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## Abstract of the Scientific Literature

## Obstructive Sleep Apnea in Children

The objective of this study was to perform respiratory-gated magnetic resonance imaging to evaluate airway dynamics during tidal breathing in 10 children with obstructive sleep apnea syndrome (OSAS; age= $4.3\pm2.3$  years) and 10 matched control subjects (age= $5\pm2$  years). The authors hypothesized that respiratory cycle fluctuations in the upper airway cross-sectional area would be larger in children with OSAS.

Studies were performed under sedation. Respiratory gating was performed automatically at 10%, 30%, 50%, 70%, and 90% of inspiratory and expiratory volume. Airway cross-sectional area was measured at 4 ascending oropharyngeal levels at each increment of the respiratory cycle.

The authors noted the following in subjects with OSAS compared with control subjects: (1) a smaller upper airway cross-sectional area, particularly during inspiration; (2) airway narrowing occurred during inspiration without evidence of complete airway collapse; (3) airway dilatation occurred during expiration, particularly early in the phase; and (4) magnitude of cross-sectional areas fluctuations during tidal breathing noted in OSAS at levels 1 through 4 were 317%, 422%, 785%, and 922%, compared with 19%, 15%, 17%, and 24% in control subjects (P<.001, P<.005, P<.001, and P<.001, respectively).

Fluctuations in airway area during tidal breathing are significantly greater in OSAS subjects compared with control subjects. Resistive pressure loading is a probable explanation, although increased airway compliance may be a contributing factor.

**Comments:** Obstructive sleep apnea often occurs in children with adenotonsillar hypertrophy. Sedation is contraindicated in children with OSA, although in this study sedation was necessary to complete the measurements required to prove the authors' hypothesis. Providing dental treatment to children with OSA can only be accomplished safely with local or general anesthesia. This study provides excellent evidence, albeit from a small sample size, that both airway resistance and compliance are highly variable and significantly elevated in OSA children and provides an important explanation why we should avoid sedation in the presence of OSA. **ARM** 

Address correspondence to Dr. Arens, Division of Pulmonary Medicine, The Children's Hospital of Philadelphia, 34th Street and Civic Center Boulevard, Philadelphia, PA 19104-4399.

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24 references

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