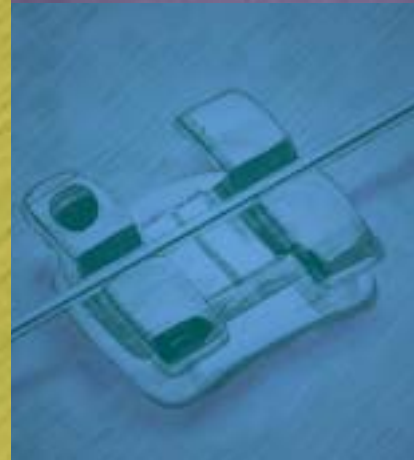


THE MCLAUGHLIN,
BENNETT, TREVISI
PHILOSOPHY OF
ORTHODONTIC
TREATMENT





RICHARD MCLAUGHLIN



JOHN BENNETT



HUGO TREVISI

ABOUT THE DOCTORS

Dr. Richard McLaughlin, DDS

Dr. Richard McLaughlin completed his orthodontic training at the University of Southern California in 1976. Since then he has been in the full time practice of orthodontics in San Diego, California. While developing his own practice, he was an associate of Dr. Lawrence F. Andrews for seven years. Dr. McLaughlin has lectured extensively on the pre-adjusted appliance in the United States, Europe, South America, Asia and Australia with orthodontic colleagues from London, England, Dr. John Bennett, and from São Paulo, Brazil, Dr. Hugo Trevisi. He is a member of the Pacific Coast Society of Orthodontists, the American Association of Orthodontists, a Diplomate of the American Board of Orthodontics and a full member of the Edward H. Angle Society. In addition, Dr. McLaughlin is an associate clinical professor at the University of Southern California, Department of Orthodontics.

Dr. John Bennett, LDS DOrth

Dr. Bennett completed his orthodontic training at the Eastman Dental Institute in London, England in 1972. Since that time he has been in the full time practice of orthodontics in London, England. For the past 20 years he has worked exclusively with the pre-adjusted appliance system, and with Dr. McLaughlin has held a particular interest in evaluating and refining effective treatment mechanics utilizing light forces. These concepts have developed and have included the more recent contribution from Dr. Trevisi. Their well tried and effective treatment approach has seen widespread acceptance. Dr. Bennett has lectured internationally on the pre-adjusted appliance for a number of years. Together with Dr. McLaughlin he has published numerous articles and has co-authored two orthodontic textbooks, both of which have been well received. He is currently a part-time clinical instructor at the post-graduate orthodontic program at Bristol University in England.

Dr. Hugo Trevisi, DDS

Dr. Hugo Trevisi received his dental degree in 1974 at Lins College of Dentistry in the state of São Paulo, Brazil. He received his orthodontic training from 1979 to 1983 at that same college. Since that time he has been involved in the full time practice of orthodontics in Presidente Prudente, Brazil. He is a Faculty Member at the University of Odontology and Dentistry in Presidente Prudente. He has lectured extensively in South America and Portugal and has developed his own orthodontic teaching facility in Presidente Prudente. Dr. Trevisi has 20 years of experience with the pre-adjusted appliance. He is a member of the Brazilian Society of Orthodontics and the Brazilian College of Orthodontics.



DEVELOPMENT OF AN ORTHODONTIC TREATMENT PHILOSOPHY

It has been more than 25 years since the pre-adjusted orthodontic appliance became available to the orthodontic specialty. By the mid 1970's, Drs. McLaughlin, Bennett and Trevisi had completed their orthodontic training and began working with the original Straight-Wire® Appliance. At the time, many clinicians had observed that due to the tip in the anterior brackets, anterior teeth tended to tip forward when initial levelling and aligning wires were placed (fig. 1).

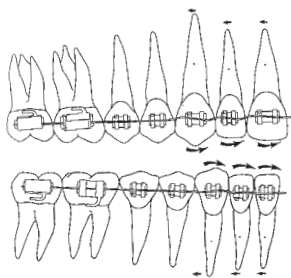
This was beneficial in cases with flat facial profiles, upright incisors, and minimal crowding in which it served as an excellent expansion appliance. However, in

cases with more severe crowding and protrusion, (extraction cases), the advancement of anterior teeth was highly undesirable. In an attempt to minimize this effect, a retracting force, such as an elastic chain, was extended from posterior teeth to anterior teeth. The result of this effort created the opposite effect; tipping of teeth into extraction sites, extrusion of incisors with bite deepening, bite opening in the posterior segments, and in the horizontal plane, lingual or palatal rotation of teeth into extraction sites (fig. 2a,b).

To minimize these negative levelling and aligning factors, extraction brackets were developed for cuspids, bicuspid and molars

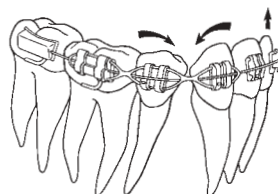
with three features; anti-tip, anti-rotation, and power arms designed to bring forces closer to the center of rotation of the teeth. When using these brackets the authors observed that no matter how light the application of elastic forces, the teeth continued to tip and rotate into extraction sites. As a result, they went back to the original Straight-Wire Appliance, and began using figure 8 ligature wires (lacebacks) to prevent cuspids from tipping anteriorly or posteriorly into extraction sites (fig. 3a). This change allowed for effective bodily retraction of cuspids into extraction sites, which in turn minimized the extrusion of incisors. The use of

FIGURE 1



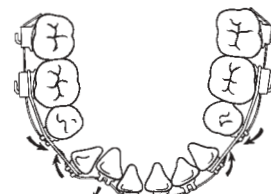
Effect of initial archwires on anterior teeth with the pre-adjusted appliance.

FIGURE 2 A



The effect of elastic chains on the dentition during the treatment of extraction cases.

FIGURE 2 B



archwire bendbacks behind the most distally banded molars also minimized anterior flaring of incisors (fig. 3b). These mechanical advances dramatically improved tooth control during the levelling and aligning stage of treatment.

There was once a general tendency during space closure to apply the same forces (approximately 600g) used with closing loop mechanics to complete archwires and sliding mechanics. Forces in this range produced a tipping and a binding effect on teeth, which did not occur with closing loop mechanics. Observation of this effect led the authors to reduce the forces applied during space closure to 150g. As a

result, sliding mechanics worked much more effectively (fig. 4a,b).

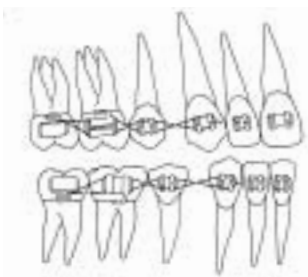
During finishing and detailing, it was noted that due to the tip, torque and in-out features of the appliance, many cases required minimal wire bending to achieve outstanding results. Minor modifications were added to the appliance to improve final tooth positioning. Included were torque changes in the anterior segments (increased palatal root torque in the upper incisors and increased labial root torque in the lower incisors) and increased buccal crown torque in the lower second molar areas.

More detailed information on the above mechanics and appliance

concepts can be found in "Orthodontic Treatment Mechanics and the Pre-adjusted Appliance" by Drs. Bennett and McLaughlin.¹ This text is available from C. V. Mosby Company (Telephone: 1-800-426-4545).

Following the application of this treatment modality over many years and in-depth review of current research information on tip, torque and in-out measurements, it was determined that new improvements in the pre-adjusted appliance were needed. The authors are most grateful to 3M Unitek for developing this new appliance.

FIGURE 3 A



Illustrations of lacebacks and bendbacks used to control cuspids and incisors during extraction treatment.

FIGURE 3 B

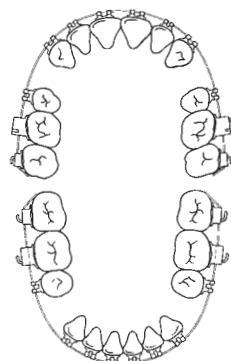


FIGURE 4 A

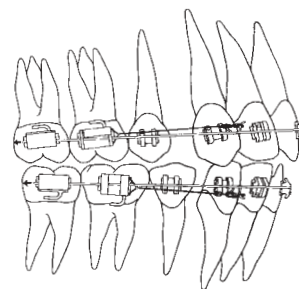
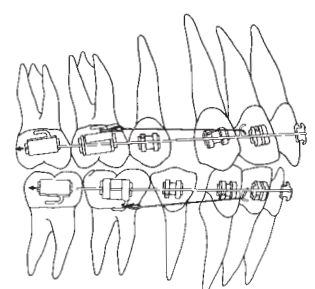


Illustration of tiebacks using elastic modules during space closure.

FIGURE 4 B





THE MBT™ VERSATILE+ APPLIANCE SYSTEM

THE MBT BRACKET SYSTEM

In 20 years of experience with the pre-adjusted appliance, Dr.'s McLaughlin, Bennett and Trevisi have all noted its very positive aspects, but have also seen a need for refinements in certain areas. These improvements are at the core of the MBT prescription and have been incorporated into three current bracket designs from 3M Unitek; options that give patients greater flexibility of choice while enabling the orthodontist to provide maximum control and treatment efficiency.

Victory Series™ Bracket

The most common choice of many orthodontists, this mid-size bracket delivers a superb combination of comfort, control and aesthetics. It's ideal in cases with smaller teeth and minimal to moderate degrees of difficulty.



Victory Series™ Bracket

Unitek™ Full-Sized Twin Bracket

Provides the greatest degree of control; a key advantage when treating patients with larger teeth, difficult malocclusions and in cases which are prone to breakage.

Clarity™ Bracket

For those patient who desire the greatest degree of aesthetics, Clarity ceramic brackets blend nicely against the tooth surface for a more refined look. The metal slot allows for better sliding mechanics. Plus, a stress concentrator in the base of the bracket facilitates easy removal at the conclusion of treatment.



APC™ Light Cure Adhesive System

For added convenience, all of the brackets in the MBT System are available with APC™ Adhesive Light Cure Adhesive already pre-applied.



Unitek™ Full-Sized Twin Bracket

FEATURES OF THE MBT VERSATILE+ APPLIANCE

The MBT Versatile+ Appliance provides several features that significantly improve clinical management of orthodontic cases. These features are as follows:

Anterior Tip

Reduced anterior tip was incorporated into the appliance to conform to Andrew's original research,³ and to dramatically reduce the anchorage needs of each case.

Upper Posterior Tip

Upper bicuspid brackets are provided with 0° of tip to keep these teeth in a more upright (Class I) position. Upper molar brackets are provided with 0° of tip, which when placed parallel to the occlusal plane, introduce 5° of tip into the upper molars.



Clarity™ Bracket

Lower Posterior Tip

Lower posterior tip in the first and second bicuspid brackets is maintained at 2°, to slightly incline these teeth forward (in a Class I direction). For the lower first and second molars, 0° tipped brackets are provided, which when placed parallel to the occlusal plane, introduces 2° of tip to these teeth.

Incisor Torque

Upper incisor brackets are provided with additional palatal root torque, while lower incisor brackets are provided with additional labial root torque. This adjustment aids in the correction of the most common torque problems occurring in the incisor areas.

Upper Cuspid, Bicuspid and Molar Torque

Upper cuspid and bicuspid brackets are provided with the

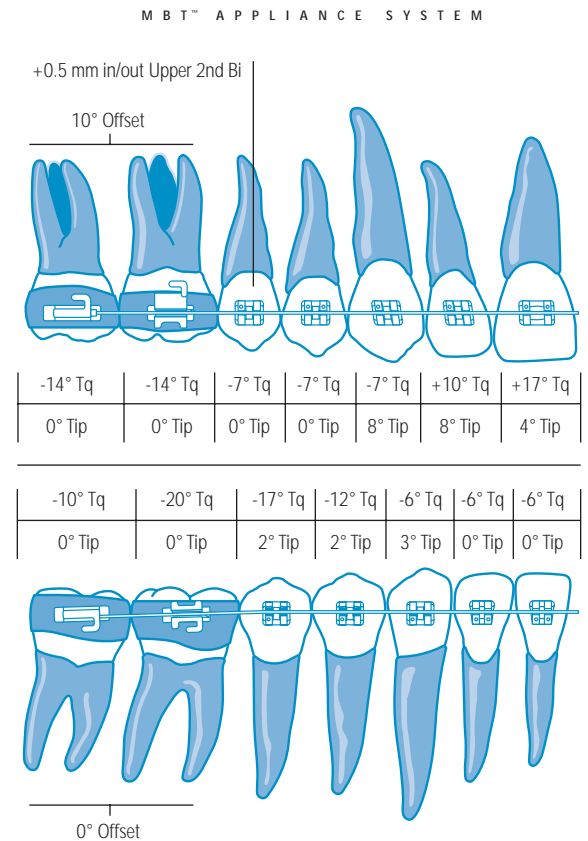
normal -7° of torque. Upper molar brackets are provided with an additional 5° of buccal root torque (to -14°) to reduce palatal cusp interferences with these teeth.

Lower Cuspid, Bicuspid and Molar Torque

Progressive buccal crown torque is provided in the brackets of the lower cuspids and lower posterior segments. This allows for buccal uprighting of these teeth, which is beneficial in most cases.

In/Out Modifications

Because upper second bicuspids are frequently smaller than upper first bicuspids, brackets with an additional .5 mm of in/out compensation are provided for these. If upper bicuspids are the same size, upper first bicuspid brackets can be used on all upper bicuspids.



The MBT™ Versatile+ System includes molar bands, molar bonding bases and buccal tubes



MBT ARCH FORM AND ARCHWIRE SEQUENCING

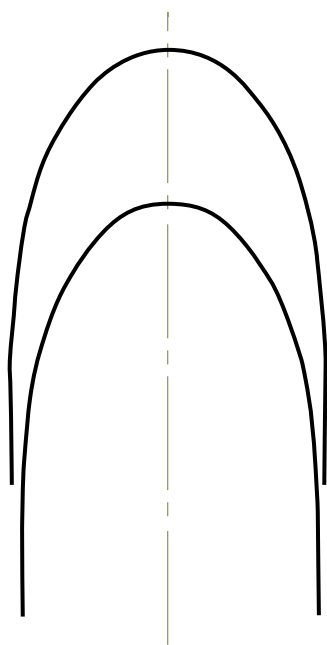
A review of the literature on arch form reveals that three basic arch forms have been described by many clinicians — Tapered, Ovoid and Square. Felton et al.², in particular, evaluated arch forms from several orthodontic companies which fell quite closely into the three shapes mentioned above and shown in illustration. When superimposed, they vary primarily in inter-cuspid width, with a range of approximately 5 mm. Inter-molar widths are quite

similar and the posterior aspects of the archwires can be widened or narrowed as needed.

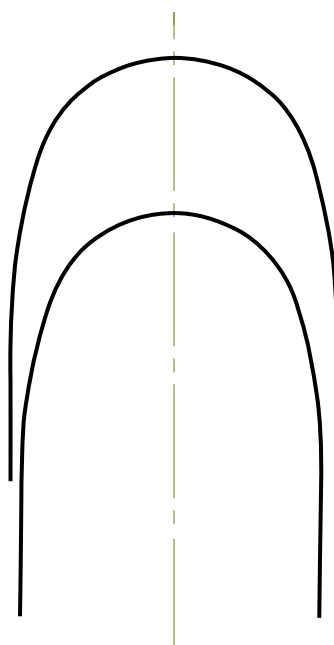
Clear templates can be superimposed on the patients lower study model prior to treatment to determine the most appropriate arch form. At chairside, each arch form template can also be used for minor arch form adjustments. The general guidelines for the selection of the appropriate arch form for each individual case are as follows:

The Tapered Arch Form

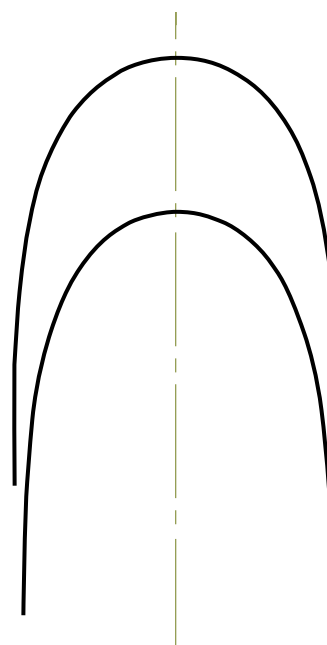
Provides the most narrow inter-cuspid width and is indicated for patients with narrow, tapered arch forms. It is particularly important to use this arch form in patients with narrow arch forms and gingival recession in the cuspid and bicuspid regions; a situation that occurs most frequently in adult orthodontic cases. Also, patients with tapered arch forms undergoing partial treatment in one arch only may benefit. The



Tapered Arch Form — OrthoForm™ I Modified



Square Arch Form — OrthoForm™ II



Ovoid Arch Form — OrthoForm™ III

Tapered, Square and Ovoid arch forms provide a suitable range of selection in the orthodontic practice.

posterior aspect of this arch form can be easily modified to conform to the inter-molar width of the patient.

The Square Arch Form

Indicated for patients with broad arch forms and in the first portion of treatment in cases that require buccal uprighting of the lower posterior segments and expansion of the upper arch. In such cases, if over-expansion has been achieved, it may be beneficial

to change to the ovoid arch form in the latter stages of treatment.

The Ovoid Arch Form

Has been used most frequently by the authors over the past fifteen years. By using this arch form, along with settling and retention procedures, post treatment relapse has been minimized in the majority of treated cases.

Note: 3M Unitek provides these arch forms as follows:

- The **Tapered Arch Form** is available as **OrthoForm™ I**, however this arch form needs to be narrowed in the anterior segment and rounded in the molar regions to fit the tapered arc form.
- The **Square Arch Form** is available as **OrthoForm II**
- The **Ovoid Arch Form** is available as **OrthoForm III**
- Arch form templates are available for both diagnostic and chair-side needs.
- Posted archwires are available in all three OrthoForms.

ARCHWIRE SEQUENCING

.015 Multistrand	.016 NITINOL HEAT-ACTIVATED
.017 Multistrand	
.014 Round (SS)	
.016 Round (SS)	.0195 X .025 NITINOL HEAT-ACTIVATED
.018 Round (SS)	
.020 Round (SS)	
.0195 X .025 Rectangular(SS)	.0195 X .025 RECTANGULAR(SS)

The use of Nitinol Heat-Activated Wires has proven most useful to the clinician during the initial treatment stage of levelling and aligning. The above table shows a substitution sequence for replacing regular stainless steel wires during this important stage. These substitutions dramatically reduce treatment chair time as well as efficiency of tooth movement.



MBT™ BRACKET PLACEMENT TECHNIQUE

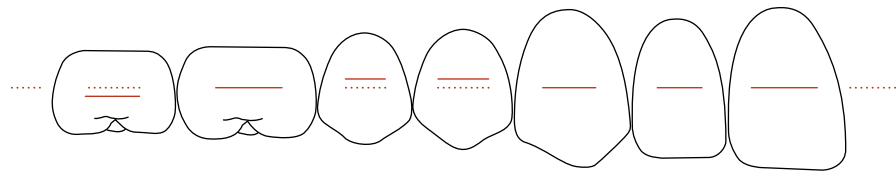
It has been recommended that pre-adjusted appliance brackets be placed with the twin bracket wings straddling, in a parallel fashion, the vertical long axis of the clinical crown, and that the center of the bracket slot be placed on the center of the clinical crown.³

As with any pre-adjusted bracket system, bracket positioning is the key to successful treatment. With this objective in mind, MBT treatment incorporates a unique bracket positioning system that provides individualized measurements for bracket placement and also allows for variations based upon differences in tooth size.

This system uses redesigned bracket positioning gauges with a unique color-coded ID system that provides the clinician easy-to-read measurements. The bracket placement guide⁴ is a superb adjunct to the placement of pre-adjusted brackets using the direct visualization technique.



3M Unitek Bracket Positioning Gauges are offered individually or as a kit of 4 instruments.



U7	U6	U5	U4	U3	U2	U1	
2.0	4.0	5.0	5.5	6.0	5.5	6.0	+1.0mm
2.0	3.5	4.5	5.0	5.5	5.0	5.5	+0.5mm
2.0	3.0	4.0	4.5	5.0	4.5	5.0	Average
2.0	2.5	3.5	4.0	4.5	4.0	4.5	-0.5mm
2.0	2.0	3.0	3.5	4.0	3.5	4.0	-1.0mm

L7	L6	L5	L4	L3	L2	L1	
3.5	3.5	4.5	5.0	5.5	5.0	5.0	+1.0mm
3.0	3.0	4.0	4.5	5.0	4.5	4.5	+0.5mm
2.5	2.5	3.5	4.0	4.5	4.0	4.0	Average
2.0	2.0	3.0	3.5	4.0	3.5	3.5	-0.5mm
2.0	2.0	2.5	3.0	3.5	3.0	3.0	-1.0mm

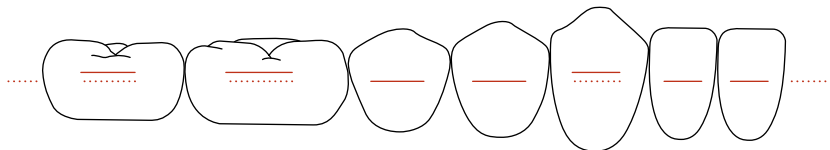


Table 1. Highlighted figures represent the three minor maxillary arch changes and the three minor mandibular arch changes that were made from the initial Bracket Placement Chart. These changes were based on evaluations of the American Board-Angle Society case measurements and cases measured at the debanding appointment.



MBT CONTINUING EDUCATION COURSES

NEW CONCEPTS IN ORTHODONTIC TREATMENT MECHANICS

This course presents a discussion of the McLaughlin, Bennett, Trevisi (MBT) philosophy of orthodontic treatment. State of the art mechanics using light continuous force systems are described in detail. The newly developed MBT™ Versatile+ Pre-adjusted Appliance, designed specifically to coincide with and enhance the treatment mechanics, is also presented. The six stages of orthodontic treatment are reviewed using the sequential demonstration of a variety of case reports. This is a practical and very clinically oriented program, which will provide information that is immediately useful for the modern orthodontic practice.

INTER-ARCH TREATMENT MECHANICS

This course is a natural progression of “New Concepts in Orthodontic Treatment Mechanics”. The principles of intra-arch treatment are carried over and applied to the management of cases requiring attention in the area of inter-arch management. It is the efficient management of intra-arch factors that allows the orthodontist to focus on the challenging aspects of inter-arch management.

Considerations include the far more difficult challenge of placing the upper and lower dentitions in three planes of space within the facial complex so that they are esthetic, fit properly during static centric occlusion, allow the condyles to be seated into a centric relation position

within the glenoid fossae in this static position, and function from this static position without interferences during lateral and protrusive movements. Thus, inter-arch considerations include such factors as growth and development, and the management of vertical, horizontal and transverse skeletal and dental discrepancies. The subjects of Class II, Class III and Asymmetrical treatment are also discussed in this course.

MANAGEMENT OF THE DENTITION

This course describes the management and correction of specific dental problems involving each individual tooth. Thus, specific clinical situations related to incisors, cuspids, 1st and 2nd bicuspid, and 1st, 2nd, and 3rd molars are discussed. The extraction versus non-extraction issue is reviewed in detail. The course will also review the material covered in Dr. Bennett's and Dr. McLaughlin's textbook, "Orthodontic Management of the Dentition with the Preadjusted Appliance".

OCCLUSION AND THE TMJ IN ORTHODONTIC TREATMENT

Correction of malocclusion to a position in which the condyles are in the correct position can be likened to the proper construction of the foundation of a house. Without it, the house is subject to future instability, as is the malocclusion treated to the incorrect condyle position. This course presents a comprehensive review of the management of orthodontic patients with Temporomandibular Disorders. The concept of ideal occlusion is discussed as well as its relationship to temporomandibular disorders. The subjects of diagnosis and treatment planning, splint therapy, and post-splint management with orthodontic appliances are discussed in detail.

DIAGNOSIS, TREATMENT PLANNING AND TREATMENT MECHANICS

This course brings together information from the previous four courses by placing emphasis on the all important area of diagnosis and treatment planning. The topics covered in previous programs are all relevant to this course, which looks at a wide variety of treatment situations. Each case is evaluated from a diagnostic point of view, and participants are invited to make their own judgments concerning treatment planning. The treatment which was completed is then reviewed in a step by step manner, with the results being evaluated. Class I, II, and III, and Asymmetrical treatment options are reviewed in the course.

REFERENCES

MBT™ Versatile+ Appliance System

1. Mclaughlin, R. P. and Bennett, J. C.: "Orthodontic Treatment Mechanics and the Pre-adjusted Appliance" London, Mosby-Wolfe, 1993.
2. Felton, M. D., Sinclair, P. M., Jones, D. L., Alexander, R. G., A computerized analysis of the shape and stability of mandibular arch form, Am. J. Orthod., 92: 478-483, 1987.
3. Andrews, L.F: Straight-Wire – The Concept and The Appliance. Los Angeles, CA. Wells Company. 1989.
4. Mclaughlin, R. P. and Bennett, J. C.: "Bracket Placement with the Straight-Wire Appliance" Journal of Clinical Orthodontics May 1995; 29: 302-311.

MBT™
M c L A U G H L I N
B E N N E T T
T R E V I S I

3M

**3M Unitek
Orthodontic Products**

2724 South Peck Road
Monrovia, CA 91016 USA

In U.S. and Puerto Rico: 1-800-423-4588 • 626-574-4000
In Canada: 1-800-443-1661
Technical Helpline: 1-800-265-1943 • 626-574-4577
Outside these areas, contact your local representative.



*Printed on 50% recycled
waste paper, including 10%
post-consumer waste paper.*

3M, Unitek, Clarity, MBT, OrthoForm and Victory Series are trademarks of 3M. Straight-Wire is a registered trademark of A-Company.
©1998-2002 3M Unitek 016-885-2 0202