

Title:	Neonatal Thermoregulation		
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Background:

Thermo instability in infants comes with associated risks of decreased surfactant efficiency, increased oxygen consumption, and hypoglycaemia due to increased energy/calorie expenditure.¹ As such, adequate thermoregulation is a significant factor in multi-systemic stability, particularly for preterm and low birth weight babies, and if left untreated carries significant morbidity/mortality implications.^{2, 3}

En route to baby:

- Check incubator is set to appropriate thermo-neutral range for the weight and maturity of the baby.
- Ensure incubator is plugged in with inverter switched on.
- Trans-warmer needs to be 19-26°C before activation. If necessary, place trans-warmer inside the incubator to achieve this.

On arrival at referring unit:

- Measure axilla temperature with a digital thermometer for accuracy and apply continuous monitoring via servo skin probe.

If temp <36.0°C

- Increase incubator temperature/humidity
- Cover baby with a Neowrap
- Emergency procedures only until baby warmed
- Consider use of a trans-warmer mattress
- Observe continuous temperature via skin probe to ensure rise
- Recheck axilla temperature at 30 minutes

If temp >36.0°C

- Adjust incubator temperature as required to maintain thermo neutral environment
- Recheck temperature with digital thermometer at 30 minute intervals

If temperature remains <36.0°C

- Increase transport incubator to pre warm to maximum temperature. (Press ↓ ↑ buttons simultaneously to increase >38.0°C)
- Use humidified respiratory support, pre-run using air flow to build up humidity in the circuit.
- Activate trans-warmer mattress and allow to fully warm before laying baby on it.
- Keep incubator doors closed until baby is prepared and ready to be moved to transport incubator.
- Pre-empt the need for 2nd trans-warmer mattress – each lasts approximately 2hrs at full heat.

Baby should ideally be >36.5°C before leaving the referring unit

On arrival at receiving unit:

- Handover all aspects of baby's management to receiving team before moving baby.
- Ensure all preparations are made for baby's transfer before opening the transport incubator:
 - receiving incubator should be warmed to appropriate temperature and humidity
 - ventilation circuits running with warmed humidification
 - fluids transferred to receiving syringe drivers
- Check and record axilla temperature with digital thermometer before moving baby from the transport incubator.
- Activate heat curtain (if available) on receiving incubator.
- If a trans-warmer is being used, where possible keep baby on the mattress and covered with Neowrap during transfer.

References:

1. Aylott, M. (2006b) The Neonatal energy triangle part 2; Thermoregulatory and respiratory adaptation. *Paediatric Nursing*. 18, 7, 38-43
2. Bissinger, R., & Annibale, D. (2010) Thermoregulation in Very Low-Birth-Weight Infants During the Golden Hour Results and Implications. *Advances in Neonatal Care*. 10 (5), pp. 230-238
3. Turnbull, V. and Petty, J. (2013) Evidence-based thermal care of low birthweight neonates, Part one. *Nursing Children and Young People*. 25 (2), pp. 18-22.