



Benchmark: Thermal Management

Score relates to practice in (unit):	
Scored by:	Date scored:
<p>Statement: Sick term infants and preterm infants may not have the ability to maintain their temperature due to prematurity-related, environmental, infectious and specific body-system related factors ^[13]. Both hypothermia and hyperthermia are associated with adverse outcomes; hence, strategies to maintain normothermia should be established and implemented. Some of these are based on high-quality evidence while others are regarded as best practice which are acquired from observational work and expert consensus ^[1] * <i>Infants requiring therapeutic hypothermia are to be excluded</i></p>	
<p>Standards: Normal range of infant temperature: Skin temperature of term infants 36-36.5°C Skin temperature of preterm infants 36.2-37.2°C Axillary temperature should be 36.5-37.3°C Delivery room temperature should be at least 25°C</p>	
<p>Definition: Thermoregulation is the capacity to balance heat production and heat loss in order to maintain the body temperature within the normal range of 36.5-37.5°C . To aid in achieving this, healthcare providers should take measures to ensure that infants are nursed in a neutral thermal environment (NTE) defined as one in which the infant uses minimal rates of oxygen consumption and expends the least energy to maintain its temperature.</p>	
<p>Patient Group: Any infant admitted to the NICU/SCBU/NNU</p>	
<p>Triggers for the development of the benchmark: Standardising practice Ensuring evidence-based practice Clinical Governance ^[4] Essence of Care ^[5] National Service Framework ^[6] CESDI Project ^[2]</p>	
<p>Criteria for scoring: The thermal care provided for six infants in the delivery unit or theatres and during their admission in the neonatal unit as well as the corresponding documentation on their records will be reviewed. These infants’ parents will be interviewed to assess their education and involvement in thermal care. Findings shall be completed over a 4-week period.</p>	

Key Factors		Individual scores	Possible total
F1	Evidence-based guideline to support clinical practice.		3
F2	Care		12
F3	Staff Education		2
F4	Parent/Carer Education and Involvement		3
	Overall Score		20

Factor 1: Evidence-based guideline to support clinical practice

A key component of the Nursing and Midwifery Council's Code of Conduct is to always practice in accordance with the best available evidence ^[14]. Clinical practice guidelines are systematically developed, evidence-based statements that guide practitioners to provide appropriate healthcare to patients for specific circumstances ^[10].

Factor 2: Care

Infants lose heat through their skin and respiratory tract to the environment through radiation, conduction, convection, and evaporation ^[11]. Body fat acts as an insulator to reduce heat loss; nonetheless, the adipose tissue of preterm infants are less developed. Understanding the mechanisms of heat loss is essential so that interventions can be implemented to prevent or reduce the transfer of heat from the infant to the environment^[11].

Factor 3: Staff Education

Staff should be able to achieve and maintain the knowledge and skills necessary for safe and effective practice in line with the NMC's Code of Conduct ^[14]. It is, therefore, imperative that staff gains awareness of the risk factors for hypothermia/hyperthermia as well as its consequences in preterm and sick term infants. They should then be able to implement current evidences and recommended practice on the thermal management of these vulnerable infants from when they are born in the delivery unit and theatres until their admission and stay in the neonatal unit.

Factor 4: Parent/Carer Education and Involvement

Family involvement in caregiving lessens the impact of the neonatal unit's environmental stressors, potentially optimising the baby's developmental outcome. It also enables bonding, lessens parental stress and improves parental confidence ^[3].

Parent education and involvement should provide clear information regarding the importance of thermoregulation and the measures to ensure that their baby remains normothermic. Evidence of teaching should be reflected on the baby's notes.

References: This benchmark is based on the East of England Neonatal ODN Thermal management guideline. The guideline along with a full list of references can be found on our website <https://www.eoneonatalpccsicnetwork.nhs.uk/neonatal/news-and-resources/>

Benchmarking Score Sheet: Thermal Management

Key factors & criteria	Notes 1	Notes 2	Notes 3	Notes 4	Notes 5	Notes 6
<p>1. Evidence-based guideline to support clinical practice</p> <p>a) There are thermal management guidelines that are evidence-based and referenced.</p> <p>b) The guideline is reviewed regularly according to Trust policy.</p> <p>c) Quarterly audit of admission temperature via network activity reports is noted and actions agreed at unit level.</p>						
<p>2. Care</p> <p>a) The delivery room or theatre temperature should be at least 25°C ^[8].</p> <p>b) Windows and doors are shut, fans turned-off and air-conditioning appropriately programmed to limit draughts at the point of delivery ^[8, 9].</p> <p>c) The neonatal resuscitation platform or radiant warmer is pre-warmed, checked & ready for use ^[8, 9].</p> <p>d) Preterm infants born < 32 weeks' gestation are placed without drying in a polyethylene bag with the back of their head covered but face exposed. They should be kept under the radiant warmer ^[9, 12]</p> <p>OR</p> <p>Term and near-term infants born ≥ 32 weeks' gestation are dried with a pre-warmed, absorbent towel to reduce evaporative heat loss. Whilst being dried, the infant should be on a warm surface (eg under the radiant warmer). Wet towels are removed and the infant is wrapped with a pre-warmed towel or blanket ^[8, 9]</p> <p>OR</p> <p>If no resuscitation is required, infants are placed skin-to-skin on the mother's chest and covered with pre-warmed towel ^[8, 9, 12].</p> <p>e) Infant's head should be covered with a hat ^[8, 9].</p> <p>f) An axilla temperature is taken in delivery unit prior to transfer to the neonatal unit ^[8].</p> <p>g) There is a heat source available when the infant is transferred from the delivery unit to neonatal unit (eg pre-warmed transport incubator) ^[11]</p> <p>h) Infants are nursed in pre-warmed, closed, double-walled incubators or hot-cot or cot/surface suitable for maintaining desired temperature</p> <p>i) Staff are aware of the use of the properties of an incubator to maintain adequate temperature of baby, e.g.</p>						

<ul style="list-style-type: none"> • Incubator lid is lowered/door closed as soon as possible after admission • Procedures are performed through the portholes • If available the warm air curtain boost is used • If the incubator lid needs to be lifted, the radiant source is turned on <p>If baby is not nursed in incubator, discussion with staff identifies they understand the rationale for this care.</p> <p>j) Occupied incubators have its air temperature monitored continuously and this is recorded hourly. If baby is not nursed in incubator, discussion with staff identifies they understand the rationale for this care.</p> <p>k) Infants <30 weeks' gestation are nursed in humidified incubators as per the humidity guideline ^[7] If baby is not nursed in humidity, discussion with staff identifies they understand the rationale for this care.</p> <p>l) Continuous monitoring of temperature via temperature probes and hydrogel covers are used for infants in closed incubators or rationale for intermittent monitoring has been clearly documented</p> <p>OR at least 4 hourly axillary temperatures for babies in hot cots/warming mattresses</p> <p>OR at least every 6 hourly axillary temperatures for babies in open cots (until near discharge if this is local policy)</p>						
<p>3. Staff Education</p> <p>a) Staff have received education and their competency on thermal management has been assessed during their local induction to the neonatal unit</p> <p>b) Staff are aware of the impact of thermal management of the preterm or sick infant in the delivery unit/theatre</p>						
<p>4. Parent/ Carer Education and Involvement</p> <p>a) Parents have received verbal and/or written information on thermal management (e.g. signposted to network parent assistant pack).</p> <p>b) Parents are given the opportunity to take their baby's axillary temperature</p> <p>c) There is documented evidence of parents' education on thermal management either in the notes or parent passport</p>						

Statements to justify scores/local action plans:

