

# New horizons in orthodontics and dentofacial orthopaedics

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## ABSTRACT

During the 20<sup>th</sup> century, functional appliances evolved from night time wear to more flexible appliances for increased day time wear to full time wear with Twin Block appliances. The current trend is toward fixed functional appliances and this paper introduces the Fixed Twin Block, bonded to the teeth to eliminate problems of compliance in functional therapy. TransForce lingual appliances are pre-activated and may be used in first phase treatment for sagittal and transverse arch development. Alternatively, they may be integrated with fixed appliances at any stage of treatment.

**Key words:** Fixed, functional appliance, transforce

## EVOLUTION OF FUNCTIONAL APPLIANCES

After a century of inconclusive evidence in the examination of orthopedic techniques, the question of whether or not we can modify cranio-facial growth by functional orthopedic techniques still remains to be resolved. Functional appliances and technique evolved during the 20<sup>th</sup> century from the early night time appliances to increased day time wear, and finally to full time wear with the Twin Block. Scientific evidence is now available from improved techniques to investigate growth modification in functional therapy, and the potential of functional forces to modify bone growth. A new paradigm for successful treatment presents a philosophical challenge to combine the benefits of orthodontic and orthopedic techniques and to extend our horizons in the treatment of malocclusion that requires dental and skeletal correction.

## FIXED TWIN BLOCKS

The Fixed Twin Block is the next logical step in the evolution of functional orthopedic technique. A protocol has been developed to integrate with fixed appliances at any stage of treatment using preformed blocks that bond directly to the teeth. The occlusal blocks eliminate buccal and lingual appliance attachments and provide efficient treatment for Class II malocclusion. The Fixed Twin Block is available in single patient kit form Figure 1.

Figure 1 – Fixed Twin Blocks can be fitted at any stage of fixed appliance therapy TransForce Lingual Appliances Arch development is an important aspect of functional therapy in

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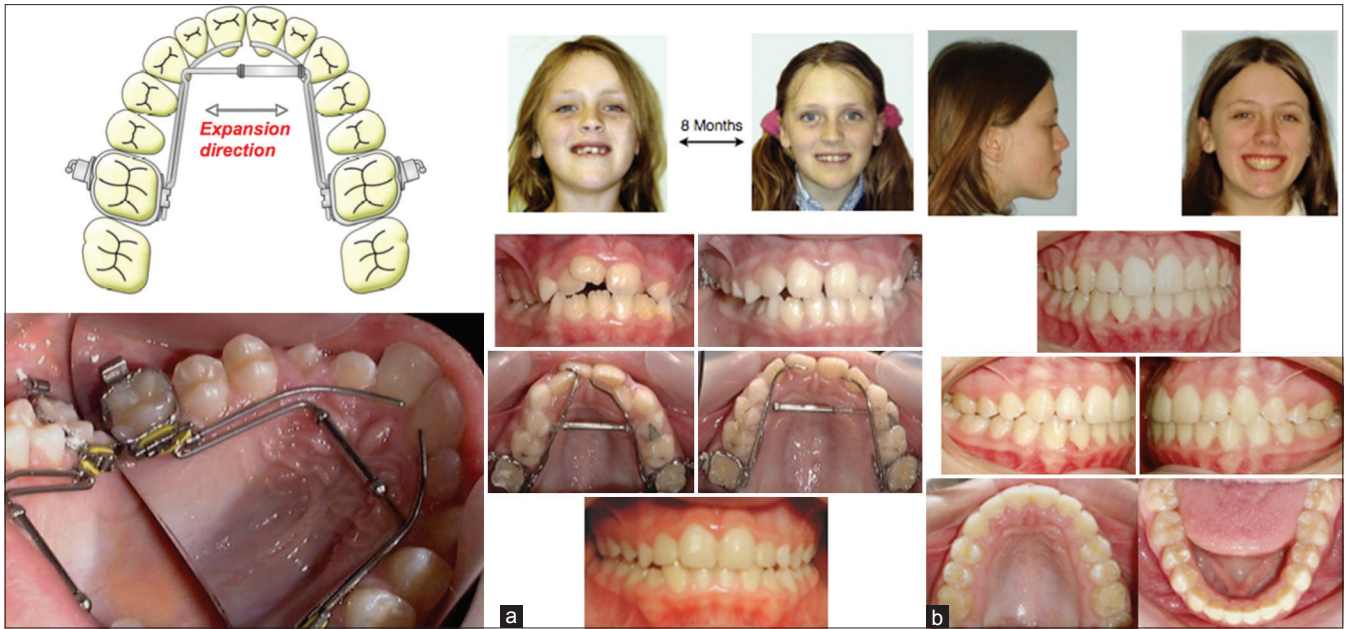
a holistic approach to benefit patients by improving tongue position and behavior.

TransForce Lingual Appliances were designed by the author to correct arch form for patients with contracted dental arches as a new series of preadjusted fixed/removable appliances.<sup>[1-3]</sup> Interceptive treatment with pre-activated lingual appliances offers new possibilities for arch development in combination with fixed appliances. Arch width and arch length may be controlled by gentle spring-driven activation, combining ease of control, and a long range of action. Palatal and lingual appliances insert in horizontal lingual sheaths in molar bands.



**Figure 1:** Fixed twin blocks can be fitted at any stage of fixed appliance therapy

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**Figure 2:** The Transverse Palatal Expander. TransForce® lingual appliances can be used for first phase arch development or integrated with fixed appliances. (a) Severe crowding of the upper incisors in this 8-year-old girl is treated with invisible *TransForce Appliances*® to expand arch width. Treatment was completed in 8 months followed by 3 months retention. The teeth remain straight after a period of observation when reviewed 2 years later waiting for the permanent canines to erupt. (b) Three years later fixed appliances are fitted for a few months to complete treatment. Early treatment is often followed by a second stage of treatment. This approach may avoid extractions and *Train Tracks* are worn for a shorter time if crowding is corrected at an earlier stage



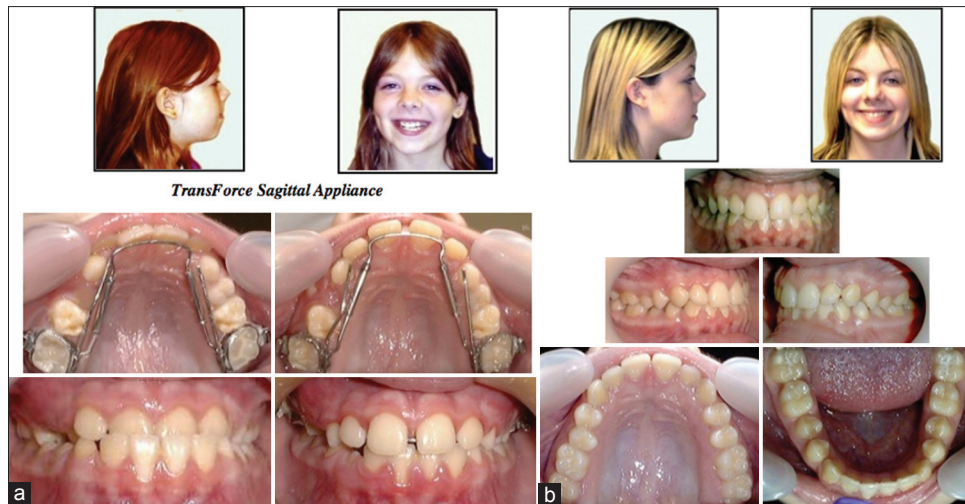
**Figure 3:** TransForce® Lingual Appliances fit behind the teeth. The tubes have enclosed springs that apply gentle force to move the teeth more quickly than clear or invisible appliances that cover the teeth. They can reduce the time in *Train Tracks* by 50%

The appliances are pre-activated by a new expansion module incorporating a nickel titanium coil spring enclosed in a tube to deliver a smooth continuous force. The force is calibrated within a range of 100 to 200 grams according to the requirements of arch development for sagittal or transverse activation.



**Figure 4:** This patient did not want fixed appliances, but he was happy to wear invisible *TransForce Appliances*®. After 9 months, he saw his teeth improving and accepted a lower fixed appliance for 4 months and he did not need to wear an upper field appliance. The severe crowding improved and his smile is wider with simple treatment after only seven visits

No activation is required after the appliance is fitted, and this principle is extended to a series of appliances for sagittal and transverse arch development. TransForce appliances® have the advantage that they do not occupy the palate allowing the tongue to adapt into the palate during treatment. Functional



**Figure 5:** (a) TransForce appliances® were used to correct an anterior crossbite. The lingual occlusion was corrected after 3 months, and the TransForce appliance® was worn as a retainer for 6 months. Treatment was completed in 9 months. (b) This shows the occlusion and facial appearance three years later. Interceptive treatment was effective in this case and no further treatment was required

therapy to advance the mandible and improve arch form can improve tongue position and behavior, with the holistic benefit of improving the airway [Figures 2a,2b,3,4,5a,5b].

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