

Southampton Oxford Neonatal Transport Guideline

USE OF INHALED NITRIC OXIDE IN TRANSPORT

(set up instructions available locally for each site)

Background

Inhaled Nitric Oxide (iNO) is an effective treatment for severe persistent pulmonary hypertension of newborn (PPHN) in term or near-term babies (at least 34 weeks gestation). iNO is a selective pulmonary vasodilator, decreasing pulmonary vascular resistance (PVR) thus reducing extra-pulmonary shunt and improving ventilation/perfusion matching. Early use of iNO can reduce FiO₂ and ventilator requirements resulting in reduced secondary lung injury, mortality, need for ECMO, neurological sequelae and BPD. Most babies who respond, do so relatively quickly after iNO is started (< 30 mins).

Indications for use

****The supervising neonatal consultant should be involved in the decision to commence iNO.****

- 1) An oxygenation index > 25 or persistent hypoxia despite maximal ventilation and FiO₂ despite optimising ventilation and cardiovascular support.
- 2) Pre- and post-ductal saturation discrepancy >5%, often 10-15% (however pre and post ductal difference may not be present if duct has closed)
- 3) If possible obtaining an echo prior to starting treatment with iNO will confirm presence of PPHN and structurally normal heart.

Evidence for the use of iNO in premature babies (<34 weeks) is less clear although infants may show benefit in selected cases. Always discuss with a consultant before starting iNO on preterm infant.

Differential Diagnosis to PPHN

If a cyanotic congenital heart malformation is strongly suspected an urgent cardiology opinion should be sought. iNO and intravenous prostaglandin may be commenced in some cases pending this assessment.

Commencing iNO treatment

Prior to commencement, where arterial blood gas is available, calculate Oxygen Index and record SpO₂: $OI = (\text{Mean airway pressure (MAP) (cmH}_2\text{O)} \times \text{FiO}_2 (\%)) / (\text{Arterial PaO}_2 \text{ (Kpa)} \times 7.5)$

Commence treatment at 20 ppm and assess the response over the next 20 minutes.

Assess response by monitoring oxygen saturations and OI. : a Discuss with consultant regarding value of continuing iNO if no apparent response to treatment.

Safety

1. **iNO is an inhibitor of platelet function.** Caution when there is thrombocytopenia or bleeding
2. **Rescue circuit (via BVM or neopuff/rPAP).** Provision of a rescue circuit containing a similar concentration of iNO should always be available, as sudden cessation of iNO may result in a profound pulmonary hypertensive rebound. When baby is reintubated or hand bagged cap the ventilator end. **DO NOT TURN VENTILATOR OFF AS THE NO AND NO₂ LEVELS RISE IN THE TUBING.**
3. **Changing the Cylinder**
Please change the cylinders according to local guidance (cylinders last many hours and do not require frequent changes).
4. **Dispersal of cylinder**

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All cylinders must be secured during transport. Following the unlikely event of a significant cylinder leak in transit, the driver should be notified immediately and asked to bring the vehicle to a stop at the next safe location. The door of the vehicle should be opened to allow the gas to disperse.

****iNO cylinder should not ideally be changed during transfer to minimise the risk of major leaks ****