

Inhaled Nitric Oxide for Treatment of Hypoxic Respiratory Failure (HRF) in Infants < 34 weeks Gestational Age at Birth

iNO was approved by the US FDA on December 23, 1999 for the treatment of term and near-term (greater or equal to 34 weeks gestational age at birth) neonates with hypoxic respiratory failure associated with clinical or echocardiographic evidence of pulmonary hypertension. Use of iNO for neonates less than 34 weeks gestational age at birth is considered off-label use.

Implications for Practice

There is currently no clear evidence to support the use of inhaled nitric oxide for infants < 34 weeks gestation at birth.

A systematic review and meta-analysis of 14 randomized controlled trials of iNO therapy in preterm infants did not show any significant effect on mortality, chronic lung disease, or other morbidities.

Barrington KJ, Finer N. Inhaled nitric oxide for respiratory failure in preterm infants. Cochrane Database Syst Rev 2010; (12): CD000509

The National Institute of Health Consensus Development workshop in 2010 concluded that “the available evidence does not support use of iNO in early-routine, early-rescue, or later-rescue regimens in the care of premature infants of <34 weeks gestation who require respiratory support.”

Cole FS, Alleyne C, Barks JD, Boyle RJ, Carrol JL, Dokken D et al. NIH Consensus Development Conference statement: inhaled nitric-oxide therapy for premature infants. Pediatrics 2011; 127: 363-369.

A clinical report published by the American Academy of Pediatrics in 2014 states:

1. The results of randomized controlled trials, traditional meta-analyses, and an individualized patient data meta-analysis study indicate that neither rescue nor routine use of iNO improves survival in preterm infants with respiratory failure.

2. The preponderance of evidence does not support treating preterm infants who have respiratory failure with iNO for the purpose of preventing/ameliorating BPD, severe intraventricular hemorrhage, or other neonatal morbidities.

Kumar P; Committee on Fetus and Newborn; American Academy of Pediatrics. Use of inhaled nitric oxide in preterm infants. Pediatrics 2014; 133(1): 164-170.

Prolonged Preterm Rupture of Membranes

There is new published literature suggesting a benefit of iNO therapy in a subgroup of preterm infants born with a history of prolonged PPRM, oligohydramnios and suspected pulmonary hypoplasia. The authors of the study “advocate iNO treatment in this particular population.”

Semberova J, O'Donnell SM, Franta J, Miletin J. Inhaled nitric oxide in preterm infants with prolonged preterm rupture of the membranes: a case series. Journal of Perinatology 2015; 35: 304-306.