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**Title:** Obesity and obstructive sleep apnea in children less than eight Years of age

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**Body:** Obstructive sleep apnea complicates obesity. The number of obese children < 8 years of age is increasing. Our aim was to describe the polysomnographic findings of obese children < 8 years of age and compare these to lean children. We retrospectively reviewed obese children, <8 years of age that underwent polysomnograms (PSG) at SickKids hospital between January 1, 2006 and Dec 31, 2011. The obese cohort was age and sex matched with lean children. Data was collected on demographics, clinical history and PSGs. PSGs were performed in accordance with the American Academy of Sleep Medicine guidelines. We compared 22 obese with 22 lean children. There were 55% males. The mean age  $\pm$  SD of each of the obese and lean cohorts was  $5.12 \pm 2.1$  years. The mean  $\pm$  SD BMI for obese and lean children was  $31.69 \pm 5.20$  and  $15.73 \pm 3.13$ ,  $p < 0.0001$ . Seventy-three percent (16/22) of each cohort had OSA. The mean  $\pm$  SD of the obstructive apnea-hypopnea index (AHI) was  $22.19 \pm 31.22$  in obese and  $9.52 \pm 11.6$  in lean controls,  $p = 0.082$ . The mean  $\pm$  SD oxygen saturation nadir in obese and lean children was  $78\% \pm 18$  and  $87\% \pm 9$  ( $p < 0.05$ ). The minimum and maximum respiratory rates were higher amongst obese as compared to lean children,  $p = 0.0017$  and  $p = 0.0018$ . In the obese cohort, the obstructive AHI correlated with oxygen saturation nadir ( $r^2 = 0.74$ ,  $p < 0.0001$ ) and maximum respiratory rate ( $r^2 = 0.45$ ,  $p = 0.007$ ). Obese children had more severe OSA AHI, lower oxygen saturation nadir and higher respiratory rates than lean children. These data suggest that obese children have increased cardiorespiratory compromise during sleep than their age matched lean peers. Early diagnosis and intervention is paramount to reducing co-morbidity in obese children.