

# PROCEDURES MANUAL

# T4B™ THE TRAINER FOR BRACES

developed by Dr. Chris Farrell (BDS Sydney University)

**BREAKS** myofunctional bad habits

**REDUCES** soft tissue trauma from brackets

**IMPROVES** effectiveness of fixed appliances

**TREATS** TMJ symptoms in zero chair time

Contact us for a **FREE** instructional video on the  
**TRAINER System / FARRELL BENT WIRE System.**

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## CONTENTS:

Research  
2

Introduction to  
The T4B  
3 - 4

Indications for  
use  
5 - 7

Design Features  
8

Issuing The T4B  
to patients  
9



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## Abstracts from American Journal of Orthodontics - Dentofacial Orthopedics, Vol. 113 No. 6 June 1998

### 1. Readers Forum: Page 14A

"It has been observed that with cases of this type, treatment can be successful but retention very questionable. Muscle factors, tongue position, and function all play a great part and can lead to eventual change or recurrence of the original problems<sup>1</sup>. My observation over the years has been that change is the only constant factor and that to expect complete long term stability is not possible. Let us hope that this muscle adaptation to the new environment is satisfactory."

H. Brown Otopalik, DDS

### Page 15A

"I would like to thank Dr Otopalik for his generous comments regarding the case I presented in the December 1997 issue of the American Journal of Orthodontics and Dentofacial Orthopedics (1998;113:589-95). I agree with his concerns about muscle and tongue position and function<sup>1</sup>. With every orthodontic case, long term stability has been a major concern for any clinical orthodontist."

Jeryl D. English, DDS, MS

### Readers Forum: Page 15A to Dr Graber

"It also stands clear to me that we are still focusing on the tip of the iceberg. Have you realized that, even with the use of orthopedic and functional appliances, the main goal is still 'straightening of the teeth?' The aim is still moving teeth, the tip of the iceberg. But, what about the ice below the ocean level, which counts for more than 90% of the iceberg mass? What about all those muscles, soft tissue, nerves, tendons, bones etc. underneath the teeth?"

Marcos Nadler Gribel, DDS

### 2. Page 603

#### Nasal Obstruction and Facial Growth: The Strength of Evidence for Clinical Assumptions

"The orthodontic relevance of nasorespiratory obstruction and its effect on facial growth continues to be debated after almost a century of controversy. If both data and untested popular beliefs are subjected to the same rigorous criteria, indications for the orthodontic management of patients with nasorespiratory obstruction may gain a more rational approach to treatment recommendations<sup>2</sup>." (Am J Orthod Dentofacial Orthop 1998;113:603-11)

Katherine W. L. Vig, BDS, MS, FDS, DOrth

### 3. Page 625

#### Unexpected Temporomandibular Joint Findings During Fixed Appliance Therapy

"This small study seems to suggest that temporomandibular joint signs and symptoms are changing, inconsistent, and ephemeral in many orthodontic patients regardless of the treatment mechanics<sup>3</sup>." (Am J Orthod Dentofacial Orthop 1998;113:625-31)

Albert H. Owen III, DDS, MSD

### 4. Page 687

"After we remove the braces, must we retain for life or risk becoming part of the 90% failure rate?<sup>4</sup>

"To create a difference, we must have the audacity to retrace our steps, bring together all interested persons, and have the courage to build and confront differences. The truth is not a truth of preferences, but a truth that will set the wheel in motion to negotiate a more realistic approach to counteract the relapse phenomenon."

Prof. Marc Saadia, DDS, MS, and Roberto Valencia, DDS

**Just one  
RANDOM issue  
of the American  
Journal of  
Orthodontics -  
Dentofacial  
Orthopedics  
illustrates  
the PROBLEM**

"Muscle factors, tongue position, and function all play a great part and can lead to eventual change or recurrence of the original problems."

"I agree with his concerns about muscle and tongue position and function."

"It also stands clear to me that we are still focusing on the tip of the iceberg."

"The orthodontic relevance of nasorespiratory obstruction and its effect on facial growth continues to be debated."

"Temporomandibular joint signs and symptoms are changing, inconsistent, and ephemeral in many orthodontic patients"

**"After we  
remove the  
braces, must  
we retain for  
life or risk  
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of the 90%  
failure rate?"**

In Europe, the concept of the use of functional appliances for redirection of growth in combination with arch expansion has been a popular choice for the treatment of many common malocclusions for most of this century. Correction of class II malocclusions would be difficult without the use of these appliances. More widespread adoption of these techniques, particularly in North America has been limited by the inherent disadvantages and criticism of these so called functional appliances. There has also been a trend in Europe to adopt a fixed only system.

**The advantages of functional appliances** are early treatment of malocclusion, orthopedic effects on the bone allowing for the correction of skeletal malocclusions not possible with dentally fixed appliances.

**General disadvantages** are lack of ability to align the teeth, plus complex and expensive construction. The more the appliances are developed to improve their performance, the more prone they are to breakage and poor compliance. Furthermore, despite their name, few functional appliances have significant effects on the soft tissue. ie; correction of tongue thrusting, reverse swallowing, oral habits and mouth breathing, all of which have been shown to greatly influence growth and dental alignment.<sup>1,5,6,7,8</sup>

### **Prolonged treatment time**

More recently there has been a trend to combine a 2 phase system to obtain the best of functional and fixed appliance treatments, recognising the shortcomings of both systems used separately. That means 1-2 years of functional appliances and then (as they are poor at dental alignment), use fixed appliances for another 1-2 years plus retention. Orthodontic treatment, therefore, can be prolonged to 4 or more years. Children, parents and Orthodontists prefer a shorter treatment time and tend to want to skip the functional phase and to just focus on effective tooth alignment for practicality. These disadvantages have led to a widespread tendency, particularly in North America, to use fixed appliances only, in the permanent dentition and to ignore the advantages of a 2 phase functional and fixed treatment procedures. This trend has also become the norm in much of Western Europe.

### **Treating more than dental alignment**

In the June issue of the American Journal of Orthodontics and Dentofacial Orthopaedics (Vol. 113, No 6) are featured articles on effects of the soft tissue in Orthodontics, impact of airway restriction on growth, TMJ in treated Orthodontic cases and relapse, plus a review of functional appliance effects. There would appear to be a healthy debate amongst Orthodontists whether this current 'fixed only' treatment is providing an adequate result in the longer term.

This single issue would indicate a continued awareness that there is a need to look at treatment plans more comprehensively. Treat the oral muscles, the tongue malposition and dysfunction<sup>1</sup>. Correct mode of breathing.<sup>2</sup> Remove some of the potential relapse factors rather than use permanent retention.<sup>1,4</sup> Treat TMJ problems as they develop during Orthodontic treatment.<sup>3</sup> (see separate panel for abstracts)

## **COMBINED FUNCTIONAL AND FIXED APPLIANCE SYSTEM**

**Treating more  
than dental  
alignment**

**Treat the oral  
muscles, the  
tongue  
malposition  
and  
dysfunction<sup>1</sup>**

**Correct mode  
of breathing<sup>2</sup>**

References cont:

<sup>5</sup>Angle "The Treatment of Malocclusion of the Teeth" Edition 7. Chapter 2. Philadelphia: 1907.

<sup>6</sup>Graber. "The Three M's. Muscle, Malformation and Malocclusion". AJO-DO 1963 Jun (418-450).

<sup>7</sup>Bresolin, Shapiro, et al. "Mouth Breathing in Allergic Children: Its relationship to Dentofacial Development". AM J ORTHOD DENTOFAC ORTHOP 1983.

<sup>8</sup>Nevant, Buschang, Alexander, Steffen. "Lip Bumper Therapy for Gaining Arch Length". AM J ORTHOD DENTOFAC ORTHOP 1991;100:330-6

<sup>9</sup>Woodside, Linder-Aronson, Londstrom and McWilliam. "Mandibular and Maxillary Growth After Changed Mode of Breathing". AM J ORTHOD DENTOFAC ORTHOP 1991;100:1-18.

<sup>10</sup>Weinstein S. - AJO 1967;53:881-903

<sup>11</sup>Proffit W.R. - Arch Oral Biol 1972;17:555-63.

## The need for a combined functional and fixed appliance system

The **TRAINER FOR BRACES™** was developed out of the need to assist the treatment of the soft tissue, tongue position and potential TMJ problems. As an added bonus, it covers the brackets and bands, preventing much of the irritation from them to the adjacent soft tissues. It is not intended to replace the functional appliance phase, but allows ‘functional type’ treatment in combination with fixed appliances. The **T4B™** has also specific design features for ‘myofunctional training’.

The **TRAINER FOR BRACES™ (T4B™)** is a prefabricated single size functional appliance that has channels to fit over orthodontic brackets providing soft tissue protection and specific myofunctional training features. It also acts like a functional appliance in Class II correction and a TMJ splint.

## Treating muscle factors, tongue position, and function<sup>1,5,6</sup>

The **T4B™** has tongue tag for the active retraining of tongue position. The tip of the tongue is ‘trained’ into the correct position. The tongue guard stops tongue thrusting while in place. This eliminates detrimental forces on the dentition which can slow treatment progress. Lip bumpers are present to stretch the mentalis muscle area to break the reverse swallow habit that is responsible for lower anterior crowding and mandibular underdevelopment<sup>3</sup>.

## A functional appliance

The **T4B™** is made in an edge to edge class I position making it effective in class II correction. In addition the double mouthguard effect prevents mouth breathing similar in function to an Oral Screen. The correction of mouth breathing<sup>2,9</sup> is one of the most important factors in maintaining maxillary arch expansion which can be lost in the fixed appliance stage. Maxillary expansion has often been criticised for lack of stability. Some orthodontists never consider expansion because of this possible relapse factor. The tongue is capable of exerting forces of 300-500gm<sup>11</sup> against the palate. In the correct position this is able to maintain the maxillary width while dental alignment is taking place. After maxillary expansion, a correction in mode of breathing and resting tongue position is the goal of the **T4B™** for this reason.

## The importance of correcting myofunctional habits in conjunction with dental alignment

Since the time of Edward Angle in 1907, many publications in the Orthodontic literature have indicated the important effect of the soft tissue in influencing both the dental position and craniofacial development.

*“..more often than is recognized, the peculiarities of lip function may have been the cause of forcing the teeth into the malpositions they occupy.”*

Dr. E.H. Angle - The Treatment of Malocclusion of the Teeth Edition 7. Chapter 2. Philadelphia: 1907.

“The effect of muscle forces is three-dimensional, although most orthodontists have considered it only in one vector - that of expansion. Whenever there is a struggle between muscle and bone, bone yields. *It is imperative that the*

## Myofunctional Training

The aim of the **T4B™** is to assist in the correction of the myofunctional habits that cause the teeth and jaws to develop incorrectly.

That is tongue thrusting, incorrect swallowing and mouth breathing. In addition the soft tissue (lips and cheeks) are protected from the irritation of the brackets and wire which cause discomfort in the initial stage of orthodontics.

*orthodontist appraise muscle activity and that he conduct his orthodontic therapy in such a manner that the finished result reflects a balance between the structural changes obtained and the functional forces acting on the teeth and investing tissues at that time.”*

From the AJO-DO 1963 Jun (418-450): The ‘Three M’s’: Muscle, Malformation and Malocclusion - Graber.

**There would appear to be 3 aspects to any malocclusion: Tooth position, Myofunctional bad habits and Jaw position.**

Modern Orthodontic appliances very efficiently move teeth, but most often myofunctional habits go untreated, slowing treatment and compromising stability. Class II correction is also unpredictable even with the best techniques. Myofunctional causes can also be a major factor.

Research has proven repeatedly that ‘muscle will always overpower the hard tissues (teeth and alveolar bone)’. Now it is possible to treat the 3 aspects of malocclusion Myofunctional as well as the dental and skeletal structures with **THE TRAINER FOR BRACES™**

## The use of the TRAINER FOR BRACES™ has 4 major categories

**Soft tissue protection, myofunctional correction, speeding up fixed appliance therapy and TMJ treatment.**

**Immediate soft tissue protection on newly banded cases.** Patients often complain of irritation to the soft tissues in the first week or two after fixed appliance placement. The **T4B™** will prevent this discomfort, particularly while sleeping. This is a good practice builder.

**Class II correction.** After phase I treatment with functional appliances, the class II correction can be lost often due to recurrence of myofunctional habits. The **T4B™** is made in a class I position to reinforce the class II correction while in the fixed appliance stage. You can also combine functional and fixed phases with the **T4B™**.

**Myofunctional habits** such as tongue thrusting, reverse swallow and mouth breathing can be major factors in some malocclusions, making treatment time prolonged and compromising stability. The myofunctional characteristics of the **T4B™** can stop tongue thrusting when in place and also the tongue tag assists in retraining the tongue into the correct position and the lip bumper stretches the overactive mentalis, preventing reverse swallowing cases.

**Eliminate TMJ symptoms** that develop during the use of fixed appliances. Patients who develop TMJ symptoms after the commencement of the treatment can have TMJ treatment concurrent with fixed orthodontic treatment without interruption. TMJ patients undergoing phase II correction can continue splint therapy using the **T4B™** without disruption to tooth movement. Discluding the dentition at night can also speed up tooth movement.

**There would appear to be 3 aspects to any malocclusion: Tooth position, Myofunctional bad habits and Jaw position**

**Soft tissue protection, myofunctional correction, speeding up fixed appliance therapy and TMJ treatment**

The Trainer for Braces™ was designed for multiple uses within orthodontic practice to resolve some of the day to day annoyances to both patient and practitioner



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## The Most Common Uses

### Soft Tissue Protection for Newly Banded Cases

The problem of trauma to the soft tissues is common when fixed appliances are first applied. This issue is often overlooked by the Orthodontist, but can be a major focus for the patient and concerned parent. This trauma is highlighted at night when the child is sleeping. Although various remedies are suggested to the patient, full and positive coverage of the fixed appliance seemed to be the best solution to the potential liability of severe soft tissue trauma. The T4B™ covers the offending braces and eliminates much of the trauma to the child in those first few weeks of fixed treatment.

### Elimination of the Detrimental Effects of Tongue Habits.

#### Anterior Open Bite

Tongue thrusting in anterior open bite cases can perpetuate the malocclusion due to the fact that the tongue can overpower the forces generated by the wire. The T4B™ obviously stops the tongue coming in between the teeth and also actively retrains the tongue to 'the spot' as in myofunctional therapies. This both speeds up treatment and improves stability.

#### Class II Correction

The T4B™ is used like a functional appliance to both advance the mandible to a Class I and stop the tongue thrusting and lip habits associated with this malocclusion. Removal of these aberrant forces allows the Class II mechanics to be more effective. **Note: Class II elastics can be used in conjunction with the T4B™ by cutting a slot for the canine tag allowing attachment of elastics between arches.**

#### Deep Bite

Bite opening can be achieved with the T4B™ worn at night and the distal ends shortened to allow super eruption of the second molars.

#### TMJ/Bruxing Treatment

With orthodontic treatment comes a lot of tooth movement which can create prematurities and subsequent TMJ symptoms. This can be disturbing for the patient and the orthodontist as many times the symptoms do not subside without treatment. The T4B™ is an ideal night time splint with a thicker section on the base for joint teeth compression with the soft silicone material allowing to compensate for occlusal disharmony. this can be implemented without interruption to the fixed appliance regime.

**Prevent soft tissue trauma**

**Issue the T4B™ at or before all full band-ups**

**Break myofunctional bad habits**

**Anterior Open Bite**

**Class II Correction**

**Deep Bite**

**Treat and prevent TMJ problems**

## Phase II Treatment After Functional Type Appliances ie. Twin Block, Bionator Frankel etc...

There is an age old problem of Class II correction can be lost after functional appliances are removed and fixed phases implemented. Although appliances like the Clark Twin Block can continue to be used during the fixed phase. Still the patient is not settling into the correct bite and also tooth movement often makes the fit of these appliances unsatisfactory. The **T4B™** is ideal to continue Class II correction vertical dimension opening and myofunctional training seamlessly in combination with phase II fixed therapy.

### Shorter treatment time

There is still considerable debate on the role of myofunctional bad habits such as tongue positioning and function, mode of breathing etc as causative factors in a malocclusion<sup>5,6</sup>. However it is considered that the removal of these detrimental forces on the dentition should alone speed up treatment and prevent some relapses. The **T4B™** is not intended as a replacement for functional appliances such as Andresson, Frankel etc or simple early treatment devices such as the Oral Screen and the Pre-Orthodontic TRAINER (T4K). It is merely another useful appliance that can continue the 'functional' philosophy into the fixed appliance treatment. For those orthodontists (the majority) who prefer to use only fixed appliances the **T4B™** can be implemented as a treatment strategy for the soft tissues and the TMJ in a seamless coordinated way without adding to treatment time and to possibly decrease it. The impact on stability of the corrected result is a matter of debate. However, with the intense existing awareness in the scientific literature that relapse is somewhat inevitable in many cases<sup>1,2,4</sup> without long term retention, any possible assistance in this area will be a positive step.

**Suggested wear time is about one hour daily plus overnight, this can be varied depending on the case and intended use**

### Orthodontists are finding other uses such as:

- Post crossbite correction.
- Post RPE to retrain the tongue and mode of breathing.
- Use with Class II elastics or headgear. (The side can be adjusted with scissors to expose individual brackets)
- When a child is not quite ready for fixed appliances (permanent teeth not fully erupted) the **T4B™** can get them started with habit correction and basic dental alignment up to 6 months before treatment.
- A marketing tool. Sticker your name and address on the back of the instruction card. Kids love to have something extra to go with their new braces.

**Phase II Treatment After Functional Type Appliances**

**Myofunctional training will decrease treatment time and enhances stability**

**Discluding the dentition at night can also speed up tooth movement**

**When a child is not ready for fixed appliances (permanent teeth not fully erupted) the T4B™ can get started with habit correction and basic dental alignment up to 6 months before fixed treatment**

## Design Features of the TRAINER FOR BRACES™

- No impressions or custom fitting required
- Single size for all patients
- Distal end trimming possible if necessary
- Silicone rubber material for maximum flexibility and comfort.
- Tooth and Appliance Channels to accommodate teeth with fixed appliances.

### Myofunctional Training

- **Tongue Tag** for the proprioceptive positioning of the tongue tip as in myofunctional and speech therapies
- **Tongue Guard** stops tongue thrusting when in place and forces the child to breathe thru the the nose
- **Lip bumpers** discourage overactive mentalis muscle activity.

Research shows lip bumpers are effective in gaining arch on crowded cases\*.

#### \*Lip bumper therapy for gaining arch length

C.T. Nevant, P.H. Buschang, R.G. Alexander and J.M. Steffen (AM J Orthod Dentofac Orthop 1991;100:330-6)

### Jaw Positioning

- **Class 1 Jaw positioning** is produced when in place (same as most functional appliances) to assist in Class II correction.

The combination of prevention of tongue thrusting and changing mode of breathing assists Class II correction. In addition the vertical sides can be trimmed to allow for class II elastics use to further enhance the clas II correction.

### T4B™ tips for parents

The child's mouth should be closed most of the time that is emphasize keeping the lips together when the T4B™ is in place. When the T4B™ is out of the mouth, the lips should still be lightly together and breathing should be through the nose only.

Remind the child to have the tip of their tongue tip on the tongue tag area at all times even when the T4B™ is not in place.

Use for a minimum period of 6-12 months as directed by your Orthodontist/Dentist.

Persevere with use while sleeping if the T4B™ falls out at night.

If overnight use is not possible increase daytime use.

Watch for favorable facial changes from correction of the myofunctional bad habits and jaw position.

Design Features of the TRAINER FOR BRACES™

Tooth and Appliance Channels

Myofunctional Training

Jaw Positioning

T4B™ TIPS FOR PARENTS

Tell the child the braces will be off sooner with use of the T4B™



## Issuing the TRAINER FOR BRACES™

- Show the patient the T4B™ and point out the tongue tag.
- Tell the child to “**place the T4B™ into the mouth with the tongue tag uppermost. Feel the tongue tag with the tip of the tongue.**” Show the child the raised section on the tongue tag, touch the tongue tip with a mirror handle. “This is where the tongue tip should be all the time, with the T4B™ in or out.” The patient now places it into the mouth.
- “**Keep lips lightly together and breathe through your nose.**”
- “**Do not chew on the T4B™. Close the teeth into the T4B™ and keep lips together.**”
- Closing into the T4B™, **not chewing**, is all that is necessary as long as the lips are kept together.
- “**Use daily**, while doing homework, reading, watching TV or playing.” Minimum daily use is 1 hour. Two half hour sessions are as effective. One hour is considered minimum and of course if they want to use it more, that will increase effectiveness. Daily use is the conscious training of the tongue position.
- **Adequate soft tissue protection requires night use.** Using at night will stop the brackets irritating the soft tissue and causing trauma when the child is asleep and cannot feel the irritation. If it falls out (which mostly it can do in the early stages of treatment), just tell them to persevere as this is a training program and once it stays in all night that is a major success! Mouth breathers and tongue thrusters in particular have this trouble, however they must be made to realise that any orthodontics will fail unless these habits are corrected and they must persevere. Night use is the passive phase stopping the detrimental effect of tongue thrusting and mouth breathing.

## Fitting and Adjusting

The T4B™ usually requires no adjustment. Have the child place it into the mouth themselves. **Do not try to place it into the child's mouth yourself.**

Ask them to check that it does not hurt anywhere. Usually it will not. Narrow mouths may require 2-3 mm off distal ends if they say it is too long or they cannot get their lips together.

**Trimming...** Cut with scissors at the distal ends to shorten or anywhere that discomfort occurs.

**If there is too much bite opening**, the anterior teeth do not come into the tooth guidance system. Trim 2-3mm off the distal ends to close the bite down and correct this. Trim back the upper labial bow if the child has an extreme class II or open bite. This will make it easier to the anterior teeth into the T4B™.

**Children younger than 10 years** without the second permanent molars can still use the T4B™. Just cut 4-6 mm off the distal ends to compensate for the lack of the permanent molars.

**Cleaning...** Rinse in warm water - brush with a toothbrush. The T4B™ can be boiled to sterilise.

What to tell  
the patient

Fitting and  
adjusting