Evidence Support and Guidelines for Using Heated, Humidified, High-Flow Nasal Cannulae in Neonatology

Oxford Nasal High-Flow Therapy Meeting, 2015

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KEYWORDS

• Preterm • Nasal high-flow • Therapy • Cannula

KEY POINTS

- Current evidence suggests that nasal high-flow therapy (nHFT) at flows between 2 and 8 L/min is safe and efficacious for term and most preterm infants.
- When applying nHFT, allow for generous egress of gas by ensuring that the prong diameter is no more than half that of the nostril.
- The gas should be heated to between 34°C to 37°C and optimally humidified.
- A clear unit protocol for use of nHFT needs to be in place to ensure safe management of infants treated with nHFT.

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- The use of nHFT during initial resuscitation or stabilization needs further study.
- Additional large randomized controlled clinical trials are needed to evaluate nHFT use in extremely low birth weight infants, to compare different flows, cannulae and devices, and to investigate nHFT during neonatal transport.

This article reports on an international meeting of experts to discuss nasal high-flow therapy (nHFT) in neonatology, held in Oxford, June 2015. The aim of the meeting was to establish consensus among leading researchers and clinicians on the current best understanding of the mechanism of action and the clinical indications for heated, humidified, high-flow nasal cannula (HHHFNC) therapy for newborn infants. This article presents a summary of discussions from the meeting together with treatment recommendations based on the latest available evidence from randomized clinical trials and the collective experience of the attendees.

WHY WAS THE MEETING HELD?

As the use of nHFT increases it is important that guidelines are developed to ensure that it is used safely and in accordance with the accumulating evidence. The term nasal high-flow therapy was proposed to emphasize that it refers to a specific treatment of infants and young children using a conditioned (heated and humidified), high-velocity gas flow. Having clear guidelines has been shown to improve patient care and assists in identifying areas in which further research is needed.[1] Clear recommendations are needed on when to initiate nHFT, for which indications, and at what settings clinicians should start nHFT. Guidance is also necessary on how to wean and when to stop nHFT.[2]

DEVELOPING TREATMENT RECOMMENDATIONS: WHO WAS INVOLVED?

A group of 24 international experts with a particular interest in neonatal and pediatric nHFT gathered to discuss the present state of research into the respiratory management of newborn infants and young children. The group comprised neonatal and pediatric clinicians with first-hand experience in the use of nHFT, clinical trialists, and primary investigators of the major studies of nHFT in infants and children. Further, respiratory physiologists, epidemiologists, authors of main reviews on nHFT, as well as policy makers attended the meeting (see Appendix 1 for participants). The meeting was held at Jesus College, Oxford, and was supported by an unconditional grant from Fisher and Paykel Healthcare (Auckland, New Zealand).

THE EVOLUTION OF NONINVASIVE RESPIRATORY SUPPORT IN NEONATES: FROM NASAL CONTINUOUS POSITIVE AIRWAY PRESSURE TO NASAL HIGH-FLOW THERAPY

Historically, the management of newborn infants with respiratory distress included the use of mechanical ventilation (MV). However, soon after its introduction to neonatal medicine, MV was recognized as an independent risk factor for chronic lung disease or bronchopulmonary dysplasia (BPD), particularly in preterm infants.[3] As an alternative to MV, noninvasive respiratory support was introduced as a treatment option.[4] The beneficial effects of noninvasive ventilation (NIV) include an increase in tidal volume and minute ventilation, a decrease in oxygen requirement, better surfactant preservation, a more stable thorax, and less frequent extubation failure.[5] The application of