

NEONATAL THERAPY OVERVIEW





NASAL HIGH FLOW **DEFINITION:**¹⁻³

Nasal high flow (NHF) is a mode of noninvasive respiratory support that delivers high flows of heated and humidified blended air and oxygen through a nasal interface.

Increasing evidence supporting the use of NHF therapy in neonates



Data from the Fisher & Paykel Healthcare internal database including systematic reviews, meta-analyses, RCTs, non-RCTs, protocols, and reviews.

Evidence-based applications for NHF



1. Franklin et al. N. Engl. J. Med. 2018. 2. Mayfield et al. J. Paediatr. Child Health. 2014. 3. Kepreotes et al. Lancet. 2017. 4. ten Brink et al. Pediatr. Crit. Care Med. 2013. 5. Milési et al. Intensive Care Med. 2017. 6. Sivieri et al. Pediatr. Pulmonol. 2012. 7. Wilkinson et al. Cochrane Database Syst. Rev. 2016. 8. Collins et al. J. Pediatr. 2013. 9. Manley. Clin. Perinatol. 2016. 10. Yoder et al. J. Perinatol. 2017. 11. Roehr et al. Clin. Perinatol. 2016. 12. Roberts et al. Matern. Health Neonatol. Perinatol. 2017. 13. Yoder et al. Pediatrics. 2013.

How does NHF therapy work?

F&P Optiflow Junior 2



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Supporting neonates on NHF for **post-extubation**

For neonates \geq 28 weeks GA, there is well-established evidence supporting the use of NHF for post-extubation support.

High-flow nasal cannula for respiratory support in preterm infants.

Cochrane Review¹ Wilkinson et al. 2016.

Data from six post-extubation RCTs was analyzed to assess the efficacy and safety of NHF:

Manley et al. 2013 (Australia)²

N. Engl. J. Med.

- > 303 infants (< 32 weeks GA)
- > Primary outcome: Treatment failure within 7 days
- Result: NHF was noninferior to CPAP (Risk difference: 8.5%; margin of noninferiority: 20%)

Campbell et al. 2006 (USA)³

J. Perinatol.

- > 40 infants (\leq 1250 g at birth)
- > Primary outcome: Need for intubation within 7 days
- Result: Statistically significant difference favoring CPAP compared to NHF

Liu et al. 2016 (China)⁴

Chinese J. Pediatr.

- > 256 infants (150 preterm < 7 days old)
- > Primary outcome: Treatment failure within 7 days
- Result: No statistically significant difference between CPAP and NHF

Collins et al. 2013 (Australia)⁵

J. Pediatr.

- > 132 infants (< 32 weeks GA)
- Primary outcome: Treatment failure within 7 days
- Result: No statistically significant difference between CPAP and NHF

Mostafa-Gharehbahgi et al. 2015 (Iran)⁶

Zahedan J. Res. Med. Sci.

- 85 infants (1250 2000 g at birth)
- > Primary outcome: Treatment failure within 3 days
- Result: No statistically significant difference between CPAP and NHF

Yoder et al. 2013 (USA and China)⁷

Pediatrics

- > 432 infants (226 in post-extubation arm \ge 28 weeks GA)
- Primary outcome: Need for intubation within 3 days
- Result: No statistically significant difference between CPAP and NHF



The Cochrane Review found that compared to CPAP, NHF is associated with:



No statistically significant difference in rate of treatment failure

N di re

No statistically significant difference in rate of reintubation

No statistically significant difference in adverse outcomes i.e. pneumothorax



Significant reduction in

rates of nasal trauma





Clinical judgement is necessary to assess the appropriate treatment for an individual patient.

The use of NHF therapy is not typically supported for infants with extreme prematurity or severe respiratory distress syndrome.

Supporting neonates on NHF as an **alternative to prolonged CPAP**

More than 25 leading NHF researchers have contributed to two consensus publications. These publications provide guidance on how to use NHF in the NICU.



CONSENSUS: Roehr et al. 2016¹

Clin. Perinatol.

Evidence support and guidelines for using heated, humidified, high-flow nasal cannulae in neonatology: Oxford nasal high-flow therapy meeting, 2015.

CONSENSUS: Yoder et al. 2017²

Clin. Perinatol.

Consensus approach to nasal high-flow therapy in neonates.





Expert consensus indicates that for neonates who require prolonged periods of noninvasive respiratory support, NHF is a suitable alternative to CPAP.^{1,2}

NHF as an alternative to prolonged CPAP

GESTATIONAL AGE (WEEKS): 23 24 25 26	27 2	28	29 30	31	32	33	34	35	36	37	38	39	40
< 28 weeks GA CPAP first ¹		≥2 NI	28 weeks G HF + Rescu	A e CPAI	0 1,2,3								
CPAP continues to be the st of care; however, NHF may l considered once infants are	The use of NHF as an alternative to prolonged CPAP may be considered once infants are stable. The benefits of NHF for older preterm infants are demonstrated in the body of literature.												

Clinical judgement is necessary to assess the appropriate treatment for an individual patient. The use of NHF therapy is not typically supported for infants with extreme prematurity or severe respiratory distress syndrome.

Supporting neonates on NHF as **primary respiratory support**

For neonates ≥ 28 weeks GA, there is emerging evidence supporting the use of NHF for primary respiratory support with "rescue" CPAP available.



Roberts et al. 2016¹ (Australia)

N. Engl. J. Med.

- > 564 infants (\geq 28 weeks GA)
- Primary outcome: Treatment failure within 72 hours
- Result: Treatment failure was significantly higher with NHF than CPAP

Yoder et al. 2013³ (USA)

Pediatrics

- > 432 infants (\geq 28 weeks GA)
- Primary outcome: Need for intubation within 72 hours
- Result: No statistically significant difference between CPAP and NHF

Murki et al. 2018⁵ (India)

N. Engl. J. Med.

- > 272 infants (\geq 28 weeks GA, birth weight \geq 1,000 g)
- Primary outcome: Treatment failure within 72 hours
- > Result: NHF is inferior to CPAP

Lavizzari et al. 2016² (Italy)

JAMA Pediatr.

- > 136 infants (29-37 weeks GA)
 > Primary outcome: Intubation and mechaical ventilation
- within 72 hours
 Result: NHE was noninferior
- to CPAP (risk diffence: 8.6%, margin of non-inferiority, 10%)

Shin et al. 2017⁴ (Korea)

J. Korean Med. Sci.

- > 85 infants (30-35 weeks GA)
- Primary outcome: Treatment failure
- Result: No statistically significant difference between CPAP and NHF





NHF or CPAP for primary respiratory support

GESTATIONAL AGE (WEEKS): 23 24 25 26 27 28 29 30 31 32 33 35 36 37 38 39 34 40

< 28 weeks GA

CPAP first¹

C.C

CPAP continues to be the standard of care and is used routinely as an alternative to invasive ventilation. There is emerging data describing the use of NHF in this population.

\geq 28 weeks GA

NHF + Rescue CPAP¹⁻³

Emerging evidence suggests that the use of NHF (with rescue CPAP available) may be considered once infants are stable, with no significant difference to intubation rates. The benefits of NHF for older preterm infants are demonstrated in the body of literature.

Clinical judgement is necessary to assess the appropriate treatment for an individual patient. The use of NHF therapy is not typically supported for infants with extreme prematurity or severe respiratory distress syndrome.

Evidence-based guidance supporting the use of NHF in neonates



1. Wilkinson et al. Cochrane Database Syst. Rev. 2016. 2. Collins et al. J. Pediatr. 2013. 3. Manley. Clin. Perinatol. 2016. 4. Yoder et al. J. Perinatol. 2017. 5. Roehr et al. Clin. Perinatol. 2016. 6. Roberts et al. Matern. Health Neonatol. 2017. 7. Yoder et al. Pediatrics. 2013.



		< 28 weeks GA	≥ 28 weeks GA		
	NHE AS				
	POST-EXTUBATION SUPPORT	СРАР	NHF + Rescue CPAP		
19					
	NHF AS AN				
	ALTERNATIVE TO	СРАР	CPAP, then NHF once stable at the clinician's discretion ⁴		
	PROLONGED CPAP				
				/	
	RESPIRATORY	СРАР	NHF + Rescue CPAP		
	SUPPORT				
-					

Setting flow rates for neonates



Starting

flow

Maximum

flow

KEY: Minimum

flow

Clinical literature and expert consensus indicate that flows can be initiated between 4 and 6 L/min:²⁻⁵

	Publication	Population	Flow rate	(L/min)						C		
			1	2	3	4	5	6	7	8	9	10
	Collins et al. 2013 ¹	< 32 weeks GA										
POST-	Manley et al. 2013 ²	Premature and neonatal cannula										
SUPPORT		Infant, intermediate infant cannula										
		Pediatric cannula										
	Yoder et al. 2013 ³	< 2 kg										
		2-3 kg				\bigcirc						
		> 3 kg										
PRIMARY	Roberts et al. 2017 ⁴	≥ 28 weeks GA										
SUPPORT	Lavizzari et al. 2016 ⁵	≥ 29 weeks GA										

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The evolution of the F&P Infant Nasal Interface



Please contact your local Fisher & Paykel Healthcare representative about an evaluation or for further information.

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Enhanced prong retention

Additional flows

Wide range

of sizes

Retains existing

product

benefit

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