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STRAIGHT WIRE, LOW FRICTION:

Synergy® System

DR. DAVID SUAREZ QUINTANILLA

received his MD from the Universidad de Santiago de Compustela, Spain in 1982. He earned his undergraduate degree in Dentistry from the Universidad de Oviedo in 1985, followed by his orthodontic specialty in Valencia, Spain in 1987. Dr. Suarez began his exclusive orthodontic practice in 1987 and since then has written several theses, published 8 books, and written over 80 articles about different orthodontic subjects. Dr. Suarez is the dean of the orthodontic department at the Universidad de Santiago de Compostela. He has received a number of scholarships and awards; including awards from the European Dental Magazine (Revista Europea de Estomatología) and the National Real Academy of Medicine (Real Academia Nacional de Medicina). He is the founder of the Spanish Association of Orthodontists (AESOR) and of the Gallego Orthodontic Society (SGO).

In the last ten years the main therapeutic progress in the field of orthodontics has been the appearance of new superelastic nickel-titanium wires. This has allows optimal orthodontic tooth movement and diminishes the length of treatment. The alignment phase has been drastically reduced due to the early use of rectangular wires of nickel-titanium. However, the new wires need new brackets with a renewed design capable of making the most of these new wires and reducing the main problem that faces us with these new alloys: Friction.

There are two problems related to the design of the traditional straight-wire bracket that prevents the early insertion of rectangular archwires, in spite of the fact that they generate very light forces and have great capacity of deflection: the resistance to the movement produced by friction and the appearance of forces and inadequate moments that may produce an excessive movement of the root in initial phases of the orthodontic treatment. Friction produces resistance to movement such that 60 per cent of the applied force may be lost in overcoming friction. Friction or binding may also result in inhibition of tooth movement and tooth tipping due to distortion of the archwire. Friction between bracket and archwire increases with reduced discrepancy between archwire and bracket slot. When clearance exists between the archwire and the walls of the slot, the material of the archwire and bracket determine the coefficient of friction, which relates the frictional force to the ligation force .

THE MAIN PHILOSOPHY OF THE SWLF IS:

- A simple technique to treat 80% of the patients/malocclusions
- Maximum sliding and less friction to improve the biology of orthodontic tooth movement
- Individual control of the anchorage (tooth-by-tooth)
- Less wires with new superelastic wires (3-4 arch wires for arch and treatment).
- The selection of wires is very easy.
- Less appointments (every 45-60 days)
- Less chair-time
- Less treatment time (less than 70% compared to straight wire technique like Roth, MBT, etc.)
- Less extractions in combination with functional orthopedics, expansion and stripping
- Ideal to combine with functional orthopedics or orthognathic surgery
- More simple and less expensive than other low friction techniques (Damon System 2, etc.).

In agreement with RMO we have developed an orthodontic technique of great biomechanical simplicity and of high clinical efficiency that we have named Straight-Wire Low Friction: Synergy System. This allows us, using few wires and in combination with mechanical stripping, to diminish dental extractions and to reduce the number of archwires, patient´s visits and the length of treatment.

Straight Wire Low Friction represents the next generation of the straight wire technique and allows us to carry out quicker, shorter and more effective treatments by reducing the number and length of appointments and the number of wires. This technique combines the new superelastic archs and the low friction brackets with high efficiency.

The Synergy bracket presents a singular design that improves sliding, the speed of tooth movement and avoids the appearance of force couples and moments unsuitable diminishing the risk of radicular resorption and/or loss of periodontal support (Fig. 1).

The Synergy bracket is not just one more bracket on the market. It represents an authentic revolution since it allows the orthodontist to select the anchorage and the degree of tooth movement individually for each tooth solely in function of the placement of the ligature and the wire-bracket surface contact. In contrast to other self-ligating low friction brackets these do not present problems of fracture or breaking of closing mechanisms and it is much more economical.

STRAIGHT WIRE, LOW FRICTION:

Wire selection and sequence are carried out depending on the degree of irregularity and dental crowding in the first phase of alignment; the quantity of overbite and the facial type in the phase of levelling; the anchorage, type of movement and the space to be closed in the phase of space closure, and the need to carry out small occlusal and aesthetic adjustments in the finishing phase of treatment. With the combination of superelastic wires and low friction brackets we have managed to diminish considerably the number of visits (25 per cent) and the length of treatment (22 per cent) . It is important that clinicians are conscious that these superelastic wires have to be left to work for enough time (from six weeks to three months minimum) and that have to be "reactivated" in every visit. Also they should pay special attention to the way of placing elastic ligature on each tooth in order to obtain, for example, maximum sliding (ligating only central wings) or minimum sliding, maximum anchorage and maximum control (ligating in the shape of an "8"). It is very important that clinical staff are aware of the importance of the way of ligating in this technique. Figure 4 shows the criteria for wire selection and the type of archwire that we use. We suggest initiating the alignment phase with round superelastic wires or braided wires of .014", as concerns adult patients with periodontal involvement (with threshold of pain diminished) and cases of great crowding and irregularity treated with dental extractions. Each Thermaloy or Neosentalloy's rectangular archwire has to be left to work for about 45 days and in the following visits it will be removed, reactivated outside the mouth and replaced changing the way of ligation: ligating only the central wings of the bracket in those teeth where we want maximum sliding and with conventional ligation (including the lateral wings) when we want control of the rotation and/or maximum individual dental anchorage. During the finishing phase of orthodontic treatment it is important to re-evaluate carefully and with the suitable technique the position of every bracket and replace those that are placed badly. In the face of any doubt or problem we recommend removing all the brackets and bonding them again with the indirect bonding method .

The treatment with SWLF is complemented with the use, in many patients, of the reduction of interproximal enamel (stripping) with the aims of:
- solving crowding (up to 6 mm for dental arch and treatment),
- improving dental morphology,
- producing wider and stable proximal dental contacts,
- coordinating mesiodistal dental width in tooth size discrepancies (Bolton's index),
- obtaining interproximal spaces adequate to the periodontal health and aesthetics.

We carry out stripping by means of a mechanical rotary dental instrument and special disks of different thicknesses (Ortostrip by Intensive). This method is much more rapid and comfortable for the patient and the clinician than manual stripping and simpler, surer and more innocuous than other more aggressive mechanical systems such as burs and discs (Fig. 5a and b).

Fig. 1-With the Synergy bracket it is possible to use rectangular archwires of superelastic nickel-titanium for the alignment, levelling or space closure from the first months of orthodontic treatment. This allows us to reduce the number of visits and the length of treatment.

Fig. 2- The Synergy bracket, when it is only ligated on its central wings, avoids the contact of the wire with the ligature and this joined to the open and rounded shape of the ends of the slot improves the sliding and allows the use of rectangular superelastic wires from the first phases of treatment.

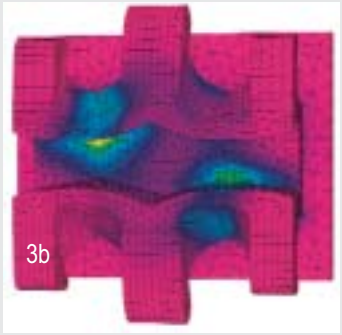


Fig 3-When we study the Synergy bracket through a magnifying glass and FEM (Finite Elements Method) the areas of pressure are wider and have a more balanced distribution than those of the standard straight-wire bracket. They are situated more towards the medial area of the slot which means that they are not going to generate force couples and inadequate moments observed in the standard straight-wire bracket.

Synergy® System

IRREGULARITY INDEX

	LOW	MODERATE	HIGH OR PERIODONTAL
ALIGNMENT	.017 x .025” Thermaloy® → .019 x .025” Thermaloy®	.016 x .022” Thermaloy® → .017 x .025” Thermaloy® → .019 x .025” Thermaloy®	.016 x .016” Thermaloy® → .017 x .025” Thermaloy® → .019 x .025” Thermaloy®

OVERBITE + FACIAL HEIGHT

	<2/3 + ANY FH	>2/3 + NORMAL FH	>2/3 + LOW FH
LEVELING	.019 x .025” Tru-Chrome®	.019 x .025” Orthonol reverse curve of spee	.019 x .025” Tru-Chrome®

DEPENDING OF THE KIND OF TOOTH MOVEMENT AND TORQUE

SPACE CLOSING PH	.019 x .025” 2 Looped Frictionless Nickel Iitanium Retraction Arches and .019 x .025” 2 Closing Loop stainless steel arch wire
FINISHING PHASE	.019 x .025” Bendaloy®

Fig. 4-Criteria of selection and types of wires used in the technique of the Straight Wire Low Friction. We consider every phase independently. In the phase of alignment we use the criterion of the index of irregularity (sum of the distances between points of contact of adjacent teeth) and in the phase of levelling the criteria of selection of wires are overbite and the facial biotype. This selection is completed by others for mixed dentition (with by-pass archwires), open bites and cases combined with osteogenic distraction or orthognatic surgery.

Fig. 5-The mechanical system Ortostrip has improved the rapidity and comfort of stripping and the possible the avoidance of extractions in many patients.

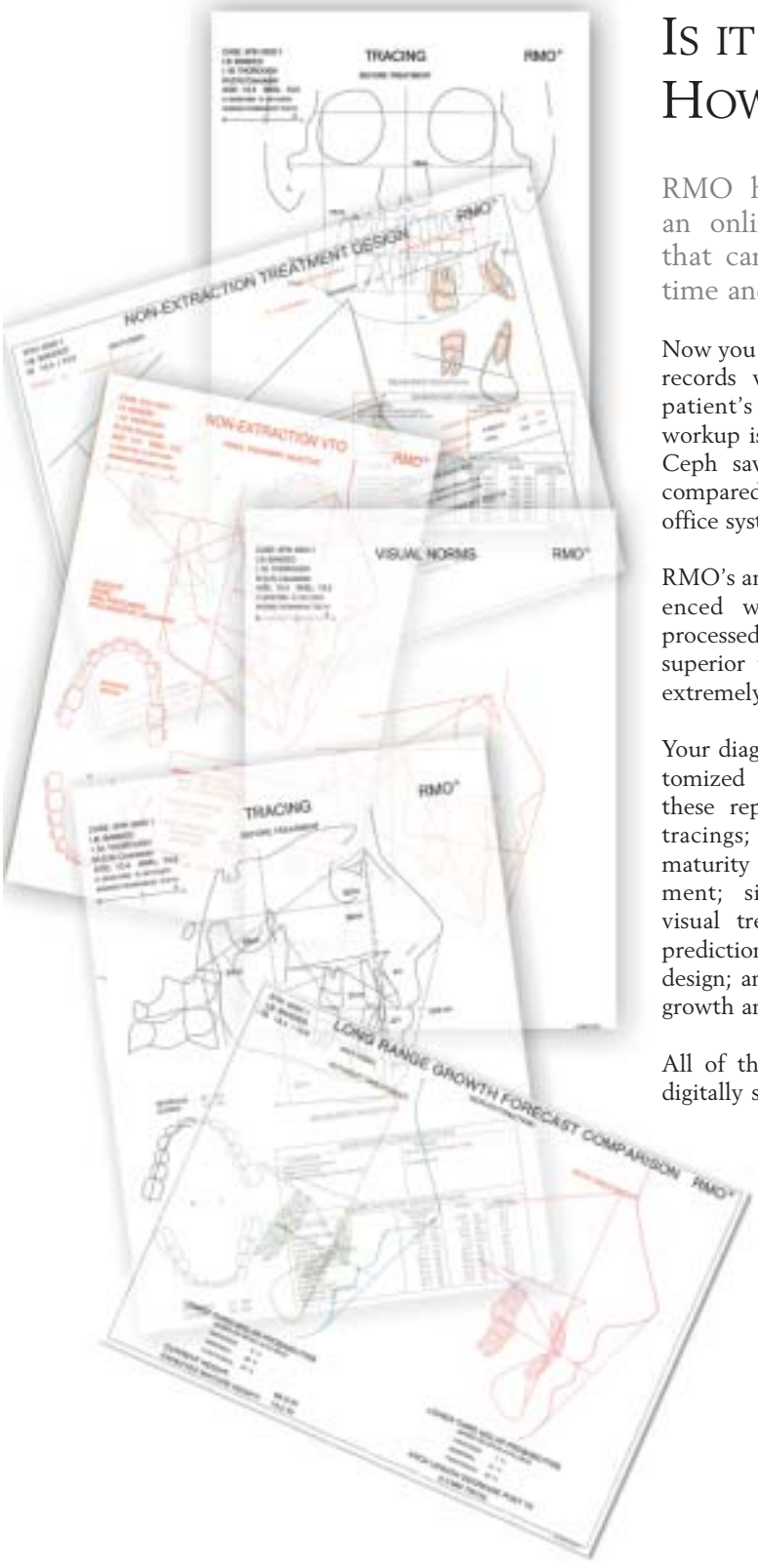
Fig. 6-A. Class I malocclusion with irregularity, crowding, overbite and dental midline symmetry. B. Upper archwire of .019 x .025" two looped frictionless Nickel Titanium Retraction. End of treatment.

Fig. 7-A. Class I malocclusion with crowding and moderate irregularity. B. Initial rectangular archwires. C. Finishing steel archwires of .019 x .025". D. End of treatment. E and F. Smile before and after treatment.

Straight Wire, Low Friction: Synergy® System

Fig. 8- A-C: Class I malocclusion with crowding, irregularity and dental asymmetry. D-F: Mechanical stripping with Ortostrip system after initial alignment with rectangular archwires. G and I. End of treatment. J and K. Smile before and after treatment.

ONLINE Orthodontic Diagnostics



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- Lower Arch Analysis
- Key Superimpositions of the Tracing to Visual Norms
- Treatment Designs
- Long Range Growth Compare-isons, with and without treatment (soft tissue)
- Treatment Sequences Worksheet
- Work-up Rationale Sheet
- Treatment Alternatives Sheet
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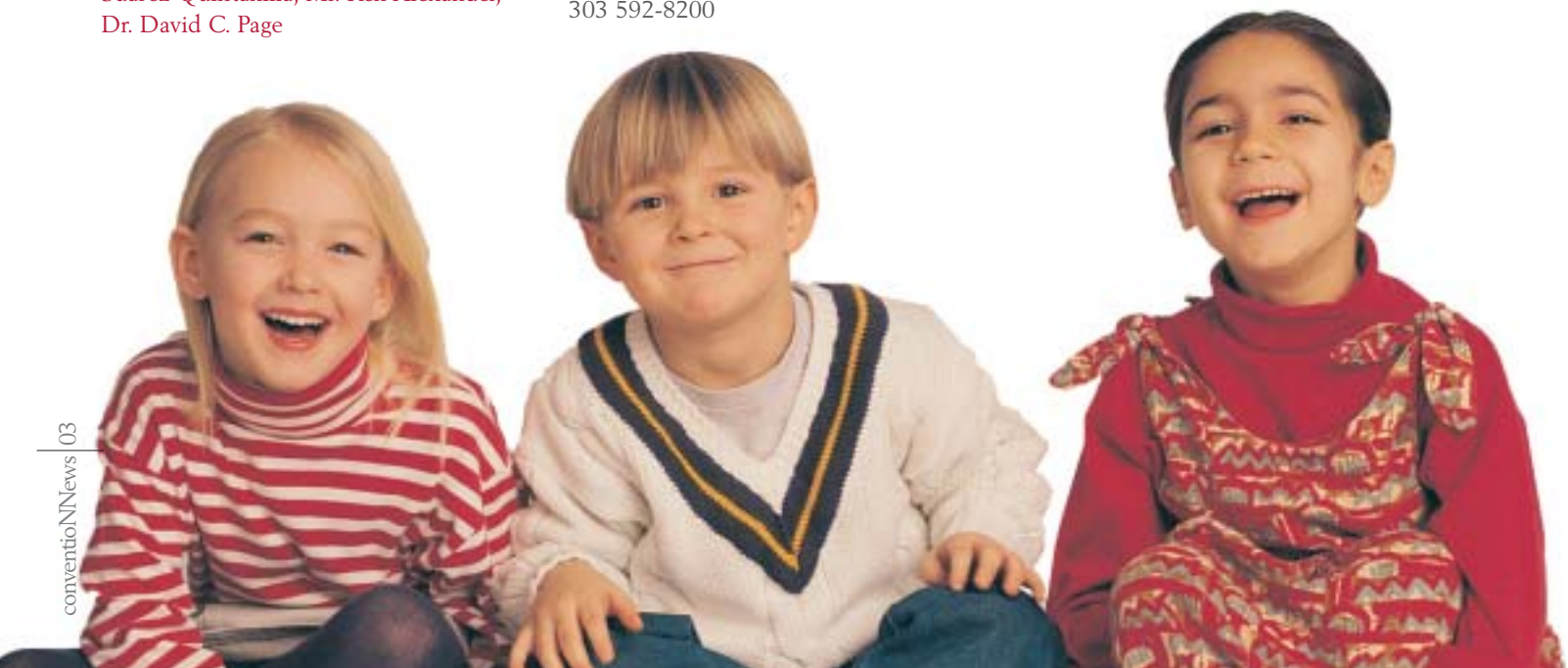

CURRICULUM 2003-2004

BIOPROGRESSIVE TODAY AND TOMORROW ON PEDIATRIC INTERCEPTIVE ORTHODONTICS

September 12-13, 2003, January 16-17, 2004, April 9-10, 2004
August 6-7, 2004
Dr. Robertt Ricketts and Dr. Richard Jacobson

Attendees of this course will receive Dr. Ricketts four volume book on Fixed Appliance Early Treatment. Equally important will be the lecturing experienced from the unstructured discussions that will develop. You will graduate with renewed understanding, consideration and passion for excellence in your life.

Dr. Robert Ricketts has devoted his professional life to lecturing, teaching and practicing orthodontics for over 45 years. He attended the Indiana School of Dentistry and the University of Illinois Graduate School, Chicago. He is the cofounder of Bioprogressive therapy and has been a major force in the development of computer-aided diagnostics. He has developed a variety of orthodontic products that are used throughout the world. Dr. Ricketts teaches and lectures at universities worldwide.

Dr. Richard Jacobson graduated form UCLA School of Dentistry, Department of Orthodontics in 1981. After graduation he went into practice with Dr. Ricketts in Pacific Palisades, California. He is the post president of the Foundation for Orthodontic Research, which is currently developing an Internet university. He is an instructor at UCLA and a lecturer at USC. Dr. Jacobson is in exclusive practice in Pacific Palisades and is currently treating over 100 of Hollywood's most famous actors and artists.

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DEVELOPING TREATMENT OBJECTIVES FROM COMPUTER GENERATED INFORMATION – FOR PREVENTIVE/INTERCEPTIVE PEDIATRIC ORTHODONTIC TREATMENT

November 14-15, 2003
Dr. Robert Vanarsdall and Dr. Bruce Haskell

Topics to be covered:
- Developing treatment objectives from computer generated information
- Using the Internet to access new orthodontic diagnostic services
- Treatment sequencing to obtain improved dentoskeletal relations in 3 dimensions
- Understanding the dentoskeletal transverse relation with RPE treatment
- Orthodontics as preventive dentistry
- How malocclusion fosters unhealthy bacterial levels
- How orthodontic forces change bacterial organisms
- Solutions for improving long term retention

Dr. Robert L. Vanarsdall Jr. is Professor of Orthodontics and Chairman of the Department of Orthodontics at the University of Pennsylvania School of Dental Medicine. He received his dental degree from the Medical College of Virginia and is board certified on both Orthodontics and Periodontics. Dr. Vanarsdall served as Chairman of the Department of Periodontics, Department of Pediatric Dentistry and has directed Orthodontics at Penn since 1981. Dr. Vanarsdall's lecture material provides details on skeletal change that has a profound effect on treatment success along with insights that attendees can immediately put into practice.

Bruce Haskell, DMD, Ph.D. serves as Clinical Professor at the University of Louisville School of Dentistry. His Ph.D. in anthropology/craniofacial biology was earned at the U of Pitt and his orthodontic specialty was completed at Eastman Dental Center. He is in private practice of orthodontics in Louisville, Kentucky.

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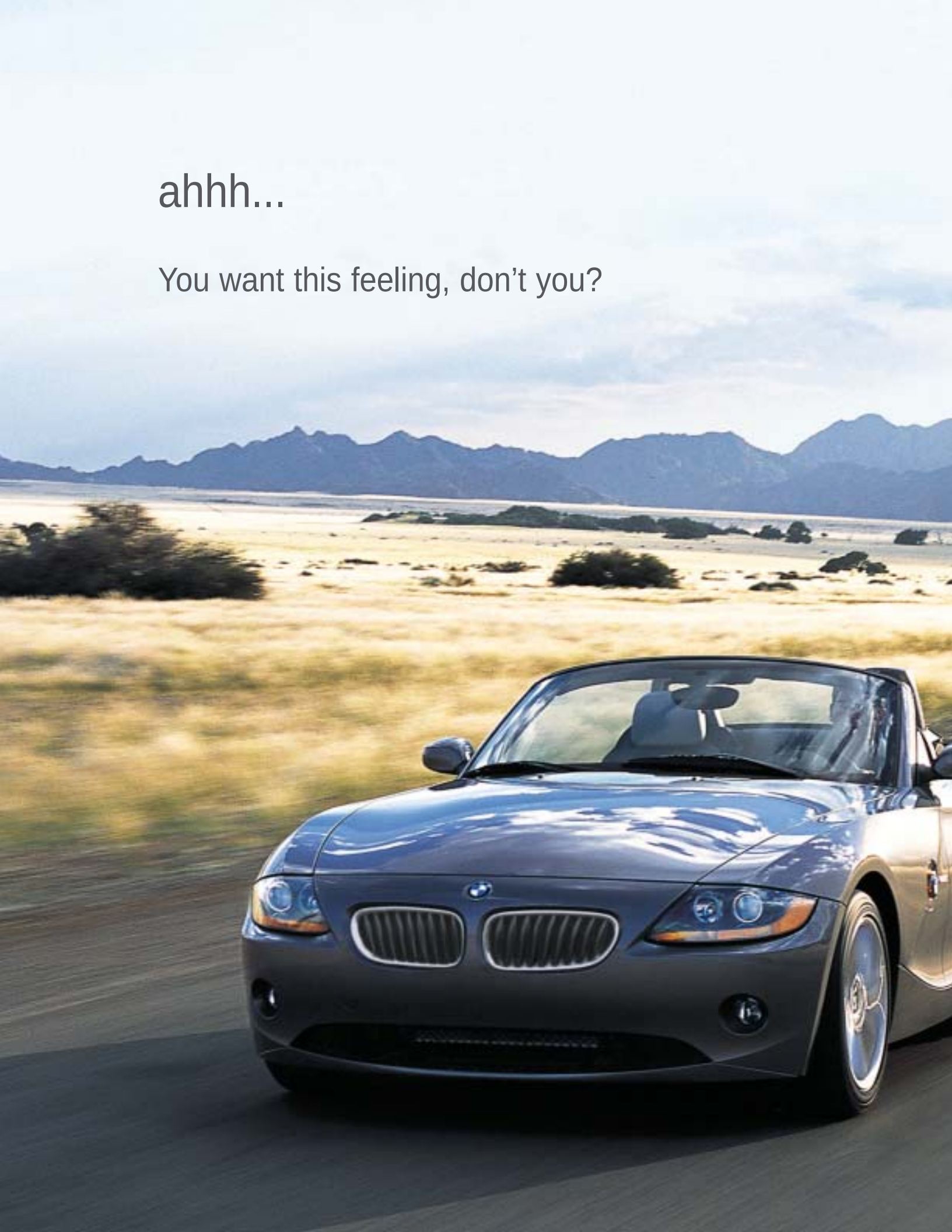

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- Motivating Patients for Cooperation
- The Art of Relationship Selling
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- Team building for Success
- Leadership - Maximizing People Potential
- Motivation and Interpersonal Communications

Bone Remodeling Orthodontics

February 20, 2004
Dr. Leon Kussick

Bone Remodeling Orthodontic is a total pediatric orthodontic system for both maxillary and mandibular management. Bone remodeling interceptive orthodontics takes advantage of young bone physiology and periosteal slippage. There are five (5) appliances: 1) Kussick Tongue Retrainer for correcting swallowing habits and mild anterior open bites. 2) The Kussick Maxillary Developing Arch for building anterior overjets, adding arch length, and rounding anterior arch forms. 3) The Kussick rapid adjusting headgear system for distalizing and expanding the maxila (without RPE), increasing arch length, closing open bites and reducing dramatic overjets. 4) The Kussick Orthopedic Incline for mandibular advancement, reduction of overjet, leveling curve of spee, opening the vertical and correcting deep bites, stimulating growth of anterior mandibular alveolar bone thus increasing arch length and long-term lower anterior tooth stability. 5) Occasional lower lingual holding arches (Wilson® 3D® linguals recommended). It has taken years to transform Dr. Kussick's complicated laboratory appliances into a simple pre-fabricated system. Likewise, RMO's new Kussick system education with "hands-on" has had to go through an evolution. To become proficient in bone remodeling interceptive treatment, four one-day seminars over a year of bone remodeling experience is needed.

During this year we will be fine-tuning our education program. In February 2004, we will open the Kussick seminars to interested and committed attendees.

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Signature III's arch slots are patented for strength and consistency. Ceramic brackets are inclined to fracture along the inside – right where the corners of the arch wire meet the side of the bracket. Signature III eliminates these stress points by adding a rounded protrusion to the center of each slot, while maintaining a continuous curve throughout the arch slot floor. The arch wire rests only on the protrusion, putting the stress on the strongest part of the bracket. This innovation drastically reduces bracket fracture. An added benefit to the rounded protrusions is that the arch wire has less contact in the slot, thus reducing friction, which can be a problem with ceramic sliding mechanics.

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CONSTRUCTION OF A HABIT CORRECTION ROLLER WITH ARCH EXPANSION

CHAIR SIDE APPLICATION OF A NEW 2-PIECE BONDABLE "BLUEGRASS" APPLIANCE.

Historically, orthodontists have relied on tongue cribs, hay-rakes and other sharp points, which employ an aversive negative stimulus to extinguish undesirable oral habits. Aversive approaches have proven to be only moderately effective, attaining some success in cases when patients desire to end their habit. In cases where the patient is ambivalent or non-cooperative, aversive approaches are generally ineffective or even counterproductive, and sometimes may trigger other habits or unexpected behaviors.

Since its general introduction in 1991 by Haskell and Mink, the "bluegrass appliance", or "habit correction roller", has obtained general approval both in this country and internationally 1,2 3 the primary application of the Habit Correction roller is to introduce friendly, non-destructive oral habits replacing the common destructive habits: digit sucking and tongue thrusting. This new thoroughly effective and "friendly" alternative has drawn recent praise in habit control for avoiding the traditionally rooted principles of a formidable physical barrier ("crib"), as well as that of negative reinforcement ("spikes"). Instead, it acts similarly to the habit-reversal techniques practiced by behavioral specialists. Both digit sucking and tongue thrusting cause major orthopedic alterations to the skeletal structures of the oral cavity and lower face. The resulting sequelae pose formidable challenges to orthodontists in correcting and maintaining a stable transverse dimension. An improved and effective treatment methodology was clearly called for.

When a free-spinning roller is placed in proximity to the tip of the tongue, a "fascination" response is quickly imprinted due to the intense sensitivity and neuromuscular nature of the tongue. Within a matter of only days the tongue will firmly establish the new non-harmful habit of "playing" with the roller. Establishing the new, non-destructive habit may take somewhat longer with older patients. The operative psychological mechanism is that the destructive habit is simply substituted with new, practitioner-encouraged non-destructive behavior. Roller-based habit correction therapy must be maintained for four to six months or longer, depending on the patient's age, to insure that the new habit is firmly established. (The original undesirable oral habit may re-emerge if the new behavioral accommodation is not firmly established). Interestingly, the appliance has reportedly been used in the treatment of cerebral palsy patients to improve tongue placement, assisting the control of drooling.

The traditional quad-helix-type transpalatal appliance works particularly well for positioning rollers appropriately in the vault of the palate. The roller is usually placed in close proximity to, but avoiding impingement in the most superior / anterior portion of the palate. This is in a position similar to that of the Hays-Nance button.

Quad-helix therapy as popularized by Ricketts, in conjunction with habit correction therapy creates a particularly efficient dual-treatment modality: The quad helix appliance is effective in correcting the habit-caused orthopedic "damage" while at the same time it provides an ideal basis for the habit correction (figures 1-5).

Thus, the first goal of ending the habit is accomplished simultaneously with a transverse orthopedic correction of the constricted maxillary arch usually associated with vigorous and prolonged digit sucking. This author has found the dual-function of such an approach to be more efficient for both habit and morphologic modification than either action undertaken alone. Even though very effective in conjunction with quad-based transverse correction, rollers are of course not limited to application on quad-helices. They can be installed on any type of laboratory or commercially produced pre-formed trans-palatal appliance featuring a suitable transverse wire segment as has been reported by Baker.

One drawback encountered when using the first generation, one-piece bluegrass roller to correct both the habit and the sequelae of arch constriction is the complexity associated with the fabrication of a suitable, supporting trans-palatal appliance. As can be appreciated, the

BRUCE HASKELL, DMD, PHD

Bruce Haskell, DMD, PhD serves as Clinical Professor and Distinguished Teaching Professor in the department of orthodontics at University of Louisville School of Dentistry. His PhD in anthropology/craniofacial biology was earned at University of Pittsburgh and his orthodontic specialty was completed at University of Rochester Eastman Dental Center. H is a Diplomate of the American Board of Orthodontics and a Fellow of the American College of Dentists. Dr. Haskell lectures nationally and internationally, and he has received the Dewell award from the AAO for his contributions to the scientific literature. His private practice of orthodontics is in Louisville.

one piece, first generation bluegrass appliance must first be threaded onto a suitable, straight piece of appliance wire. The appliance must then be bent and formed by hand, either at chair side or by a laboratory accompanied by impressions. Custom-formed appliances of this type are typically soldered to molar bands rather than fabricated to take advantage of vertical inserting or sheath-based fixed/removable attachment. Because of these inherent limitations, the first generation, one-piece roller cannot be added to the many currently available pre-formed and pre-sized arch width development products. Thus, the significant time and cost savings achievable through use of pre-formed appliances cannot be realized.

Using the old bluegrass-type one-piece roller with a soldered appliance typically relegates a practitioner to making adjustments intra-orally and to having access only to the two A-P palatal legs. A full adjustment of such an appliance combination (figure 5) requires removal, reshaping with pliers or by hand, followed by re-cementation.

Most of the commercially available trans-palatal correction appliances are based on a fixed/removable 'plug-in' attachment method. Chair side adaptation and activation of pre-formed appliances supporting the new type of a chair side or counter-top bondable roller could be of great benefit. A quad-helix with a habit roller or other similar assembly could simply be 'popped out' of the lingual sheaths, adjusted by hand (expanded), and easily re-inserted.

The "Split" (Bondable) Habit Roller

A new treatment approach is enabled, and the problems described above have been resolved through the use the new 2-piece, bondable version rollers. They are cast from the same medical grade material as is used for a successful and proven line of "composite" urethane orthodontic brackets. Like the successful brackets, the flat male and female features of both of the roller bonding faces are treated with a bond-strength enhancing process called Micro-Rock™. The 2 halves are simply bonded together with any routinely used bracket adhesive system, and thus capture a wire segment in its free-spinning center. Secure and safe bond strength is easily achieved since the bonded faces are flat and ideal for bonding, as well as providing significantly more bonding area than any orthodontic bracket. Further, the forces acting on a roller located in the palate are obviously unlike the forces encountered by a much more precariously placed and structurally challenged bracket. Typically, the assembled habit roller is positioned on the anterior leg of the quad-helix and cemented together extra-orally, and at chair-side if desired (figures 6a, b, c, d).

The new 2-piece roller series consists of 3 configurations: A hexagonal version (5.25-mm mesio-distal length, is used as the primary habit "re-trainer", as its facets and edges create the greatest sensory feedback to the tongue. When bonded, an effective diameter of the hexagonal roller of 7mm is achieved. Two

Figures


figure 1


figure 2


figure 3


figure 4


figure 5


figure 6a

other versions with smooth, round outer surfaces are available in 5.25mm and 12mm mesio-distal lengths. These are smaller in outer diameter, at 5mm. All versions have an inner lumen of 1.5 mm allowing free spinning on any gauge wire likely to be used for constructing trans-palatal appliances. Both the hexagonal and round versions of the 5.25 mm long rollers have concave ends designed to accommodate the left and right palatal helices of a quad-helix, insuring smooth, friction-free spinning.

An unexpected side-benefit of using the habit correction roller therapy is one of reducing tongue irritation in patients undergoing traditional quad-helix or similar type expansion therapy, independent of whether or not habit correction is involved: During expansion therapy, severe irritation or deep indentations in the tongue can frequently occur, particularly with patients with large unruly tongues or shallow palates. Such irritation is caused by tongue interaction with the appliance. In these cases, early removal of the appliance has been seen as the only option available to the clinician. To counter this dilemma, the round versions of the bondable rollers can serve by providing smooth tongue-shielding or tongue-protecting surfaces on the central, anterior section of a quad-helix appliance. By adding a smooth roller as a tongue protector, appliance-induced irritation and the interruption of the physiological processes associated with palatal expansion can usually be avoided. (Figure 7)

Use of the new 2 piece bondable rollers can prevent a series of time-consuming interruptions involving the discarding of the original expansion appliance and the undertaking of an entirely different means of transverse correction.

TESTING

Because the new appliance is manufactured in a 2-piece configuration, it was essential to confirm adequate bond strength of the bonded assembly.
24 rollers were subjected to bond testing using four popular orthodontic adhesive systems: Mono-Lok, Transbond XT, Master Dent Light Cure and Fuji Light Cure10. The Mono-Lok-bonded sample halves were held in place for one minute and allowed to cure for 5 minutes. All other cements were bonded with a 60-second light cure. Testing was performed at the laboratory of the manufacturer; Advanced Products Inc., Leland North Carolina; a manufacturer of urethane orthodontic brackets and other orthodontic products.

The rollers were pulled apart with one wire looping up to the upper movable jaws of a Dillon Tensile Testing Machine with another wire looped downwards to the stationary jaws. Both wires (.030 SS) passed through the lumen of the bonded roller halves. This protocol created a concentration of forces at the ends of the rollers and a peeling action against the bond. The peeling motion permitted the roller to unnaturally flex due to the concentration of forces at the ends. Bond failure propagates as the material of the roller flexes. Only a small portion of the bond actually becomes loaded to failure at any given time during a test pull.

In testing the bond strength of brackets for example, known failure modes can be duplicated by test fixturing. In the case of rollers, it is much more difficult to anticipate destructive force vectors since all forces are radial. The testing methodology used by the manufacturer was therefore thought to serve as providing relative bond strength values, useful for future reference. This means that the actual bond strength is likely far higher than reflected in the test.

RESULTS FIGURES

figure 6b

figure 6c

figure 6d

figure 7

AVERAGE BOND STRENGTHS	RANGES	CONVERSION TO POUNDS PER INCH
Hexagonal 5.25mm Roller: 28.92 lbs.	18.39 - 34.76	751 psi
Round 5.25mm Roller: 30.45 lbs.	22.46 - 38.00	927 psi
Round 12mm Roller: 27.68 lbs.	20.57 - 46.61	403 psi

OVERALL MEAN: 28.63 POUNDS

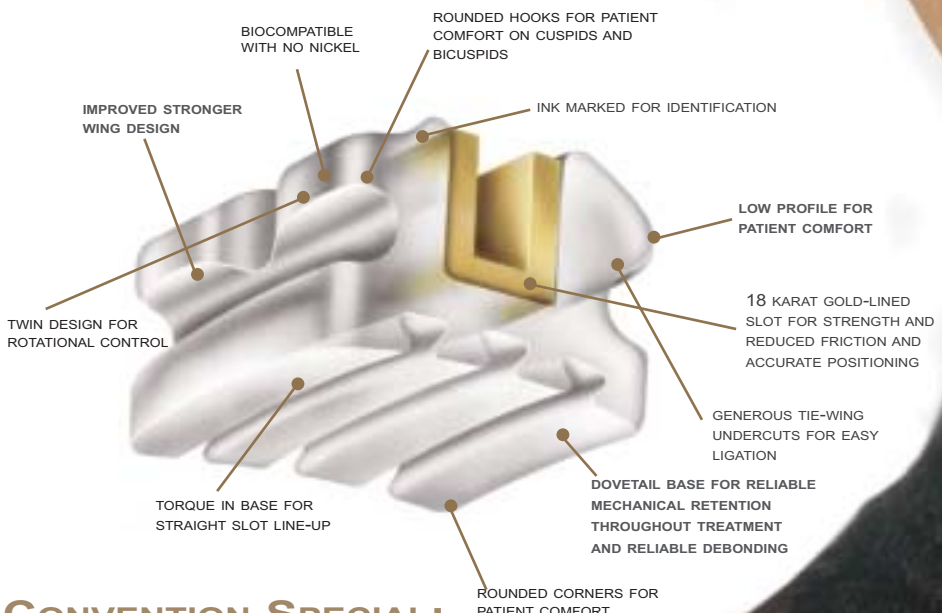
NEW & IMPROVED

LUXI™ II

The one thing that sets LUXI II apart from all other ceramic brackets is its 18 karat gold insert. LUXI II is a reduced-friction ceramic bracket containing a biocompatible gold sliding guide. Ceramic brackets create more friction than metal due to the surface texture. The arch slot in the LUXI II bracket contains a gold insert. This patent pending feature enhances sliding mechanics by reducing friction compared to conventional stainless steel and ceramic brackets. LUXI II, because of the gold insert, has better sliding mechanics and less friction than either metal brackets or other ceramic brackets. The gold insert reduces friction compared to all-ceramic brackets, including Clarity™ with a stainless steel insert.

LUXI II's base has a new improved, patented, dovetail design that enhances bond strength while allowing it to debond easily. This gives the adhesive a large surface area free of air pockets, so a sturdy, mechanical bond can form. These features make LUXI II's placement secure and debonding quick and clean. A gentle squeeze and the bracket pops right off in a single piece.

The low profile makes LUXI II more comfortable (lower than Clarity™*). The unmatched combination of aesthetics with gold strength, along with the self-assuredness from wearing appliances that perform as beautifully as they look, make this a great choice.



Convention Special:

LUXI II $8.20 each!

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70 Years of Rocky Mountain Orthodontics...

As an independent company, RMO has pioneered many product and service developments.

1933

1933
First multi-purpose welder and electrolytic polisher

1933
First preformed bands made

1933
Stainless Steel Wire

1933
First weldable flanged chrome alloy brackets, lingual and buccal tubes

1934
First long cone x-ray materials and technique education (Fitzgerald)

1934
Introduction of Dr. Simon's orthodontic diagnostic system which included gnathastat (made in Germany) and special camera made by RMO, beginning of Cephalometrics

1941
First national public relations campaign for orthodontics.

(Above) Cover of Life Magazine and an article in Parents Magazine

1948
First chrome crown and preventive materials for children's dentistry

70 years in business – not many businesses are able to celebrate this anniversary – and very few as independent business. We feel proud and fortunate to have enjoyed success for 70 years and be related to the dental health field, particularly the specialty of orthodontics.

With the development of stainless steel, coupled with the ingenuity and foresight of Dr. Archie Brusse, a pioneer Denver orthodontist, RMO began. RMO set about developing the first set of prefabricated orthodontic appliances. After much clinical research and experimentation, the first preformed bands, attachments, stainless steel wire and welder were introduced at the 1933 AAO annual meeting in Oklahoma City. The impact of these prefabricated devices on the world of orthodontics was dramatic. They changed the face of dentistry. The wide variety of appliances supplied by RMO enabled orthodontists to treat a diverse array of patients more effectively.

Dr. Brusse's philosophy continues today with his words: "Make it fun, make it different than regular business, and make some creative contributions for the future."

RMO will remain dedicated to provide both quality products and services for the orthodontic specialty in coming years. With this in mind RMO continues to serve all areas of orthodontics:

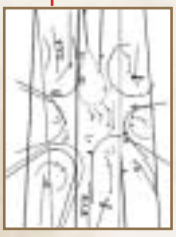
- Pediatric orthodontic prevention
- Interceptive pediatric orthodontics
- Mixed dentition orthodontics
- Adult orthodontics
- Reconstructive dentistry orthodontics
- TMJ orthodontics
- Surgical orthodontics
- Breathing/sleep problem related orthodontics

Business can be judged by the contributions it makes to improve its industry and the many environments in which it operates. We are proud of the loyalty and efforts of the employees and business partners who have helped RMO succeed and advance during the company's history. RMO is, by all measures, an international standard bearer poised to build upon its legacy of excellence for decades to come. We have endeavored not only to harvest the fruits of the tree of RMO's inheritance – but equally important, to nourish the roots.

Thank you past and present members of the American Association of Orthodontists for making these 70 years possible.

All RMO's clinical appliances are manufactured in our plant in Denver, Colorado.

1950
First high technology wires and wire forms (Elgiloy)



1951
Ford lock non-ligating bracket

1957
First pediatric functional orthodontic prevention program

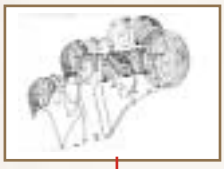
1957-1960
First original contributions for many techniques: Jarabak, Broussard, Ricketts Bioprogressive, Wilson Modular Components, Kussick Bone Remodeling

1960
First prefabricated complete prescription appliances

1965
First direct bonding appliances

1967
First computerized diagnostic software and services

1970
First orthodontic practice management services



1985
First metal injection molding process for orthodontic products

1990
First reduced friction bracket system (Synergy)

2001
First internet based orthodontic diagnostic service (E-Ceph)

2003

New

Roth First Molar Tube

The Roth First Molar Tubes are available now as loose tubes and prewelds; they soon will be available on an anatomical base

In response to many requests for a new Roth Single Convertible 1st Molar Tube, RMO is pleased to offer the following Maxillary and Mandibular tubes, with hooks, in 0.018 and 0.022 arch slots. Dimensions and Product Numbers for these tubes are:

Angulation	Torque	Distal Offset	Right/Left	.018 Arch Slot	.022 Arch Slot
Maxillary					
0˚	-10˚	15˚	R	A05664	A05692
0˚	-10˚	15˚	L	A05665	A05693
Mandibular					
-1˚	-30˚	0˚	R	A05666	A05694
-1˚	-30˚	0˚	L	A05667	A05695

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