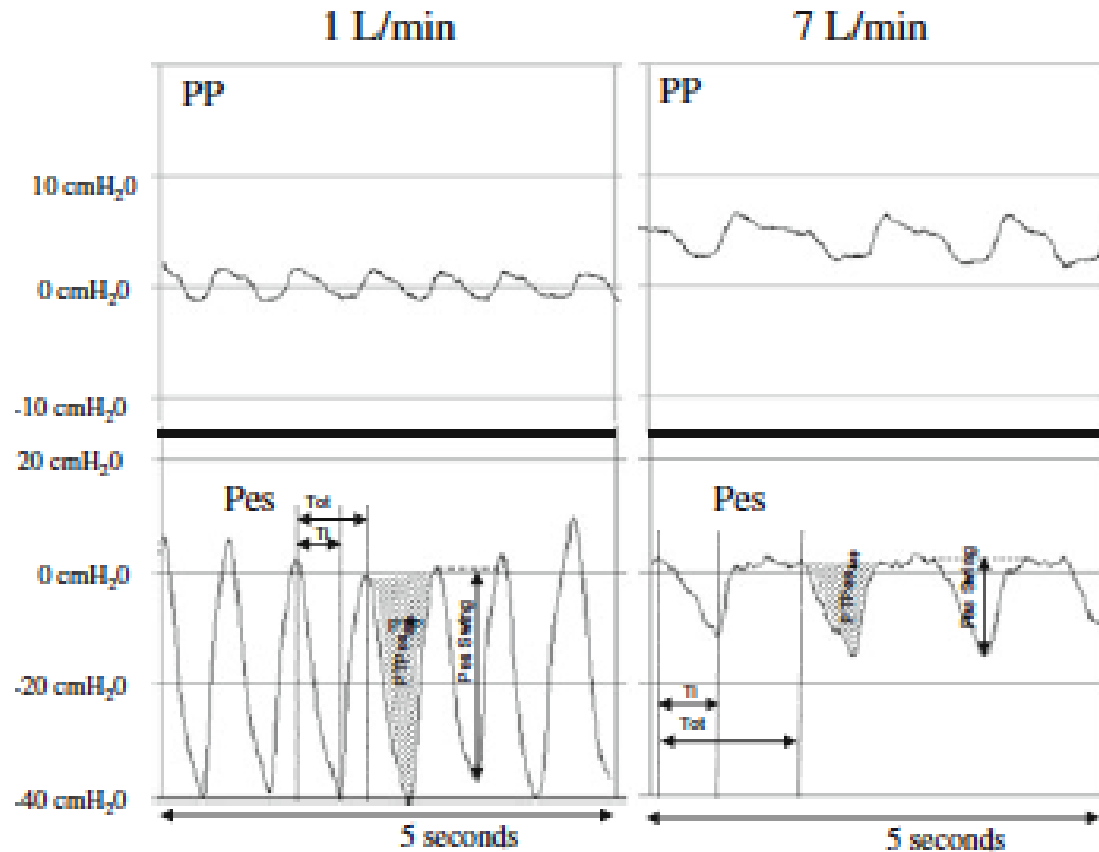


Paediatric High flow: Pipe Dream or Promising Therapy?

Susan Murphy
CHBAH PICU

Acute Viral Bronchiolitis



» Milesi, Intensive care Med 2013;39 (1088-1094)

Acute Viral Bronchiolitis

- Positive clinical effect on various respiratory parameters
- Decreased need for CPAP and invasive ventilation
- For mild as well as moderate to severe bronchiolitis
 - Kepreotes et al. Lancet 2017 March 4 (389)
 - Franklin et al . NEJM 2018 378(12) 1121-1131

Obstructive Sleep Apnoea

- Reduced inspiratory flow limitation
- Lower respiratory rate
- Fewer arousals
- Improved apnoea hypopnoea index (comparable to CPAP)
- Increased oxygen saturation
 - McGinley, Pediatrics 2009;124(179-88)
 - Joseph L, J Clin Sleep Medicine 2015; 11 (1007-1010)

Acute Severe Asthma

- High flow may be feasible and safe in children with severe asthma
- Variability of bronchodilator dose delivered with high flow (0.5-25%)
 - Baudin et al. Ann Intensive Care (2017)7:55
 - Kelly et al Pediatric Emergency Care (2013)29:8
 - Wing et al Pediatric Emergency Care (2012) 28:11

Extubation after Cardiac Surgery in Infants

- High flow vs Conventional oxygen
 - Better P:F High Flow
 - No difference in PCO₂, rates of intubation
 - Testa G, Interactive CardioVascular and Thoracic Surgery 19 (2014) 465-461
- High flow vs NIV
 - High flow equivalent to NIV
 - Less utilisation of hospital resources with high flow
 - Richter R, PCCM Feb 2019 vol 2(2) 149-157

Post Extubation in ICU

- Adult and neonatal data
- Compared to venturi
 - Better P:F, fewer desaturations, fewer re-intubations, less need for NIV, less discomfort
 - Maggiori et al. Am J Resp Care 2014; 59(489-490)
 - Decreased need for reintubation; no delay in re-intubation
 - Hernandez et al JAMA 2016; 315 (1354-1361)
- Those at high risk of re-intubation
 - High flow non-inferior to NIV
 - Hernandez et al JAMA 2016;316 (1565-74)

What about delayed re-intubations?

- Retrospective: High flow nasal cannula failures
 - Early re-intubation(<48hrs) associated with lower mortality compared to late (>48hrs)
 - Kang et al Intensive Care Med 2015; 41(623-632)

During endotracheal intubation

- Prolonged safe apnoea time in healthy children
 - No effect on CO₂ clearance
-
- Humphreys S et al BJA 2017, 118(2) 232-8

Immunocompromised children with Acute Respiratory Failure

- From adult data: possibly benefit
 - Association with lower short-term mortality, intubation rate
 - Without increased length of stay

- Huang H et al J Crit Care 2018 (43) 300-305

ED: Respiratory Distress and Hypoxaemia



High-Flow Nasal Cannula Use in Children With Respiratory Distress in the Emergency Department

Predicting the Need for Subsequent Intubation

Geoffrey S. Kelly, MS, MD,* Harold K. Simon, MD, MBA,† and Jesse J. Sturm, MD, MPH†‡

TABLE 1. Patient Characteristics

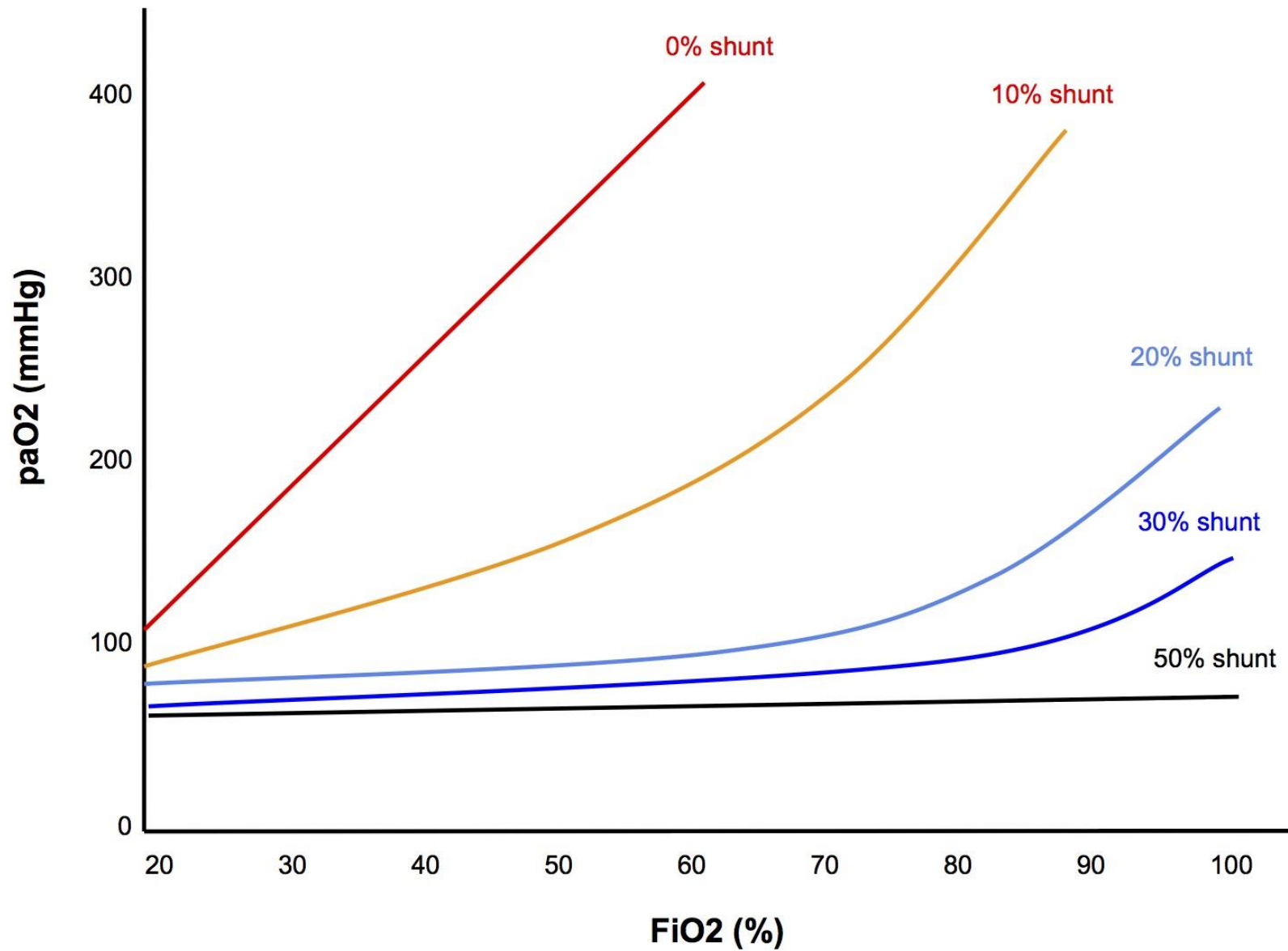
Characteristic	Nonintubated (n = 456)	Intubated (n = 42)	P
Age, mean (SD), mo	10.7 (6.1)	10.1 (6.6)	0.572
Corrected age, mean (SD), mo	7.2 (5.5)	4.6 (7.0)	0.016*
Sex, male, n (%)	272 (59.6)	26 (61.9)	0.87
Ethnicity, white, n (%)	205 (45.0)	16 (38.1)	0.421
Admission RR, mean (SD), breaths/min	50.5 (13.1)	56.2 (17.3)	0.009*
Initial venous P _{CO₂} , mean (SD), mm Hg	47.1 (14.6)	54.9 (18.8)	0.002*
Initial venous pH, mean (SD)	7.35 (0.08)	7.29 (0.11)	<0.001*
RSV positive, n (%)	158 (34.6)	20 (47.6)	0.129
Acute bronchiolitis, n (%)	216 (47.4)	15 (35.7)	0.195
Medical history, n (%)			
Atopy	62 (13.6)	4 (9.5)	0.496
Cardiac	55 (12.1)	7 (16.7)	0.461
Genetic	44 (9.6)	2 (4.8)	0.409
Previous intubation history	73 (16.0)	8 (19.0)	0.661

Corrected age: chronological age (months) – [(40 weeks – gestational age in weeks) × 1 month / 4 weeks].

**P* < 0.05.

Respiratory Distress and Hypoxaemia

- Possibly: Single organ failure without criteria for intubation
- Not: Criteria for intubation present, or extrapulmonary organ failure
- High flow humidified oxygen is not a ventilatory strategy
- Recognize when escalation is needed
 - Wing et al Pediatric Emergency Care (2012) 28:11
 - Kelly et al Pediatric Emergency Care (2013) 29:8
 - Slain et al J Pediatr(Rio J) 2017; 93(s1)36-45





Geissmann

YES	MAYBE	NEED MORE INFO	NO
Acute Viral Bronchiolitis	Post cardiac surgery	Immunocompromised patients with Acute respiratory failure	Hypoxaemic respiratory failure with criteria for intubation
	Post-extubation ICU patients	Preoxygenation for intubation hypoxaemic patients	Hypoxaemic respiratory failure with multi-organ failure
	Acute Asthma	Palliative care	
	Obstructive sleep apnoea		
	Pre-oxygenation normal children undergoing intubation		