Online Table S5.3: Benefits of CPAP (except decrease in AHI)

Author	Country	Journal	Study design	Number of patients	Ages	Benefits
Rains et al. [1]	USA	Clin Pediatr	Descriptive study	4 children: Down syndrome, Hurler disease, Hunter disease, Treacher Collins syndrome	3 - 12 yrs	Clinical observation of improved alertness, attention/concentration, and behavior/temperament in all 4 children
Johnstone et al. [2]	Australia	Sleep Med	Prospective study	19 children with ADHD and SDB	7 – 15 yrs	EEG before and after 6 m of CPAP 13/19 compliant with CPAP (use 6- 10h/night): IAH 1.4 - 4.2/h Children treated with CPAP had a decrease in slow wave (delta and theta) and an increase in fast wave (beta) EEG activity In children with ADHD and SDB, CPAP is associated with some improvement in the typical EEG features of ADHD
Beebe et al. [3]	USA	Plos One	Prospective study	13 obese children with OSA + 15 obese controls without OSA	10-16 yrs	13 obese with OSA all treated with CPAP: 6 CPAP users + 7 CPAP non-adherent Academic function: self-report on grades + parent and self-report on scholastic functioning on PedQL 4.0 Generic Attention: age-normed Total Corrected z-score on the computerized Gordon Diagnostic System Non-adherent: worsening functioning over time CPAP-adherent: improved attention and academic function
Marcus et al. [4]	USA	AJRCCM	Prospective study	52 children after 3 m of CPAP	12 ± 4 yrs	Neurobehavioral assessment before and at 3 m of CPAP Significant improvement in attention deficits (ADHD by Connors Abbreviated Symptoms Questionnaire + Attention Problems subscale on the Child Behavior Checklist: CBCL), sleepiness, behavior (on CBCL) and caregiver and child-reported QoL (on PedQL) and on OSAS-related symptoms and disease-specific QoL (on OSAS-18)

						Positive correlation between adherence and decrease in sleepiness but not with behavioral outcomes
Brooks et al. [5]	USA	Sleep & Breathing	Prospective study	23 children with Down syndrome, 10 had an AHI > 5/h	7.2-18.7 yrs	7 children treated with CPAP: CPAP effective in 5 Improvement in attention (Connors Hyperactivity test) in all 5 ($p < 0.05$)
Konstantinopoulou et al. [6]	USA	Sleep Med	Prospective randomized study	23 children with Down syndrome, 20 had OSA	8-19 yrs	9 patients randomized to CPAP, 11 to sham-CPAP (2 cmH_2O) Median CPAP use: 116 (70-139) min/night Duration of CPAP use: Negatively correlated with E/e' mitral lateral (reflects left ventricular (LV) diastolic dysfunction, higher index reflects greater dysfunction) Positively correlated with LV mass z-score
Katz et al. [7]	USA	J Clin Sleep Med	Prospective multicenter study	27 obese children treated with CPAP	8-16 yrs	At baseline: 10/25 (40%) had HOMA-IR (homeostasis model assessment of insuline resistance > 97° perc. 10/23 (44%) hypertension, 16/23 (70%) loss of nocturnal blood pressure dip, high sensitive-CRP was elevated in 16/27 (64%) No change in any outcome at 3 and 6 m between CPAP-adherent and non-adherent
Delrosso et al. [8]	USA	J Pediatr	Retrospective chart review	3 groups of 25 children: snorers, untreated OSA, CPAP-treated OSA	7-17 yrs	OSA: AHI between 4.3-22/h CPAP patients had higher body mass index than snorers and non-CPAP OSA patients Systolic blood pressure was higher in the 2 OSA groups vs snorers Systolic blood pressure decreased in the CPAP group after 6 m of CPAP

Abbreviations: m: months, yrs: years, ADHD: attention-deficit hyperactivity disorder, EEG: electroencephalography, CPAP: continuous positive airway pressure, NIV: noninvasive ventilation, SDB: sleep-disordered breathing, OSA: obstructive sleep apnea, AHI: apnea-hypopnea index.

References

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