

Spot the children with a sleep disorder

Myofunctional appliance treatment: Sleep dentistry for the 21st century

By Chris Farrell, BDS (Syd)



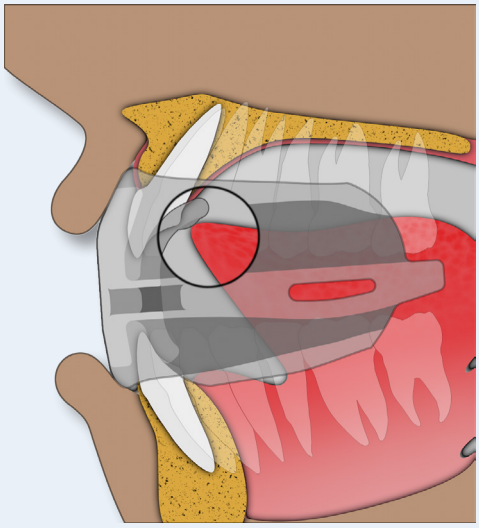
During the last decade, the medical profession has become much more aware of Sleep Disordered Breathing (SDB) acting as a major contributor to a range of health problems. In addition to having a negative impact on mood, energy levels, ability to regulate stress, behavioural problems and emotional well-being, severe sleep disorders, such as obstructive sleep apnoea (OSA), have been associated with the causes of life shortening events such as heart disease or stroke.

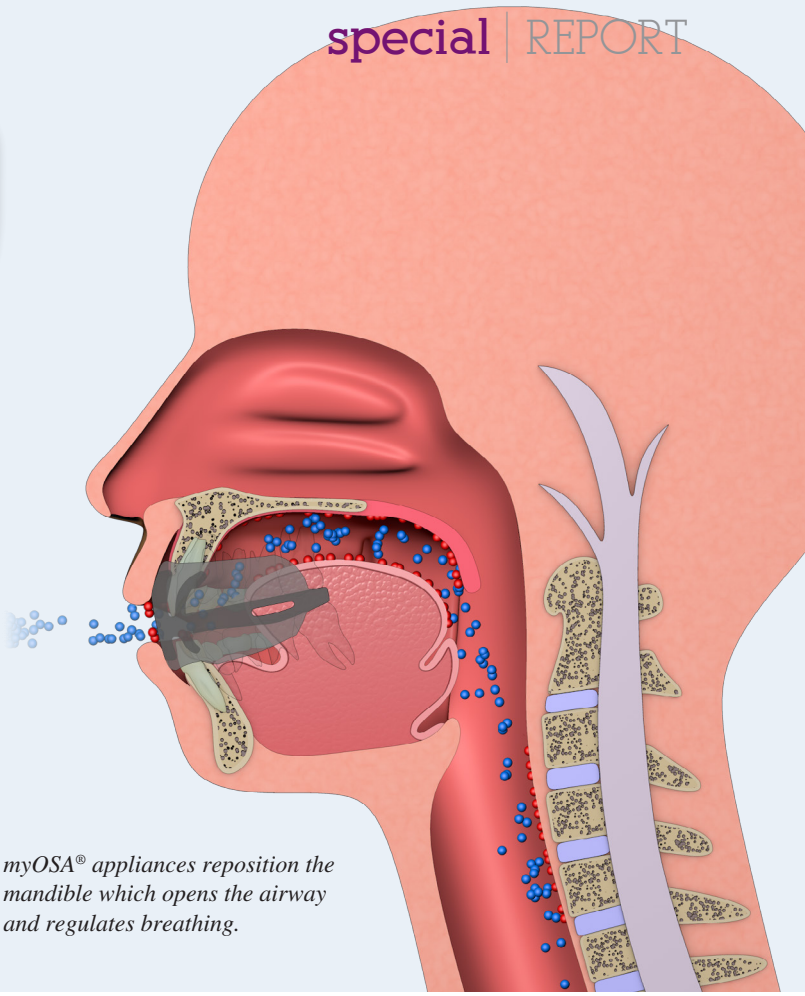
SDB characteristically occurs when the flow of air through the nose or mouth is obstructed during sleep. While this airflow obstruction is typically caused by relaxation and poor muscle tone around the throat and jaws, there are many underlying causes of SDB. The most common of these are chronic mouth breathing, poor diet, obesity and poor development of the jaws. Additionally, orthodontics with extractions may exacerbate breathing issues by restricting tongue space.

Treating sleep disordered breathing

Traditionally, treatment for Sleep Disordered Breathing, particularly Obstructive Sleep Apnoea (OSA), has been the domain of the medical profession involving the use of the Australian developed Continuous Positive Air Pressure (CPAP) device. However, the inconvenience caused by







myOSA® appliances reposition the mandible which opens the airway and regulates breathing.

> "Increasingly, it has become apparent that the causes of SDB begin to develop during early childhood. If these causes are left unchecked, a child's SDB can result in a variety of disorders, ranging from enlarged tonsils and adenoids to learning difficulties and behavioural problems...."

the bulky CPAP machine and discomfort from the mask that must be worn has often discouraged patients from continuing with treatment. The research shows now that there is more than 50% non-compliance of patients on CPAP and its variants. As a result, treatment with oral appliances are now considered to be the most convenient way to alleviate SDB. So, almost by default, the dental profession has had a new field of sleep medicine thrust upon it with little scientific basis for treating SDB using Mandibular Advancement Devices (MADs).

In the USA, where the problem has been extensively researched by the medical profession, estimates suggest that as many as *"50-70 million people in the United States are chronic sufferers from sleep disorders, who have impaired health and daily functioning issues as a result of these disorders."*[1] Furthermore, Center on Sleep Disorders Research concludes *"The societal economic impact of sleep disorders is estimated at $16 billion annually for health care expenses and $50 billion annually regarding lost productivity."*[2]

Early childhood intervention

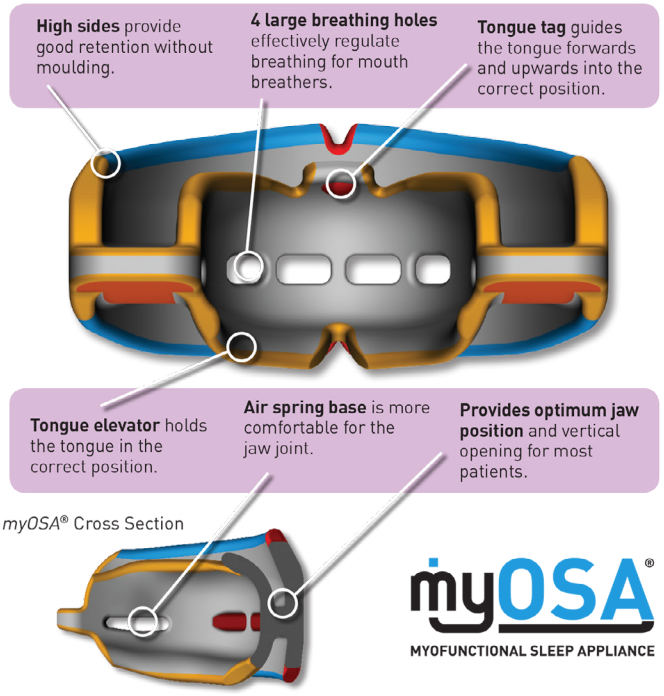
Increasingly, it has become apparent that the causes of SDB begin to develop during early childhood. If these causes are left unchecked, a child's SDB can result in a variety of disorders, ranging from enlarged tonsils and adenoids to learning difficulties and behavioural problems. In fact, *"more recent concern for upper-airway patency would seem to demand scrutiny much earlier. The age of 5 years has been suggested, but even by then the face has achieved most of its adult proportion."*[3]

SDB in children has also 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.

Stanford University Sleep Medicine Division has focussed on the causes of SDB and has found a high prevalence of SDB in young children. In fact, according to the division "Obstructive sleep apnoea (OSA) has become increasingly recognised as a notable health concern in children given its consequences on behaviour, function and quality of life."[4]

Furthermore, *"the importance of early recognition and treatment in children is paramount to maximizing resolution of symptoms and potential avoidance of OSA syndrome during adulthood."*[5] Additionally, the *"elimination of oral breathing, i.e., restoration of nasal breathing during wake and sleep, may be the only valid 'finishing line' in paediatric SDB."*[6]





Emerging role for dentists in treating SDB

This raises the issue of where the general dentist or dental specialist can find protocols for the treatment of SDB? The potential demand from the medical profession as well as the general public will undoubtedly increase pressure on the entire dental profession to become more proficient in sleep dentistry and to cater for this, there are comprehensive courses now becoming accessible to the profession.

Traditionally, adult treatment of SDB, mild OSA and snoring has focused on Mandibular Advancement Devices (MADs). While there have been numerous design variations and whilst these can be effective, there seems little concern about the potential harm their long-term use exposes patients to. The design of these MADs is based primarily on orthopaedic appliances, used extensively by orthodontists, particularly in Europe, during the last 50 years. Major players in the sleep medicine industry, such as CPAP leader Resmed, have also now become involved in Dental MAD appliances. This is a strong indication that it is essential for dental professionals to better educate themselves regarding treatment of SDB.

I have been recognised as being critical of the current orthodontic practice taking too mechanical an approach to a biological problem and this view is now supported in dental literature. In fact, according to an article written by Dr James Ackerman and published in the American Journal of Orthodontics and Dentofacial Orthopedics *"it is fair to say that orthodontics has been more technology driven than biologically or scientifically based."*[7]

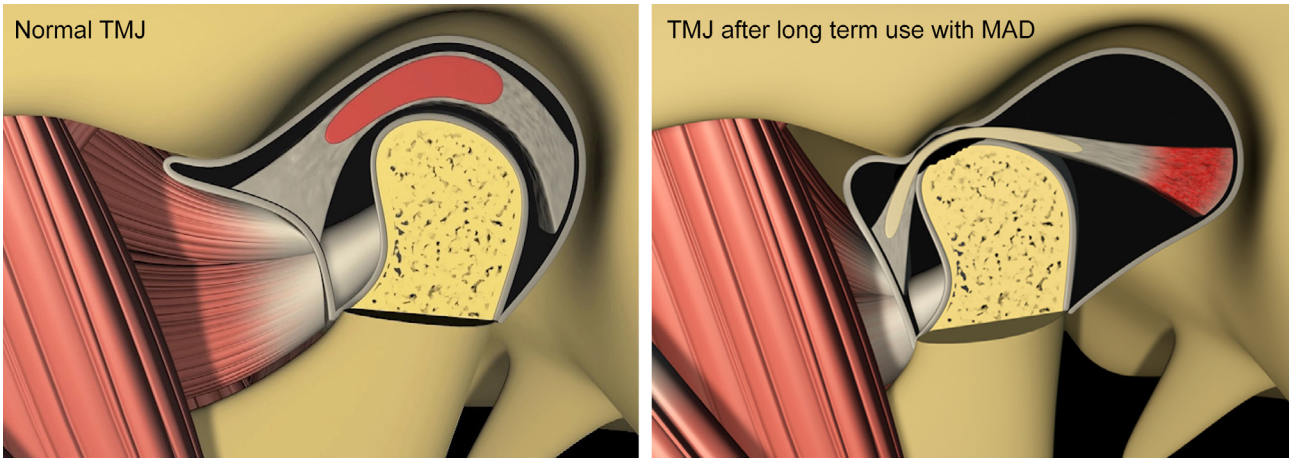
Mechanical vs Biological

The overly mechanical approach of using MADs in sleep dentistry is cause for concern for two main reasons. Firstly, there is the derangement of the occlusion with retraction of the maxilla making the airway more compromised and secondly, this approach can cause exacerbation of TMJ problems and initiate damage and remodelling of the TMJ capsule. Added to this, research shows a close association between SDB and bruxing and typically these MADs are rigid, thus allowing little if any scope for bruxers.

MRC myOSA® Range

- myOSA® for Juniors
- myOSA® for Kids
- myOSA® for Adults
- myOSA® for Snorers
- myOSA® for Bruxing
- myOSA® for TMJ

Treatment of SDB in children, which typically involves referral to an ENT for a tonsillectomy, is another area where an overly mechanical approach is used in an attempt to alleviate a biological problem. Research shows this approach is successful less than 50% of the time and recurrence of SDB issues routinely takes place. Furthermore, SDB and poor craniofacial growth in children are intimately associated and malocclusion is an all too obvious result.



The connection between SDB, poor craniofacial growth and malocclusion was highlighted in a study published in the Japanese Journal of Clinical Dentistry for Children. According to the research, the mouth breathing habit, which is a major cause of SDB, has a negative impact on the *"morphology of the jaws and dental arches in growing children. The morphology of the jaws and dental arches then begins to control function, perpetuating a downward or negative spiral."*[8] Furthermore, the literature is increasingly quoting myofunctional therapy as a vital missing link in the treatment of paediatric as well as adult SDB. In fact, there is an *"abundance of literature on the benefits of myofunctional treatment on growth and orthodontic development."*[9]

During the 1990s, I was a founder of the Myofunctional Research Co. *(MRC)* as a vehicle for developing a range of functional intraoral appliances designed to address myofunctional problems in growing children and thereby resolve orthodontic problems. Today, our signature product, the highly successful *Myobrace*® System, is sold globally and all told, we have sold several million appliances. These appliances, which include a range for treating TMJ Disorder and bruxing, are equally well-suited to treatment of both paediatric and adult SDB. Hence, a different philosophy and protocol, which does away with the complexities of the current MADs, is already present.

This new approach to treating SDB has taken shape as the *myOSA*® System, which is a functional range of intra-oral appliances designed to provide the medical and dental professions with an effective means of diagnosing and treating Sleep Disordered Breathing and TMJ disorders with a myofunctional instead of a mechanical approach. Rather than just focus on alleviating the symptoms of SDB, the *myOSA*® appliance range aims to treat the upper airway and neuromuscular dysfunction, which can cause SDB.

The *myOSA*® appliance range functions by posturing the lower jaw forward, correcting tongue position and opening the bite, which opens the airway and regulates breathing. While the causes of SDB are varied and can differ between individuals, the *myOSA*® range includes sleep appliances for a wide spectrum of patients. The range includes appliances to suit SDB patients from as young as two-years-old through to adults as well as specialty appliances targeted at TMJ disorder and tooth grinding.



The *myOSA*® myofunctional sleep system can be easily implemented into any dental or medical practice to satisfy patient demand for effective sleep treatment solutions. To learn more regarding how to begin integrating *myOSA*® into your practice visit myoresearch.com/courses.

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About the author

Dr Chris Farrell graduated from Sydney University in 1971 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 etiology 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.