

## **Learning in children and sleep disordered breathing: findings of the Tucson Children's Assessment of Sleep Apnea (tuCASA) prospective cohort study.**

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We examined the relationship between nocturnal respiratory disturbance and learning and compared learning in children with and without nocturnal respiratory disturbance. Subjects were 149 participants in a prospective cohort study examining sleep in children ages 6-12: The Tucson Children's Assessment of Sleep Apnea study (TuCASA). Sleep was assessed via home polysomnography. Intelligence, learning and memory, and academic achievement were assessed. Parents rated attention. Group comparisons were used to test the hypothesis that the group with an apnea/hypopnea index (AHI) of 5 or more ( $n = 77$ ) would have weaker performance than the group with AHI less than 5 ( $n = 72$ ). The group with AHI of 5 or more had weaker learning and memory though differences between groups decreased when arousals were taken into account. There was a greater percentage of Stage 1 sleep in the AHI 5 or more group, and Stage 1 percentage was negatively related to learning and memory in the sample ( $n = 149$ ). There were negative relationships between AHI and immediate recall, Full Scale IQ, Performance IQ, and math achievement. Hypoxemia was associated with lower Performance IQ. Thus, findings suggest that nocturnal respiratory disturbance is associated with decreased learning in otherwise healthy children, that sleep fragmentation adversely impacts learning and memory, and that hypoxemia adversely influences nonverbal skills.

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