

HUMIDIFIED AND HEATED GAS FOR PRETERM INFANTS AT BIRTH

This Local Operating Procedure is developed to guide safe clinical practice in Newborn Care Centre (NCC) at The Royal Hospital for Women. Individual patient circumstances may mean that practice diverges from this Local Operating Procedure.

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INTRODUCTION

The use of humidified and heated gas during respiratory support is standard care for infants. Heat and humidity are required to prevent hypothermia, inspissation of airway secretions, necrosis of airway mucosa and nosocomial infections. The physical characteristics of preterm infants and their large skin-air temperature gradient make them at risk for a high evaporative heat loss after delivery. The consequent hypothermia has been associated with increased mortality and morbidity.

1. AIM

- To provide humidified and heated gases at birth for preterm infants <32 weeks gestation

2. PATIENT

- Newborns

3. STAFF

- Medical and nursing

4. EQUIPMENT

- Infant T-piece resuscitator (Dräger Resuscitaire bed)
- MR850 Heated Humidifier
- T-piece Circuit- Humidified (900RD110 [Fisher and Paykel Healthcare])
- Water for irrigation 1L

5. CLINICAL PRACTICE

Procedure:

1. Connect the power cord of the humidifier base to the wall power outlet and switch it on.
2. Connect the humidification chamber to the water for irrigation bag.
3. Check that there is water in the chamber.
4. Set the gas flow at 8 L/min.
5. Connect the humidified T-Piece Neopuff circuit to humidifier chamber.
6. Disconnect humidifier base from power outlet prior to transfer to NCC.
7. Once the infant is in the NICU, transfer to the standard humidified respiratory support as per NCC protocol.

6. EDUCATIONAL NOTES

- The use of cold un-humidified gas at the time of birth and during transport increases the incidence of hypothermia on admission. Infants born at or less than 32 weeks who received respiratory support with cold air had a mean rectal temperature on admission of 35.9°C. Infants who received heated humidified gas had a rectal admission temperature of 36.4°C.¹
- Mechanically ventilated preterm infants experience more air leaks and more severe chronic lung disease when <36.6 C° inspired gas is given.² The use of dry air leads to impaired surfactant activity.³

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- Cold and dry air dehydrates the mucus, which slows the transport rate and cilia beat frequency, which lead to inspissations, inflammation, and sloughing of the airway mucosa. The water loss by evaporation may induce bronchial smooth muscle contraction leading to bronchoconstriction.⁴
- A multicentre trial compared the effects of heated humidified gases (HHG) versus cold, dry gas as initial respiratory support from delivery until arrival at the neonatal unit. It was observed that HHG not only led to an increase in normothermia (69% vs 55%) on admission but it was also more effective in reducing severe hypothermia than cold, dry gas (2% vs 12%).⁵

7. RISK RATING

- Low

8. NATIONAL STANDARD

- Standard 1 Clinical Governance
- Standard 5 Comprehensive Care

9. ABBREVIATIONS AND DEFINITIONS OF TERMS

NCC	Newborn Care Centre	HHG	Heated Humidified Gases
NICU	Neonatal Intensive Care Unit		

10. REFERENCES

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Revision	19/3/2020	NCC LOPs Committee

REVISION & APPROVAL HISTORY

July 2017 Original version reviewed and approved by NCC Quality Committee
March 2020 Revision approved by NCC LOPs Committee

FOR REVIEW: 2025