



**NCCU CLINICAL GUIDELINES**  
**SECTION: 4**

**THERMOREGULATION**

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Modes of heat loss  
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Neonatology Clinical Guidelines  
King Edward Memorial/Princess Margaret Hospitals  
Perth Western Australia

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**MODES OF HEAT LOSS**

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An important aspect of neonatal care is the provision of a neutral thermal environment (NTE) = an environmental air temperature at which an infant with a normal body temperature range has a minimal metabolic rate and therefore minimal oxygen consumption.

The required neutral thermal environment temperature decreases with increasing gestational age and postnatal age.

Oxygen and glucose are required for heat production, depletion of these stores results in hypoglycaemia, acidosis, hypoxia weight loss. Prolonged hypothermia may result in seizures and disseminated intravascular coagulation.

**CONDUCTION**

Heat loss to a cooler surface temperature.

These are objects in contact with infant's body surfaces.

Prevented by pre-warming receiving blankets, plastic wraps, bedding, mattress, and clothing.

Stethoscopes and saturation probes may also be prewarmed.

**CONVECTION**

Heat loss to cooler surrounding air.

Prevented by minimising exposure to drafts and cooler air currents.

Incubators minimise convective heat loss with the use of circulating warmed air.

Hats covering the infants head minimises convective heat loss from a larger surface area.

Dressing infants with warmed clothing reduces convective heat loss.

**RADIATION**

Loss of heat to cooler solid surfaces close to the infant's body.

Prevented by pre-warming incubators, thermal tunnels and stethoscopes, linen and clothing before use.

Position infants away from larger solid surfaces.

**EVAPORATION**

Loss of heat when a liquid evaporates.

Prevented by ensuring infants are thoroughly dried at birth, and following wash / bath; change wet clothing promptly, ensure gel is thoroughly removed following ultrasound examinations, humidification of ventilation gases.

Use of humidification for small infants on radiant warmers and in incubators.

## **AMBIENT AIR TEMPERATURE**

The hospital air-conditioning system is pre-set to achieve the following room temperatures in the NCCU nurseries...

26<sup>o</sup>C KEMH SCN 3

25<sup>o</sup>C KEMH SCN 2 / 2 West / HDU

25<sup>o</sup>C PMH 6B

These temperatures are set at a warmer level than most hospital room temperatures in an effort to reduce convective heat loss.

Doors to the nurseries are to be kept closed to assist in achieving the set temperatures.

Apparent changes in ambient air temperature are to be reported to the hospital Shift Engineer for further investigation.

## **RELATIVE HUMIDITY**

The provision of increased humidity to the infants environment is known to reduce evaporative heat loss. Infants less than **30 weeks gestation or less than 1500gms birthweight** will require further environmental humidification within the microclimate of an incubator, or radiant warmer.