HUMIDIFICATION - Dräger Isolette

This LOP 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 Operations Procedure (LOP).

INTRODUCTION

Skin immaturity and the large surface area to weight ratio of extreme premature infants put them at risk of dehydration and hypothermia. It is essential that neonates are nursed within their NTE. This is defined as "the environmental air temperature at which an infant with a normal body temperature has a minimal metabolic rate and therefore minimal oxygen consumption".

Table 1. Humidification is provided within the isolette as listed below (**R1**):

Gestation at birth	Day 1-7 humidity	Day 8-14 humidity	Day 15-21 humidity
≤28+6days	85%	Wean by 5% daily to 50% by day 14	Cease humidity if the air temp <34C
29-30+6 days	70% from Day 1-3, then wean by 5% daily*	Cease humidity**	
≥31+0 & <1000 g	Humidity is commenced at 50% if the air temperature is ≥34C		

* Cease humidity if the air temperature is <34C
** Recommence at 50% humidity if the air temperature is ≥34C.

1. AIM

- To provide appropriate humidity environment in an isolette for infants <30 weeks gestation
  - To limit TEWL and maintain adequate skin moisture
  - To preserve the infant's skin integrity and decrease the risk of skin breakdown
  - To improve temperature control and reduce oxygen and energy expenditure
  - To reduce the risk of fluid and electrolyte imbalance

2. PATIENT

- Neonates

3. STAFF

- Medical and nursing staff

4. EQUIPMENT

- Dräger Isolette
- 2 x 500 ml Bottle of Sterile Water
- Clean bed linen
- Servo Control probe
- Reflective disk

…./2

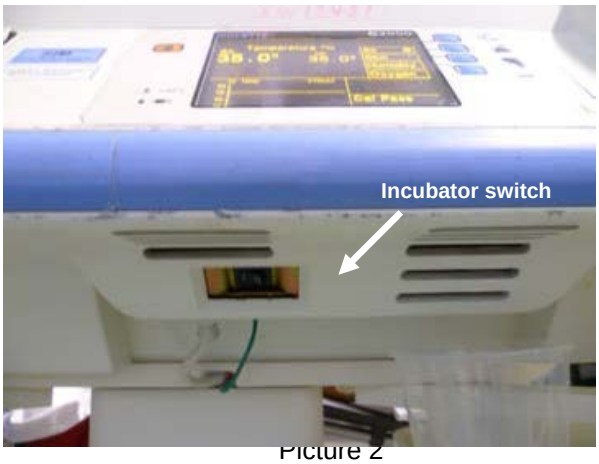
HUMIDIFICATION - Dräger Isolette cont'd

NOTE:
- Change the isolette every 7 days (**R 2**)
- Ensure there is water in the water chamber at the beginning of each nursing shift
- Use a new bottle of sterile water for each refill
- When humidification therapy is ceased – humidicrib must be changed
- Use servo control mode throughout the humidification period
- Nurse the infant naked with a small boundary around the infant
- The reflective probe cover of the servo probe must be visible on the upper trunk of the infant's body – **DO NOT** cover the probe with clothes or bed-linen (**R 3**)
- Kangaroo Mother Care is permitted at the discretion of the NICU team when environmental humidification for the infant is at 50%. Please refer to Kangaroo Mother Care Procedure.

5. CLINICAL PRACTICE

1. Collect equipment.
2. Wash hands.
3. Make up the bed with linen (if bed is not made).
4. Fill the water reservoir of the incubator with sterile water to watermark on right side of plastic reservoir (Picture 1). Do not refill humidification chamber until indicated by alarm.
5. Ensure the main electrical power from the wall to incubator is switched on and the incubator switch is on (Located below the display screen - Diagram 2). The electroluminescent display is activated with Menu Functions on the screen.

Picture 1



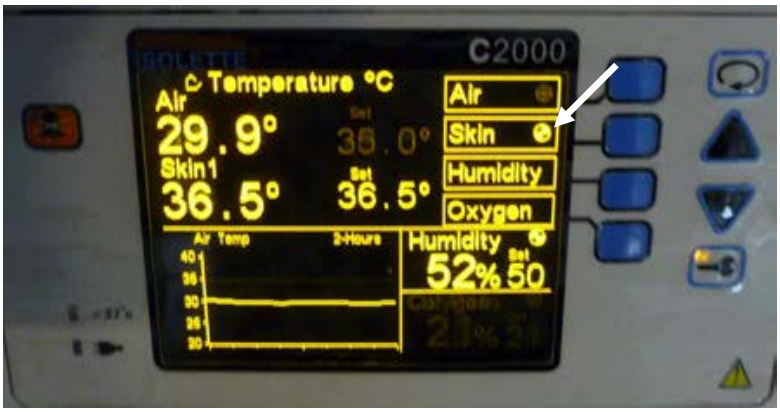
Picture 2

USE BLUE KEYPADS THAT CORRESPOND TO FUNCTIONS ON SCREEN TO ACCESS EACH FUNCTION.

6. Nurse the infant in the isolette and remove the infant's clothing – nurse the infant naked (**R 4**).
7. **To Activate Humidification**
    1. Press keypad with "Key" icon to unlock the menu for accessing (located below the Black -triangle keypads) the parameters.
    2. Select "HUMIDITY" keypad.
    3. Press "ON" keypad.
    4. Commence Relative Humidity level as per Table 1. Use the "UP" or "DOWN" keypad (Black triangles) to set the required humidity.
    5. Press 'HOME' keypad to return to Main Menu Display.
    6. Press "KEY ICON" keypad to lock access to menu.

HUMIDIFICATION – Dräger Isolette cont'd

7. A rotating disc is now displayed in the "HUMIDITY" box on the screen (Picture 3).



Picture 3

8. Record percentage of humidity hourly and change of set-humidity on the infant's Flow Chart.
9. Attach skin probe sensor for servo-control (see: Set-up of incubator temperature with isolette® infant incubator- Section with Skin Mode).
10. Skin should be inspected regularly to check for integrity and any signs of infection (**R 5**).

8. **To Wean Humidification Therapy**
   1. Ensure stable "AIR" temperature is maintained over 24 hours.
   2. Press keypad with "Key" icon to unlock the menu for accessing (located below the Black –triangle keypads) the parameters.
   3. Select "HUMIDITY" keypad.
   4. Press "OFF" keypad.
   5. Press 'HOME' keypad to return to Main Menu Display.
   6. Press "KEY ICON" keypad to lock access to menu.
   7. Remove the water reservoir from the incubator to discard the water.
   8. Cautiously insert the reservoir back into the incubator

6. DOCUMENTATION

- Integrated Clinical Notes
- Observation Chart
- Nursing Care Plan

7. EDUCATIONAL NOTES

- Studies have shown that providing humidity helps reduce TEWL, improve body temperature control, and reduce epidermal stripping, preserving skin integrity and reducing infection. However, there are insufficient evidence-based recommendations available and humidification practices vary.
- TEWL refers to the insensible water loss from the skin for premature infants (up to 150mLs/kg/day without humidification) and reflects both skin immaturity and large surface area to weight ratio.
- ELBW infants (<26weeks) is about 80-90% water. Therefore preterm infants can lose up to 13% of body weight as TEWL in the 1st day of line in only 50% humidity affecting urine output, affecting electrolyte imbalances and fluid requirement as well as calories and body heat (Heuchan et al, 2006).

HUMIDIFICATION - Dräger Isolette cont'd

8. RELATED POLICIES/PROCEDURES/CLINICAL PRACTICE LOP

- Kangaroo Mother Care Policy
- Ventilated Infants for Kangaroo Mother Care

9. RISK RATING

10. NATIONAL STANDARD

- Comprehensive Care

11. REFERENCES

- Smith, J. Alcock, G. and Usher, K. (2013) Temperature measurement in the preterm and term neonate: A review of the literature. Neonatal Network, 32 (1), pp. 16-25.
- Turnbull, V. & Petty, J., (March 2013). Evidence-based thermal care of low birth weight neonates, Part one. Nursing children and young people, Vol. 25, (2).
- Waldron, S. and MacKinnon, R. (2007) Neonatal thermoregulation. Infant, 3 (3), pp. 101-104.

12. ABBREVIATIONS AND DEFINITIONS OF TERMS

NTE	Neutral thermal environment.	TEWL	Trans-epidermal water loss

13. RATIONALES

Rationale 1	This level of humidity is optimal to minimise trans-epidermal water loss.
Rationale 2	To meet the Infection Control Policy.
Rationale 3	Abdominal/liver skin temperature is closest to the body's central temperature and is non-invasive.
Rationale 4	Damp clothes will cause the infant to become cold and they can also harbour bacteria. It is easier to view skin integrity.
Rationale 5	If the skin becomes damp it will cause temperature instability. It also can become a breeding ground for bacteria and fungus and effect the skin integrity which is already underdeveloped.

14. AUTHOR:

Primary	Feb. 2003	CNC KB Lindrea & NE A. Wright
Revised	4th Nov 2014	RN S. Binoy & CNC KB Lindrea

REVISION & APPROVAL HISTORY

Approved Quality & Patient Care Committee 5/5/16
Reviewed Neonatal Quality & Safety Committee March 2016
Approved NCC Quality Committee 4/11/14
Revised 21/10/14
Developed February 2003

FOR REVIEW : MAY 2021