

Orthodontic Perspectives

News-worthy information for the orthodontic professional

: : : : : : : : : A 3M Unitek Publication

Volume IV No. 2 : : : : : : : : :

Dr. McLaughlin



Dr. Bennett



Dr. Trevisi



"It was determined that new improvements in the pre-adjusted appliance were needed."

A Clinical Review of The MBT™ Orthodontic Treatment Program

MBT Treatment Philosophy – p. 3

Treatment Mechanics – p. 3

MBT Appliance – p. 4

MBT Appliance Versatility – p. 8

Bracket Placement – p. 14

Arch Form and Wire Sequencing – p. 15

(An interview with Dr. Richard P. McLaughlin)

MBT Continuing Education Seminars – p. 17

MBT Text Support – p. 19

Special EdVentures™ & Continuing Education Supplement – p. 9-12

Recent Developments – back page

• Into The Future

Good Luck Rich Iverson

3M Unitek is sad to say goodbye to our President and General Manager, Mr. Rich Iverson, but we are happy for him as he assumes his new responsibilities in his appointment to head up the Medical Resource Technology Division at 3M. In his 8 years with us, Rich has helped to smooth the transition as we evolved from Unitek into 3M Unitek and became the unquestionable leader in orthodontics as well as the world's largest orthodontic manufacturer. This growth has been due to our strategic goal of developing and maintaining the **Best Customer Relationships** in the Orthodontic industry. Good luck Rich.

3M Unitek Now On The Web

A further demonstration of 3M Unitek's commitment to the future can be found on our brand new web page. We invite you to stop by and browse.

W E L C O M E
3M Unitek Home

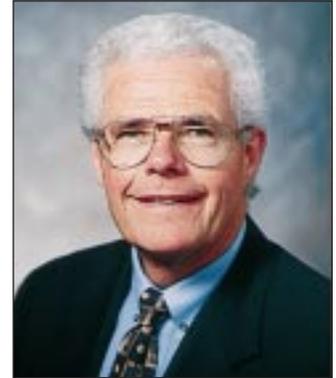
<http://www.3M.com/unitek>



3M Dental Receives '97 Baldrige Award

3M Unitek congratulates 3M Dental for receiving the 1997 Malcolm Baldrige Quality Award. 3M Dental is the first division within 3M and only the second company in health care to receive this coveted award, which certifies a company's ongoing commitment to business excellence.

Welcome Pat Ford



We are also very fortunate to be able to introduce our new President and General Manager, Mr. Patrick B. Ford. Pat is a seasoned manager with over 30 years experience with 3M. Pat has a strong background in health care, sales operations, international market development and subsidiary management. Both his track record and background make him well qualified to guide 3M Unitek's continued growth and market leadership worldwide. He's extremely pleased to join us at this exciting time, as 3M Unitek launches innovative new products such as Clarity™ Metal-Reinforced Ceramic Brackets and the MBT™ Appliance System. 3M Unitek is also exclusive distributor for the AJO-DO, JCO, as well the Angle Orthodontist on CD-ROM. These, and other orthodontic products, will help usher in our upcoming 50th anniversary celebration in 1998. Pat has firmly endorsed and is committed to 3M Unitek's credo of providing superior service to our customers.

Please join us in welcoming Pat Ford as the new leader of 3M Unitek, producer of orthodontic products and services to make your life easier.

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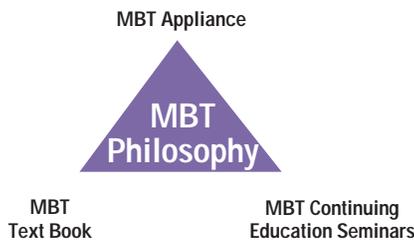
• A Clinical Review of the MBT™ Orthodontic Treatment Program

By Dr. Richard McLaughlin, Dr. John Bennett and Dr. Hugo Trevisi

MBT Treatment Philosophy

The MBT philosophy of orthodontic treatment has been developed over a twenty year period of time and has involved the combined efforts of its three principle clinicians, along with the help of numerous other clinician colleagues. Their philosophy places emphasis on four critical areas of orthodontic treatment: 1. Treatment mechanics, 2. The pre-adjusted appliance, 3. Bracket placement technique, and 4. Arch form and archwire sequencing.

The MBT philosophy is supported not only by a custom designed appliance, but also by worldwide continuing educational opportunities as well as a long awaited textbook.



The MBT Philosophy of Orthodontic Treatment in Practice

1. Treatment Mechanics

Emphasis on dento-alveolar change

The major effect of orthodontic treatment is on the dento-alveolar structures. Thus the term "growth modification" in growing patients consists primarily in the modification of the growth and development of the dento-alveolar processes. While other "orthopedic" changes may be occurring in some patients, the majority of change is dento-alveolar, and, therefore,

emphasis is placed on the management of these structures.

Use of Light, Continuous Forces

Intermittent forces have proven to be relatively ineffective in bringing about dental tooth movement; on the other hand, continuous forces are most effective in moving dental structures. Heavy forces have been shown to have a detrimental effect on the root structure while lighter forces have been shown to maximize biologic response and efficacy in tooth movement. Therefore, treatment planning is directed at providing light continuous forces on the teeth that need to be moved at any given time during orthodontic treatment.

Anchorage Control

A combination of extra-oral (facebows and "J" hooks) and intra-oral (palatal bars, lingual arches, Class II elastics, Class III elastics, Nance arches, Utility arches, etc.) methods of anchorage control are utilized in the MBT system.

Leveling and Aligning

The leveling and aligning stage of treatment consists of the following techniques:

- Use of Nitinol Heat-Activated nickel titanium wires during the aligning process
- The use of canine lace backs for cuspid control and retraction
- The use of bend backs to control forward movement of incisors
- The use of open coil springs to create space for blocked out teeth
- Early establishment and maintenance of arch form, followed by bringing malposed

teeth into the primary arch form without arch form distortion

Overbite Control

Overbite control is best accomplished by using the following principles:

- Differentially controlling the eruption/extrusion (intrusive and extrusive forces) of the anterior and posterior segments
- Including second molars early in treatment for the opening of most deep bite cases
- Being aware that in most cases leveling and bite opening are not complete until rectangular wires have been in for one or two months
- Avoiding leveling of the posterior portion of the Curve of Spee in open bite cases

Space Closure

Space closure control is best accomplished by using the following principles:

- A .019 x .025" rectangular wire in the .022 bracket slot is preferred for effective sliding mechanics without major archwire deflection
- Sliding mechanics is accomplished with elastic module tie backs
- Incisor torque control is accomplished through bracket design and archwire bending

Overjet (Class II-Class III) Correction

Class II and Class III correction is accomplished by using a combination of headgear, Class II and Class III elastics, and functional appliances. These appliances are used in combinations that bring about the best opportunity for continuous forces on the dento-alveolar processes.

Finishing

Finishing involves three main processes:

- The correction of mistakes made earlier in treatment (bracket positioning, torque control, anchorage control etc.)
- Over-correction as needed (periodontal, alveolar-sutural, muscular, and growth)
- Settling of cases in light wires for approximately six weeks (minimum) prior to debanding

Retention

Retention is accomplished using a combination of bonded retainers for the lower anterior segment, wrap around upper retainers to allow for continued arch settling, and some positioners as well as some clear acrylic full coverage retainers.

2. MBT Appliance Bracket System



Victory Series™ Brackets – Figures 1, 2, 3 show a good candidate for this small steel bracket, as evidenced by the patient's short clinical crowns.



Fig. 1



Fig. 2

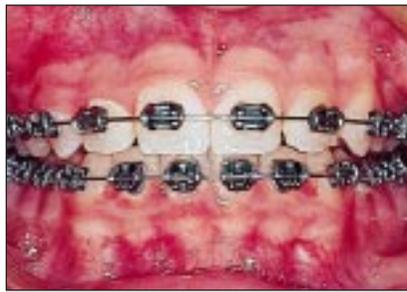


Fig. 3

Clarity™ Brackets –

Figures 4, 5, 6 show Clarity metal-reinforced ceramic brackets on her upper teeth, aesthetic brackets for an aesthetic appearance during treatment.



Fig. 4



Fig. 5



Fig. 6

Full Size Twin Brackets –

Figures 7, 8, 9 show a patient with large teeth, a difficult malocclusion and poor hygiene. The larger bracket will maximize base surface area and increase control.



Fig. 7



Fig. 8



Fig. 9

APC™ System

In addition to the MBT Versatile+ appliance types available, our offices also appreciate the option of APC adhesive coating on our brackets. The efficiency and simplified inventory management has been most beneficial for staff and patients.

MBT™ Appliance Features

Reduced Upper and Lower Anterior Tip

	Upper Anterior Tip			Lower Anterior Tip		
	Central	Lateral	Cuspid	Central	Lateral	Cuspid
Andrews' norms	3.59°	8.04°	8.4°	0.53°	0.38°	2.5°
Sebata's data	4.25°	7.74°	7.7°	-0.48°	-1.2°	1.5°
Watanabe's data	3.11°	3.99°	7.7°	1.98°	2.28°	5.4°
MBT Versatile+	4.0°	8.0°	8.0°	0°	0°	3.0°
Original SWA	5.0°	9.0°	11.0°	2.0°	2.0°	5.0°
Roth SWA	5.0°	9.0°	13.0°	2.0°	2.0°	7.0°

Table 1 Anterior Tip

Table 1 shows anterior tip measurements: Andrews' non-orthodontic normal study¹, two Japanese studies^{2,3}, the MBT Versatile+ Appliance, the Original Straight-Wire Appliance™⁶ and the Roth Appliance⁶.

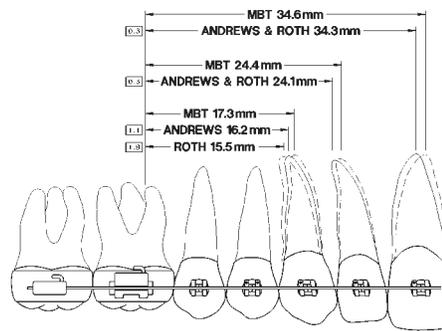
The anterior tip measurements for the original Straight-Wire Appliance are all greater than those found in Andrews' research. This was presumably done to control what Andrews referred to as the "wagon wheel" effect* that torque places on anterior crown tip¹. This is somewhat similar to the compensating anti-tip, anti-rotation and power arms built into the extraction brackets for the treatment of bicuspid extraction cases.

**As palatal root torque is added to the anterior segment, mesial crown tip is reduced*

It has been observed by the authors that with light continuous force mechanics, tip is well controlled by the pre-adjusted appliance. Using "lace-backs" and "bend-backs" during leveling and aligning, and elastic module "tie-backs" during space closure, very little adverse tipping occurs during these stages of treatment. By the finishing stage of treatment, completely levelled upper and lower rectangular wires are normally in place, indicating that full expression of both anterior and posterior crown tip has occurred. Thus, additional tip is not seen to be necessary in the anterior segments.

Also, additional anterior tip creates a significant drain on molar anchorage, Figure 10, 11. If the original research values for tip are used, a total of 10° less distal root tip in the upper anterior segment and 12° less distal root tip in the lower anterior segment is needed (compared against the Original Straight-Wire Appliance).

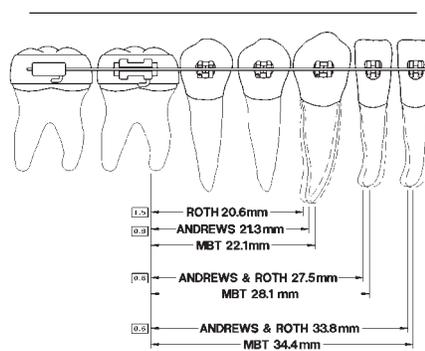
• Figures 10 and 11 show the difference in root positions with MBT Versatile+ Appliance and two SWA.



Total Arch Length Change	Cuspid Tip	Lateral Tip	Central Tip	
MBT	0.0mm	8°	8°	4°
Andrews	1.7mm	11°	9°	5°
Roth	2.4mm	13°	9°	5°

Fig. 10

Upper Arch Length



Total Arch Length Change	Cuspid Tip	Anterior Tip	Anterior Tip	
Roth	2.7mm	7°	2°	2°
Andrews	2.0mm	5°	2°	2°
MBT	0.0mm	3°	0°	0°

Fig. 11

Lower Arch Length

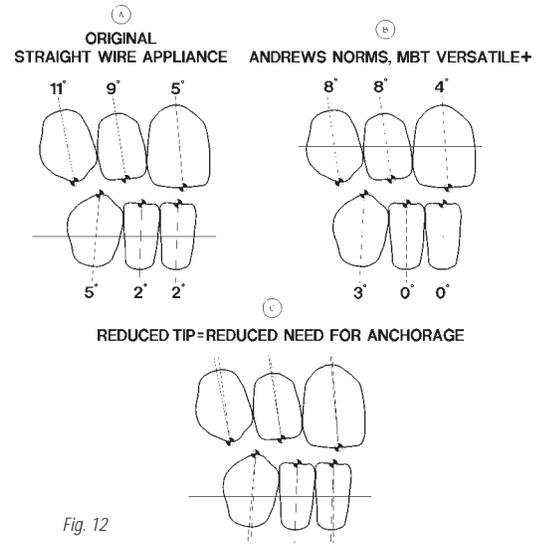


Fig. 12

• Figure 12. The MBT Appliance provides anterior tip measurements that correspond to Andrews' norms. This reduced tip provides a significant reduction in anchorage needs.

Also, reducing the tip on the cuspids avoids the frequently observed problem of cuspid and bicuspid roots that finish in close proximity.



Fig. 13

• Figure 13: This X-ray shows a case treated with a bracket with excessive cuspid tip. This is what the MBT Versatile+ bracket was designed against.

Thus reduced tip significantly reduces the need for anchorage control, which normally translates into a reduced need for patient cooperation. Since the MBT Versatile+ measurements are identical to Andrews' original research figures, there is no compromise in ideal static occlusion. And if the condyles are in centric relation, there is no compromise in ideal functional occlusion as described by Roth⁴.

Upper Posterior Tip

Table 2 shows posterior tip measurements for the upper bicuspid and molars: Andrews' non-orthodontic normal study¹, two Japanese studies^{2,3}, the MBT™ Versatile+ Appliance, the Original Straight-Wire Appliance™⁶ and the Roth Appliance⁶.

	Upper Posterior Tip			
	1st Bi	2nd Bi	1st Molar	2nd Molar
Andrews' norms	2.7°	2.8°	5.7°	0.4°
Sebata's data	3.5°	6.2°	5.2°	-0.3°
Watanabe's data	4.7°	5.2°	4.9°	4.1°
MBT Versatile+	0°	0°	0° *	0° *
Original SWA	2.0°	2.0°	5.0°	5.0°
Roth SWA	0°	0°	0°	0°

Table 2 Upper Posterior Tip * Effective tip is 5°

For the MBT Versatile+ Appliance, 0° of tip, as opposed to 2° of tip, was selected for all upper bicuspid brackets to place the crowns in a slightly more upright position, (in a Class I direction). It also provides for slightly reduced anchorage needs for the upper arch.

The buccal groove is the reference for crown tip in the upper molars. This buccal groove shows a 5° angulation to a line drawn perpendicular to the occlusal plane. There are two methods of achieving 5° of effective tip in the upper first and second molars.

If a 5° bracket is used, the band must be seated more gingivally at the mesial aspect to position bracket wings parallel to buccal groove. (Fig 14a). This makes band positioning more difficult. When using these 5° brackets, it is frequently necessary to trim band material from the distal of the band. If the 5° bracket is used and the band is placed parallel to the occlusal plane, it provides an excessive 10° of actual tip to the upper first and second molars (Fig. 14b).

Alternatively, the authors prefer to use a 0° crown tip bracket with the band and bracket slots placed parallel to the occlusal plane. This introduces the correct 5° of tip in the upper molars, as measured from the buccal groove (Fig. 14c) and is easier to seat. The new Unitek™

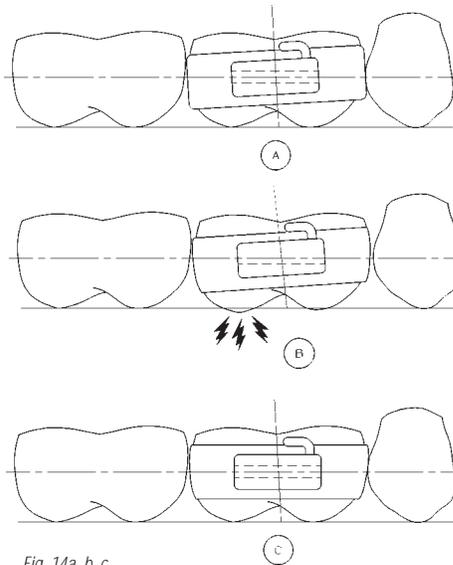


Fig. 14a, b, c

Narrow Contoured Molar Bands have been extremely easy to use and are a welcome addition to the MBT system.

In summary, then, all of the upper posterior brackets are provided with 0° of crown tip for the reasons described above.

Lower Posterior Crown Tip

Table 3 shows tip measurements for the lower bicuspid and lower molars: Andrews' non-orthodontic normal study¹, two Japanese studies^{2,3}, the MBT Versatile+ Appliance, the Original Straight-Wire Appliance⁶ and the Roth Appliance⁶

	Lower Posterior Tip			
	1st Bi	2nd Bi	1st Molar	2nd Molar
Andrews' norms	1.3°	1.54°	2.0°	2.9°
Sebata's data	2.5°	6.70°	5.7°	7.3°
Watanabe's data	3.8°	3.91°	3.7°	3.9°
MBT Versatile+	2.0°	2.0°	0° *	0° *
Original SWA	2.0°	2.0°	2.0°	2.0°
Roth SWA	-1.0°	0°	-1.0°	-1.0°

Table 3 Lower Posterior Tip * Effective tip is 2°

The authors prefer to maintain 2° of mesial crown tip in the lower bicuspid. Angling these teeth slightly forward in this manner moves them more in a Class I direction; 2° of tip is also preferred in the lower first and second molars. This is accomplished in a manner similar to

the tip placed in the upper molars. The lower buccal groove lies 2° off of a line drawn perpendicular to the occlusal plane. As with the upper molars, introducing this 2° of tip to the lower molars can be accomplished by placing 0° tip brackets parallel to the occlusal plane. In summary then, the lower bicuspid brackets show 2° of mesial crown tip and the lower molar brackets show 0° of crown tip (2° effective tip) with the bands placed parallel to the occlusal surface.

Incisor Torque

Table 4 shows anterior torque values: Andrews' non-orthodontic normal study¹, two Japanese studies^{2,3}, the MBT Versatile+ Appliance, the Original Straight-Wire Appliance⁶ and the Roth Appliance⁶.

	Anterior Torque			
	Upper Central	Upper Lateral	Lower Central	Lower Lateral
Andrews' norms	6.11°	4.42°	-1.71°	-3.24°
Sebata's data	9.42°	7.48°	3.55°	1.66°
Watanabe's data	12.8°	10.4°	0.71°	0.53°
MBT Versatile+	17.0°	10.0°	-6.0°	-6.0°
Original SWA	7.0°	3.0°	-1.0°	-1.0°
Roth SWA	12.0°	8.0°	-1.0°	-1.0°

Table 4 Anterior Torque

The authors observed that torque is rather poorly controlled with the pre-adjusted appliance system. This is due to the fact that the torque movement is a difficult one since less than 1mm of contact between the bracket and the archwire must bring about this movement. In general, here lies the greatest challenge to bracket design in the pre-adjusted appliance. In the majority of orthodontic cases, because of this lack of torque control, torque tends to be lost in the upper incisors during overjet reduction and space closure. The lower incisors frequently tend to procline forward during Curve of Spee leveling and when eliminating lower incisor crowding. This incisor torque factor, along with the tip and tooth size factors, frequently prevents posterior teeth from fitting into a Class I relationship.

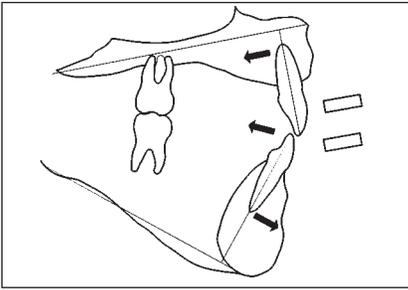


Fig. 15 Labial Root Torque

Because of these factors there is generally a need for greater palatal root torque of the upper incisors and labial root torque for more uprighting of the lower incisors (Figure 15). For all these reasons, the authors recommend +17° of torque for the upper central incisors, +10° of torque for the upper lateral incisors, and -6° of torque for the lower incisors.

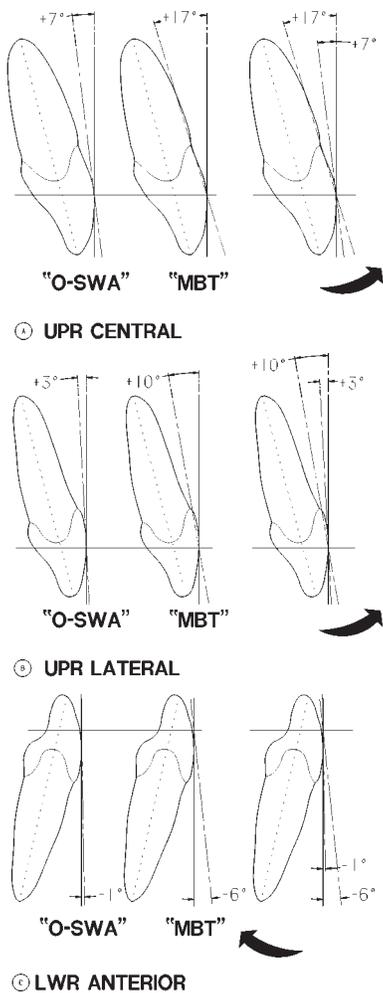


Fig. 16a, b, c Anterior Root Torque

In Figure 16 the MBT™ Versatile+ Appliance provides increased palatal root torque for the upper incisors (a, b) and increased labial root torque for the lower incisors (c), the most common requirements in orthodontic cases.

Upper Cuspid, Bicuspid and Molar Torque

Table 5 shows upper cuspid, bicuspid and molar torque values: Andrews' non-orthodontic normal study¹, two Japanese studies^{2,3}, the MBT Versatile+ Appliance, the Original Straight-Wire Appliance⁶ and the Roth Appliance⁶.

	Upper Posterior Torque				
	Cuspid	1st Bi	2nd Bi	1st Molar	2nd Molar
Andrews' norms	-7.3°	-8.5°	-8.9°	-11.5°	-8.1°
Sebata's data	0.7°	-6.5°	-6.5°	-1.7°	-3.0°
Watanabe's data	-5.3°	-6.0°	-7.2°	-9.8°	-9.5°
MBT Versatile+	-7.0°	-7.0°	-7.0°	-14.0°	-14.0°
Original SWA	-7.0°	-7.0°	-7.0°	-9.0°	-9.0°
Roth SWA	-2.0°	-7.0°	-7.0°	-14.0°	-14.0°

Table 5 Upper Posterior Torque

The upper cuspid and bicuspid torque values of -7° have proven to be satisfactory in most cases, and have therefore been selected for the MBT Versatile+ Appliance. The upper molars, on the other hand, frequently show excessive buccal crown torque with palatal cusps "hanging down" which creates centric, balancing side

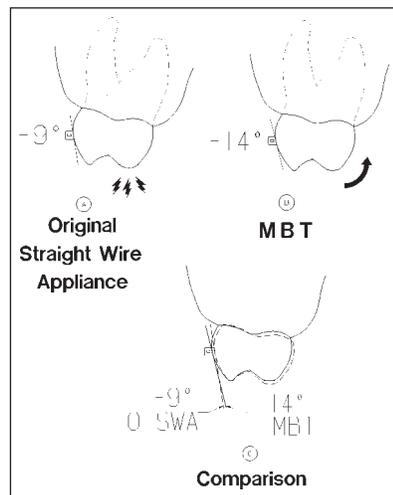


Fig. 17

and working side interferences. For this reason the authors prefer -14° of buccal root torque in these teeth, as opposed to only -9° of buccal root torque (Fig. 17a, b, c).

Lower Cuspid, Bicuspid and Molar Torque

Table 6 shows torque values for lower cuspids, bicuspids and molars from Andrews' non-orthodontic normal study¹, two Japanese studies^{2,3}, the MBT Versatile+ Appliance, the Original Straight-Wire Appliance⁶ and the Roth Appliance⁶.

There are three reasons for reducing the amount of lingual crown torque in the lower cuspid, bicuspid and molar areas: 1) Since lower cuspids and sometimes bicuspids often show gingival recession, they benefit from the roots being moved closer to the center of the alveolar process; 2) many orthodontic cases demonstrate narrowing in the maxillary arch with lower posterior segments that are compensated toward the lingual. These

	Lower Posterior Torque				
	Cuspid	1st Bi	2nd Bi	1st Molar	2nd Molar
Andrews' norms	-12.7°	-19.0°	-23.6°	-30.7°	-36.0°
Sebata's data	-4.7°	-14.8°	-22.6°	-26.2°	-31.0°
Watanabe's data	-11.1°	-18.4°	-21.8°	-31.2°	-32.9°
MBT Versatile+	-6.0°	-12.0°	-17.0°	-20.0°	-10.0°
Original SWA	-11.0°	-17.0°	-22.0°	-30.0°	-35.0°
Roth SWA	-11.0°	-17.0°	-22.0°	-30.0°	-30.0°

Table 6 Lower Posterior Torque

cases benefit from buccal uprighting of the lower posterior segment. 3) It has been consistently observed that lower second molars with -35° of torque consistently "roll in" lingually. Therefore, the authors have chosen to reduce the lingual crown torque, by 5° in the lower cuspids and bicuspids, by 10° in the lower first molars, and by 25° in the lower second molars (Fig. 18a, b and 19a, b, c).

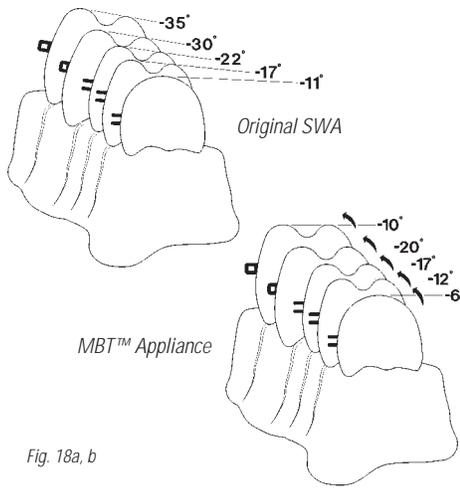


Fig. 18a, b

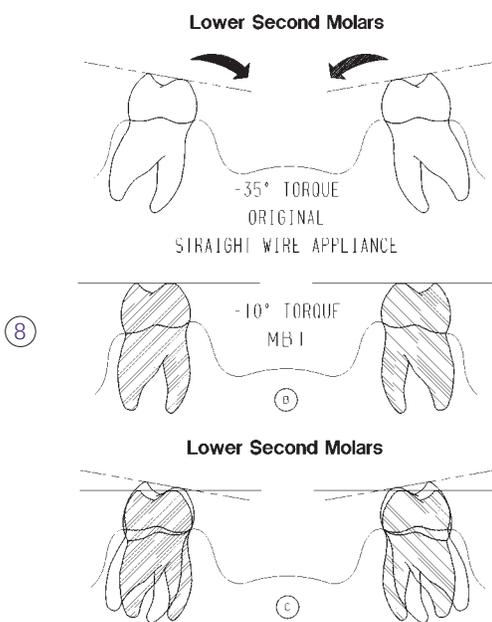


Fig. 19a, b, c

• Figure 19a, b, c Progressive buccal crown torque in the lower posterior segments (cuspid through molars) provides uprighting of these areas, which are frequently inclined lingually.



Fig. 20

• Figure 20 A patient in need of posterior buccal crown torque.

In-out Modifications of the MBT™ Versatile+ Appliance

It has been observed by the authors that the in-out measurements (including molar rotation) for the original Straight-Wire Appliance™ have, for the most part, proven to be quite satisfactory. With the exception of severe rotations at the initiation of treatment (best handled by space opening in combination with facial and lingual rotation elastics) minimal modifications in archwires need to be made until the finishing stage of treatment. At that time some teeth may need to be over-rotated for stability (using rotation wedges) and first molars may need archwire offsets to complete their rotation.

One important in-out feature that has been added to the MBT Versatile+ appliance is because upper second bicuspid are frequently smaller in size than upper first bicuspid. For this reason, an upper second bicuspid bracket has been provided with an additional 0.5mm of in-out compensation. This will allow for better alignment of central fossae in the upper arch and will also provide for relatively increased mesio-buccal rotation of the upper first molar. When upper second bicuspid are similar in size to the upper first bicuspid, an upper first bicuspid bracket can be used on the upper second bicuspid.

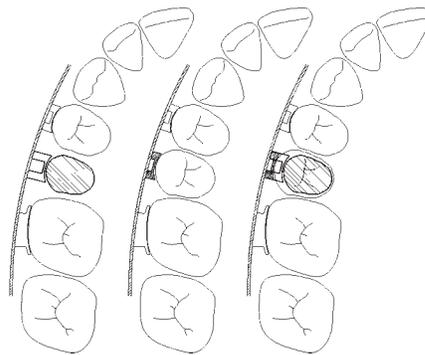


Fig. 21

• Figure 21 An upper second bicuspid bracket with an additional 0.5 mm of in-out compensation is provided for the common situation in which upper second bicuspid are smaller than upper first bicuspid.



Fig. 22

• Figure 22 Patient with smaller 2nd bicuspid

MBT Appliance Versatility

• Inversion of upper lateral incisor brackets (Fig. 23, 24, 25). This is beneficial in cases with palatally displaced laterals requiring labial root torque for proper stability.

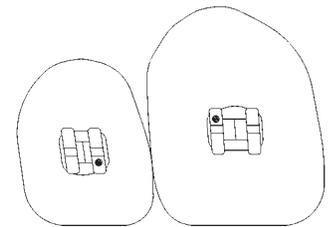


Fig. 23

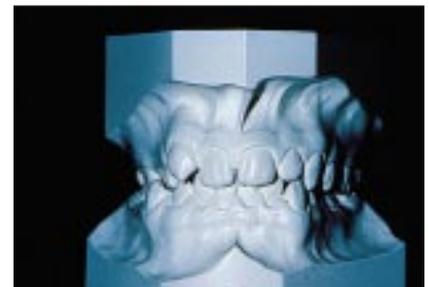


Fig. 24



Fig. 25

• Same tip and torque in lower incisor brackets. With the same lower incisor brackets, inventory is simplified and the possibility of confusion during bracket placement is minimized.

Continuing Education

DATE	PRESENTER	LOCATION	SPONSOR SUBJECT
NOV. 7-8, 1997	<i>Dr. Terry Dischinger</i>	Newport Beach, CA	"Fixed Edgewise Herbst Appliance" Seminar
NOV. 13-17, 1997	<i>Dr. Richard McLaughlin</i>	San Diego, CA	In-Office Seminar
DEC. 4-7, 1997	<i>Dr. Terry Sellke</i> <i>Dr. Anoop Sondhi</i> <i>Ms. Rosemary Bray</i>	Amelia Island, FL	Summit in the Sun
JAN. 16-17, 1998	<i>Dr. Terry Dischinger</i>	Orlando, FL	"Fixed Edgewise Herbst Appliance" Seminar
JAN. 30, 1998	<i>Dr. Richard McLaughlin</i>	Denver, CO	"New Concepts in Treatment Mechanics and the Pre-adjusted Appliance"
JAN. 30-31, 1998	<i>Dr. Anoop Sondhi</i>	Omaha, NE	"Current Concepts in the Orthodontic Management of Temporomandibular Disorders"
JAN. 31 - FEB. 1, 1998	<i>Dr. Richard McLaughlin</i>	Denver, CO	"Inter-Arch Treatment Mechanics"
FEB. 6-7, 1998	<i>Dr. Terry Dischinger</i>	Lake Oswego, OR	"Fixed Edgewise Herbst Appliance" Hands-on program
FEB. 12-16, 1998	<i>Dr. Richard McLaughlin</i>	San Diego, CA	In-Office Seminar
FEB. 13, 1998	<i>Dr. Daniel German</i>	Alaska	Alaska State Society meeting
FEB. 19-21, 1998	<i>Dr. Stephen Tracey</i>	Redlodge, MT	Montana Orthodontic Society
FEB. 19-23, 1998	<i>Dr. Richard McLaughlin</i>	San Diego, CA	In-Office Seminar
FEB. 22-24, 1998	<i>Dr. Terry Sellke</i> <i>Dr. Carl Gugino</i> <i>Dr. Robert Ricketts</i> <i>Dr. Ruel Bench</i>	Loma Linda University Loma Linda, CA	"Zero Base - The West Side Story"
MAR. 26-29, 1998	<i>Dr. Richard McLaughlin</i> <i>Dr. Terry McDonald</i> <i>Dr. Steve Hanks</i>	Las Vegas, NV	Summit in Las Vegas
MAR. 27, 1998	<i>Dr. Gerald Samson</i>	Nebraska	Nebraska Society of Orthodontists
APR. 17-18, 1998	<i>Dr. Terry Dischinger</i>	Lake Oswego, OR	"Fixed Edgewise Herbst Appliance" Hands-on program
APR. 18, 1998	<i>Dr. Richard McLaughlin</i>	Chicago, IL	"New Concepts in Treatment Mechanics and the Pre-adjusted Appliance"
JUN. 26, 1998	<i>Dr. Anoop Sondhi</i>	San Diego, CA	San Diego State Society Meeting
JUN. 26-27, 1998	<i>Dr. Terry Dischinger</i>	Lake Oswego, OR	"Fixed Edgewise Herbst Appliance" Hands-on program
SEP. 25, 1998	<i>Dr. Terry Dischinger</i>	Washington, DC	"Fixed Edgewise Herbst Appliance" Seminar
OCT. 16-17, 1998	<i>Dr. Terry Dischinger</i>	Lake Oswego, OR	"Fixed Edgewise Herbst Appliance" Hands-on program
OCT. 23, 1998	<i>Dr. Richard McLaughlin</i>	Boston, MA	"New Concepts in Treatment Mechanics and the Pre-adjusted Appliance"
OCT. 24-25, 1998	<i>Dr. Richard McLaughlin</i>	Boston, MA	"Inter-Arch Treatment Mechanics"
OCT. 29 - NOV. 2, '98	<i>Dr. Richard McLaughlin</i>	San Diego, CA	In-Office Seminar
NOV. 5-9, 1998	<i>Dr. Richard McLaughlin</i>	San Diego, CA	In-Office Seminar

Continuing Education

DATE	PRESENTER	LOCATION	SPONSOR, SUBJECT
<u>STAFF DEVELOPMENT</u>			
DEC. 4-7, 1997	<i>Dr. Anoop Sondhi</i> <i>Dr. Terry Sellke</i> <i>Ms. Rosemary Bray</i>	Amelia Island, FL	Summit in the Sun
MAR. 26-29, 1998	<i>Dr. Richard McLaughlin</i> <i>Dr. Terry McDonald</i> <i>Dr. Stephen Hanks</i>	Las Vegas, NV	Summit in Las Vegas
Spring 1998	<i>Dr. Randy Kunik</i>	Austin, TX	In-Office Staff Development Program
Summer 1998	<i>Dr. Randy Kunik</i>	Austin, TX	In-Office Staff Development Program
Fall 1998	<i>Dr. Randy Kunik</i>	Austin, TX	In-Office Staff Development Program
Winter 1998	<i>Dr. Randy Kunik</i>	Austin, TX	In-Office Staff Development Program
<u>INTERNATIONAL CALENDAR</u>			
OCT 14-15, 1997	<i>Dr. Anoop Sondhi</i>	Bombay, India	"Current Concepts in the Orthodontic Management of TMD"
JAN. 10-12, 1998	<i>Dr. Carl Gugino</i>	Madrid, Spain	"An Overview of The Zero Base Philosophy"
FEB 5-7, 1998	<i>Dr. Anoop Sondhi</i> <i>Dr. Stephen Tracey</i>	Whistler, Canada	3M Unitek Ski Weekend '98
JULY 18, 1998	<i>Dr. Richard McLaughlin</i>	London, Ontario, CAN	"New Concepts in Treatment Mechanics and the Pre-adjusted Appliance"
<u>ORTHODONTIC EVENTS</u>			
NOV. 2-5, 1997	_____	Atlantic City, NJ	Middle Atlantic Society of Orthodontics
NOV. 3, 1997	_____	San Francisco, CA	Pacific Coast Society of Orthodontists
NOV. 7-11 1997	_____	Marco Island, FL	Southern Association of Orthodontists
DEC. 6-10, 1997	_____	New York, NY	Northeast Society of Orthodontists
MAY 16-20, 1998	_____	Dallas, TX	American Association of Orthodontists
<p>For more information, please call the 3M Unitek CE HOTLINE at 1-800-852-1990 ext. 4649 or 626-574-4649. Or, visit the Professional Relations/Continuing Education Site on the 3M Unitek web page at http://www.3M.com/unitek.</p>			
		<p>Dr. Thomas Creekmore Receives 1997 Martin E. Dewey Memorial Award</p> <p>The Martin E. Dewey Memorial Award was established by the Southwestern Society of Orthodontics in 1953. This award immortalizes Dr. Martin Dewey, an honorary member of this society, founder of the Kansas City School of Orthodontics, first editor of the American Journal of Orthodontics in 1911, President of the AAO, one of the first seven men elected to serve on the American Board of Orthodontics in 1922, and present of the ADA in 1932.</p> <p>This award provides recognition to Southwestern Society of Orthodontics members for their contributions to the field of orthodontics, especially in the areas of education, research or public relations. 3M Unitek is pleased to offer congratulations to the 1997 recipient of the Martin Dewey Award, Dr. Thomas D. Creekmore.</p>	

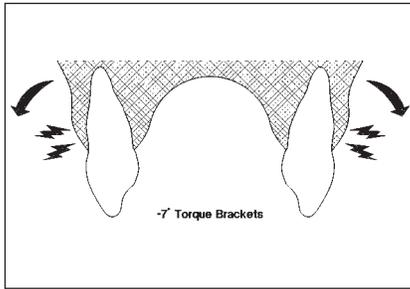


Fig. 26 Normal Bracket -7° Torque

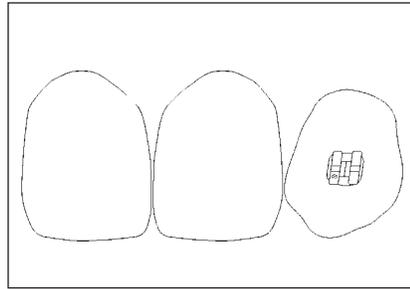


Fig. 29



Fig. 32

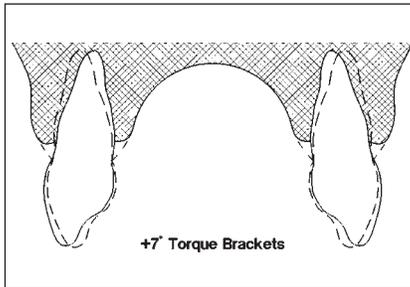


Fig. 27 Inverted Bracket +7° Torque



Fig. 30



Fig. 33

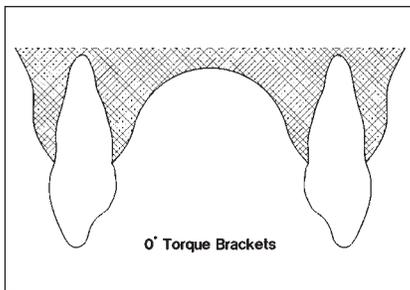


Fig. 28 Optional Bracket 0° Torque With Hook



Fig. 31



Fig. 34

- **Inversion of cuspid brackets with prominent cuspid roots.** (Figure 26, 27). This adjustment allows for movement of the cuspid roots away from the cortical plate and into the center of the alveolar process.

- **0° cuspid brackets with hook for extraction cases.** (Figure 28). Many orthodontists prefer to have a hook on their cuspid bracket, and the zero degree torque value also allows the cuspid to move away from the cortical plate for easier retraction.

- **Inversion of upper cuspid brackets when cuspids are in the lateral position.** (Figure 29, 30, 31). This adjustment allows the cuspid root to move palatally and assume a position and appearance that more closely resembles the lateral incisor.

- **Same tip and torque in upper bicuspid brackets.** Thus, in most situations, one bracket is used for all four upper bicuspids. This simplifies inventory and provides for less confusion during placement.

- **Additional 0.5mm of in-out in upper second bicuspid brackets.** (Figure 32). Approximately 30% of upper second bicuspids are smaller than upper first bicuspids. This bracket is most beneficial in this situation. If all four bicuspids are the same size, then first bicuspid brackets can be placed on both first and second bicuspids.

- **Upper second molar bands and brackets on upper first molars in non-headgear cases.** (Figure 33). This adjustment provides greater comfort for the patient, as opposed to the placement of an unnecessary headgear tube.

- **Lower second molar bands and brackets on lower first molars.** When the buccal cusps of upper first molars impinge on the bracket of the lower first molar, the use of the lower second molar band with a much lower occlusal profile bracket often eliminates this problem.

- **Lower second molar brackets on upper first and second molars when finishing in a Class II molar relationship.** (Figure 34, 35). The lower second molar bracket has zero rotation and 10° of torque which places the Class II upper first molar in a correct relationship with the lower first molar.

- **Inventory identification.** This is vastly simplified by the pre-labeled individual blister packs of the APC™ Adhesive Coated brackets used in the operatory.



Fig. 35

3. Bracket Placement

Prior to the development of the pre-adjusted appliance, edgewise brackets were placed using gauges which set the bracket a specific number of millimeters from the incisal or occlusal tooth surface. When the pre-adjusted

"In the past, the best results were achieved by the orthodontists who were the best wire benders. In the future, the best results will come from those orthodontists who are the best bracket positioners."

-MBT

appliance was developed, the center of the clinical crown became the vertical reference for bracket placement, and most orthodontists discontinued the use of gauges. The brackets were therefore placed by visually selecting the center of the clinical crown. Unfortunately, this method resulted in significant errors relative to vertical placement. For example:

- Gingival variations, such as partially erupted teeth, labially and lingually (palatally) displaced roots, and gingival inflammation led to placement errors.
- Large teeth (upper central incisors) and small teeth (upper lateral incisors) within the same patient led to obvious errors when brackets were placed in the center of the clinical crown.
- Incisal or occlusal fractures and wear, as well as teeth with extremely tapered and pointed cusps, led to bracket placement errors. (Figure 36)

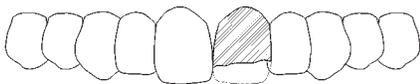


Fig. 36

MBT™ Versatile+ Appliance Bracket Placement Guide

	U7	U6	U5	U4	U3	U2	U1	Upper Arch
A	2.0	4.0	5.0	5.5	6.0	5.5	6.0	+1.0mm
B	2.0	3.5	4.5	5.0	5.5	5.0	5.5	+0.5mm
C	2.0	3.0	4.0	4.5	5.0	4.5	5.0	Average
D	2.0	2.5	3.5	4.0	4.5	4.0	4.5	-0.5mm
E	2.0	2.0	3.0	3.5	4.0	3.5	4.0	-1.0mm

	U7	U6	U5	U4	U3	U2	U1	Lower Arch
A	3.5	3.5	4.5	5.0	5.5	5.0	5.0	+1.0mm
B	3.0	3.0	4.0	4.5	5.0	4.5	4.5	+0.5mm
C	2.5	2.5	3.5	4.0	4.5	4.0	4.0	Average
D	2.0	2.0	3.0	3.5	4.0	3.5	3.5	-0.5mm
E	2.0	2.0	2.5	3.0	3.5	3.0	3.0	-1.0mm

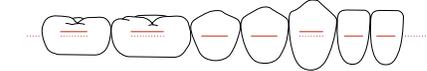


Fig. 39



Fig. 40



Fig. 41

The use of a bracket placement chart (developed in 1994), as well as pre-adjusted Dougherty gauges, Figures 37 and 38, dramatically reduces bracket placement errors in the vertical dimension. Figures 39 through 44 show placement technique. We have experienced approximately a 50 - 60% reduction in the need to reposition brackets

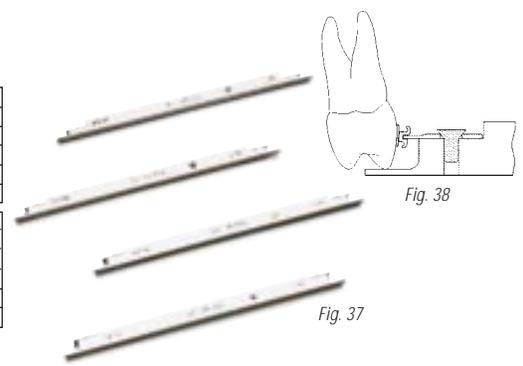


Fig. 42



Fig. 43



Fig. 44



during treatment using this very simple but effective system.

Figure 39, 40, 41 illustrate measuring on the occlusal plane, burnishing the band, and then light curing the band and tube in position.

Figure 42, 43 and 44 show checking bracket height and tip, then curing.

• A Clinical Review of the MBT™ Orthodontic Treatment Program

4. Arch Form and Wire Sequencing

Interview with Dr. Richard P. McLaughlin

Editor: Arch form and archwire sequencing are a very important part of the McLaughlin-Bennett-Trevisi philosophy of orthodontic treatment. Can you comment in general on this importance?

Dr. McLaughlin: The proper selection of an arch form for each patient as well as the development of a general archwire sequencing system in the orthodontic practice can greatly increase treatment efficiency and also provide greater stability in completed cases.

Editor: Can you offer an historical perspective on the subject of arch form?

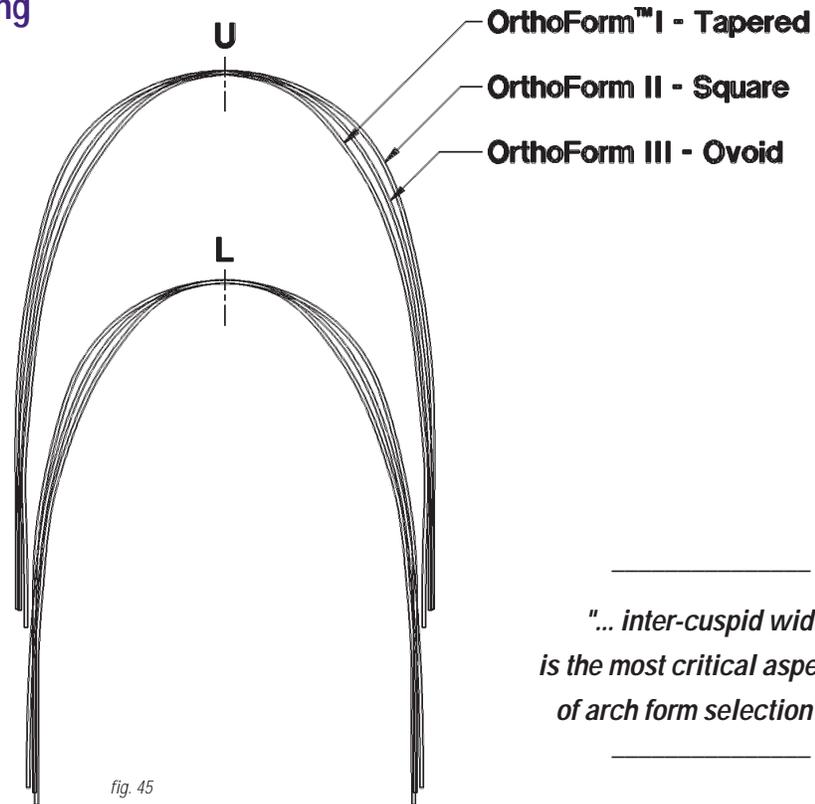
Dr. McLaughlin: A review of the orthodontic literature on the subject of arch form reveals that there are three main themes that run throughout this information. The first is the search for the ideal arch form (Bonwill-Hawley, catenary curve, Brader arch form, etc.). Second is the conflicting view that there is a great deal of variation in human arch form. The third is that when arch form is significantly changed in the patient, there is a great tendency toward orthodontic relapse.

Editor: How should this information affect the choices an orthodontist must make when selecting an arch form for each patient?

Dr. McLaughlin: This information, as well as treating patients over a 20 year time period, indicates that the use of a single arch form in all patients is an unsatisfactory method of treatment. Some method of individualization must be carried out.

Editor: Does this then mean that archwires must be individually customized for each patient, or can some system of pre-formed arch wires be utilized?

Dr. McLaughlin: The arch form has four main components, 1) the anterior



curvature, 2) inter-cuspid width, 3) posterior curvature and 4) inter-molar width. Anterior curvature is primarily determined by inter-cuspid width, with a more tapered shape in patients with narrow inter-cuspid width and wider curvature in patients with wider inter-cuspid width. The literature reveals that inter-cuspid width is the most critical aspect of arch form selection.

Figure 45 shows the super-imposition of three arch forms, tapered, square and ovoid. (This designation was used by Dr. Robert Ricketts a number of years ago.)

Selecting one of these three arch forms using a clear template over the lower study model provides a 6mm range of inter-cuspid width, which is adequate for the great majority of patients in an orthodontic practice. These three arch forms are important with wires that are stiff enough to

affect arch form, such as the wires in Figure 47. For lighter force wires, such as the wires in Figure 46, a single ovoid arch form is adequate, which simplifies inventory requirements.

In the past, posterior arch form shape has varied from a straight line (Bonwill-Hawley) to a significant curvature (Brader). Figure 45 arch form super-impositions show a slight curvature in the posterior arch form, which seems to be a practical approach. The posterior arch form is slightly widened in the bicuspid region to provide better function during protrusive movement, (as described by Roth) and to decrease the tendency for arches to collapse in the bicuspid region in extraction cases.

Figure 45's inter-molar width is essentially the same. That is because it is impractical to maintain a large inventory of arch forms with many

choices for inter-molar width. Therefore, this area can be easily widened or narrowed for each patient, particularly in the rectangular wire stage of treatment and in the heavier wires just prior to this wire. This of course is much easier to do than constantly adjusting to the anterior aspect of the arch form, which is much more difficult and very time consuming.

Editor: What other methods can be used to aid in the stability of the orthodontic case relative to arch form?

Dr. McLaughlin: Rather than proceeding from rectangular wires to retainers, it is beneficial to allow cases to settle for a minimum of a month and a half in very light arch wires at the end of treatment. This allows for settling of the arch form to a more physiologic position for the patient, based on the tongue and face musculature. It also allows for vertical settling of the dentition, which is most important. In addition to this, the use of a bonded lower anterior retainer allows for some settling of inter-cuspid width without movement in the incisor area.

Editor: You have recently developed a more efficient system of arch-wire sequencing by taking advantage of major developments in wire technology. Was this sequence transition easy, and more important, how valuable has it been in your practice?

Dr. McLaughlin: Figures 46 and 47 illustrate the six wires replaced by only two wires for the .022 slot MBT™ Versatile+ Appliance system.

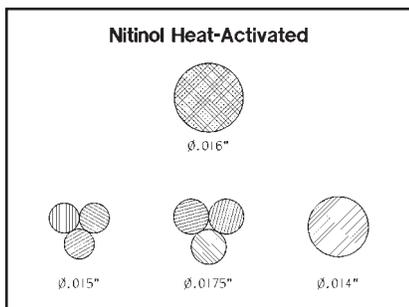


fig. 46

• **Figure 46 Nitinol Heat-Activated .016" replacing .015" and .0175" multi-strand steel and .014" stainless steel.**

The use of the .016" Nitinol Heat-Activated wire to replace multi-strand and the .014" round wire has been most satisfactory. This initial arch wire can be placed with ease in most cases, and can be retied one or two times at 4 to 6 week intervals.

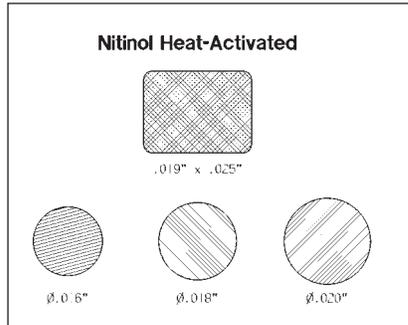


Fig. 47

• **Figure 47 Nitinol Heat-Activated .019 x .025" replacing .016", .018" and .020" round stainless steel.**

The .019 x .025" Nitinol Heat-Activated can also be retied at the same 4 to 6 week intervals.



fig. 48



fig. 49



fig. 50



fig. 51

As Figure 48, 49, 50, 51 illustrate, engagement of a Nitinol Heat-Activated wire can be facilitated with use of Endo Ice®, followed by tying in with a steel ligature*. Because of rapid cooling, this procedure can be performed quickly and comfortably.

(*CF: Newswire article by Dr. Joseph Caruso, Spring 1994)

The remaining wire used is an .019 x .025" rectangular stainless steel.

Use of Nitinol Heat-Activated wires in my orthodontic practice has resulted in much less chair time involved in each visit. Secondly, the intervals between patient visits has been slightly increased. Thirdly, tooth movement is actually much more efficient, and as a result, the aligning phase of treatment is completed more rapidly. This in turn allows me to complete overbite control, overjet reduction and space closure sooner in treatment, which in turn allows more time for finishing and detailing of the case, which enhances treatment end result quality.

Editor: What role do the tapered, ovoid and square wire arch forms play in preventing relapse?

Dr. McLaughlin: With the edgewise appliance, most orthodontists customized archwires to the patient's arch form. When the pre-adjusted appliance was developed, there seemed to be an unwritten assumption that one specific arch form needed to be used for that system, and that arch form was the most appropriate.

After twenty years of using the pre-adjusted appliance, it is apparent that customizing the arch form to the individual patient is what is really most important. Failure to do this will result in relapse. In and out dimension covered some problems, but not all of them. What I would like to see is a return to a customized arch form for each patient without the need to overstock office inventory or waste time in unneeded wire bending. This seems to be the best method of efficiently achieving stable and esthetic end results.

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6. 'A' Company Orthodontics catalogue, 'A' Company Orthodontics, 9900 Old Grove Rd., San Diego, CA 92131-1683

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• MBT™ Continuing Education Seminars

New Concepts in Orthodontic Treatment Mechanics - Available in 1997 and 1998

This seminar 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+ 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 - Available in 1998

This seminar is a natural progression of the "New Concepts" seminar. The principles of intra-arch treatment mechanics 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 areas are also discussed.

Management of the Dentition - Available in 1999

This seminar describes the management and correction of specific dental

problems involving each individual tooth. Thus, specific clinical situations related to incisors, cuspids, 1st and 2nd bicuspids, and 1st, 2nd and 3rd molars are discussed. The extraction versus non-extraction issue is reviewed in detail. The seminar will also provide an in-depth review of the material in Dr. Bennett's and Dr. McLaughlin's newest 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 a house's foundation. Without it, the house is subject to future instability, as is the malocclusion treated to the incorrect condyle position.

This seminar 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 is discussed in detail.

Diagnosis, Treatment Planning and Treatment Mechanics

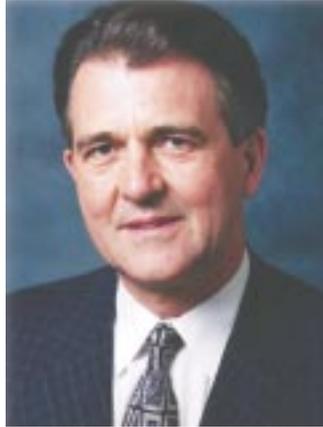
This seminar brings together the information from the previous four seminars by placing emphasis on the all important area of diagnosis and treatment planning. The topics covered in previous programs are all relevant to this seminar, which looks at a wide variety of treatment situations. Each case is 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 as well.

• About the Authors



Dr. Richard McLaughlin -
San Diego, California

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 -
London, England

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.

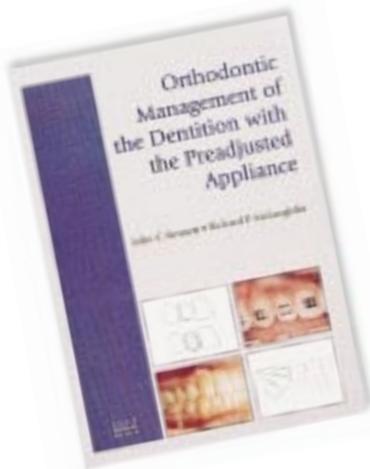


Dr. Hugo Trevisi -
São Paulo, Brazil

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.

• MBT™ Text Support

Two text books, "Orthodontic Treatment Mechanics and the Preadjusted Appliance" & "Orthodontic Management of the Dentition with the Preadjusted Appliance," both co-authored by *Dr. John Bennett and Dr. Richard McLaughlin*, support the MBT philosophy, but are not Edition 1 and Edition 2 textbooks. Rather, each are textbooks on entirely different subjects.



"Orthodontic Management of the Dentition with the Preadjusted Appliance" was released in 1997.

A book by orthodontists for orthodontists that blends research evidence with long clinical experience, this new and innovative book considers each tooth separately in the dentition. Entirely new, it looks at orthodontics in a fresh and organized way, that allows you to fine-tune your treatment management strategies.

Easily readable with ultra-clear layouts and diagrams, it is a valuable sequel to the best selling "Orthodontic Treatment Mechanics and the Preadjusted Appliance".

Contents Include:

1. General information on research involved in bracket placement techniques as well as information on the use of the bracket placement chart.
2. Detailed information on research involved in bracket placement

3. Individual information on each tooth in the dentition concerning general mechanical considerations and common clinical concerns.

Incisors - Information on various aspects of incisors such as trauma, tooth size discrepancy, congenital absence and malformation and shape of these teeth.

Cuspids - Information on the management of clinical situations such as cuspid impaction.

First bicuspid - In this section of the text the controversy of first bicuspid extraction over the years is discussed in detail. There is also information which overlaps somewhat with Book I on the mechanics of first bicuspid extraction.

Second bicuspid - The problems of congenitally missing second bicuspid, retained deciduous second molars and second bicuspid extraction are discussed in this chapter.

First molars - General considerations on first molars, including discussion of possible indications for extraction, are included in this chapter.

Second molars - The vertical and horizontal anchorage aspects of second molars are discussed in this chapter as well as the very controversial subject of second molar extraction.

Third molars - Research on the development, eruption and extraction timing of third molars is discussed in this chapter.

4. In each chapter a detailed discussion of the MBT bracket prescription and rationale for use of these brackets is discussed in detail.

376 pages, 1050 color illustrations, 330 line drawings, 31 case studies showing stage-by-stage treatment methods. *Available worldwide through 3M Unitek, (REF 014-243).*

"Orthodontic Treatment Mechanics and the Preadjusted Appliance," on the other hand, published in 1993, contains the following information:

1. Basic orthodontic mechanics on Class I extraction and non-extraction types of cases.
2. General information on bracket positioning and basic information on the pre-adjusted orthodontic appliance.
3. Information on the transition from Standard Edgewise to the pre-adjusted appliance
4. Information on anchorage control and leveling and aligning of the orthodontic case
5. Information on overbite control with emphasis on correction of deep overbites.
6. A limited amount of information on the very large subject of overjet reduction.
7. Information on the mechanics of space closure in extraction cases.
8. Some general information on the subject of finishing and detailing of orthodontic cases.