can be engaged without creating damaging or painful levels of force or unwanted side effects.
- **35°C Thermoactive Copper Ni-Ti** is the most commonly used temperature-influenced wire. It generates mid-range, constant force levels when the wire reaches mouth temperature. Early ligation is easier and unloading forces are higher and more sustained than conventional nickel titanium wires when the wire reaches body temperature. To capitalize on this property, it is recommended that the patient rinse with cool liquid at least once a day to bring the oral temperature below the activating range, then follow the cool liquid with a liquid that exceeds 35°C to “reactivate” the wire. By doing so, maximum effect is achieved. Because of the thermally influenced nature of the wire, special ligating procedures should be followed to ensure maximum efficiency. (See Ligating Copper Ni-Ti on the opposite page.)
- **27°C Superelastic Copper Ni-Ti** generates constant unloading forces that can result in sustained tooth movement. It is thought of as the stiffest of the Copper Ni-Ti wires. Engagement force is lower than with other superelastic wires because of the lower loading forces built into the copper alloy. The unloading forces are consistent with other superelastic nickel titanium wires.

So why is it that some clinicians report that they are not seeing the performance from the wire that other practitioners claim? It appears that there are two reasons for these discrepancies. One reason is unfamiliarity with the proper technique of engaging the wire in the brackets (see opposite page). The other and most important reason is that most clinicians do not leave the wire in the mouth long enough for it to perform its function. My advice is this: put it in and leave it alone for 10 to 12 weeks, retying it at your normal appointment interval but not changing the wire.

An opportunity to demonstrate the validity of this protocol was offered recently when a patient, who works for the Chinese government in Beijing, presented for comprehensive orthodontic, implant and prosthetic needs. Her wanting to have the work performed in the United States while living in China dictated infrequent office visits. She was fitted with Copper Ni-Ti wires, and was readjusted at her normal appointment interval but not changed. The result: her severe malocclusion was resolved without any discomfort or side effects.
Wide Wire

visits. Because appointment intervals were to be from 4 to 11 months, Copper Ni-Ti, with its inherent properties, was the obvious wire of choice. Her case demonstrates the utility and practicality of Copper Ni-Ti wire and Ni-Ti springs in situations where long periods of time will elapse between appointments. While I am certainly not advocating appointment intervals of these durations, the case does demonstrate the durability of the alloy and its ability to exhibit constant unloading forces over long periods of time.

Visit One: Pretreatment
Female, age 30, presented with an edge-to-edge Class II malocclusion and a moderately deep vertical overbite. The arches were moderately to severely crowded. There was an anterior crossbite between the maxillary right lateral incisor and the mandibular right cuspid. Both maxillary cuspids are congenitally absent. The primary cuspids were retained with insufficient mesiodistal width for ideal implant placement. There was a late-closing pop in the left temporomandibular joint.

Treatment Plan. Correct the Class II relationship, crowding and rotations. Establish proper occlusal vertical dimension. Open adequate space for implant replacement of the maxillary cuspids.

Since there was not adequate space to place an aesthetically pleasing, ideally-sized cuspid on either side of the maxillary arch, I distalized the first molars by placing a compressed Ni-Ti coil spring between the maxillary right first and second molars, while also distalizing the buccal segments with heavy Class II elastics attached to sliding hooks placed mesial to the maxillary first bicusps.

Full Appliances. Ormco .018 Spirit®MB brackets on the maxilla, Ormco .018 Mini-Wick brackets on the mandible, with Ormco first molar bands and Ormco Washbon second molar bands.

Ligating Copper Ni-Ti

Copper Ni-Ti wire is ligated in a very definite fashion. Spray the wire with “Endo-ice” or use some other mechanical product to cool it, maximizing its flexibility. Begin tying it in by securing the most malpositioned tooth first. (In this case it was the lower right lateral incisor.) Then, secure the next most malaligned tooth, followed by the next most maligned, and so forth. This technique is effective for two reasons: (1) It allows for the most complete wire engagement in the bracket, and (2) It minimizes the potential for debonding the bracket during tie-in. Patients are then instructed to rinse with warm to hot liquids at least three times a day to energize the wire.
Initial Wires. Ormco .016 x .022 Copper Ni-Ti (35°C) with ligature ties.

Auxiliary Appliances. A bite plate with “C” clasps in the maxilla to increase the occlusal vertical dimension and a bumper sleeve over the maxillary wire in the cuspid area to minimize soft tissue irritation.

Visit Two: 7 Months into Treatment
Following the 7-month interval, the superb aligning power of Copper Ni-Ti is clearly demonstrated. The patient followed all instructions and being an avid consumer of tea, had no difficulty in having warm to hot liquids come in contact with the wire multiple times during the course of each day. What was particularly impressive at this visit was the superb alignment of the mandibular lateral incisor, exceptional arch form (especially in the mandible) and appropriate torque in the mandibular second molar area. Note also the subtle interproximal rotational correction between the
mandibular first and second molars. The upper lateral was still in rotation, and had we been able to tie in the wire more frequently, that rotation would have been eliminated. Additional time will remedy that situation. The bite plate had been effective in creating an increase in the occlusal vertical dimension, so it was eliminated. The Class II relationship had not worsened. The compressed Ni-Ti coil spring was making space as evidenced by the space between the maxillary first and second molar.

Visit Three: 12 Months into Treatment
There was now adequate space for appropriately sized cuspids so we removed the Ni-Ti coil spring between the first and second molars. The Class II elastics had distalized the buccal segments to assist in creating that cusp space (note the increase in mesiodistal width in the aforementioned area), but we continued the Class II elastics (with a stronger elastic on the left side) to address the Class II relationship. An anterior diagonal elastic from the maxillary right cusp to the mandibular left cusp was also directed to correct the midline while the Class II was improving. The patient was then sent for implant and prosthodontic consults. The maxillary right lateral incisor was repositioned for aesthetic improvement.

Visit Four: 19 Months into Treatment
The patient underwent implant surgery in the maxillary cuspid area and the primary cuspids were removed. Typically, the pontic of choice is an acrylic tooth bonded with a bracket and attached to the archwire. Because the patient was to recover unsupervised, the best course of action was to construct an acrylic stent with the pontics placed on it. This would not only create improved aesthetics and allow removal to facilitate cleaning, it would also foster healing, minimizing any postsurgical complications. The stent was placed at this appointment.

Visit Five: 23 Months into Treatment
Final detailing of the case was begun at this appointment. An .016 round stainless steel wire with fixed hooks was placed in the maxillary arch. The original .016 x .022 Copper Ni-Ti was still in the lower arch. The implants were healing well and the pontic/stent was performing well. Plans were made with the implantologist and prosthodontist to coordinate

“What was particularly impressive at the 2nd visit was the superb alignment of the mandibular lateral incisor, exceptional arch form (especially in the mandible) and appropriate torque in the mandibular second molar area.”
uncovering the implants, removing the orthodontic appliances and placing the temporary crowns.

**Visits Six, Seven and Eight: 28 Months into Treatment**

After removing the bands and brackets, we placed an invisible retainer (with pontics in the cuspid area) prior to implant uncovering and temporary crown placement.

**Final Visit: 30 Months into Treatment**

After implant uncovering and temporary crown placement, the sutures can be seen above the temporary crowns, but they do not detract from the pleasing result.

**Conclusion**

Although it can be argued that the need to treat patients with such long appointment intervals is rare, this case does serve to demonstrate several important features of the Copper Ni-Ti alloy. First is its durability. The lower archwire was never changed during the entire course of treatment and delivered constant forces. It also demonstrates that Copper Ni-Ti is extremely effective in correcting rotations, crowding and other alignment issues.

When left to do its job, Copper Ni-Ti works. Again, I believe practitioners who have been frustrated with its performance have been too hasty to change the wire before it has had the opportunity to do its job. All Copper Ni-Ti wires should be left in for a minimum of 12 weeks.

The importance of precise band and bracket positioning cannot be overemphasized. If the appliance is not well constructed, the wires cannot deliver an ideal result. Inappropriate bracket position will result in inaccurate tooth position. My advice to Copper Ni-Ti users is to construct the appliance well, tie in the Copper Ni-Ti as previously outlined and then sit back and watch it work. The results should be more than satisfactory.
Product Review: New Impression Trays Effective for Diagnostics and Appliance Fabrication

by Michael L. Swartz, D.D.S.
Orange, California

In his capacity as director of clinical affairs for Ormco, Dr. Swartz uses Ormco products in treating patients. He will, from time to time, offer clinical tips for using these products effectively.

I have always been a big fan of disposable Styrofoam impression trays. They are deep, offer good tissue reflection and are comfortable for patients.

Ormco’s new line of Bright Trays are now my impression tray preference, providing excellent tissue reflection for high-quality diagnostic models and patient comfort (Figure 1). The rim lock and perforations hold alginate well, and each size is a different color, making them easy to identify as well as aesthetically pleasing.

Improving alginate retention by spraying the trays with contact adhesive makes these same trays perfect for appliance impressions. You will want to use contact adhesive spray containing hydrocarbon solvents that will dry quickly and adhere well to the tray.

Wrap a paper towel around the tray handle and spray the inner tray with a thin layer of adhesive (Figure 2). Allow the adhesive to set for about 1 minute or until it becomes tacky. You can spray multiple trays in advance and store them in plastic bags or wrap them in household plastic wrap. Once the adhesive has dried (becomes tacky), take the impression as usual. The retention is awesome (Figure 3).

Figure 1. Although disposable, Bright Trays are comfortable, sturdy (to prevent distortion) and hold alginate well. They make excellent trays for both diagnostics and appliance fabrication.

Figure 2. To improve alginate retention for appliance impressions, spray trays with a contact adhesive and let set for 1 minute, then take the impressions as usual.

Figure 3. Impression material retention in Bright Trays gives excellent results.

Dr. Michael Swartz has spent more than 30 years in the dental field in a variety of capacities. He began his profession as a dental technician and then became a dental materials research chemist, later earning his D.D.S. from the University of Southern California School of Dentistry. While serving as the director of research and development for Ormco, he also developed a practice and began lecturing. He returned to school and earned his certificate in orthodontics from the University of California at San Francisco in 1985 and then opened a private practice in Encino, California, while continuing to lecture both in and outside the U.S. He currently holds the position of director of clinical affairs for Ormco, conducting numerous continuing education programs. He has given over 300 presentations around the world and publishes extensively.
Orthodontists have used lip bumpers for years as a usual part of their Phase One treatment regimen and clinical research has repeatedly proven their effectiveness. What we have needed is a patient-friendly lip bumper that is easy to seat, easy to adjust and improves our clinical efficiency. Now we have it: the Orthos Lip Bumper.

I use hundreds of lip bumpers every year. When I first got into lip bumper therapy, I made the things myself from straight lengths of .045 stainless steel wire. When commercial lip bumpers became available, the same problems I had with my homemade versions still existed plus other problems that were manufactured into the product. Those problems included:

- Constricted arch form.
- Tissue impingement that causes ulcers.
- Inadequate range of sizes.
- No way to measure accurately for correctly sizing individual patients.
- Extensive wire bending needed to seat.
- Incorrect placement of adjustment loops for patient comfort.
- Lack of tie-in hooks.

- Without tie in, the lip bumper would often become passive in the buccal tubes and slide out, thus creating emergency visits to reseat it.
- Because the patient could remove the lip bumper, patient compliance suffered.
- Seating challenges.

- The only way to get a lip bumper to stay seated for any length of time was to create friction between it and the buccal tube either by expanding the lip bumper (a bad idea) or by toeing in the distal end of the lip bumper and adversely rotating the first molar.

I solved the last two problems myself by soldering hooks on each lip bumper when I received them. The other problems were just going to be there so I resigned myself to dealing with them as we treated each patient. While hooks finally became commercially available, the other problems persisted.

As my experience using lip bumpers grew, I found that I was going through the same motions, making the same bends every time I seated one. Also, when I observed bumpers at the end of their use, I found they all had a similar look in terms of arch form. It was logical to think that the repetitive bends I was making manually to seat a lip bumper could easily be manufactured into the product, thereby making it more clinically efficient; thus, the Orthos Lip Bumper was developed.

**Appropriate Mandibular Arch Form**

One of the desired effects of lip bumper therapy in Phase I treatment is the development of an appropriate mandibular arch form. The Orthos Lip Bumper is manufactured to fit the Orthos mandibular large arch form. The mandibular large arch form was chosen because the lip bumper sits outside the mandibular arch. (As most everyone using the Orthos arch forms knows, the Orthos archwire shape is uniquely derived from actual skeletal and dental anatomy rather than from a theoretical concept of an ideal arch shape.) Figure 1 shows the correct fit of the Orthos Lip Bumper to the Orthos arch form as compared with the constricted arch form of another manufacturer's lip bumper (Figure 2).

**Minimal Tissue Impingement**

Efficiency and profitability demand that there be as few emergency visits as possible throughout treatment. Emergency visits associated with lip bumpers are usually due to irritations of the soft tissue. The Orthos Lip Bumper has greatly reduced these problems. Figure 3 shows the smooth, clean edges of the plastic part.

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* Products identified as “Orthos” are distributed in Europe as “Ortho-CIS.”

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**Dr. Michael Scott** earned his D.D.S. from the University of Tennessee School of Dentistry in 1982 and his M.S.D. in orthodontics from Baylor College of Dentistry in 1984. He has lectured extensively in the United States, Asia, Latin America and Europe on the Orthos Appliance System, Copper Ni-Ti, early treatment, facemask therapy and is a proponent of extended treatment intervals. He maintains a private orthodontic practice in Longview, Texas.
of this appliance, the smooth round solder joint where the hook is attached and the large ball on the hook – all of which serve to lessen soft tissue problems. Figure 4 shows the other manufacturer's lip bumper with a small ball hook and the solder joint with a corner – both of which often cause irritation. This appliance often has a plastic tag that can create ulcerations as well.

**Pearl.** Even with the improved design of the Orthos Lip Bumper, there will still be times when a patient's soft tissue will wrap itself around the lip bumper wire and become inflamed and tender. When this occurs, I simply cover the wire with a light-cured composite. To apply the composite, moisten your gloved fingers with a small amount of sealant and shape a mass of composite around the wire. Smooth the composite with your wet finger making sure to keep the hook accessible for connecting the power chain. Light cure for 20 seconds (Figure 5).

**Reduced Appliance Rework**

One of the repetitive motions that I found myself going through as I seated lip bumpers was bending the hooks lingually in order to prevent them from sticking into the buccal soft tissue. Hooks of the Orthos Lip Bumper come with a lingual inclination (Figure 6). Figure 7 shows an occlusal view of the same manufacturer's lip bumper shown previously. You cannot see the hook because it is directly under the wire. Notice again the plastic tag that is a potential tissue irritant. Figure 8

*continued on following page*
shows a side-by-side comparison of the two lip bumpers.

You might ask why the hook is in front of the adjustment loop. The answer is simple. All adjustments are made from the loop distally. The hook is never in the way of adjusting the lip bumper. Placing the hook anterior to the loop also allows the loop to be positioned to the buccal of the second bicuspid or second primary molar. This keeps the loop away from the frenum that attaches to the buccal of the first bicuspid. If the hook were distal to the loop, the loop would have to be more mesially positioned and would impinge on that frenum.

Another repetitive and time-consuming task with previous lip bumpers was accentuating the bayonet bend. The bayonet bend creates a positive stop to prevent the bumper from sliding through the buccal tube and impinging on the soft tissue distal to the first molar. If the bayonet bend does not create a solid stop when adjusting the lip bumper, one might think the bumper is correctly positioned 2 to 3 mm in front of the mandibular incisors, only to discover that it has actually slid back through the buccal tube, requiring removal and adjustment. Figure 9 shows a comparison between the bayonet bend of the Orthos Lip Bumper (top) and that of a competitor’s (bottom). Figure 10 shows how the accentuated bayonet bend in the Orthos Lip Bumper prevents the wire from sliding through the buccal tube. Figure 11 shows how an indistinct bayonet bend allows the wire to protrude through the buccal tube and cause the problems previously mentioned.

**Accurate Measurement for Proper Sizing**

With previous lip bumpers, there was no accurate way to determine the correct size. Many times our “clinical experience” proved wrong. More often than we liked to admit, we’d work to make a particular size fit only to discover that we needed a different size. We’d then have to sterilize the original, mangled appliance to return it to stock, but with no clue about what size it now was. The Orthos Lip Bumper completely solves this problem by providing a ruler and conversion table to determine the correct size. The measurements are printed on both sides of the ruler to accommodate right and left sides, and the conversion table is accurate.

**Sizing the Orthos Lip Bumper**

- Place the tooth on the ruler at the midline (Figure 12).
- Measure to the mesial of the buccal tube of the right quadrant.
- Flip the ruler and measure to the mesial...
Figure 13a. After cementing the bands, connect two 3-unit power chains to the lip bumper tube.

Figure 13b. Connect the dual power chains to the hook.

Figure 13c. Occlusal view of the lip bumper tied in.

Figure 14a. Hold the anterior leg of the loop as shown and bend the part of the lip bumper wire anterior to the loop upward (occlusally) about 15°.

Figure 14b. Bend the part of the wire with the bayonet bend downward (gingivally) 15° as shown.

Figure 14c. Hold the posterior leg of the adjustment loop as shown and bend the bayonet bend upward (occlusally) about 15°.

Tying in the Orthos Lip Bumper

• After cementing the bands, connect two 3-unit power chains to the lip bumper tube (Figure 13a). **Pearl:** Two power chains substantially reduce emergency visits. Do not tie with steel ligatures. Doing so is far too difficult and unnecessary.

• Connect the dual power chains to the hook (Figure 13b).

Figure 13c shows an occlusal view of the Orthos Lip Bumper tied in. Notice that the hooks are bent to the lingual of the lip bumper and that the distal ends of the bumper wire do not protrude past the distal end of the molar tubes.

Follow-Up Lip Bumper Adjustments

I typically see patients at 9-week intervals and, by then, the lip bumper will be touching the lower anterior teeth, requiring adjustment. Adjustment is easy and chair time is minimal.

To advance the lip bumper 2 to 3 mm in front of the anterior teeth, hold the anterior leg of the adjustment loop as shown. Bend the part of the lip bumper wire anterior to the loop upward (occlusally) about 15° (Figure 14a).

Bend the part of the wire with the bayonet bend downward (gingivally) 15° as shown (Figure 14b). The net effect of these two bends is to open the loop.

Hold the posterior leg of the adjustment continued on following page
loop as shown and bend the bayonet bend upward (occlusally) about 15° (Figure 14c). This bend serves to level the lip bumper in the mouth so that the anterior part is not too low in the vestibule. This bend does NOT negate the second bend. Because the plier is moved to the posterior part of the adjustment loop, the loop stays open and the lip bumper stays advanced. This final bend simply gets the lip bumper back to the correct horizontal plane in the mouth.

I delegate seating and adjusting lip bumpers to my staff. When I check a lip bumper seating, it is already in place with the power chains ready to be connected to the hooks. I remove one side from the buccal tube to see that it is not constricted or expanded, check to make sure it is advanced the correct amount in front of the anterior teeth, then use a hemostat to secure the power chains to the hooks. My total time involved in the procedure is mere seconds.

Case 1 demonstrates the typical use of the Orthos Lip Bumper in the late mixed dentition.

**Conclusion**
The goal of this article was to introduce the reader to the Orthos Lip Bumper and to show why I consider this product to be superior to any other lip bumper now available. I believe the Orthos Lip Bumper will significantly improve clinical efficiency in Phase I cases.

Case Study: Lip Bumper Therapy in Late Mixed Dentition of Male Patient, Age 11-6

Pretreatment.

Pretreatment. Mandibular cuspids in crossbite.

Treatment in Progress: 11 weeks into treatment.

Treatment in Progress: 18 weeks into treatment. Note how the adjustment loops have opened throughout treatment as compared with Figure 13b.

End of Lip Bumper Treatment. Total lip bumper treatment time: 27 weeks (right).

Lingual arch seated to maintain space (far right).
The Proven Performer in the Orthos Rx

The Orthos™ Lip Bumper

If you have experienced clinical limitations caused by design inadequacies or limited size availability when using competitive lip bumpers, you will be pleased with the new Orthos Lip Bumper design. It’s patient friendly, easy to seat and adjust, reducing chair time and increasing clinical efficiency. It is available in 5 patient-specific sizes that cover the entire range of patient needs.

Dr. LeClerc

continued from page 17

thinking. I like to think that we belong to a brotherhood of artists. The Balance of the Smile represents that essential artistry – the synthesis of science and philosophy. It projects the idea of facial harmony and beauty that transcends mere alignment.

CI: It seems that you would like to call attention to overall facial aesthetics in lingual orthodontic treatment.

JFL: Yes, for too long the specialty in general – both labial and lingual – had focused narrowly on occlusion. Like many of the progressive labial practitioners, we who practice lingual have also broadened our diagnosis and treatment planning to include the entire face and how the smile – the composition of the teeth, gums and lips – relates to its general aspect. Because lingual braces are invisible, I feel that we can be ever cognizant of building the smile; for example, of controlling the gum line, and urging the incisal edges to follow it, fostering the cuspid-to-cuspid curve. As important to this philosophy is treatment customization according to each patient’s personality, sex and tooth shape.

CI: Give us a Congress overview.

JFL: The Congress lasts for three full days. Sixty-five speakers will address an expected audience of 600 participants on one of five general subjects: (1) the smile, its analysis and the contribution of video-imaging systems to analysis and the consultation process, (2) lingual orthodontics and its aesthetic results, (3) auxiliary appliances, (4) implantology, and (5) orthognathic surgery versus osteodistraction. Participants will return home with numerous helpful techniques that they can immediately put to good use.

CI: And lastly, what made Brussels your choice for the 4th biennial session?

JFL: We chose Brussels because of its easy accessibility from all corners of the globe. Within Europe, high-speed trains travel regularly to this destination. It is a cosmopolitan, multilingual city, renowned for its culture. The social program will take full advantage of Brussels’ historic, artistic and gastronomical delights. Post-conference tours have also been arranged to Bruges, Antwerp, Amsterdam, Paris and London. It will be a memorable trip for everyone who attends.

For more information about ESLO2000, consult its Web site: www.eslo2000.com or contact the European Congress Consultants and Organizers at phone: 32 2 647 8780 or fax: 32 2 640 6697 or e-mail: dshanni@ecco-congress.be
and speaks with conviction. We have neither altered our credit management policies nor have our collections suffered because of extended intervals.

Script to Create the Correct Payment/Appointment Association

“Mrs. Jones, with this advanced technology you will only need to visit the office quarterly. Our patients love this arrangement because it is so much more convenient for them. We will, of course, establish a monthly payment schedule, ensuring payments fit into your budget.”

Patient Perceptions: Overcoming the Fear that Quantity = Quality

As orthodontists we have mistakenly connected the idea of frequency of visits (quantity) with quality – that patients will feel that treatment in fewer visits is less valuable and may expect a lower fee. I have found the opposite to be true. We conducted an informal survey in our office, asking patients two questions. Would you consider your treatment more or less valuable if you came for 18 visits in 18 months or for 6 visits in 18 months? When the answers came back overwhelmingly that treatment in fewer visits is more valuable than treatment that requires more visits, I asked the patients how much more they would be willing to pay. To my surprise, the response was an astounding 33% increase over my usual fee.

In spite of all of our enticements – video games, contests, TVs in the ceiling – patients and their parents have less time than ever to spend in our offices. Actually, they would love it if we placed braces one appointment and took them off one visit later, even if that visit were 18 months later.

Doctor Scripting for the Initial Exam/Consultation

“Mrs. Jones, it used to be necessary to see patients every 4 weeks in order to do the proper adjustments. In our office we use advanced wires that work best if adjusted less often. This results in less painful and more convenient treatment – with adjustments every 12 to 13 weeks. Of course, if you have something you want us to look at sooner, we are always happy to see you when you want.”

Overcoming Referring Doctor Resistance

Uninformed general dentists may initially feel that extended treatment intervals are somehow less effective. Ultimately, dentists want what is best for their patients, and once informed about the advances in technology, support the added convenience. Remember, dentists have embraced dozens of new dental technologies in the past decade.

Overcoming Negative Staff Reaction Fears

As with any change in the office, it is imperative to have the commitment and support of your staff. I suggest a well-planned staff meeting – perhaps even an off-site meeting – to present the concept, field questions and concerns and develop an action plan together. Once educated about the new technology, staff members are usually eager to extend adjustment intervals and become ambassadors of the program, especially when they understand the goals and benefits and their role in the process. Staff members are patient advocates. If you have a conviction about the benefits of the process and you and your staff implement the initial patient transition together, they will recognize the benefits to the patients as well as to the office.

Conclusion

High-quality treatment results are paramount. No less important is the quality of your patients’ experience. Treating patients well means being respectful of their time. I am not recommending that you sacrifice treatment effectiveness and quality for the sake of treatment efficiency. What I am suggesting is this: Allow the new technologies to fulfill their potential. I believe it is a mistake to think that somehow we are better orthodontists, that we do better work, or that we enhance patient cooperation by seeing patients 20 to 30 times during treatment. I feel more in control of treatment than ever before because I have more time with each patient. I have time to carefully evaluate what has happened since their last appointment and anticipate future changes more accurately. I have time to devote additional energy to the complex cases, adolescents who have special needs, my staff and my family.

Some patients need to be seen every 4 to 6 weeks, some patients should probably be seen every few days, and many cooperative patients can be seen every few months. The treatment interval should be specific for each patient and each treat-
Orthos and Copper Ni-Ti: Efficiency and Predictability

With Orthos™ orthodontists around the globe are realizing the clinical benefits of the first concurrently designed systems of brackets, buccal tubes and archwire forms. The ideal bracket and buccal tube geometries, archwire shapes and bracket placements – based on analysis of 100 actual cases – consistently optimize occlusion and compensate for the mechanical efficiencies inherent in previous appliances.

The initial objective for developing Copper Ni-Ti was to improve the performance of nickel titanium archwires. We wanted to enhance the tooth-moving force characteristic of high-quality nickel titanium wires while reducing the loading force required for ligation. The addition of a small percentage of copper allows us to set controlled heat transformation temperatures (+/- 2°C.) that ensure consistent performance, unlike other temperature transformation wires with widely fluctuating, unpredictable activations and correspondingly unpredictable results. Proper choice of materials plus tight tolerance standards and rigidly controlled manufacturing processes result in inherent benefits that perfectly complement the Orthos system.

"Before implementing Orthos in my practice, I routinely spent 6 appointments or more finishing my cases. With Orthos I have reduced my finishing appointments to 2 to 3 visits, which I attribute to main factors: improved in/out geometries, resulting in much earlier alignment of the marginal ridges, and coordinated arch forms that provide improved interdigitation of the occlusion."

Joseph Gray, D.D.S., M.S.
Upland, California

Frequently Asked Questions

Q: What happens when a patient who breaks something in week 3, doesn't call and is not seen until week 12? A: We spend considerable time educating the patient about potential problems, especially in the case of breakage, demonstrating that for the benefit of the fewer appointments, they must be diligent about breakage, less we lengthen the overall treatment time. Where we were previously spending 10 minutes with each patient, we now spend 15 to 20 minutes. We use much of that additional time to continue to educate them. If they don't cooperate we see them more often.

Q: Do hygiene patients run greater risk of decalcification if not monitored more frequently than 10 to 12 weeks? A: Patients who don’t brush well always run the risk of decalcification. We put noncompliant hygiene patients on a 12-week cycle for adjustments and require more-frequent hygiene check appointments where hygiene is checked and discussed but no adjustment is made.

Q: If a patient wearing elastics is left unmonitored for 12 weeks, isn’t there a possibility of overcorrection of the bite? A: That’d be a refreshing problem to have. In reality, most of our patients are just diligent enough in their elastic wear that they get the job done without overcorrecting. In finishing, we may also be bringing certain patients in a little more often – let’s say at 8-week intervals – so we’d be monitoring some cases a little more closely anyway. We spend a great deal of time educating patients so that they are aware of the changes they should see in the bite.

Q: If a patient wearing elastics does not wear them or runs out and fails to call, won’t treatment be extended? A: Here again the key is patient education. In the case of an uncooperative patient, you may want to see them more often. You can book an appointment for an elastic wear check with no adjustment.

Q: Do you always see every person at 10- to 12-week intervals or does it depend on the individual circumstances? A: Some patients need to be seen more often during certain phases of their treatment, especially when finishing. The interval is always dictated by the diagnosis, treatment plan, patient cooperation and treatment progress at each appointment.

Q: How do you handle elastics that discolor or do you use steel ligatures? A: We don’t routinely tie in with wires. Power “O’S” do just fine. We appoint everyone at the appropriate interval then recommend that they call if they need to be seen sooner, specifically for elastic changes.

Q. When using power chain to close space, do you still run appointments at 12-week intervals? It is commonly thought that elastomeric forces quit working after a very short period. A: You’re right. According to one study, elastomeric chain loses at least 50% of its elongation force within hours. The remaining force dissipates slowly over several weeks. Consolidating small spaces with this force is sufficient. In closing extraction sites, I use Ni-Ti coil springs or TMA® closing loops.

References
## Lecture/Course Schedule at a Glance

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<td>3/3-4</td>
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<td>Randy Moles</td>
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<td>Dr. Gross 49 2 0224 5220; TMD Treatment</td>
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*Typodonts and/or Participation

For additional information on any course, please call the contact number shown or (international doctors) Ormco distributor.

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