

Questioning orthodontics: is it just a mechanical makeover of a biological problem?

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



THE doctrines of the orthodontic profession were initially established by Edward Angle in the early 20th century. One hundred years later, with the incidence of malocclusion in modern children approaching 100 per cent and demand among adults for re-treatment following relapsed earlier treatment on the rise, specialist orthodontists should expect a brighter future. However, as the orthodontic profession passes its 100th anniversary, there are reasons to pause and reflect on the basis of those principles established by Angle, who was considered the father of modern orthodontics, a century ago. Although technology has made the mechanics of orthodontics easier for practitioners and treatment more accessible to patients, increasing demand has encouraged non-specialists, who often possess only a rudimentary understanding of the complexities involved in orthodontics, to become involved. This has also given rise to increasing concerns regarding techniques where the anterior teeth are straightened rapidly then fixed in place via permanent retention, ignoring Angle's dogma of correcting to Class I. (Molar relationship)

The Australian Society of Orthodontists has expressed their views on their web site:

*"The ASO regularly reviews orthodontic courses in the market and to date has not seen any short course that trains a dentist to safely put on fixed appliances or carry out complex orthodontic work."*¹

A further cause for concern is that during the past 100 years, despite technological advances improving the mechanics of orthodontic practice, no scientific evidence has been produced to corroborate Angle's original hypothesis. In fact, following its' inception as the first dental specialty in the early 20th century, according to Dr Cerny "the 'laws of orthodontics' were developed from trial and error assessments, opinions and anecdotal claims. Most of the laws have never being scrutinised or validated scientifically."²

And this from the most eminent Dr James Ackerman writing in the American Journal of Orthodontics and Dentofacial Orthopedics, reflecting on 100 years of the publication, "Occlusion is no more a science today than it was in the 19th century. In spite of this flawed conceptual underpinning to orthodontics, ideal occlusion is likely to remain the most fundamental concept in orthodontics until a new and hopefully more scientific paradigm replaces it."³ Furthermore,

*"ideal occlusion has served as a highly useful arbitrary standard for judging the skills of orthodontists and is still the major tool used by the American Board of Orthodontics for ascertaining board qualification. How might orthodontics have evolved if Bonwill and Angle had been more broadly educated in the biologic sciences of their day? Thus, it is fair to say that orthodontics has been more technologically driven than biologically or scientifically based."*⁴

This raises the question of whether the aetiology of malocclusion is truly understood or is the orthodontic profession trying to monopolise entrenched and outdated concepts, which lack scientific grounding? It is reasonable to expect that in order to treat safely and effectively, first you need to understand the aetiology.

And this from the Graber text book from the 1960's chapter 6 – ETIOLOGY OF MALOCCLUSION. "the orthodontist should pinpoint the most likely basis for a malocclusion, define it by stripping away associated or symbiotic conditions, study it carefully in broad population groups and then demonstrate its validity. Nothing of this sort has been done in orthodontics."⁵ In fact, "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."⁶ Yes – correct. Was Graber trying to tell orthodontists back then to look beyond the occlusion? He continues, "the question of whether they are causative (primary) factors or merely related (symbiotic) factors that may also be attributed an entirely different and unrecognized etiologic entity must be answered."⁷

So rather than arguing who is capable "to safely put on fixed appliances or carry out complex orthodontic work"⁷ the recognition of the causative or symbiotic factors in malocclusion need to be understood BEFORE we think

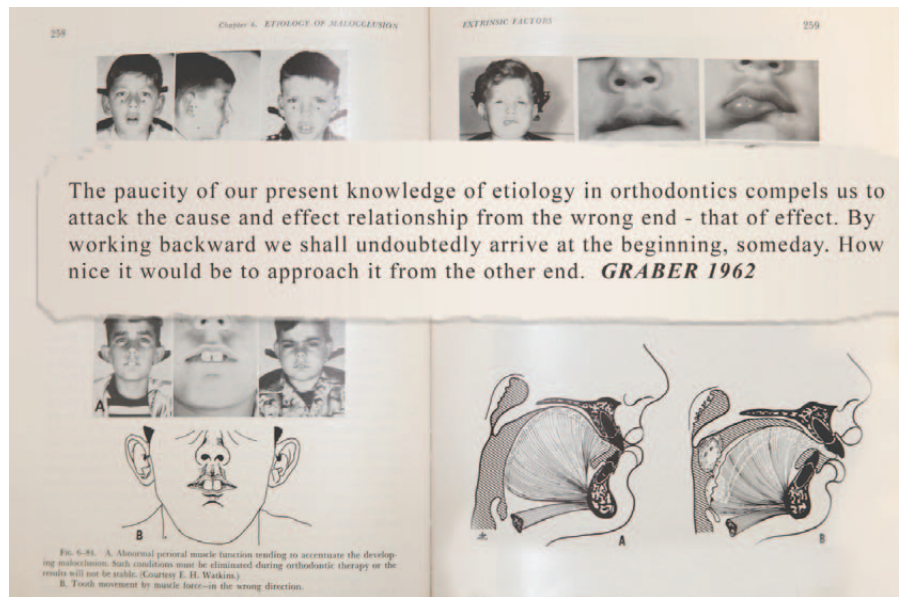
about treating with only one tool – fixed appliances. Is it coincidence that mouth breathing, enlarged tonsils and incompetent lip function are present in every class II div 1 malocclusion? Claiming malocclusion is multifactorial while failing to define those factors then treating to arbitrary Class I without reference to the malocclusion’s aetiology would seem unscientific at least and fundamentally flawed. After adhering to Angle’s doctrine for the previous 100 years, should the way forward for the orthodontic profession involve a shift from the technical and mechanical excellence of the past to a more health driven, biological, evidence based and effective approach?

Increasingly, various orthodontic publications, where the fundamental doctrines of traditional orthodontic treatment have been established, the tough questions are being asked “*Science had a tough time getting a foothold in orthodontics and has for the entirety of the profession. This might explain why many of our advances have been more technical and mechanical rather than biological.*”⁸ Dr Fields in the centennial guest editorial to the American Journal of Orthodontics and Dentofacial Orthopedics.

Considering the prevalence of treatment relapse, as well as the ubiquitous need for permanent retention in fast or slow braces, it raises further questions regarding the effectiveness and long-term benefit of traditional mechanical treatment as well as whether the aetiology of malocclusion is being addressed or only the symptoms. Has the patient really benefitted if the causes have not been addressed? Therefore, in order to effectively address the causes of malocclusion rather than merely treat symptoms, recognition of the aetiology underlying the malocclusion becomes vital.

As far back as the 1960’s Harvold demonstrated in his experiments with monkeys that “*the connection between neuromuscular activity and skeletal morphogenesis can be illustrated by a simple experiment.*”¹⁰ Nowadays recognition is growing that malocclusion develops as a result of incorrect or restricted craniofacial development, caused by the patient’s upper airway or neuromuscular dysfunction. Consequently, it is reasonable to expect that if a child breathes through their mouth, has poor lip or cheek function, has an incorrectly postured tongue and a reverse swallow exacerbated by a nutritionally deficient diet, craniofacial growth will be restricted and they will develop a malocclusion.

Therefore, rather than just straighten the teeth, treatment should first be directed at these contributing factors, not just



the malocclusion. Because the aetiology of malocclusion has little to do with the teeth early pre-orthodontic treatment can begin and without the use of braces.

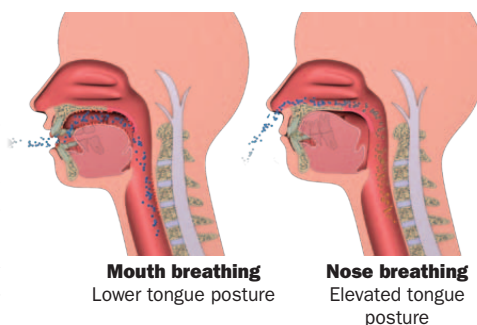
Fortunately for practitioners seeking to distinguish themselves in a more competitive market, recognition of the effect upper airway and neuromuscular dysfunction has on craniofacial growth and therefore, malocclusion, has prompted a change in ideology. As a result, focus has shifted from the technical and mechanical excellence of the past towards more health driven, biological, evidence based and effective approaches to correcting or preferably preventing malocclusion altogether. Again, the orthodontic journals are now publishing more on airway as the new way. However, it was really there all the time and we missed Graber’s, Harvold’s and Ricketts’ bio-logical approach.

The author penned the title ‘myofunctional orthodontics’ 30 years ago. It could also be called aetiology orthodontics. The core tenets of myofunctional orthodontics are aimed towards addressing the aetiological causes of malocclusion. Rather than just straightening teeth into an arbitrary Class I and then retaining forever, myofunctional orthodontic practitioners target the upper airway and neuromuscular dysfunction,

which inhibits craniofacial development. Furthermore, by focusing on the aetiology of the malocclusion and promoting correct growth in the primary or early mixed dentition, teeth are often provided with the space required to move into the correct alignment naturally, “*and often the teeth will come in straight even before you get to the braces.*”¹¹ According to New Jersey Orthodontist Dr Barry Raphael, “*Just as the future of medicine has to be looking at root cause, the future of orthodontics is also going to be looking at root cause.*”¹²

The rectification of the aetiological factors restricting development can not only correct malocclusion, with myofunctional orthodontics it is possible to begin treatment while the patient is young enough to satisfy the increasing demand from parents for early orthodontic intervention. Because “*the optimal timing for myofunctional intervention is a period of active growth and development with high adaptive capacity*”¹³ upper airway and neuromuscular dysfunction can be corrected before it reaches a severity “*which would require considerable efforts to correct later in life.*”¹⁴

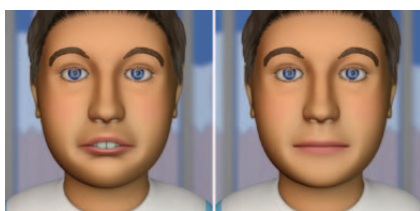
Because during “*the last 100 years, no one has been able to produce scientific evidence to corroborate Bonwill and Angle’s original hypothesis.*”¹⁵ and the only advances in orthodontic practice have been mechanical, myofunctional orthodontics represents a logical step forward. According to the American Journal of Orthodontics and Dentofacial Orthopedics “*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*”¹⁶ which indicates orthodontics is already moving in this direction.



When considering the challenges, the orthodontic profession is faced with today this change of direction cannot come soon enough. No longer does the profession have a monopoly on orthodontic care and technology has enabled access for more patients who are predominantly treated using century old mechanical doctrines by either orthodontic specialists or by the less well-trained general dentist. Compounding this is the oversupply of new dental professionals and corporatisation of the dental industry where orthodontic care has been relegated to a mere commodity where the dollar value can become more important than a patient's health and well-being. However, myofunctional orthodontics requires a new paradigm in learning for the specialty of orthodontics, which tends to be behind on these diagnostic skills to safely "carry out complex (myofunctional) orthodontic work"¹⁷ in growing children in the future. Time to learn new skills.

For some orthodontic practitioners, reliant on the traditional orthodontic standard of care, the profitability of the past is diminishing, and the future is far from assured. However, for forward thinking practitioners it has presented the opportunity to play an active role in shaping the profession's future by looking towards new treatment systems, which are evidence based and health driven rather than focused on just mechanically straightening teeth into an arbitrary Class I. In fact, when considering "the history of how orthodontic education evolved, it is easy to see how the specialty could grow, flow, and turn with ideas and views that were not science-based and were provided by a selected few persons."¹⁸

Myofunctional orthodontics, which is focused on treating the aetiology of malocclusion to achieve lifelong natural health outcomes by establishing nasal breathing as a primary goal, provides a means for today's practitioners to distinguish themselves from the crowd. Additionally, there are new opportunities emerging that offer the prospect for forward thinking orthodontic professionals to work with members of the medical profession and offer solutions for the health issues related to sleep disordered breathing (SDB).



Myofunctional orthodontics focuses on treating the aetiology of malocclusion to achieve lifelong natural health outcomes by establishing nasal breathing as a primary goal.

"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."¹⁹ Furthermore, paediatric SDB has been recognised as causing widespread health, developmental and behavioural problems, including difficulty concentrating at school. Additionally, as well as being detrimental to the development of the face, jaws and teeth, if left untreated paediatric SDB can lead to significant and serious health problems causing poor quality of life later in adulthood. "Untreated OSA can result in serious morbidity and mortality mostly caused by cardiovascular disease and traffic accidents"²⁰

Understanding of the relationship between upper airway and neuromuscular dysfunction, poor craniofacial development and malocclusion has progressively improved during the last century. Nowadays, because malocclusion is recognised as a symptom of the same upper airway and neuromuscular dysfunction causing SDB, "treating these patients presents unique opportunities for orthodontists to collaborate with other medical specialties to improve a patient's health and treatment outcome."²¹

After a century of following the fundamentals of Angle where an arbitrary occlusion has been the standard by which orthodontic treatment success has been judged, even though very little advancement has been made regarding the science of occlusion, the orthodontic profession is now asking the hard questions evoking potential rapid change. Rather than rely on technologically advanced, mechanical methods of straightening teeth into an arbitrary alignment, the focus is shifting towards new means of recognising and then addressing the aetiology of malocclusion.

"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."²² Dr Tom Graber 1962.

Now in 2015 the profession can begin employing more evidence-based approaches. Because "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."²³



Making orthodontic cases easier and shaping the future with myofunctional orthodontics.

As a result of new treatment systems focused on the aetiology of malocclusion as well as breathing and myofunctional disorders, there is now an opportunity for the orthodontic profession to collaborate and not compete with general dentists to both achieve the status of premier dental specialty as well as become more closely integrated into the medical profession. Myofunctional orthodontics ideally incorporates evidence based, biological solutions from the past, "creating brighter futures"²⁴ for all. ♦

References

- 1, 8, 17, 24: The Australian Society of Orthodontists web site www.aso.org.au
- 2: ORTHODONTICS and the "PINOCCHIO FACTOR" by Dr Robert Cerny, BDS, MDS. Specialist orthodontist Australasian Dentist
- 3, 4, 15: Centennial guest editorial. James L. Ackerman. American Journal of Orthodontics and Dentofacial Orthopedics March 2015 Vol 147 Issue 3
- 5, 6, 7, 22: Graber, T. M. (1962) Orthodontics; Principles & Practice, Chapter 6, Etiology of Malocclusion – Extrinsic or General factors.
- 9, 18: Centennial guest editorial. Henry W. Fields. American Journal of Orthodontics and Dentofacial Orthopedics July 2015 Vol 148 Issue 1
- 10: American Journal of Orthodontics Dec 1968 Vol 54 No. 12.
- 11, 12: MYOBRACE. (2015). World Fencing Champion Miles Chamley Watson visits Myobrace Center. [Online Video]. 24 November 2015. Available from: https://www.youtube.com/watch?v=sKiF_yCBzw.
- 13, 14: Kanao A, Mashiko M, Kanao K (2009) Japanese Journal of Clinical Dentistry for Children, Vol 14, No. 4 April
- 16, 19, 20, 21, 23: American Journal of Orthodontics and Dentofacial Orthopedics November 2015 Vol 148 issue 5: 740-7

Dr Chris Farrell graduated from the University of Sydney in 1971 with a Bachelor of Dental Surgery, having gained a comprehensive knowledge of traditional orthodontic treatment using the BEGG technique. As a result of his clinical experience, he became interested in TMJ/TMD disorder and after further research, discovered the aetiology of malocclusion and TMJ disorder was myofunctional, which contradicted the established view of his profession. Dr Farrell founded Myofunctional Research Co. (MRC) in 1989 with the intent to develop a myofunctional orthodontic system targeted at treating the upper airway and neuromuscular dysfunction causing malocclusion. Dr Farrell's Myobrace® and Trainer treatment systems have proven extremely effective at providing early, preventive pre-orthodontic treatment and are now used by dental professionals in more than 100 countries.