ADENOTONSILLECTOMY FOR PAEDIATRIC OBSTRUCTIVE SLEEP APNOEA – SUBMISSION FROM THE AUSTRAILASIAN SLEEP ASSOCIATION (ASA)

The Australasian Sleep Association (ASA) is the peak scientific body in Australia representing clinicians, scientists and researchers in the broad area of Sleep. The vision of the ASA is to live in a community that recognises the importance of good sleep to health, public safety, productivity and quality of life. A key mission of the ASA is to lead and promote sleep health & sleep science across Australia.

Executive summary
Obstructive sleep apnoea (OSA) is one of the most common respiratory disorders of childhood affecting an estimated 1.2-5.7% of children\(^1\). The prevalence of paediatric OSA peaks in the preschool years but is also common at all ages from infancy to adolescence. The leading cause is adenotonsillar hypertrophy\(^1\),\(^2\). There are a number of serious complications of obstructive sleep apnoea including lowered quality of life\(^3\), behavioural and neurocognitive deficits\(^4\), poor school performance\(^4\), and adverse cardiovascular effects including elevated blood pressure (10-15 mmHg above that of non-snoring children)\(^5\)-\(^7\).

Surgical removal of the tonsils and/or adenoids is internationally recommended as the first line therapy for most children with obstructive sleep apnoea\(^1\),\(^8\)-\(^10\). Adenotonsillectomy (T&A) is very effective in treating OSA in children, and such treatment has also been demonstrated to lead to improvements in symptoms, objective sleep parameters, quality of life, behavioural concerns, neurocognition and cardiovascular outcomes. Other treatments such as continuous positive airway pressure and topical anti-inflammatory agents are relevant in some children, but T&A remains the first line and the only necessary treatment in the vast majority of cases.

Evidence for resolution of OSA after T&A
Over the last decade many studies have demonstrated the efficacy of T&A as a treatment for paediatric OSA, in terms of improvements in polysomnography measures of OSA severity and sleep quality. Early reports investigating the effect of T&A as an intervention for OSA suggested cure rates of 85-95%\(^11\),\(^12\). Recent studies have suggested this figure may be lower than that, but these studies include large numbers of obese children, in whom it is well documented that the likelihood of cure is lower\(^13\),\(^14\). When children with obesity are excluded, the recent studies confirm a response to T&A of 73-95%\(^11\),\(^12\). Although the definition of a complete cure can be argued, all studies demonstrate a substantial improvement in OSA in the vast majority of children who undergo T&A, in terms of symptoms, sleep quality and polysomnographic measures of severity, including hypoxia\(^15\)-\(^20\).
Impact of treatment with T&A on consequences of OSA in children

Studies have demonstrated positive effects of T&A for OSA in children, in terms of quality of life, behaviour and psychological functioning, autonomic function, and factors affecting long term cardiovascular health such as metabolic markers, markers of inflammation and endothelial function.

- **T&A improves neurocognitive morbidity:** In a review of 25 studies investigating behavioural and neurocognitive outcomes following T&A in children with OSA, all studies reported improvement in one or more of the outcome measures such as quality of life, behavioural problems including hyperactivity and aggression, and neurocognitive skills including memory, attention and school performance. One study that compared children on the waiting list for T&A with those having an unrelated surgical procedure found that children waiting for T&A were more hyperactive, inattentive, and sleepy, and more likely to have psychiatrist-diagnosed attention-deficit/hyperactivity disorder. In contrast, one year later, the two groups showed no significant differences in the same measures, with children who had T&A improving substantially in all measures, and control subjects improving in none.

- **T&A improves blood pressure:** Several studies have shown a reduction in blood pressure in children following T&A for OSA, as well as reduced heart rate and pulse rate variability, and improved cardiac sympathovagal balance, suggesting decreased sympathetic activity post-T&A in association with improved OSA. As it is known that increased blood pressure during childhood is predictive of hypertension in adulthood, it is important that the cardiovascular effects of OSA are recognised in childhood and that the condition is treated.

- **T&A improves cardiac morbidity:** Early reports of OSA in childhood found high proportions of children with major cardiac morbidity such as right heart failure. More recent studies have shown left and right ventricular hypertrophy and reduced left ventricular function. These abnormalities resolve after treatment with T&A.

- **T&A improves inflammation:** A relatively new area of research related to OSA in children has been the finding of elevated markers of inflammation and reduced vascular reactivity. As inflammation is associated with long term cardiovascular morbidity, these findings have potential implications for the long term health of children with untreated OSA. These inflammatory markers are reduced following T&A.

**Health service implications of treatment of childhood OSA with T&A**

Health care costs of children with OSA are elevated by 215% compared to children without OSA. Total annual health care costs are reduced by one third in children with OSA who undergo T&A, with a 60% reduction in admissions to hospital, 39% reduction in emergency department visits, 47% reduction in medical consultations, and 22% reduction in costs for prescribed drugs. Thus, T&A significantly reduces health care utilization in children with OSAS. Untreated children with moderate and severe OSA will continue to consume high levels of health care resources.

**SUMMARY**
Paediatric OSA has substantial impacts on daytime functioning, quality of life, cardiovascular health and health care utilisation. Adenotonsillectomy (T&A) is a highly effective treatment for paediatric OSA, and is the only treatment required in most cases. Studies consistently demonstrate that T&A results in significant improvements in the severity of the disorder, with concomitant improvements in sleep quality, quality of life, psychological health and important risk factors for cardiovascular disease such as elevated blood pressure, increased blood pressure variability, and dampened blood pressure control and elevated inflammatory markers. Failure to provide such treatment has potential to lead to major cardiac and psychological morbidity particularly. We strongly recommend that T&A be maintained as a publicly funded treatment for this important childhood condition.

Dr Garun Hamilton  
Chair, Clinical Committee Australasian Sleep Association

On behalf of:

A/Prof Gillian Nixon  
Board member, Australasian Sleep Association

Dr Andrew Tai  
Member, Clinical Committee Australasian Sleep Association

Dr Sadasivam Suresh  
Board member, Australasian Sleep Association

Prof Rosemary Horne  
Co-chair Paediatric SIG, Australasian Sleep Association

Prof Shantha Rajaratnam  
President, Australasian Sleep Association

© Australasian Sleep Association 2013
References


