



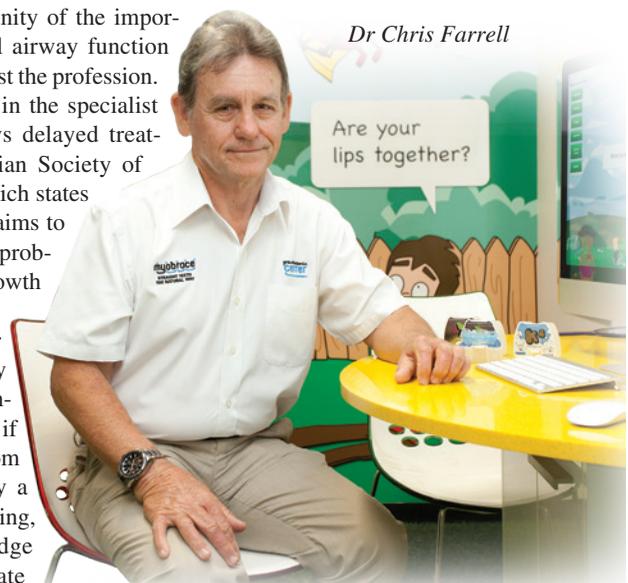
Orthodontists know best

By Dr Chris Farrell BDS, CEO & Founder of Myofunctional Research Co.

Since Dr Edward Angle established the principles and philosophies underpinning modern orthodontics in the early 20th century, debates centred on the benefits of early treatment versus later treatment and extraction versus non-extraction techniques have also been hotly contested. At various times during the last 100 years of modern orthodontic practice, the profession has been polarised along these lines until recent decades, where delaying treatment until the early to mid-teens then using fixed appliances, extractions and permanent retention to obtain an arbitrary Class I occlusion became the norm or “gold standard” in orthodontics. However, new research and an increasing reservoir of evidence is causing the profession to re-examine the treatment norms of the 20th century and the significant health and well-being benefits of effective early treatment are now undeniable. The increasing recognition within

the specialist orthodontic community of the importance of evaluating physiological airway function is also triggering a reaction amongst the profession.

There is evidence of this shift in the specialist orthodontist profession’s early vs delayed treatment philosophy on the Australian Society of Orthodontists’ (ASO) website, which states that early orthodontic treatment “aims to correct more serious bite related problems as well as guide the jaw’s growth pattern”¹ and “may also help to make extra room in the mouth for the permanent teeth to be properly placed as they come in.”¹ Additionally, the ASO website claims that if a “child needs or would benefit from early orthodontic treatment, only a specialist orthodontist has the training, experience and expert knowledge to determine the most appropriate treatment options and the best time to start treatment.”¹ The recognition that specialist orthodontists now have the best knowledge of the appropriateness of early treatment is curious, when for decades it has been discouraged by the very same organisations. Furthermore, a cursory browse of the most recent orthodontic journals shows airway dysfunction has become a hot topic and each issue carries new research regarding airway. Therefore, it is worthwhile examining



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why, in recent years, early treatment has become favoured among orthodontists and how the profession has recognised the significance of airway, sleep related breathing disorders and the impact these have on overall health and well-being.

For much of its existence, the orthodontic profession has failed to consider the impact extractions could have on the airway. In fact, a late 2016 article, published in the *American Journal of Orthodontics and Dentofacial Orthopedics* (AJO-DO), regarding the effect of orthodontic treatment on the upper airway volume concluded that “Orthodontic treatment in adults does not cause clinically significant changes to the volume or the minimally constricted area of the upper airway. These results suggest that dental extractions in conjunction with orthodontic treatment have a negligible effect on the upper airway in adults.”² Now that is a relief to know.

However, the article did continue with a word of caution, stating that images used for the study were obtained while the patient was awake and in an upright position. Therefore, the authors warned “caution is warranted when extending the findings of this or any other examination of airway anatomy while the patient is upright and awake. The nonsignificant findings between extraction and non-extraction orthodontic treatments on airway changes apply to anatomic findings alone and not necessarily to airway function, particularly to the complex neuromuscular functional deficits associated with obstructive sleep apnoea. To truly assess the implications of orthodontic treatment with extractions on airway function, future studies with larger samples are required. Furthermore, these studies should assess not only anatomic changes but also changes in respiratory function during sleep.”² So the verdict that extracting healthy teeth for the convenience of alleviating crowding and to achieve an arbitrary Class I occlusion may still have serious implications on the future health of a patient, but we do not know this for sure. Let us wait for more research to be conducted before extracting teeth is no longer commonplace as it has been in orthodontics over the last 60 years.

According to the ASO, early treatment “may also help to make extra room in the mouth for the permanent teeth to be properly placed as they come in” and “is an effective interceptive measure that lays the foundation for a healthy and well-functioning mouth in adulthood”.¹ Therefore, even though the impact of extractions on the airway remains largely unresearched, the effective interceptive qualities of early intervention and the recognition of the impact this can have on health and function in adulthood provide ample reason for orthodontic professionals to now advocate early treatment based on the existing evidence on airway function and arch form.

Unfortunately for current orthodontic patients, treatment options predominantly remain the same as they were last century; mechanical and targeted at the symptoms rather than the causative factors of malocclusion, with no techniques that assist in dysfunctional airway correction.

However, in the same way that early intervention has gained traction in the orthodontic profession, a push towards recognition that treatment of the causative factors of malocclusion and airway dysfunction beyond the teeth is also gaining momentum. An increase in the amount of content that has been included in orthodontic journals prompting the profession to look beyond the symptoms their patients exhibit and contemplate playing an increased role in their health and well-being by looking for and treating the aetiological reasons for those symptoms, is evidence of this.

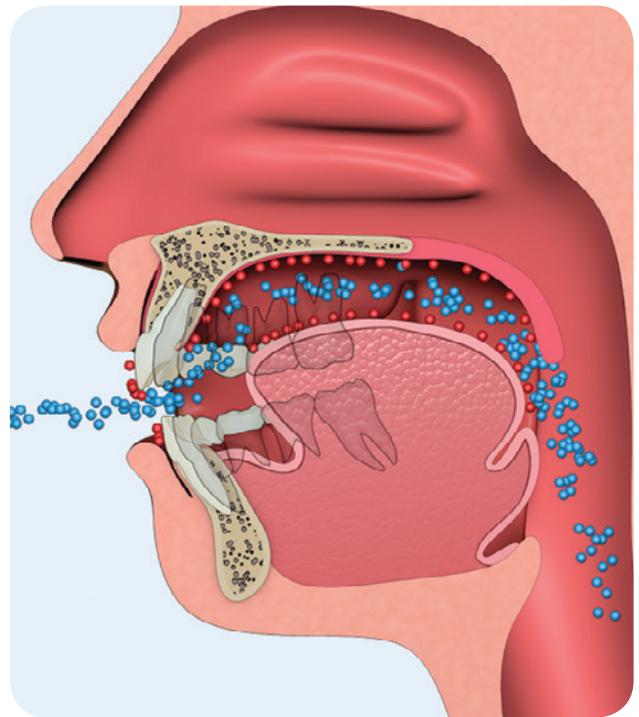


Figure 1. Mouth breathing is abnormal and is one of the major causes of airway dysfunction and malocclusion.

As recently as May 2017 the AJO-DO published a Japanese study aimed at clarifying the relationships between upper airway factors (nasal resistance, adenoids, tonsils, and tongue posture) and maxillofacial forms in Class II and III children. The study concluded that the “necessity of a comprehensive evaluation of the upper airway (nasal airway resistance, adenoids, tonsils, tongue) was shown to relate to the diagnosis of maxillofacial malocclusions. Class II morphology with nasal obstruction and an inferior tongue posture are related to a relatively narrow maxillary dentition. Class III morphology with enlarged tonsils with an anterior tongue posture might induce protrusion of the mandible.”³ However, despite this conclusion, the study cautioned against suggesting that mouth breathing as well as altered tongue position and function are the cause of most malocclusions and could potentially lead to sleep related breathing disorders. “We evaluated only the association between upper airway factors and maxillofacial form and caution is advised with interpreting this as cause and effect. Long-term follow-up data and randomized controlled trials will be required in the future. This evaluation of nasal obstruction was by computational fluid dynamics rather than direct measurement of airflow in the patients. Therefore, calibration of computational fluid dynamics with rhino manometry, which is the standard method, should be undertaken.”³ Thus, more research is likely required for a definitive conclusion to be accepted universally.

The shift in interest towards a more aetiologically centred focused profession was also evident in a Turkish study published in December 2016. The study, aimed at examining the effects of orthodontic treatment with and without extractions on the anatomic characteristics of the upper airway in adults, suggested causative factors of airway dysfunction have been hiding in plain sight among routine patient records. “In particular, the increased forward inclination of the cervical column on lateral cephalograms taken for routine orthodontic purposes may indicate that these patients already have or may develop OSA later in life.”⁴ Furthermore, the study suggested that mechanical treatments could further hinder the airway and collaboration with the

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Figure 2. The Myobrace® for Teens is a four-stage myofunctional orthodontic system designed to replace the need for complex orthodontics with braces and extractions.

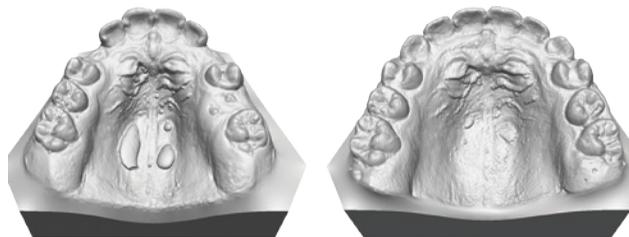


Figure 3. Substantial improvement in arch form produced by Myobrace treatment.

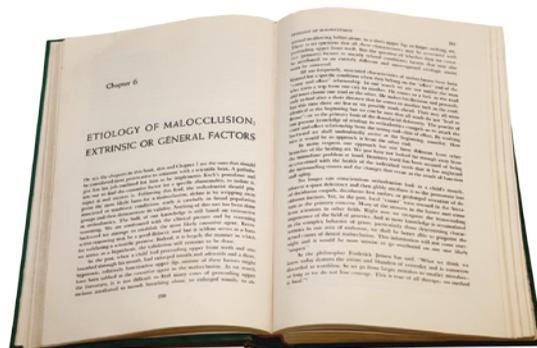


Figure 5. Orthodontics; Principles & Practice- Etiology of Malocclusion: Extrinsic or General Factors by Thomas M. Graber.

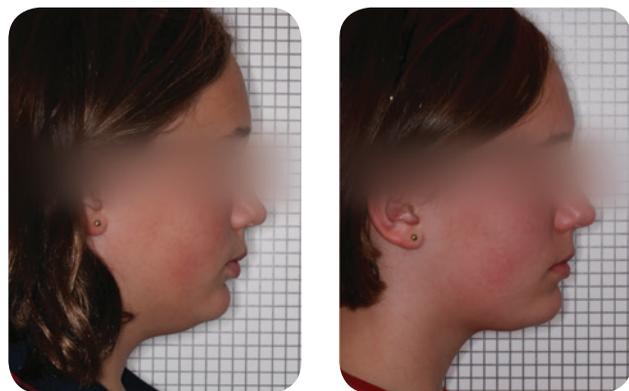


Figure 4. Left: Before treatment began; Right: 12 months after treatment began with the Myobrace for Teens appliance series. Note improved facial growth due to correction of poor myofunctional habits and change in mode of breathing.

medical profession might be in the best interests of the patient. "In these patients, treatment plans that may hinder the airway (setback surgeries, maximum retraction of the teeth with extractions, (and so on) should be avoided, and the airway should be further developed if possible (functional jaw orthopedics, expansion, advancement surgeries). It may also be a good practice to consider referring these patients for a medical evaluation to make sure that they receive professional care for prevention or treatment of OSA if they are diagnosed."⁴

This aetiological focus, where correct airway and craniofacial function is as important as Class I occlusion, may seem radical in our seminal journals today, but this information was there in front of every post-graduate at least as far back as the early 1960s. In his student standard text, *Orthodontics: Principles and Practice*, Graber warned that the profession's lack of aetiological understanding hampered the ability to treat the causative agents of malocclusion and resulted in a wrong ended approach to the cause and effect relationship.

"In the past, when a child had protruding upper front teeth and also breathed through the mouth, had enlarged tonsils and adenoids and a short hypotonic, relatively functionless upper lip, anyone of these factors might have been tabbed as the causative agent in the malocclusion.

"As we search the literature, it is not difficult to find many cases of protruding upper incisors attributed to mouth breathing alone, to enlarged tonsils, to abnormal swallowing habits alone, to a short upper lip to finger sucking, etc. There is no question that all these characteristics may be associated with protruding upper front teeth. But the question of whether they are causative (primary) factors or merely related (symbiotic) factors that may also be attributed an entirely different and unrecognised etiologic entity must be answered." *Graber 1962*

“The paucity of our present knowledge of etiology in orthodontics compels us to attack the cause and effect relationship from the wrong end - that of effect. By working backward, we shall undoubtedly arrive at the beginning someday. How nice it would be to approach it from the other end.”⁵

Unfortunately, even though his text was an educational standard for student orthodontists, Graber’s message failed to sink in and symptom focused treatment remained the norm. 55 years later, the importance of approaching orthodontic treatment from an aetiological perspective is gaining momentum in leading professional literature. In May 2015, the AJO-DO published an airway related article pointing out the profession’s understanding of aetiological links between function and growth and development as well as the opportunities this offered.

“Since the beginning of our specialty, our understanding of the link between function and facial growth and development has progressively improved. Today, we know that children with sleep-related breathing problems will often develop distinctive facial characteristics. In adults, sleep apnea can result in serious morbidity and mortality. Orthodontists can ask sleep-related questions in the health history to help identify sleep breathing disorders. Treating these patients presents unique opportunities for orthodontists to collaborate with other medical specialties to improve a patient’s health and treatment outcome.”⁶

However, rather than urge practitioners to learn more about the evidence-based, aetiologically focused treatments that are highly developed and already available, the article again poured cold water on Graber’s causative approach by suggesting this could still be decades from being possible. “Research presented in our Journal in the next century may shed new light that will help us better identify the problem and aid the specialty in developing more effective evidence-based treatment. Additional efforts are needed to understand the physiology, neurology, and genetics of sleep breathing disorders.”⁶

While the AJO-DO advocates for a cautious approach where future research is needed to shed more light on evidence-based treatment and the ASO recognises the lifelong health benefits of early treatment, only if conducted by a specialist orthodontist, industry innovators are changing the course of the profession. Rather than wait for the inevitable, when evidence-based, causative targeted treatment becomes the professional standard, those who have recognised that a lessening reliance of mechanical symptom focused treatments of the last century and a move to aetiologically focused treatment represents the future.

With close to three decades spent developing, honing and employing highly effective, easily implemented myofunctional treatments for breathing disorders and malocclusion, Myofunctional Research Co. (MRC) already has both feet planted in the future. Based on Graber’s understanding that orthodontics must be approached from the causative end, as well as the deep accumulation of research promoting early intervention as the optimal time to treat the aetiological causes of malocclusion and airway dysfunction, MRC already has an impressive portfolio of success stories, often early and without using braces or extractions. While the leading journals and associations are grudgingly considering what a causative focused profession might look like, MRC has



Figure 4. Myofunctional Orthodontic courses offer a hands-on experience for practitioners looking to diversify their treatment options.

embraced 100 years of research published in thousands of articles, written by Angle, Graber and others, that proves tongue position and function, as well as mode of breathing, causes poor facial growth and malocclusions. A collection of references for this research, as well as more recent published articles highlighting the effectiveness of MRC’s appliances in treating a variety of malocclusions, is available at myoresearch.com/research.

Rather than wait for 100 more years of research, 55 years after Graber’s urging, MRC’s highly developed early airway and malocclusion treatment systems provide dental professionals with the ability to approach the cause and effect relationship from the correct end. By directing treatment first at establishing correct airway function and tongue posture as well as habit correction, MRC has provided dental practitioners from around the globe with the ability to take an aetiological approach and effectively treat the causative factors that result in breathing disorders and malocclusion for countless children, as young as three and most often without requiring brackets.

About the author

Dr Farrell presents courses on the Myofunctional Orthodontic System and TMJ Disorder regularly in Australia and USA. For information visit www.myoresearch.com.

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