This article has been peer reviewed.

Sleep Disorder Breathing: 9 Clinical Cranial Morphological Indicators for Dentists

By James Bronson, DDS

Abstract: Sleep disordered breathing (SDB) is a condition characterized by intermittent partial or complete airway obstruction that disrupts normal ventilation during sleep and normal sleep patterns.1 Approximately 10% of 6-8 year olds have SDB according to a Finnish study.2 There is no consensus on the definition of pediatric SDB, but clinically there is a spectrum of symptoms, in which the milder forms only have primary snoring and mouth-breathing, while the more severe forms have symptoms similar to the more defined entity obstructive sleep apnea syndrome (OSAS), i.e., intermittent breathing pauses (apneas), habitual snoring, snorts or gasps, disturbed sleep, and daytime neurobehavioral problems with impaired school performance.3 The impact of SDB on the growth and development of children may have detrimental effects on health, neuropsychological development, quality of life, and economic potential. 4 Understanding the parameters of early diagnosis and treatment are paramount to stemming this problem.

Key words: *S*leep disorder breathing, SDB, sleep apnea, OSA, lingual frenum, retruded mandible, long face, hyoid bone, UARS, upper airway restrictions, high palate, crossbite, mouth breathing, tonsils

Nine Cranial Morphological Indicators of Sleep Disorder Breathing

1. A retruded maxilla and/or mandible,[5] a long face height and restrictions in the space of the upper airway.[6,7]

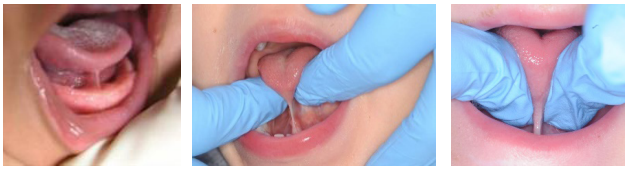
2. A long face height[5,6]

3. Restrictions in the space of the upper airway[5,6]

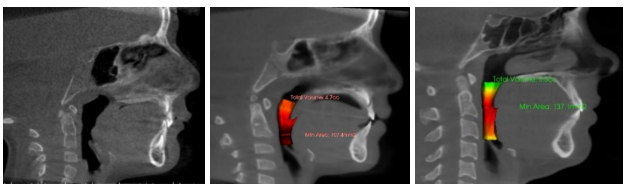
4. Study model analyses demonstrated that OSA subjects differ significantly from control subjects in palatal height measurements.[6]

5. Crossbite and open bite malocclusions were associated with SDB, and may be predictive of SDB in children.[7]

6. Lingual frenulum … leads to a skeletal malocclusion, with the degree being influenced by the different levels of attachment of the frenum on the tongue.[8]



7. The vertical position of the hyoid bone is believed to be a predictor of obstructive sleep apnea (OSA).[9]



8. Mouth-breathing can influence craniofacial and occlusal development early in childhood.[10]

9. Enlarged tonsils, childhood OSAS (obstructive sleep apnea syndrome) usually stems from adenotonsillar hypertrophy. OSAS in infants is usually related to craniofacial anomalies.[11]

Sleep disorder breathing (SDB) is the current buzz around the medical community. In the July 23, 2012 edition of the *Fiscal Times* an article on "Sleepless in America" indicated that sleep is a $32.4 billion dollar business.

Dentist should be the first line of diagnosis for SDB, dentists see their patients more frequently than most pediatricians and internists. Understanding and recognizing the cranial morphological indicators of sleep disorder breathing and then treating or referring are paramount in stemming this ever increasing healthcare problem and expense

References

1. American Academy of Pediatrics. Clinical practice guidelines: diagnosis and management of childhood obstructive sleep apnea syndrome. *Pediatrics*. 2002;109:704–12.
2. University of Eastern Finland. "One in ten 6- to 8-year-olds has sleep-disordered breathing, Finnish study finds." ScienceDaily. *ScienceDaily*, 14 December 2012. <www.sciencedaily.com/releases/2012/12/121214085851.htm>.
3. Kaemingk KL, Pasvogel AE, Goodwin JL, et al. Learning in children and sleep disordered breathing: findings of the Tucson Children's Assessment of Sleep Apnea (tuCASA) prospective cohort study. *J Int Neuropsychol Soc*. 2003;9:1016–26.
4. Sanjeev, Kumar Verma, Sandhya Maheshwari, et al. Role of oral health professional in pediatric obstructive sleep apnea *Natl J Maxilloofac Surg* 2010; 1(1): 35-40.
5. Korayem MM, Witmans M, MacLean J, et al. Craniofacial morphology in pediatric patients with persistent obstructive sleep apnea with or without positive airway pressure therapy: A cross-sectional cephalometric comparison with controls. *Am J Orthod Dentofacial Orthop* 2013;144:78–85.
6. Johal A, Conaghan C. Maxillary morphology in obstructive sleep apnea: A cephalometric and model study. *Angle Orthodontist*, 2004; 74(5).
7. Fernando Rodrigues Carvalho, Débora Aparecida Lentini-Oliveira , Graziele Maria Missiano Carvalho, Lucila Bizari Fernandes Prado, Gilmar Fernandes Prado, Luciane Bizari Coin Carvalho: Sleep-disordered breathing and orthodontic variables in children—Pilot study: *International Journal of Pediatric Otorhinolaryngology* 2014; 78(11): 1965–1969.
8. Meenakshi S, Jagannathan N. Assessment of lingual frenulum lengths in skeletal malocclusion. *Journal of Clinical and Diagnostic Research*. 2014; 8(3): 202-204.
9. Pae, E-K, Blasius JJ, Jeffrey JJ, Blasius,Nanda, R. Heterogeneity in vertical positioning of the hyoid bone in relation to genioglossal activity in men. *Angle Orthodontist* 2004;74(3).
10. Mattar SE, Anselmo-Lima WT, Valera FC, Matsumoto MA. Skeletal and occlusal characteristics in mouth-breathing pre-school children. *J Clin Pediatr Dent* 2004; 28(4):315-8.
11. Ward SL, Marcus CL. Obstructive sleep apnea in infants and young children. *J Clin Neurophysiol*. 1996; 13(3):198-207.

Dr. Bronson graduated "Cum Laude" from Georgetown University School of Dentistry in 1983. He has General Dental Practices in McLean and Charlottesville, Virginia, and a practice limited to ALF (Advanced Light Force) Orthodontics and TMD therapy in Santa Cruz, CA. In 2013, Dr. Bronson founded The ALF Educational Institute, LLC (AEI) and is Director of Clinical Programs. The mission of AEI is to provide structured and certified education in the functions, actions, and designs of the ALF family of appliances, while emphasizing the need for combined cranial osteopathic treatment, orofacial myofunctional therapy, and orthodontics. Dr. Bronson is a Senior Certified Instructor IAO and international speaker.