

DON'T DO SOMETHING... JUST STAND THERE

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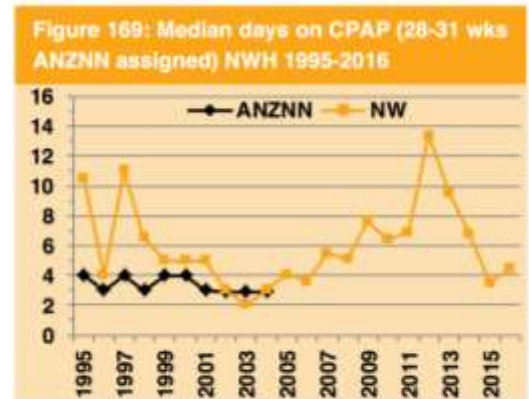
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Increasing use of non-invasive ventilation in late-preterm and term infants

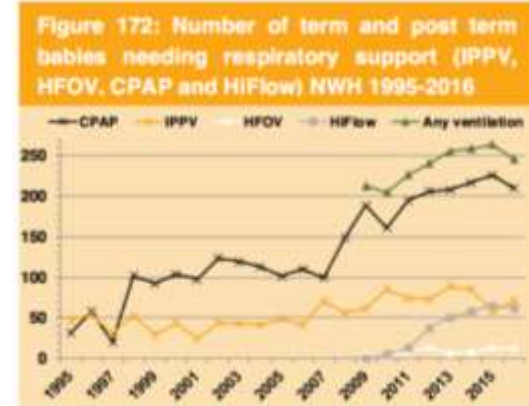
- Nasal (humidified) high flow (nHF) cannulae easy to apply
- Preferred by parents and nursing staff
- Perceived as more comfortable
- Less nasal trauma

Increasing use of non-invasive ventilation at ACH

- CPAP use in term infants has increased since 2008
- nHF use in term infants has increased since 2010
- nHF has increased in preterm infants since 2013

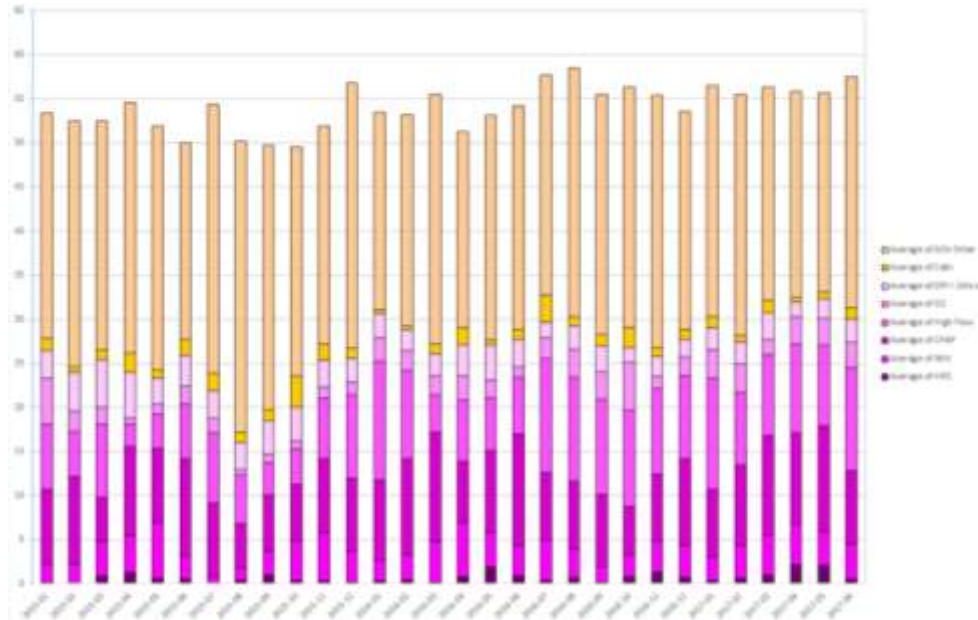


The decrease in median days on CPAP from 2013 is offset by use of HiFlow.



Increasing use of non-invasive ventilation in all infants at RWH, Melbourne

- nHF has increased from 30% to 55% of NIV days in the past 18 months



Why do babies receive respiratory support?

- Respiratory distress
- Oxygen requirement
- "Work of breathing"
- Apnoea
-?

HIPERSPACE - nHF following extubation

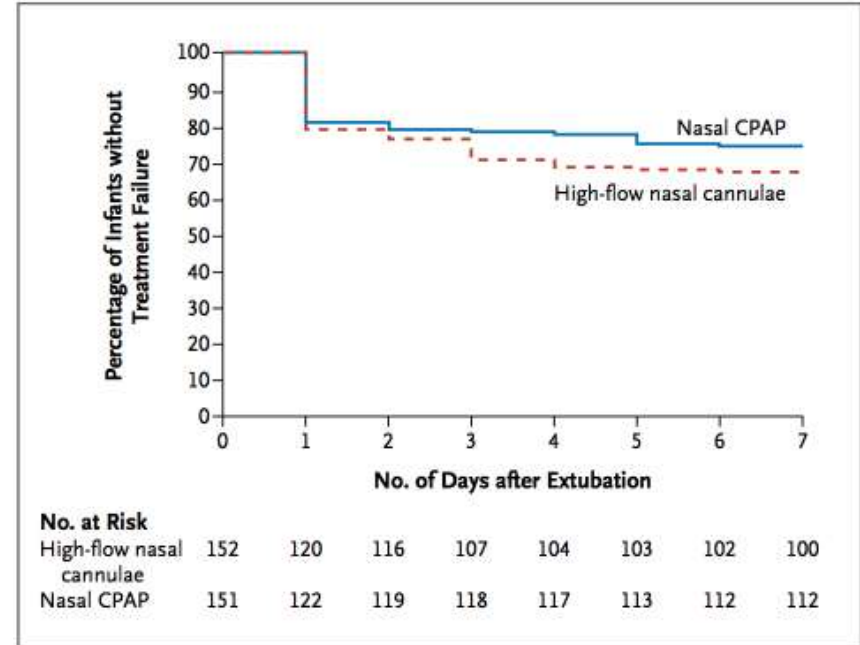
- Non-inferiority multicentre RCT
- 303 infants <32 weeks receiving IPPV
- Extubated to initial settings of:
 - CPAP 7cm
 - or nHF 5 or 6LPM
- Primary outcome: Treatment failure <7 days
 - CPAP: reintubation
 - nHF: CPAP/reintubation
- Estimated failure rate: 25% in CPAP group

HIPERSPACE - nHF following extubation

- No differences in patient groups by
 - GA
 - Weight
 - Sex
 - Ventilation settings or duration prior to extubation
 - Surfactant use or caffeine use

HIPERSPACE - nHF following extubation

- Treatment failure not different
 - CPAP 25.8%
 - nHF 34.2%
- Reintubated within 7 days
 - CPAP 25.2%
 - nHF 17.8% (p=0.17)
- Nasal trauma
 - CPAP 54.3%
 - nHF 39.5% (p=0.01)



HIPERSPACE - nHF following extubation

- nHF not inferior to CPAP
- Half those who failed nHF were rescued with CPAP
- Caution in infants <26 weeks (failure rate high)
- Less nasal trauma

nHF following extubation

- Papers appearing with concerns that nHF has increased time on support
- Variable methods of weaning
- Some NICUs using nHF instead of low flow oxygen in babies still at risk of ROP

Sasi A, Malhotra A. High flow nasal cannula for continuous positive airway pressure weaning in preterm infants: a single-centre experience. *J Paediatr Child Health* 2015;51:199-203

Heath Jeffery RC, Broom M, Shadbolt B, Todd DA. Increased use of heated humidified high flow nasal cannula is associated with longer oxygen requirements. *J Paediatr Child Health* 2017; doi:10.1111/jpc.13605

HIPSTER - nHF as primary support

- Non-inferiority multicentre RCT
- 564 preterm infants 28⁰ to 36⁶ weeks
- Attending clinician decision to commence support
CPAP 6-8cm
or nHF 6-8LPM
- Primary outcome: Treatment failure <72 hours
FiO₂>40% or pH<7.2 (with pCO₂<8kPa) or Apnoea
- Estimated failure 17% in CPAP group

HIPSTER - nHF as primary support

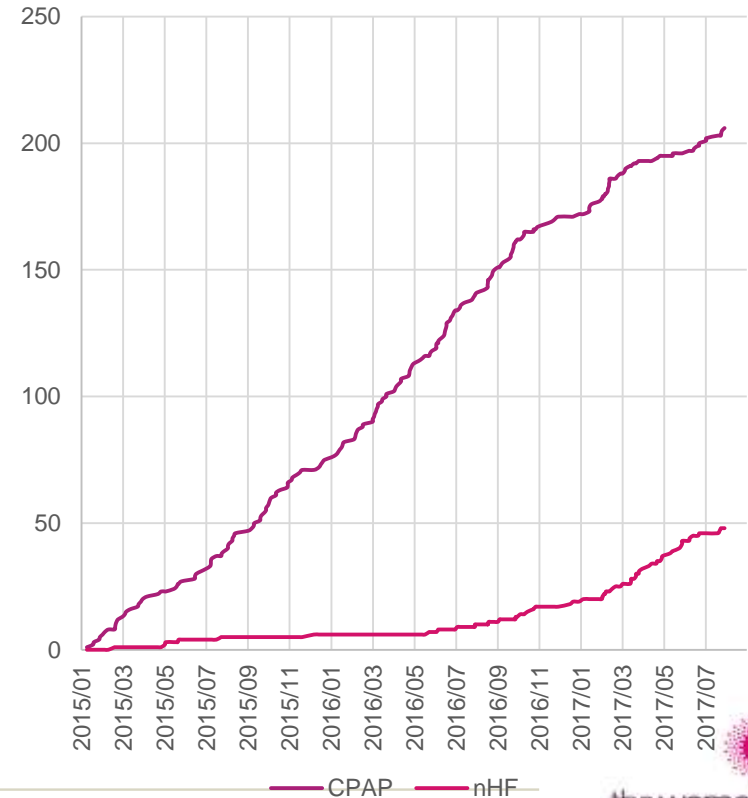
- No differences in patient groups by
 - GA (50% of babies <32 weeks)
 - Weight
 - Sex
 - Age at randomisation (1.3-1.4 hours)
 - Support prior to randomisation
 - Median FiO₂ 21%
 - CPAP prior in nearly 60%

HIPSTER - nHF as primary support

- Trial stopped early due to high failure rate with nHF
- Treatment failure <72 hours
 - CPAP 13.3% vs nHF 25.5% $p < 0.001$
 - <32 weeks 18.1% vs 32.9% $p = 0.004$
 - ≥ 32 weeks 8.0% vs 18.1% $p = 0.01$
- No difference in intubation rates
- Treatment costs no different

CPAP and nHF as primary support for infants ≥ 34 weeks

- Infants 34 weeks or greater
- Only one episode of respiratory support, commencing on day 0 or 1
- Not transferred <2 days
- nHF being used more commonly as primary support



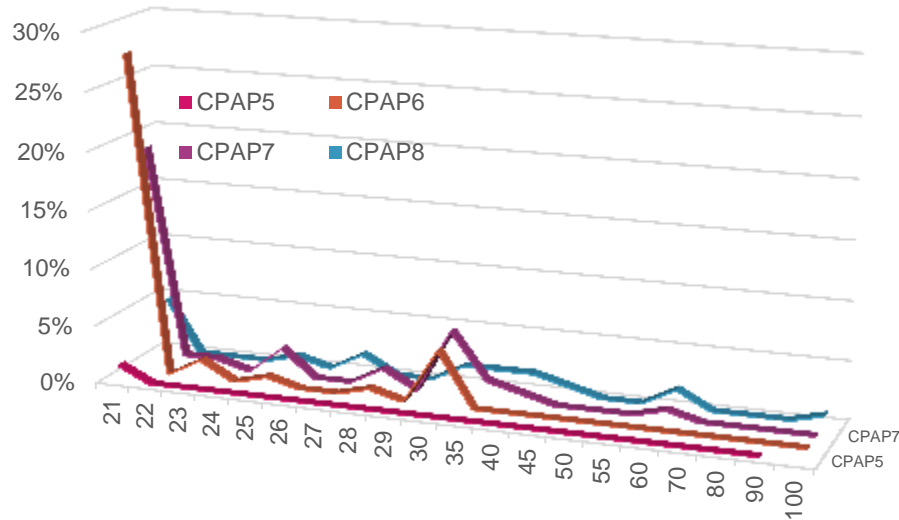
Duration of support in Infants ≥ 34 weeks with only one episode of CPAP or nHF

	CPAP (N=206)	nHF (N=48)	P Value
Gestation (weeks)	37.5 +/-2.3	37.6 +/-2.4	0.79
Age at commencement (hours)	0.9 +/-2.0	3.8 +/-5.1	<0.0001
Duration of support (hours)	11.1 +/-14.0	30.1 +/-32.1	<0.0001
Mean FiO2 in first 2 days*	25.8 +/-8.8 (n=258)	25.6 +/-10.1 (n=74)	0.87
Length of stay (days)	4.2 +/-5.6	6.9 +/-8.6	0.008

*Settings as recorded in neonatal database

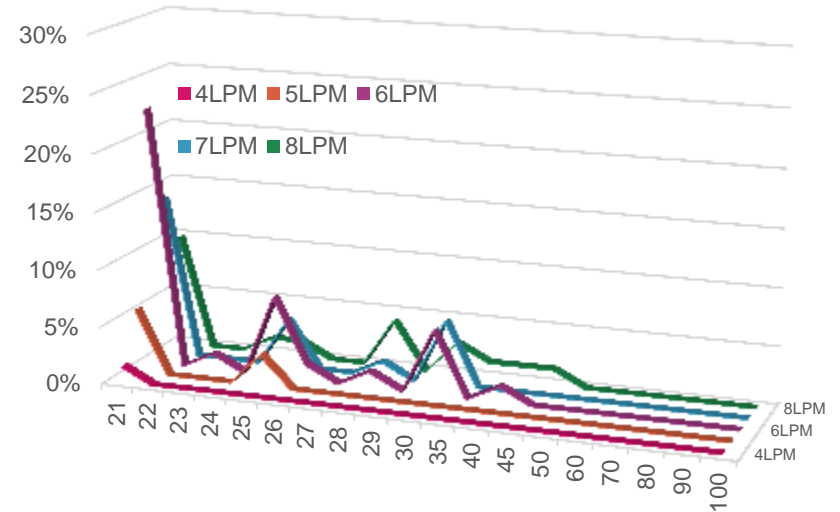
Settings in the first 48 hours

CPAP



- 66% of FiO2 recordings are 21%

nHF



- 54% of FiO2 recordings are 21%

What does all this mean?

- nHF is less effective than CPAP as primary support
- nHF use is associated with a longer duration of support and a longer length of stay
- There are significant costs associated with equipment and staffing when babies receive respiratory support
- There is an impact on acuity and occupancy
- There will be an impact on parental anxiety and attachment

Where to from here?

- Local review of term and near-term babies receiving non-invasive ventilation
- Restrict the circumstances in which it is commenced
- Wean quickly and try off often when in air
- Educate staff and monitor compliance to any guideline
- Develop a KPI that can be monitored in near real-time
CGA at nHF ceasing?
Hours on nHF in air without a trial off support?