Local Guideline

John Hunter Children's Hospital
CHILDREN, YOUNG PEOPLE AND FAMILIES

NSW GOVERNMENT Health
Hunter New England Local Health District

Extremely Preterm Early Management in the first 72 hours (ePREM72)

Sites where Local Guideline applies	Neonatal Intensive Care Unit JHCH
This Local Guideline applies to:	
1. Adults	No
2. Children up to 16 years	No
3. Neonates – less than 29 days	Yes
Target audience	All neonatal clinicians caring for extremely preterm infants in the first 72 hours of life
Description	Provides guidance for the clinician to care for an extremely preterm infant
National Standard	Standard 3 –Healthcare Associated Infections

Go to Guideline

Keywords	ELBW (extremely low birth weight, outcomes, resuscitation, thermoregulation
Document registration number	JHCH_NICU_03.11
Replaces existing document?	No

Related Legislation, Australian Standard, NSW Ministry of Health Policy Directive or Guideline, National Safety and Quality Health Service Standard (NSQHSS) and/or other, HNE Health Document, Professional Guideline, Code of Practice or Ethics:

- HNELHD PD2013_043:PCP 31 Medication Safety in HNE Health
- NSW Health Policy Directive PD2017_013 Infection Prevention & Control Policy
- NSW Health Policy Directive PD2017_032Clinical Procedure Safety

Prerequisites (if required)	N/A
Local Guideline note	This document reflects what is currently regarded as safe and appropriate practice. The guideline section does not replace the need for the application of clinical judgment in respect to each individual patient but the procedure/s **require mandatory compliance**. If staff believe that the procedure/s should not apply in a particular clinical situation they must seek advice from their unit manager/delegate and document the variance in the patient's health record.
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This document contains advice on therapeutics	No
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PURPOSE AND RISKS

This local clinical procedure has been developed to provide instruction to health practitioners and to ensure that the risks of harm to the extremely preterm infant are prevented, identified and managed.

The risks are:

- *Hypothermia*
- *Sepsis*
- *Skin damage*

The risks are minimised by:

- *Clinicians having knowledge of principles of thermoregulation and preparing delivery area to minimise heat loss*
- *Clinicians seeking assistance if the therapy is outside their scope of practice*
- *Following the instructions set out in the clinical procedure for procedures requiring aseptic technique*
- *Recognition of the common clinical signs of sepsis*
- *Assessment and management of optimal skin integrity*

Risk Category*:* *Clinical Care & Patient Safety;*

GUIDELINE

Staff Preparation

It is mandatory for staff to follow relevant: “Five moments of hand hygiene”, infection control, moving safely/safe manual handling, documentation practices and to use HAIDET for patient/carer communication: **H**and hygiene **A**cknowledge, **I**ntroduce, **D**uration, **E**xplanation, **T**hank you or closing comment.

ABBREVIATIONS & GLOSSARY

Abbreviation/Word	Definition
LBW	Low birth weight-those babies born weighing less than 2500g
VLBW	Very low birth weight-those babies born weighing less than 1500g
ELBW	Extremely low birth weight-those babies born weighing less than 1000g
NICU	Neonatal Intensive Care Unit
DS	Delivery Suite
OG	Orogastric

OT	Operating Theatre
PIVL	Peripheral Intravenous Line
PICC	Peripheral inserted central catheter
UVC	Umbilical Venous Catheter
UAC	Umbilical Arterial Catheter
CPAP	Continuous Positive Airways Pressure
NNP	Neonatal Nurse practitioner
RCT	Randomised Control Trial
IVN/TPN	Intravenous Nutrition/Total Parenteral Nutrition
IVABs	Intravenous antibiotics
ISOC	Immune Support Oral Care
SBR	Serum bilirubin
NBST	Newborn Screen Test
KC	Kangaroo Care-the practice of skin to skin contact between infant and parent
HC	Head circumference

GUIDELINE

This Guideline does not replace the need for the application of clinical judgement in respect to each individual patient.

Rationale

The care in the first week of life of babies less than 29 weeks is extremely important and what happens in the first few hours and days can lead to both short- and long-term consequences and even death (Doyle 2012). The Neonatal Intensive Care Unit in John Hunter Children's Hospital admits approximately 40 to 50 extremely low birthweight (ELBW) preterm infants to the unit each year and 60-70 infants <29 weeks.

This guideline has been developed to support staff specialists, fellows, registrars, neonatal nurse practitioners (NNPs), residents & nursing staff in the initial management by the neonatal team of these extremely fragile infants.

Aim

To optimise the survival free of disability in extreme preterm infants by providing optimal interventions in the first few hours/days of life.

To make every effort to accomplish the following goals by 2 hours of age:

- Admission to NICU
- Welcome introduction to family
- Weight and head circumference

- Attach and commence monitoring
- Stabilise the infant on CPAP/mechanical ventilation (including Poractant alfa - Curosurf surfactant) if required)
- Insert OG tube
- Establish vascular access including PIVC/UVC/UAC/PICC as deemed necessary
- Commence IV fluids/TPN
- Confirm all line and tube positions on X-ray.
- Perform the first blood gas and sugar estimation
- Administer medications including Vitamin K (phytomenadione), Hepatitis B vaccine, first dose of antibiotics (where applicable) and caffeine.
- Top to toe examination
- Complete all appropriate documentation

Patient population

Extremely preterm infants <29 weeks gestation at birth

Clinical Practice Guidelines common to the management of ELBW babies should be considered an essential component of this policy

Stabilisation and thermoregulation

- Resuscitation of the Newborn Infant JH campus JHCH_NICU_1.02
- Giraffe™ Incubator bed in NICU JHCH_NICU_04.01
- Thermoregulation of the neonate in NICU JHCH_NICU_04.02
- Admission of babies to NICU, HDU, and SCN JHCH_NICU_01.01

Lines and Nutrition

- Intravenous (IV) cannulation and care in NICU JHCH_NICU_10.01
- Umbilical lines in NICU JHCH_NICU_10.03
- PICC Line Insertion and Management in NICU _JHCH_5.4.2
- Aseptic technique in NICU JHCH_NICU_03.01
- Extravasation of IV in NICU JHCH_NICU_10.02
- Enteral feeding – Initiation, Progression and Methods JHCH_NICU_09.01
- Parenteral Nutrition in NICU – JHCH_NICU_09.02
- Expressed Breast Milk – Freezing, Storage and checking of JHCH_NICU_09.03
- Hypoglycaemia Screening and Management JHCH_NICU_16.01

Respiratory support

- Apnoea and Bradycardia management in NICU JHCH_NICU_12.12
- Assisted Ventilation CPG 5-5.1.4 (a)
- CPAP in NICU using Hudson Prong CPAP JHCH_NICU_12.02
- High Frequency Oscillating Ventilation CPG 5-5.1.23
- Neopuff IPPV through Hudson Prong CPAP JHCH_NICU_12.07
- Surfactant Administration in NICU JHCH_NICU_12.03
- Volume Targeted Ventilation in NICU JHCH_NICU_ 5.1.4(d)

Other body system support

- Hypotension and poor circulation in neonates JHCH_NICU_13.04
- Jaundice in the Neonate JHCH_NICU_13.03
- Patent Ductus Arteriosus (PDA) management in NICU JHCH_NICU_13.03
- HUS guideline JHCH_NICU_05.02

Monitoring

- Newborn Screen Test in NICU JHCH_NICU_16.02
- Monitoring of the Infant in NICU JHCH_NICU_03.06
- Assessment and Management of pain in the neonate JHCH_NICU_03.04
- Phototherapy in NICU and Postnatal wards, JHCH_NICU_16.04
- Retinopathy of Prematurity (ROP) – Screening for and Management of in NICU JHCH_NICU_18.01

Developmental care

- Developmental Care Principles in NICU JHCH_NICU_06.01
- Kangaroo Care in NICU JHCH_NICU_6.04
- Positioning for the preterm or sick neonate in NICU JHCH_NICU_6.02
- Skin Guidelines for babies in NICU JHCH_3.05

Infection control

- Probiotics in Preterm Neonates JHCH_NICU_09.04

Before Delivery (-30 to 0 minutes)

Family counselling

- Parents should have counselling and be given a copy of the booklet “Birth before 32 weeks” at the earliest convenient time when an extremely preterm delivery is thought by obstetric staff to be a risk.
- During business hours a Staff Specialist or Neonatal Fellow will provide this if ≤26^{6} weeks or a NNP or Registrar if 27^{0}-28^{6} weeks.
- In the event of an imminent delivery or out of hours admission a NNP or Registrar can provide counselling and booklet for all <29 weeks if time permits. If delivery does not occur, further counselling should be provided during working hours the next day

Maternal history (minimum initial history)

- Care team, relevant scans and results
- Complications in pregnancy/labour

Preparation of environment/people

- If surgical delivery, ensure OT is given time to warm theatre to 26°C (this can take up to an hour). Request should be made by delivery suite staff when theatre booked OR by NICU staff when informed of imminent delivery.
- Ensure the consultant/fellow is provided timely notice of the impending delivery to attend with Registrar/NNP
- Admitting nurse is informed to set up space and attend delivery

- Roles allocated within attending team – team leader, airway/breathing, circulation, other
- Communicate plan regarding cord clamping with delayed cord clamping as default in vigorous, breathing infants.

Preparation of resuscitation equipment

- Ensure humidified Neopuff set up according to guidelines for gestation or study if enrolled
- Small Neopuff mask available
- Small Vygon Neo-HeLP bag out and radiant heater maximised on Resuscitaire. Receiving blanket for midwife also warmed under radiant heater.
- Laryngoscope working and Resuscitaire adequately stocked with anticipated sizes of equipment. If baby expected to be <600g consider taking the Microprem box.
- Poractant alfa (Curosurf surfactant) may be required in DS/OT and should be readily available.

Preparation of patient space

- Giraffe bed ready and warm
- CPAP circuit ready to go
- Ventilator checked and in bedspace
- Resuscitation trolley for intubation/surfactant
- Procedure trolley adequately stocked and ready for line placement

Enrolled in any RCTs/Audits?

- May require intervention or recordings during delivery.

Delivery/Resuscitation (0 to 20 minutes)

At birth

- Admitting nurse to push Apgar timer at delivery
- Observe immediate response of infant and decide on early cord clamping where needed

Vygon NeoHeLP

- Infant received from midwife and placed wet in bag with right arm free for saturation probe

Saturation probe

- Admitting nurse to place on dried right arm/hand

Resuscitation

- Neonatologist +/- Neonatal Fellow should be present at all ≤26[6] week deliveries and available for those <29 weeks
- A, B, C as per local resuscitation of newborn infant guideline/ANZCOR guidelines.
- CPAP at a minimum is required for all babies under 27 weeks. Make every attempt to provide uninterrupted CPAP.

Temperature taken prior to leaving DS/OT

- Remove wet linen.
- Additional warmed blankets should be used to cover infant.
- An additional woollen hat can be used **over** the Vygon NeoHeLPbag; do not remove plastic covering from the head.

Communication

- Inform parents of infant's current clinical condition prior to leaving delivery suite.
- If deemed clinically stable, make every effort to allow parents to see/touch their baby.
- Inform NICU team leader when leaving OT/DS and obtain admission room and bedspace information.

Admission to NICU (20 minutes to 2 hours)

Transfer on Resuscitaire

- Recent local audit of babies admitted <29 weeks has shown that there is little change in temperature en route from OT/DS to NICU. Therefore, transfer without the radiant heater on is reasonable for our current environment in JHCH.

Temperature on admission

- Prior to transfer onto Giraffe bed

Weight and head circumference/monitoring

- Taken on Giraffe bed by admitting nurse and assisting nurse.
- Ventilation/CPAP provided by Neopuff
- If intubated, tube should be secured prior to weigh
- Attach saturation and temperature probes only, obtain BP
- ECG monitoring is not required unless concerns regarding heart rate/rhythm (e.g. SVT) until after the first X-ray taken/umbilical lines placed (if required).

Give Poractant alfa (Curosurf surfactant) if required

- See guideline for Poractant alfa (Curosurf surfactant) administration
- Infants that require surfactant/intubated on admission should have this within 30 mins of birth

Respiratory support and management in NICU

- CPAP circuit, initially at 8cmH_20
- Ventilator, setting prescribed by Consultant/Fellow/NNP/Reg whilst being weighed
- Insert PIVC (at discretion of admitting fellow/consultant), connect 10% dextrose/TPN and start IVABs if indicated (within 60 mins of admission)
- Cultures should be taken if intending to start IVABs. These should be taken first.
- Blood gas with BSL, FBC, cross-match, group and DAT are desirable but can wait as long as baby stable if umbilical lines are to be inserted and difficulty obtaining blood.

- Give Vitamin K (phytomenadione), Hepatitis B vaccine vaccine and Immunoglobulin (if indicated)
- Insert umbilical lines if indicated (discuss with Neonatologist/Neonatal fellow), commence starter TPN
- Place temperature probe for servo-controlled monitoring prior to umbilical line placement
- Obtain chest/abdomen X-ray to confirm placement of umbilical lines prior to starting TPN (AP film and consider lateral) and to assess lung disease.
- Attach cardiac monitoring
- Keep in Vygon NeoHeLP until umbilical lines secured, incubator lid down and humidity started (check infant temperature)
- Caffeine loading dose

Documentation

- Obtain maternal details if not already known
- Complete NICU admission sheet, observations, notes, drug (with Neomed) and fluid orders.
- Consent for UVC, UAC or PICC can be gained after emergency placement but should be obtained and documented in the progress notes using the appropriate forms

Communication

- Update parents on clinical progress and interventions instituted or planned.

The First Days (2 to 72 hours)

- Serum electrolytes at 12 hours
- Commence lipids as per nutritional guideline
- Monitor blood sugar (as per protocol)
- Monitor blood gas (dependent on patient condition) including SBR on appropriate chart
- Consider second dose of Poractant alfa (Curosurf surfactant) 6-12 hours after first dose in consultation with neonatologist or fellow
- Head ultrasound scan (if medically unstable)
- Encourage expressing of breast milk to commence ISOC and trophic feeds
- Communicate with parents
    - Condition of infant
    - Probiotics
    - Studies – discuss eligibility for ongoing trials, gain consent if in agreement
    - Ward booklet and Miracle babies bag
- Update database
- NBST at 48 hours of age
- Offer Kangaroo care if stable (see guideline)
- Update obstetric staff of condition once stabilised

Family

The delivery of an ELBW infant can be one of the most traumatic experiences of any family. They are worried, exhausted, scared and bewildered. Suddenly they have had their perceptions of a “normal” pregnancy shattered. Most parents and parents-to-be are not prepared, either emotionally or in terms of medical knowledge, to easily engage in making difficult and important decisions about perinatal care.

In a study undertaken in 2014 the authors identified four distinct categories of support required by parents of very preterm infants: emotional support; advice, information, and involvement in decision making; prayer; and instrumental help (someone caring for their other children). These findings indicate that extended family play important roles in supporting parents in decision making even when they are not actively involved in making the decisions.

Appendix ePREM Flow Chart

ePREM Flow Chart for the First 2 hours of Life

Personnel

Admission Nurse (nurse attending delivery)
Assisting nurse
NNP/Registrar
Consultant/Fellow

Before Delivery (-30 to 0 minutes)

Obtain history from obstetric staff/mother
Inform consultant/fellow of impending delivery
Collect Neohelp bag, small mask and temperature pack. Check Resuscitaire, ask OT to increase temperature.
Fill humidifier base with water, attach and switch on. Prepare saturation probe.
Prepare patient space – CPAP, Ventilator checked, 10% dextrose and TPN ready
Travel to hospital/oversee preparations and allocate roles

Delivery/Resuscitation (0 to 20 minutes)

Push Apgar timer on delivery. Assist with placing into Neohelp and attach saturation probe to right hand. Available for HR/chest compressions if needed. Take temp prior to leaving DS
Provide respiratory support with Neopuff as required. ETT if required.
Provide additional support if required – intubation, umbilical lines etc.

Admission to NICU (20 minutes to 2 hours)

Take temperature on arrival and secure ETT if required. Transfer to Giraffe, HC and weight taken. Attach saturation probe. Attach definitive respiratory support Apply Neopuff and provide respiratory support if needed while being weighed. Attach definitive respiratory support, take BP Determine ventilator settings if needed and if antibiotics needed Chart fluids/curosurf
Insert PIVC and take bloods (FBC, X-match, Grp and DAT +/- culture) Give Curosurf Assist with PIVC/check drugs if needed Prepare drugs while PIVC inserted, commence IVABS once culture taken Assess and communicate need for umbilical line placement Update family on progress and upcoming procedures
Prepare for umbilical lines if required. Place lines Attach temp probe and assist with lines Prepare arterial line fluids/TPN Check line placement

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Implementation, monitoring & compliance AND AUDIT

1. The finalised document will be communicated via email and on the Neonatal HUB and displayed on the PPG.
2. The guideline changes in practice will be implemented by the ePREM Group in NICU;
3. The document will be monitored for effectiveness and compliance

Appendix

ePREM Flow Chart for the First 2 hours of Life

Approval

NICU Executive Operational Management Committee 18/12/2017
Clinical Quality and Patient Care Committee 19/12/2017

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Feedback

Any feedback on this document should be sent to the Contact Officer listed on the front page.