# Giraffe™ Incubator bed in NICU

**GUIDELINE**

**SUBJECT:** Giraffe™ Incubator bed in NICU

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**Disclaimer:**

It should be noted that this document reflects what is currently regarded as a safe and appropriate approach to care. However, as in any clinical situation there may be factors that cannot be covered by a single set of guidelines, this document should be used as a guide, rather than as a complete authoritative statement of procedures to be followed in respect of each individual presentation. It does not replace the need for the application of clinical judgment to each individual presentation.
Giraffe™ bed in NICU - One Page Summary and Checklist

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**Rationale & Outcome**

**Background**

**Admission setup procedure**
- Turn on Giraffe™ at mains switch behind bed+ near probe jack
- Set temperature to 35°C-defaults to 33°C
- Following admission set to comfort zone
- Dry skin exposed eg. head prior to applying CPAP hat
- Depress control knob at right of control panel & rotate clockwise until comfort zone ‘lit up’
- Pre-warm by setting comfort zone according to gestation, age & expected weight
- Necessary to set manually—if baby <1200g upper range of ‘comfort zone’ used
- To set >37°C depress >37° button-lower to middle range if >1200g
- Keep bed closed until admission arrives-NO humidity until lines insitu and bed closed

**Admission guidelines**
- Open hood-automatically switches to radiant warmer in manual mode
- Set to 50%
- Take axilla temp & attach servo probe under axilla & switch to servo
- Place Mepitac over servo probe then silver reflective disc
- Keep infant wrapped in glad wrap & ensure sides of cot up
- If possible warm drapes prior to line placement (inside warmer)
- Set manual temp alarm-depress control knob & then scroll to wrench. Depress and select temperature 0.5°C above baby’s axilla temp
- When canopy closed, automatically switches to incubator& returns to earlier setting
- Commence humidity 85%<30 weeks-when 85% reached remove glad wrap
- Scroll control knob to humidity-↑or↓settings and push knob to set

**Weighing the infant**

**Additional features**
Rationale:
- To achieve an optimum environment to care for extreme low birth weight/ low birth weight and premature infants.
- To contribute to maintaining a safe, secure and healthy environment for the neonate, family and multi-disciplinary team.

Outcomes:
- The provision of appropriate safe use of equipment to care for neonate.
- The ability to assess and evaluate equipment needs to care of the neonate.
- Responsible team members to communicate and request help and advice in the event of equipment failure, repair and service.
- Maintenance of accurate records of all equipment and devices used in accordance with legal and Hunter New England Area Health requirements.

Background:

Infants should be nursed in a neutral thermal environment and have a core body temperature 36.4- 37.2 Celsius. For an infant to grow appropriately they must be in their neutral thermal environment (NTE) (Lyon et al 2011). This is defined as the environmental temperature at which oxygen consumption is at a minimum, metabolic rate is at a minimum and no additional calories are used for heat production or heat loss. NTE is not a set temperature or value and is dependent on weight, gestational age and post-natal age. This is when the neonate is able to maintain a normal core temperature with minimal oxygen and caloric expenditure (Waldon and McKinnon 2007).

Infants lose heat through conduction, convection, radiation and evaporation. Radiation accounts for the majority of heat loss in term infants, but evaporative losses account for the majority of heat loss in preterm infants during the first week of life (Bissinger and Annibale 2010). Evaporation is the loss of heat that occurs when water changes from a liquid to a vapour state via the skin and respiratory tract. Preterm infants have less keratinization of the skin which increases evaporative losses across the permeable skin barrier (Blackburn 2007). At 24 weeks gestation total body content is approximately 86% of body weight with most of it in extracellular compartments (Agren 1998). Water loss is prevented by wrapping in cling wrap post-delivery and with the use of humidity. This will reduce evaporative losses, reduce fluid requirements, which in turn will increase respiratory function and assist with stabilizing the infant’s temperature (McCall et al 2010). Heat production requires oxygen consumption and glucose metabolism. Persistent hypothermia may deplete these stores leading to metabolic acidosis, hypoglycaemia, reduced surfactant production and increased calorie requirements (Aylott 2006). Therefore the policy in our unit states that babies born under 30 weeks gestation are nursed in an incubator. Please refer to Humidification Care for an Infant in an Incubator NICU CPG No 5-3.7 for further information.

All level 3 infants are admitted to a Giraffe ™ bed. The Giraffe ™ bed can be used as an overhead heater and as an incubator +/- humidity (Moore 2003).
Admission set up procedure

- Turn on Giraffe Omnibed at mains power switch behind bed, also power button on probe jack.
- The Giraffe bed defaults to the air control mode at start up. You will see a visual ‘ENTER SETTING’ prompt at top of accessory control panel accompanied by a low priority auditory signal. You will also see the air control set point numeric display flashing “33” in most cases. It is necessary to change this temperature setting to warm the giraffe bed more efficiently for the infant prior to admission. Set temperature prior to the admission to 35 degrees Celsius. When baby is admitted, follow the comfort zone option below. Dry any areas of skin intending to be exposed such as the head prior to applying the CPAP hat.
- Depress the control knob to the right of the accessory control panel screen (picture 4).
- Rotate control knob in clockwise direction until “comfort zone” icon is highlighted.
- Based on gestational age, post natal age and expected weight of admission you will see a recommended ‘comfort zone’ air temperature that should be used to pre warm the Giraffe™ bed.
- NOTE the recommended temperature is not automatically set; the clinician must do this manually.
  1. If the baby is < 1200gms, the upper range of the ‘comfort zone’ should be used to adjust the temperature control.
  2. To set temperature above 37 degrees Celsius, the clinician must depress the >37 degrees button
  3. If the baby is >1200gms the lower to middle range of the comfort zone should be used to adjust the temperature control.
- Exit ‘comfort zone’ chart by rotating to DONE/EXIT.
Depress control knob to return to the accessory control panel screen.
Humidity is not used initially. It will commence after the bed is closed and line placement has occurred.
Bed remains closed until the admission has arrived.

Admission guidelines

Prepare Giraffe Omnibed™ bed air environment as above.
Move baby on to bed by opening hood of the bed. When the Giraffe Omnibed is closed it operates as air incubator, when canopy is raised it automatically switches to radiant warmer.

Picture 3 Radiant warmer with canopy raised
Once the canopy is raised it operates in manual mode as a radiant warmer. The factory preheat is 25%; set it to 50% = approximately 36 degrees at the bed surface.

On admission dry any areas of skin intending to be exposed such as the head prior to applying the CPAP hat (infants < 30 weeks).

Attend to axilla temperature and attach servo probe. It is recommended to use servo (baby mode) at all times. Skin probes are accurate to 0.1 degree. Best placement is away from regions where brown fat metabolism occurs; therefore under axilla area is a good choice (Waldon and McKinnon 2007).

Mepitac® tape over the servo probe has been found by other sites to prevent dermal stripping and to prevent the probe being displaced. The probe is first placed on the Mepitac® then on to the skin to avoid air entrapment and then a silver reflective disc over the top to reflect heat away from the probe.

Place the probe into the temperature probe jack.

If an extremely low birth weight infant keep the baby wrapped in glad wrap and leave the sides of the bed up (to prevent evaporative heat loss). Dry any areas of skin intending to be exposed, such as the head prior to applying the CPAP hat.

Ideally warm the drapes prior to line placement and place in the warmer.

Set manual temperature alarm by depressing control knob and scrolling to the ‘wrench’ picture. Depress again and select manual temperature alarm.

**Set 0.5 °C above the infant’s axilla temperature to alert the clinician/nurse early and prevent overheating.**

If the infant is normothermic and all procedures are completed close canopy lid and the Giraffe™ Omnibed automatically switch to operate as an incubator. It will return to the temperature setting entered previously.

After closing the incubator commence humidity at 85% for all babies under 30 weeks gestation. Refer to Humidification Care for an infant in an Incubator/NICU No. 5-3.7. When the humidity reaches 85% remove the glad wrap from the baby.

To commence humidity, place sterile water in water bath to maximum line. Grasp chamber in middle and pull/tilt down. The reservoir will open to allow filling of the chamber to desired level and close.

Using the control knob scroll to humidity option. To set humidity level push knob to highlight setting and turn to increase or decrease, then push knob to enter new setting. Exit menu. The actual relative humidity measured inside the infant’s compartment is displayed in large numerals. The set relative humidity is shown in smaller numerals.
Weighing the infant

- Use Giraffe Omnibed to weigh the infant as it allows weights to be obtained without excessive handling and noxious touch..
- The Giraffe Omnibed mattress must be flat, not tilted.
- Untuck the sheets from around the mattress edges and fold on to mattress as sheets may interfere with weight-(more accurate when mattress only in contact with scales).
- Depress control knob to weigh icon and depress again to start the weighing procedure. An audio prompt sounds and the screen will prompt you to lift the baby from the bed surface while the scale zeros. Follow the prompt to hold until an audio plus visual prompts to replace the baby on the bed. It will then calculate the infant’s weight. Select trend to record and plot the weight on a graph. Exit menu.
- Infant may be weighed with the nappy on etc. Important to place a nappy on the scales while zeroing and remove it when baby goes down on scales to negate weight of nappy.

Additional features

The Giraffe Omnibed has large clear walls with 2 portholes each side, and fold down sides and end panel. This allows multiple personnel to gain access to the infant if required.

Foot pedals are depressed to raise and lower bed to adjust to optimum height for clinician and also visiting family members if seated or in a wheelchair. Note, the side doors can be completely removed to allow a chair or wheelchair to fit closer to the baby.

The canopy foot pedal raises the hood quickly in emergency situations. However, use caution to avoid items being dislodged if stored on top of incubator and remember to move overhanging equipment such as spot lights.

Multiple tubing grommets at the head and foot of the bed are suitable for Intravenous infusion lines, electrode leads etc. End panel center grommets are for ventilator/ CPAP tubing etc.

The Giraffe Omnibed mattress has a unique pressure diffusing mattress due to its memory foam design. A gel mattress is not required.

There is an internal 360 degree rotating mattress which is useful for intubation. It allows for the infant to be moved and turned as well as be observed for compromise to the lines UVC/UAC etc.

There is an internal bed tilt to 12 degrees at the foot and head of bed. This is useful for elevating the infants head to minimize reflux of milk and to allow for respiratory positioning.
Integrated x-ray tray. This tray is in-built under the mattress and allows for the x-ray cassette to be placed under the baby. This allows minimal disturbance to the infant during the procedure.

Heated drawer module. While the Giraffe™ Omnibed is in incubator mode, it has been designed to channel some warm air from the convective heat source to gently heat the drawer module and its contents, e.g. warmed nappies to enhance thermoregulation.

Spot phototherapy light - there is spot phototherapy lights on all Giraffe™ Omnibeds within the unit. It provides an adjustable spot size with no change in intensity across the spot.

Boost air curtain. If the Giraffe™ Omnibed is being used as an incubator and the porthole doors need to be opened for an extended period of time, pushing the boost air curtain button increases the fan speed and improves open door thermal performance. An indicator on the Boost Curtain button lights up when the boost air curtain is activated. It will automatically shut off after 20 minutes and the light will go out. This is designed for short-term interventions as increased operating noise is not recommended for extended periods of time. Important to use this function for central line changes requiring door opening or physical examination by medical team including head ultrasound and echocardiogram.

Timer. Depress the control knob and scroll to the clock and select same by depressing knob again. Select start/stop to start timer, select again to stop timer. This is useful for resuscitation situations and can be used to time procedures.

Trends Select the trending icon brings up the ‘trending’ screen. The graph will plot temperature from skin or air temperature and set temperature.

Help? Select help icon to bring up the help screen. The screen will present a menu of topics on how the Giraffe™ Omnibed works.

Alarms Lists all alarm messages on the left side and how to react to them on the right side of the screen. When an alarm is displayed it will also be accompanied by an alarm audio tone. Usually it is an intermittent single tone alarm but there is an alternating two tone alarm which indicates a critical alarm and triggers automatic heater shut down. All alarms trigger the alarm light and this is silenced by depressing the alarm silence button. All alarms should be responded to immediately.

Cleaning
It is recommended that the Giraffe™ Omnibed be cleaned and replaced every 1-2 weeks. The water chamber is soaked, dried and replaced each week if in use. The Giraffe™ bed will be cleaned by our technical assistants on the unit as per recommendations and protocol.
References:

Bissinger R, Annibale D. 2010 Thermoregulation in very low birth weight infants during the golden hour. Advances in Neonatal Care, 10, 5,230-238.

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