1.0 PURPOSE AND INTENT:

1.1 To provide a process for care of infants who are less than 1000 grams birthweight and/or 27 weeks or less gestation at birth for a minimum of 3 weeks.

See also: Elsevier Nursing Skills: Developmental Care (neonatal) and Skin Assessment (neonatal);

*Note: All recommendations are approximate guidelines only and practitioners must take in to account individual patient characteristics and situation. Concerns regarding appropriate treatment must be discussed with the attending neonatologist.*

2.0 PRACTICE OUTCOME:

2.1 Minimize the risk for development of complications of prematurity including intraventricular hemorrhage, skin breakdown and nosocomial infections.

3.0 GUIDELINES:

3.1 Initial Management

3.1.1 Initiate “Transition Checklist for Infants Born at Less than 33 Weeks Gestation (HSC Form # NS01173 SBH Form #7102-8902-5). HSC: Initiate Standard Order Sheet “Admission Orders Infants Less Than 1.5 kg Birthweight” PHOR293.

3.1.2 Pre-warm:
- Room temperature to 25°C.
- Resuscitation room warmer with additional chemical warming mattress.
- Humidified ventilator tubing.
- Intravenous solutions and anticipated medications that have been refrigerated – warm to room temperature.
- Blankets used to nest infant after birth.
- Transport incubator/bed to 37°C.

3.1.3 Place infant in polyurethane plastic wrap before infant is dried and leave infant wrapped until after NICU admission. If wrap is removed for any reason, replace with a clean wrap. The baby should remain wrapped in plastic at all times. Slits can be cut in the plastic to insert lines etc.

3.1.4 Place a hat on infant’s head and immediately nest the baby with warm blankets. This may be the CPAP hat.

3.1.5 Monitor infant’s temperature closely using skin temperature probe (under the plastic wrap) on servo control. Apply probe within 10 minutes of birth by placing in axilla or on baby’s back using minimal or no tape.

3.1.6 Apply pulse oximeter on right wrist under the plastic wrap as early as possible and monitor infant’s oxygen saturation and after the first 10 minutes of life. Maintain oxygen saturations between 88-92% if receiving oxygen. Chest cardiorespiratory leads may cause skin breakdown and should be used only when a reliable heart rate cannot be obtained using the oximeter or an arterial line if one is in place.
3.1.7 Place an umbilical venous line for provision of TPN and to avoid need for peripheral IV insertions. Use a double lumen catheter. When inserting umbilical lines protect the skin using a sterile drain sponge. See clinical practice guideline “Umbilical Catheters in Neonates” Avoid using chlorhexidine with alcohol. To secure the catheter if possible suture the line to a bandaid as pictured in Appendix A. If UVC difficult to place, utilize a low lying UVC for provision of fluids until a longer term solution is available. See the video for skin antisepsis prior to insertion of umbilical lines (https://www.youtube.com/watch?v=O4C62MVNokY).

3.1.8 Intubate if indicated with appropriate sized endotracheal tube. To secure the tube, apply a pectin or hydrocolloid barrier on the cheeks to attach the tapes and DO NOT use tincture of benzoin on the skin. Determine ventilation parameters according to the clinical practice guideline “Mechanical Ventilation of Newborns”. Avoid hand ventilation. Utilize in-line suction and attach a medication administration catheter (MAC) for administration of artificial surfactant. (see clinical practice guideline “Surfactant Replacement Therapy in Neonates”). For all intubations the most experienced practitioner should be the one performing the procedure.

3.1.9 Give the vitamin K dose IV. Dilute according to drug monograph or pharmacy instructions and infuse over 10-15 minutes. Repeat the dose in one month (pharmacy to make a note).

3.1.10 Ask Labour and Delivery staff to bring mom to see the baby before transport to NICU rather than bringing baby to mom if possible.

3.1.11 If the infant is born in a location other than the labour and delivery area, ensure that appropriate staff from the NICU assist in planning and implementing care and transfer processes.

3.2 Management During Transport to NICU

3.2.1 Baby must remain in the plastic wrap during transport to the NICU and leave on the baby until temperature is stable and baby can tolerate removal. This may take up to 6 hours. (See 3.4.2).

3.2.2 Place the quilted cover over the prewarmed transport incubator/bed to minimize radiant heat loss and place a chemical warming mattress as an additional heat source at HSC.

3.2.3 Use the ventilator with heated humidity during the transport if possible.

3.2.4 If necessary to transfer baby from one bed to another, transfer the entire mattress. This will minimize the amount of handling of the baby. When possible, place baby in the NICU omnibed in the case room or resuscitation room.

3.2.5 Transfer baby on a bed that maintains heat during the move. Utilize GE Shuttle and ensure bed is plugged in and heat maintained if a GE bed is used for the transfer.

3.3 Ongoing Management

3.3.1 Consult the assistant medical director (HSC) / medical director (SBH) to facilitate continuing of medical management.

3.3.2 Minimize endotracheal and oral suctioning.

3.3.3 Avoid pCO₂ below 40 or pH above 7.40 and limit use of bicarbonates.

3.3.4 Maintain infant with head midline for the first 3 days whenever possible except when prone positioning is recommended for respiratory benefit.
3.3.5 In the absence of a daily weight, guide fluid management using serum sodium (Na) with a goal of keeping Na 135-145 mmol/L. Consider starting parenteral fluids at 100 ml/kg/day in infants 23-24 weeks gestation and at 80 mL/kg in those who are older at delivery, and then adjust based on serum electrolytes. Ongoing, provide fluids according to the clinical practice guideline “Parenteral Fluid Management”. Avoid saline boluses. Be aware of total fluids provided with medication administration.

3.3.6 Start minimal enteral feeding according to the clinical practice guideline “Enteral Nutrition for the Preterm and High Risk Infant”. Initiate oral immune therapy using mother’s fresh breastmilk.

3.3.7 Draw serum electrolytes no more than once a day. Follow trending of electrolytes on blood gases with correlation to laboratory values. If available utilize point of care testing devices in order to reduce iatrogenic blood loss while providing immediate results. Monitor glucose from arterial sample rather than heel poke when possible.

3.3.8 When drawing or infusing blood in an arterial or central venous line, use slow and steady technique with a minimum 30 seconds each step.

3.3.9 Avoid early cranial ultrasound within the first 72 hours unless, in speaking with the family, the decision to withdraw support would be influenced by the result.

3.4 Environment and Thermoregulation

3.4.1 Place the baby in a bed with radiant warmer and incubator capacity (i.e. Giraffe OmniBed) as soon as possible after birth. Keep the bed closed as an incubator as much as possible and use the radiant warmer only when absolutely necessary in order to maintain humidity and prevent heat loss and insensible fluid loss. If the bed is used in radiant warmer mode, cover over the baby with a plastic wrap to minimize heat and moisture loss. Consider providing additional warmth to the baby during procedures.

3.4.2 Leave chemical heating mattress and plastic wrap in place until baby's temperature is stable between 36.5 and 37.0° C. If baby’s temperature is less than 36°C, rewarm slowly to avoid rapid temperature shift. Baby's temperature should rise no more than 0.5°C per hour. Monitor closely for hypotension which can result from fast warming. Do not bath for the first 72 hours.

3.4.3 Provide supplemental humidity:
   - 70% during the first week of life
   - 60% during the second week of life
   - 50% during the third week of life and until discontinued
   - Discontinue humidity when the baby reaches 32 weeks post-conceptual age or sooner if the baby is dressed and bundled.

Note: Change the incubator every 14 days and the humidity reservoir every 7 days according to manufacturer guidelines.

3.4.4 Ensure any product that will be infused, fed to, or placed on the infant is at room temperature prior to use whenever possible. This includes gels for diagnostic testing.

3.4.5 Keep ambient lighting low. Use indirect lighting whenever possible. Always shield infant’s eyes from spotlights and procedure lights if their use is absolutely necessary.

3.4.6 Keep eyes shielded and/or incubators covered. When incubator is partially covered consider which direct lights the infant may still be exposed to from adjoining areas.
3.4.7 Eliminate unnecessary noises:
- Do not place items on top of the incubator.
- Take care in handling equipment and supplies around the infant.
- Keep conversations muted or take them away from the bedside.
- Post signs and enforce a quiet zone.
- Close incubator portholes gently.
- Do not play music around the baby.
- Silence alarms as quickly as possible.
- Be aware of potential noise sources in the area and mitigate them if possible.

3.5 Skin Care

3.5.1 Take extreme care to prevent skin tears and dermal stripping by preventing any friction from handling and from baby’s movement. Minimize use of tape. Use sterile clear dressings or other sterile securement devices whenever possible. Use warmed sterile water to remove adhesives. Use a natural oil adhesive remover only if necessary. A non-stretchy gauze wrap may be used as long as it does not compromise circulation.

3.5.2 Monitor skin condition closely and describe any areas of redness or breakdown in detail in the clinical record. Assess and document skin condition at least once a shift. Swab any areas of skin breakdown, redness or rash and send for yeast and bacterial infections.

3.5.3 Prevent skin breakdown in the vulnerable areas such as skin creases by applying a barrier with either a water-based gel or Cavilon™ no-sting wipes or spray. If using the no-sting, do not remove with bathing or rubbing as it will wear off on its own, but will appear like peeling skin.

3.5.4 Avoid use of 70% alcohol. Use chlorhexidine (without alcohol) before procedures. DO NOT use povidone iodine. Cleanse areas with sterile water following the procedure to remove residual solution and visualize any areas of potential pooling of cleansers. (See Clinical Practice Guideline: Infection Prevention for Newborns).

3.5.5 Perform routine diaper care with waterless perineal wipes. Bathing no more than every 4 days, using warmed waterless bath wipes. Prevent tap water exposure. If bath wipes not available, use warmed sterile water.

3.5.6 If skin breakdown occurs consider covering the bed mattress with a disposable low friction sterile sheet.

3.5.7 Change oximeter probe sites every 4-6 hours or more often only if evidence of skin irritation. Observe the sites closely for burns and abrasions.

3.5.8 When using transcutaneous monitors use the lowest heat setting possible and rotate sites every 3-4 hours. Apply two fixation rings and alternate between them to avoid having to remove them as often. Assess skin integrity within the ring before application and change to a new site if skin has been compromised.

3.5.9 Cleanse areas of skin breakdown with body temperature sterile water. Use a sterile applicator and do not increase the friction to the tissue. For significant wounds cover with a hydrogel (i.e. Intrasite gel), hydrofibre wound dressing, and a hydrocolloid (such as tegasorb) or with a clear sterile dressing. Once a dressing is on, removal will cause additional skin stripping. If the dressing must be removed, use a moistened sterile applicator to slowly and gently roll the edges away from the skin. Monitor closely for infection and fungal rashes and treat appropriately. Cover areas of redness which may progress to skin breakdown with additional Cavilon™ (or equivalent) no-sting barrier wipe if available.

3.5.10 Consider applying Mepitel® (or equivalent) skin dressing under chest leads and oxygen saturation probe. Consider taking heart rate from the arterial line without use of leads.
3.6 Developmental Care

3.6.1 Minimize handling by individualizing care and doing hands-on assessments when appropriate for the baby. Allow sufficient recovery time between any handling. Stop procedures or assessments when the baby shows signs of intolerance (such as desaturation, bradycardia, tachycardia) and provide containment and quiet until the baby recovers with the goal of reducing any stress that causes a sharp increase or decrease in blood pressure.

3.6.2 Assess need for routine care procedures and do only what is necessary and then only when baby is stable enough to tolerate the handling. For the first 3-7 days:
- Delay doing routine measurements of head circumference and length
- Do not do abdominal girth measurements unless there has been demonstrated clinical pathology.
- Do not weigh the baby unless requested by the Neonatologist.
- Avoid inserting central lines, chest tubes, or endotracheal intubations

3.6.3 When doing procedures:
- Those doing procedures should have previously established competency in the procedure in order to minimize the stress on the baby. This should be the most experienced person available (at <25 weeks gest age). Learners may scrub in and assist in this procedure.
- For infants 25 weeks and greater, when learners are performing procedures under the direct supervision of the medical house staff, ensure that both are scrubbed in before the procedure begins.
- For a UAC – attempt only one artery if unsuccessful, in order to preserve the second artery for the medical house staff.
- Use a timer and at the 10-15 minute mark (from the onset of start of actual procedure excluding preparation time) have a discussion to determine the infant's tolerance of the procedure and the options of finishing the procedure, stopping briefly and allowing recovery and warming, or delaying until a later time.
- At any time that a member of the team believes that the best interests of the patient are not being addressed, any team member calls a timeout and that person or a designate contacts the Neonatologist on service to discuss the concerns and provide direction on the appropriate next steps.
- Provide hand containment for 5 minutes following all procedures to assist the baby in recovering.
- If more than one procedure is required discuss the options to ensure that the baby is not compromised.

3.6.4 If more than 4 attempts are required for a peripheral IV insertion discuss the possibility of a central line with the Neonatologist.

3.6.5 Position infant in midline, flexion, and with containment using appropriate aids to assist. Change positions every 6-8 hours using 2 people. Caution – DO NOT lift baby by their feet or raise the hips higher than the head when doing diaper change.

3.6.6 Assess for appropriateness of kangaroo care only after the first 72 hours. (See clinical practice guideline “Skin to Skin / Kangaroo Care in Neonatal Units”). It may be appropriate during the first 72 hours for babies who are 26-27 weeks if they are assessed to be physiologically stable and tolerant of handling.

3.6.7 Follow infant's stress cues when doing any handling and stop when infant shows signs of stress (ie. oxygen saturation <88%) and allow time for recovery before continuing. Provide rest before and after stressful procedures. To assist recovery, provide containment and supportive positioning. Encourage facilitated tucking given by parent or bedside nurse.

3.6.8 Provide opportunities for suck and hand grasping.
4.0 REFERENCES:


5.0 PRIMARY AUTHORS

6.1 Doris Sawatzky-Dickson RN MN, NICU Clinical Nurse Specialist, HSC

6.2 Karen Bodnaryk RN BN, NICU Nurse Educator

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