The Hierarchy of Evidence

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynyk and Fineout-Overholt (2011).

I Evidence obtained from a systematic review of all relevant randomised control trials.

II Evidence obtained from at least one well designed randomised control trial.

III Evidence obtained from well-designed controlled trials without randomisation.

IV Evidence obtained from well designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case- series

V Evidence obtained from systematic reviews of descriptive and qualitative studies

VI Evidence obtained from single descriptive and qualitative studies

VII Expert opinion from clinicians, authorities and/or reports of expert committees or based on physiology

Melynyk, B. & Fineout-Overholt, E. (2011). Evidence-based practice in nursing & healthcare: A guide to best practice (2nd ed.). Philadelphia: Wolters Kluwer, Lippincott Williams & Wilkins.

National Health and Medical Research Council (2009). NHMRC levels of evidence and grades for recommendations for developers of guidelines (2009). Australian Government: NHMRC. http://www.nhmrc.gov.au/_files_nhmrc/file/guidelines/evidence_statement_form.pdf

OCEBM Levels of Evidence Working Group Oxford (2011).The Oxford 2011 Levels of Evidence. Oxford Centre for Evidence-Based Medicine. http://www.cebm.net/index.aspx?o=1025

Databases searched:	X CINAHL (Ebsco)	X Medline (Ebsco)	☐ Pubmed (NLM)	☐ Nursing (Ovid)	☐ Emcare (Ovid)	☐ Other List: _____
Keywords used:	Thermoregulation, Neonate, Servo-control, temperature regulation, cold stress					
Search limits:						
Other search comments:	Current guidelines for RWH, RCH and other Australian paediatric hospitals were utilised as additional resources.					

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Reference (include title, author, journal title, year of publication, volume and issue, pages)	**Evidence level (I-VII)**	**Key findings, outcomes or recommendations**
De La Fuente, L., Campbell, D., Rios, A., Graff, M., & Brion, L. (2006) Frequency analysis of air and skin temperature in neonates in servo-controlled incubators	**VII**	Premature infants may exhibit temperature instability as a response to infection or to total care nursing procedures. Decreases in core temperature (abdomen) can be accompanied with even greater changes in peripheral temperature (toe), resulting in increases in temperature gap. This supports the monitoring of peripheral temperature monitoring in conjunction with central temperature monitoring.
Draegar Baby Leo Userguide, Manual and userguide (2019)	**VII**	Outlines functions and optimal environment for neonates based on research studies. Details instructions for usage, cleaning recommendations and probe usage and placement.
Engorn, et al. (2016). Perioperative hypothermia in neonatal intensive care unit patients: effectiveness of a thermoregulation intervention and associated risk factors	V	• Discusses the pathophysiological processes of cold stress, modes of heat loss in neonates and interventions to prevent heat loss. Infants may be weaned from an incubator when they weigh at least 1700 grams or 34 weeks post menstrual age and are medically stable.
Hanhhayanti, L., Rustina, Y., & Budiati, T. (2017) Differences in Temperature Changes in premature infants during invasive procedures in Incubators and radiant warmers.	VI	Radiant warmer is strongly recommended to minimise heat loss during invasive procedures. Radiant warmers are not optimal for preterm infants for routine nursing care as they may increase insensible water losses. The hybrid incubator system provides a solution for this.

Molgat-Seon, Y., Daboval, T., Chou, S., Jay, O. (2013). Accidental overheating of a newborn under an infant warmer: a lesson for future use.	VI	It is vital to mitigate all bouts of thermal strain to promote growth and recovery in NICU, particularly those induced by nursing apparatus. Infants nursed with servo-control are at risk of overheating and as such, independent temperature checks should be performed regularly to ensure thermal stability. Should consider placing an additional probe at a peripheral site to monitor temperature variance and minimise risk of unreliable probe feedback.
Molgat-Seon, et al. (2014). Assessing neonatal heat balance and physiological strain in newborn infants nursed under radiant warmers in intensive care with fentanyl sedation. *European Journal of Applied Physiology.* 114 (pp. 2539 – 2549). DOI: 10.1007/s00421-01402964-0	VI	Infants nursed under radiant warmers experience positive and negative body heat storage, resulting in marked fluctuations in core and skin temperatures. The placement of the temperature probe is pertinent in minimising these fluctuations to heat output, and may be optimised by monitoring several sites simultaneously. Neonates experiencing overheating may present with an increase in MAP, HR and RR.
Parker Healthcare Atom Infant warmer Manual	VII	Instructions to optimise functions and features of the atom radiant warmer.
WHO recommendations on newborn health: guidelines approved by the WHO Guidelines Review Committee. Geneva: World Health Organization; 2017 (WHO/MCA/17.07).		For newborns admitted to the neonatal intensive care unit (NICU), providing an optimal thermal environment is a priority to ensure survival, recovery and growth Unstable newborns weighing 2000g or less at birth should be cared for in a thermo-neutral environment either under radiant warmers or in incubators. The optimal mode of temperature regulation for neonates is kangaroo mother care, however when this is unable to be provided, or is intermittently provided, normothermia should be maintained utilizing a thermos-neutral device.