WEB TABLE I STUDIES COMPARING VARIOUS TYPES OF CONSTANT-FLOW WITH VARIABLE- FLOW PRESSURE GENERATORS

Author	*Study design & study population*	*Comparison*	*Results*
Moa, *et al*.,1988	Experimental in vitro study Lung model simulated breathing pattern of a newborn	Variable flow NCPAP *vs* Continuous flow NCPAP	Pressure variations in airway and external workload were less with variable flow CPAP device
Klausnr, *et al*., 1996	Experimental in vitro study Breathing apparatus simulating breathing pattern of a VLBW newborn	Variable flow NCPAP *vs* Continuous flow NCPAP	Imposed work of breathing and variations in airway pressure was less with variable flow NCPAP device
Ahluwalia, *et al*., 1998	Crossover study (*N*=20); Infant of 24-34 weeks on CPAP with FiO2 of 0.3.	Infant Flow Driver (IFD) *vs* Single prong ventilator NCPAP	No significant difference in respiratory rate, heart rate, blood pressure and comfort score
Courtney, *et al*., 2001	Crossover study (*N*=32); birth weight 1081 ±316 g, 29 ±2 weeks receiving NCPAP for apnea or mild respiratory distress were enrolled at the age of 13 ±12 days	IFD *vs* Ventilator NCPAP via CPAP prongs *vs* Ventilator NCPAP via modified nasal cannula	Compared with two continuous flow devices, the variable flow nasal CPAP device leads to greater lung recruitment
Pandit, *et al*., 2001	Crossover trial (*N*=24); <1800 g receiving constant- flow NCPAP for apnea or mild respiratory distress	Infant flow system NCPAP *vs* Ventilator NCPAP	Work of breathing lower with variable flow (13 to 29%) as compared to ventilator CPAP
Mazella, *et al*., 2001	RCT (*N*=36); RDS in <36 weeks infants and <12 hours old	IFD *vs* Nasopharyngeal bubble CPAP	Oxygen requirement and respiratory rate significantly decreased by four hours. Probability of remaining supplementary oxygen free over the first 48 hours of treatment significantly higher in patients treated with the IFD.
Liptsen, *et al*., 2005	RCT (*N*=18); <1500 g birth weight, <28 days of age, requiring NCPAP for mild respiratory distress	IFD *vs* Bubble NCPAP	Resistive work of breathing, respiratory rate and phase angle (time lag between chest and abdominal movement) were all greater with bubble CPAP as compared to IFD
Boumecid, *et al*., 2007	Crossover study (*N*=13); 26-32 weeks All were evaluatedon each device applied for 30 minutes in random order	Variable-flow NCPAP *vs* Continuous flow NCPAP *vs* Nasal cannula	Variable-flow NCPAP increases tidal volume and improves thoraco-abdominal synchrony. Increased tidal volume is probably due to increased contribution of the rib cage.
Pantalitschka, *et al*., 2009	Crossover trial (*N*=16); 31 weeks; all infants having apnea of prematurity were allocated to four different modes of respiratory support for 6 hour each	Non invasive positive pressure ventilation (NIPPV) via a conventional ventilator *vs* NIPPV via a variable flow device *vs* NCPAP via a variable flow device *vs* NCPAP via a constant flow underwater bubble system	The median event rate [cumulative event rate of bradycardias (< or =80 beats per minute) and desaturation events (< or =80% arterial oxygen saturation] was significantly less with variable flow CPAP as compared to bubble CPAP (2.8 per hr vs 5.4 per hr)
Yaqui, *et al*., 2011	RCT (*N*=40); > 1500 g (mean birth weight 2500 g)with FiO2 > 30% within first 24 hours after birth (70% of subjects had TTNB)	Variable flow CPAP *vs* Bubble CPAP	Bubble CPAP showed the same benefits (CPAP failure rate, total CPAP duration, total oxygen duration) as variable flow CPAP

			in newborns with birth weight ≥ 1500 g and moderate respiratory distress
Bober, *et al*., 2012	Multicentric RCT (*N*=276); infants with birth weight 750-1500 g and ≤32 weeks were divided into 'weaning group' (infants that met criteria for intubation and surfactant) and 'elective group' (infants that did not meet intubation criteria but required respiratory support within 6 hrs of delivery) and then were randomly assigned intervention	Infant flow CPAP *vs* Ventilator CPAP	Treatment failure (defined as the need for reintubation and mechanical ventilation within 3 days of initial extubation in the 'weaning group' and need for intubation in the first 3 days after first weaning from NCPAP in the 'elective group') was not statistically different between the two groups
Kirchner, *et al*., 2012	Experimental in vitro study Noise production was measured in a closed incubator at 2 mm lateral distance from the end of the nasal prongs in an experimental model	Variable flow CPAP generator (Infant flow and Medijet) *vs* Constant flow CPAP generator (Bubble CPAP and Baby flow ventilator CPAP)	Values measured at a continuous constant flow rate of 8 l/min averaged 83 dB for the Infant Flow, 72 dB for the MediJet, 62 dB for the Bubble CPAP and 55 dB for the Baby Flow. Constant flow CPAP generator work more quietly than variable flow CPAP generators
In post extubation setting			
Roukema, *et al.*, 1999	Crossover trial *N*=93; <1250 g; Used as post extubation respiratory support to decrease extubation failure	Infant flow NCPAP *vs* Nasopharyngeal CPAP	Less extubation failure with IFD CPAP
Sun, *et al*., 1999	RCT (*N*=73); <1250gms g Had RDS and were mechanically ventilated	Flow driver CPAP *vs* Conventional NCPAP	Extubation failure rate was higher in conventional NCPAP on Day 1 and within 7 days of extubation
Kavvadia, *et al*., 2000	RCT (*N*=36); 25-35weeks 12 infants in each group after extubation were put on IFD or single nasal prong NCPAP or no CPAP	IFD *vs* Single nasal prong NCPAP *vs* No CPAP	IFD offered no short term advantage over single nasal prong NCPAP when used after extubation
Stefanescu, *et al*. 2003	RCT *N*=162; <1000 g Used as post extubation respiratory support to decrease extubation failure	Infant flow NCPAP *vs* Ventilator NCPAP	IFD CPAP as effective as ventilator CPAP in preventing extubation failure
Huckstadt, *et al*., 2003	Randomized cross over trial (*N*=20), 26-40 weeks; 640-4110g; Being mechanically ventilated for TTNB, RDS, sepsis	Infant flow CPAP *vs* Ventilator CPAP	No significant increase in the inspiratory flow and tidal volume and less fluctuations in CPAP pressures during breathing cycle with Infant flow system
Gupta, *et al.*, 2009	RCT (*N*=140), 24-29 weeks; 600-1500 g had RDS and were mechanically ventilated	Bubble CPAP *vs* IFD	Bubble CPAP was as effective as IFD CPAP, associated with a significantly higher rate of successful extubation in infants ventilated for < 14 days, and a significantly reduced duration of CPAP support