

**Online Table S4.3:** Ventilators for CPAP and NIV

Author	Country	Journal	Type of study	Design	Results
Parmar et al. [1]	Canada	Paediatr Respir Rev	Review of CPAP devices for pediatric OSA		A wide variety of CPAP and BPAP devices are commercially available, each with unique capabilities and proprietary algorithms used to measure the phases of the respiratory cycle and airflow resistance. There are two distinct trademark comfort features in CPAP and APAP: ramp/delay and pressure reduction during exhalation. Many devices have the ability to wirelessly transfer data via cellular or Wi-Fi, from the device to a cloud-based software program on a daily basis.
Khirani et al. [2]	France	Clin Respir J	Bench and prospective clinical study	A classical inspiratory trigger (ITc) and an improved IT (NIV + IT) were tested on a bench with 6 pediatric profiles and 6 young patients requiring long-term NIV: fascioscapulohumeral myopathy, DMD, chronic obstructive pulmonary disease, Kenny–Caffey syndrome, SMA, congenital myopathy Age 9.9–16.5 yrs (mean $14.1 \pm 2.7$ yrs)	On the bench, trigger time delays ( $\Delta T$ ) and trigger pressures ( $\Delta P$ ) were significantly reduced with the NIV + IT as compared with the ITc. The clinical study confirmed the significant decrease in $\Delta T$ and $\Delta P$ .
Norregaa	Denmark	Eur Respir	Review		When applying respiratory assist, the trigger function,

rd [3]	ark	J			<p>usually sensed as either pressure or flow changes in the system, is of fundamental importance. In the case of a small or weak child, inspiratory flows generated by the child may be insufficient to activate the trigger.</p> <p>If supplemental oxygen is added, this is usually via the single hose system or via the mask.</p> <p>Heated humidifiers are much more efficient than passover humidifiers. The addition of a humidifier will add to the resistance of the circuit, and will tend to interfere with triggering and possibly pressure delivery. Complications related to NIV in paediatric ventilator users are: nasal and pharyngeal dryness, vasomotor rhinitis, air leaks, gastric distension, air flow-induced arousals, possible increase in work of breathing due to dyssynchrony/compromised triggering, carbon dioxide retention associated with large dead space.</p>
Wallis [4]	UK	Paediatr Respir Rev	Review + results of a survey (home CPAP via nasal mask for OSA: The Great Ormond Street Experience 1994–1998)	<p>76 children (survey)</p> <p>34 craniofacial anomalies,</p> <p>6 mucopolysaccharidosis,</p> <p>8 NMD, 2 achondroplasia, 26 other</p> <p>0.3-16 yrs</p>	Factors determining the choice of a home device: cost, noise, alarms, trigger sensitivity, portability and adaptability, pressure vs. volume.

Khirani et al. [5]	France	Sleep Med	Prospective study	Comparison of AHI scoring on the built-in software and a PG in 15 children treated with CPAP aged 1.5-18.6 yrs	Comparison of scoring of AHI on -built-in software of a CPAP device (Resmed) + integrated SpO <sub>2</sub> : automatic analysis and manual scoring on a breath-by breath analysis -PG during CPAP in hospital Strong correlation between the AHI scored on a manual analysis of built-in software and a PG: useful for cheap and simple follow up
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Abbreviations: yrs: years, CPAP: continuous positive airway pressure, NIV: noninvasive ventilation, Vt: tidal volume, PEEP: positive end-expiratory pressure, SMA: spinal muscular atrophy, DMD: Duchenne muscular dystrophy, NMD: neuromuscular disease, OSA: obstructive sleep apnea, PG: respiratory polygraphy, AHI: apnea-hypopnea index.

## References

1. Parmar A, Baker A, Narang I. Positive airway pressure in pediatric obstructive sleep apnea. *Paediatr Respir Rev* 2019; 31: 43-51.
2. Khirani S, Louis B, Leroux K, *et al.* Improvement of the trigger of a ventilator for non-invasive ventilation in children: bench and clinical study. *Clin Respir J* 2016; 10: 559-566.
3. Nørregaard O. Noninvasive ventilation in children. *Eur Respir J* 2002; 20: 5.
4. Wallis C. Non-invasive home ventilation. *Paediatr Respir Rev* 2000; 1: 165-171.
5. Khirani S, Delord V, Olmo Arroyo J, *et al.* Can the analysis of built-in software of CPAP devices replace polygraphy in children? *Sleep Med* 2017; 37: 46-53.