# Extremely Low Birth Weight (ELBW) Bundle of Care for Prevention of Intra Ventricular Haemorrhage (IVH)

## Guideline Responsibilities and Authorisation

| | |
|---|---|
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## Guideline Review History

| Version | Updated by | Date Updated | Summary of Changes |
|---|---|---|---|
| 1 | Arun Nair, SMO NICU & Leanne Baker, NE NICU | August 2020 | First version |
| 2 | Arun Nair | Oct 2022 | Revision of the Golden Hour Flow Chart |
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## Contents

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## 1 Overview

### 1.1 Purpose

To reduce Intra Ventricular Haemorrhage (IVH) rates and other morbidities.

### 1.2 Scope

Te Whatu Ora Waikato staff working in Neonatal Intensive Care Unit (NICU) Delivery Suite and Delivery Theatres.

### 1.3 Patient / client group

Babies with BW <1000g and/or </= GA 28/40 Weeks

### 1.4 Definitions

| | |
|---|---|
| **BW** | Birthweight |
| **CNS** | Clinical Nurse Specialist |
| **CPAP** | Continuous Positive Airway Pressure |
| **CVAD** | Central venous access device |
| **D10%** | Glucose 10% solution |
| **EBM** | Expressed Breast Milk |
| **ECHO** | Echocardiogram |
| **ELBW** | Extremely Low birth Weight |
| **ETT** | Endotracheal Tube |
| **$FiO_2$** | Fraction of Inspired Oxygen |
| **GA** | Gestational Age |
| **Glamorgan skin and pressure assessment** | Risk assessment tool for skin and pressure injury |
| **Golden hour management** | Management in the first hour from birth |
| **HFOV** | High Frequency Oscillatory Ventilation |
| **IVH** | Intra Ventricular Haemorrhage |
| **LISA** | Less Invasive Surfactant Administration |
| **MAP** | Mean Airway Pressure |
| **Modified NPASS** | A tool used to assess pain and sedation in neonates. It has 5 assessment criteria: crying/irritability, behaviour/state, facial expression, extremities/tone and vital signs. |

| | |
|---|---|
| **NNP** | Neonatal Nurse Practitioner |
| **OIT** | Oral Immune Therapy |
| **PAL** | Peripheral Arterial Line |
| **$pCO_2$** | Partial Pressure of Carbon Dioxide |
| **PIV** | Peripheral intravenous canula |
| **PRN** | pro re nata: as occasion arises |
| **RMO** | Resident Medical Officer |
| **SMO** | Senior Medical Officer |
| **$TcpCO_2$** | Trans Cutaneous $pCO_2$ |
| **IVN** | Intravenous Nutrition |
| **TTV** | Targeted Tidal Volume |
| **UAC** | Umbilical arterial Catheter |
| **UVC** | Umbilical Venous Catheter |

## 2 Clinical Management

### 2.1 Competency required

- Registered Nurse who has completed ventilator orientation and attended service specific ELBW education day. It remains preferable for nurses with greater than 2 year's ventilator experience or who have completed a neonatal intensive care course.

- Neonatal Nurse Practitioner (NNP) / Clinical Nurse Specialist (CNS) / Registered Medical Officer (RMO). All medical staff / NNP / CNS under the Supervision of the Senior Medical Officer (SMO).

## 2.2 Summary of Bundles

A. RESUSCITATION Bundle

B. CARE BUNDLE for the first 5 days in the NICU (Includes golden hour management)

**For all babies print Golden hour algorithm for ELBW babies (Appendix A) and file in babies notes.**

## 2.3 Guideline

### A. RESUSCITATION BUNDLE

**A1 SPECIAL CONSIDERATIONS FOR ELBW BABIES with BW ≤ 750g OR 23-24 Weeks**

- Babies of these gestations are at the limits of viability.
- Each case should be individualised, always in discussion with the parents and according to the parent's wishes and the clinical condition.
- A decision of not to resuscitate is appropriate, if the parents have expressed this wish.
- If < 24 weeks with no antenatal steroids and impending birth at non-tertiary hospital - Advise Comfort / Palliative Care always in discussion with the parents.
- Clinical decisions to resuscitate should take into account antenatal steroid coverage, obvious sepsis, and congenital malformations.
- If resuscitation is started with mask and Neopuff ventilation, assess the response to resuscitation by the response of the heart rate in deciding whether to continue or stop after an adequate period of effective ventilation.
- It is usually inappropriate to provide chest compressions or medications at these gestations.
- Refer to Te Whatu Ora Waikato NICU Guideline: Resuscitation of Marginally Viable Infants (ref: 5773).

## A. RESUSCITATION BUNDLE

**For all babies <1000g, and/or </=28/40**

### A2 DELIVERY ROOM SET UP AND PREPARATION

- Check Resuscitation Package (refer to section A4).
- Assemble a Resuscitation team (minimum two experienced persons) if time permits- (for </=26/40 SMO in attendance)
- Assign clear roles and brief all personnel prior to delivery.
- Ensure Resuscitation Team readiness: Confirm antenatal discussions, care plans and interventions, whether there has been a Neonatology consultation, check if appropriate doses of steroids and MgSO4 have been administered.
- Meet with the parents: Outline the resuscitation plan and address any concerns.

### A3 RESPIRATORY CARE IN DELIVERY SUITE/THEATRE/NICU

- If the baby is spontaneously breathing offer CPAP as the initial mode of respiratory support.

For Intubations:

- Ideally 2 clinicians to be present (intubation by experienced NP / CNS / medical personnel only).
- Treatment thresholds for Surfactant: (pre-warm e.g. Surfactant vial to body temp)
  - For babies with GA </= 26/40 - FiO2 > 0.3 and for babies with GA >26/40 - FiO2 > 0.4
  - Surfactant (Curosurf TM) Dose: 200mg/kg (2.5 ml/kg) for initial dose, followed by 100mg/kg (1.25 ml/kg) for additional doses (earliest repeat dose after a minimum of six hours).
- If the baby is on CPAP: Consider LISA technique (and positioning, wrapping and holding baby to reduce the stress).
- If the baby is intubated: Avoid ETT dislodgement by securing it before surfactant administration
- Make sure that the ETT is secure prior to transfer to NICU.

Endotracheal Tube (ETT) Taping - Nasal and Oral in Newborn I… (Ref 2627)

### A4 RESUSCITATION PACKAGE

In addition to routine equipment / procedures for the management of high risk infant, resuscitation and stabilisation of babies with < 1000g (expected) BW or </=28/40 weeks gestation includes:

- Inform consultant: Ensure at least two pairs of experienced hands, ideally an SMO plus assistants.
- Request the NICU ACNM / shift co-ordinator or a senior nurse to accompany initial medical / NNP responder.

- Delegate tasks, so everyone knows their responsibility at delivery including documentation.

**Equipment:**

- Curosurf™ – 200mg/kg (2.5 ml/kg) first dose followed by 100mg/kg (1.25ml/kg) for subsequent doses.
- Surfcath (small extension tube) , Size 5 feeding tube or a syringe with needle for administration of surfactant
- Sterile plastic wrap e.g. NeoHelp™ or plastic bag, placed on resuscitaire to pre-warm (if using plastic bag pre-cut right hand bottom corner).
- Gamgee (warmed)
- Pre-warmed radiant warmer bed or Shuttle to transport infant maintaining temperature through transfer to NICU).
- Check Laryngoscope and blades sizes 00/0.
- 2.0, 2.5 & 3.0 ET tube (with stylet inserted as required for oral insertion only).
- Pedicap™
- Pre-cut tapes of appropriate sizes for oral and nasal fixation of ET tubes.

## A4.1 RESUSCITATION REMINDERS IN DS/OT

**ENSURE DELAYED CORD CLAMPING AT DELIVERY**

- Ensure room temp is warm (ideally 24-26 degree C) and all linen used is pre-warmed.
- Plastic wrap (do not attempt to dry the baby). Ideally a sterile warmed Neohelp placed on the sterile surgical field and baby placed in it immediately at birth prior to delayed cord clamping
- Warm Gamgee
- Cord clamping delayed for 1 minute (unless needing urgent resuscitation).
- Baby should have head up and feet down while waiting, making sure that the baby is below or at level with the placenta (advise obstetric team).
- Seek advice to collect sample for Placental histology.
- **Avoid prolonged sustained inflations (> 5 Seconds) as a part of resuscitation in these group of babies.**
- SpO2 monitor and probe to the right wrist.
- Cord blood sampling: Arterial and Venous, pH and lactate.
- Elevate head end of the bed to approximately 30 degrees after resuscitation.
- Vitamin K injection (<1500g, 0.5mg, ≥1500g 1mg) – (Refer Vitamin K (Phytomenadione) for Neonates drug guideline (Ref. 2980)).
- Avoid weight check and other measurements in Delivery Suite / Theatre unless using ELBW incubator
- Positioning to keep the head in the midline, **avoid undue lifting or turning of head at all times.**

- **Transfer the baby to NICU on CPAP or IPPV, only after stabilisation in the Delivery Suite/Theatre. Allow for father or designated member of the family to accompany the baby to NICU.**

**A4.2 PREPARATION FOR ADMISSION IN NICU (simultaneously by another team)**

- Ensure Omnibed™ is pre-prepared for infant (can use it for the next 72 hours).
- Humidity to be adjusted to 85-95%.
- Loose rolls for easy access or removal when placing lines and for doing x-ray.
- Weigh the infant using Omnibed™ scale - level bed slowly prior to weigh, elevate bed slowly immediately after weighing. If no Omnibed™ available ensure alternate scales zeroed and ready.
- Measuring tape opened and positioned for head circumference and length.
- Check and lower the volume of alarms on monitors and ventilators as low as is clinically safe.
- Prepare the necessary line set up (UAC/UVC), CPAP circuits, prongs and medications (caffeine citrate and prophylactic antibiotics) ready for administration before IVN is connected. Consider infusing Glucose 10% via UVC/ peripheral line if present, if any delay in commencement of IVN is anticipated.

## B. CARE BUNDLE for the first 5 days in the NICU (Includes golden hour management)

**NOTE: IT IS PREFERABLE FOR THESE BABIES TO BE CARED FOR BY NURSING STAFF WITH GREATER THAN 2 YEARS VENTILATOR EXPERIENCE OR WHO HAVE COMPLETED A NEONATAL INTENSIVE CARE COURSE.**

**IT IS NOT APPROPRIATE TO USE THESE BABIES FOR ORIENTATION PURPOSES DURING THE FIRST WEEK**

### B1 ENVIRONMENT - includes bed position / weighing

- Admit all babies with BW < 1000g into a pre-warmed Giraffe Omnibed™ bed with humidification on at 85-95%.
- Use Omnibed™ with set Comfort Zone in order to optimise bed settings for infant weight and gestation.
- Elevate head end of the bed to maximum allowed on the Omnibed™ (up to 30 degrees).
- If bed needs to be levelled for any reason - be slow and steady.
- Consider “Deep nesting” of infant to promote neurodevelopmental stability.
- **Use of incubator scales - no routine weights for the first 5 days after birth.** Use the birth weight (BW) unless otherwise indicated by clinical status.
- If weight check or for any other procedure lifting is required - MUST be done as a 2 person process (see below) ensure minimal linen change for the first 5 days (no routine linen changes).
- For X-ray - level the bed and use incubator x-ray tray whenever possible.
- Minimize noise and light levels in the room - use Giraffe incubator drape if available but ensure visibility of the baby at all times.
- Take particular care to prevent temperature loss during procedures like UVC, UAC line placements and Intubations by leaving the radiant warmer on and allowing the temperature to stabilise before closing the lid. Make sure that the temperature probes are attached to the skin and the servo is turned on.
- Use air curtain when accessing the incubator portholes or opening the side door to avoid heat loss.
- Refer to Te Whatu Ora Waikato NICU Nursing Procedure: Temperature Control of infants in NICU (ref: 1476) for management of temperature.

### B2 MONITORING

**Temperature** - measure baby’s temperature as soon as possible on arrival prior to procedures, normo-thermia is one of the parameters for outcome measures.

**BP/Vital sign monitoring** Blood pressure MUST be obtained as soon as the baby is clinically stable.

SpO2 monitoring – ( Link :oxygen monitoring guideline)

**When UAC is present:**

- If arterial line is present, avoid chest or limb leads - heart rate may be obtained from arterial pulses.

- Do not use chest or limb leads - heart rate may be obtained from arterial pulses.
- Do not use manual BP unless clinically unstable and correlation is required.
- Any flushing / withdrawal needs to be slow and steady (minimum 30 seconds each step).
- Ensure umbilical lines are well secured - securing all lines with base duoderm and clear tegaderm dressing on top of curled line, if duoderm or bridging is required for active infant - ensure minimal surface area of duoderm in contact with skin.

  Umbilical Artery and Vein Catheterisation in the Neonate (ref 6294)
- Minimise blood sampling as possible - consider using 0.15ml arterial sample for blood gas.

**If no UAC is present**

- Use only limb leads for cardio respiratory monitoring.
- If clinically stable, cuff BP 1-4 hourly only as clinically indicated (re-site cuff 4 hourly).

**Non-Invasive Monitoring**

- Peripheral temperature sensor is best on the hand or wrist secured with sticky foam or a small piece of silicone tape - change location 4-6hrly.
- Skin temperature probe to be placed on non-bony area (i.e. abdomen) secure with silicone tape and then reflective heart cover - silicone tape is repositionable and safe on immature skin.
- pCO2 monitoring by blood gases (ensure pCO2 is within normal range 4.6 – 6.2 kPa), consider use of TcpCO2 if there is no UAC.

**B3 TESTS AND PROCEDURES**

**UAC/UVC Placements - limit attempts to within one hour if possible, or retry later when more stable: (To be attempted by the most experienced NNP/ Registrar/SMO on the shift)**

**It is a good idea to insert a PIV first, and run IV 10%Glucose while preparations are made for insertion of lines**

For UVC/ UAC line placement, restrict to one attempt by the most skilled hand on the floor, if difficult, one may choose to do only UVC and wait till after the Golden Hour for further line options – see Flow Chart appendix)

- Careful measurement and calculation of insertion depth in order to avoid later re-adjustment.(see umbilical lines guideline – link)
- Arterial line sampling technique - slow and steady. Refer to Waikato DHB NICU Nursing Procedures: Arterial Line: Catheterisation and Set Up Umbilical and Peripheral Arterial catheter in NICU (Ref:1637) and Arterial lines in Neonates – sampling, nursing management and removal (Ref: 1638)
- Glucose monitoring with blood gases via the UAC, if it is present.
- Lumbar puncture should be avoided until after 72 hours if possible.
- If infant requires an invasive procedure (PAL, chest tube, CVAD) consider Fentanyl bolus prior to procedure Fentanyl for neonates (ref 2916).

- **Routine head ultrasounds** should be deferred until at least 72 hours unless there are specific decision making concerns - will require 2 people to retain positioning as required to complete the test.
- Consider point of care ECHO to assess haemodynamic significance, if need be.
- **Participation in research and Studies** - as consented by the medical team,
- Careful consideration of blood tests requested in order to avoid iatrogenic anaemia.

## B4 RESPIRATORY SUPPORT

- CPAP via prong / mask – cycle 4-6 hourly: Initial settings- 6cm/6L flow (Clean the ears gently before putting on CPAP hat. Continuous Positive Airway Pressure (CPAP) - Management in N… (ref 4939)
- Do not remove /replace CPAP hat if possible - ensure hat is not too tight (should be able to insert the 'pinky' fingertip under rim of hat - check forehead / ears during cares for pressure area and positioning.
- If intubated connect to ventilator as soon as possible once intubated (minimise Neopuff and bagging) – one designated staff member to adjust ventilator settings
- If ventilated: initial settings - TTV: Inspiratory volume 4-6ml/kg, pressures 25/5, MAP 8 (consider HFOV if needing higher setting).
- Aim for blood gas pH > 7.25.
- No routine suctioning - if suctioning is clinically indicated, provide comfort measures before, during and after the procedure.
- Avoid changing ETT for first 72h if at all possible (even if oral ETT), or if need be, restrict to only one extubation attempt in the first 72h

## B5 MEDICATIONS

Refer NICU Drug guidelines

- Caffeine citrate loading dose as soon as practical, if possible before starting IVN. Refer to the Caffeine Citrate for neonates drug guideline (Ref. 0591).
- Antibiotics if needed, give it within 1st hour after collection of blood for culture.
- Hydrocortisone low dose for babies with GA < 28 weeks if cortisol level less than (<) 500nmmol/L. refer to the Hydrocortisone for neonates drug guideline (Ref. 2928). -
- Vitamin K IM if not already given at birth.
- Probiotics- start as soon as possible Probiotic (Infloran) for neonates (ref 2931)

## B6 HANDLING AND POSITIONING *(ensure minimal handling at all times)*

**Cue based cares wherever possible:**

- Keep head and body in line at all times (ears, shoulder and hips should be in a straight line).
- Deep nesting to be used to facilitate positioning and musculoskeletal development.
- Use rolls or positioning devices as appropriate to keep the head and neck in line with the body.

- Neck rolls (folded not rolled) for CPAP babies - in ventilated babies, only as indicated (not routinely required) - neck supports must not exert direct pressure on neck during lateral positioning.
- No prone positioning for 5 days even if no umbilical lines are present.
- Nurse infant in lateral or supine midline position only - reposition 4-6hrly as indicated, ¼ to ½ turns only, if baby is stable.
- Skin to skin or kangaroo cuddles should not be offered routinely during the first 5 days of life and while umbilical lines in place except if the baby is for palliative care.
- **Two person handling and repositioning for**:
- Any repositioning which involves movement of the head
  - Weighing or linen change (if indicated - refer above).
  - Transfer to other incubator or radiant warmer (if indicated).
  - Removal of polyethylene occlusive plastic wrap following completion of procedures/lines etc. (as per Te Whatu Ora Waikato NICU Nursing procedure: Admission to Level 3 Intensive Care Nursery in NICU Ref: 4571).
- Head Circumference - initial measurement to be performed after admission - gently slide the tape under to minimise lifting the head off the bed.
- **Assessments** (healthcare team) must be kept to a minimum
  - Group all assessments (medical / surgical / nursing / physio) as possible.
  - ALL examinations should be focused and brief.
- **Nappy care** - lift from the hips and slide under (do not lift legs).
- **Fontanelle checks** - No routine assessments or head massage at least for five days.
- **Skin care** - complete Glamorgan skin and pressure area assessment form within 8hours of admission then with handling / cares 2-4 hourly/PRN - back assessment: observe during lateral position) use paraffin gauze on the vulnerable areas PRN at risk of break down.

## B7 MANAGEMENT OF PAIN AND DISCOMFORT

- Monitor pain and sedation scores using Modified NPASS; manage pain/sedation scores using Te Whatu Ora Waikato NICU Nursing Guideline: Neonatal pain and sedation: Assessment and nursing management in NICU (Ref: 1684).
- Pain scoring should be noted on daily nursing chart
- Minimal handling and / or cluster cares as tolerated to allow rest periods - must be individualised based on infant condition and tolerance of stimulation.
- Gentle handling always.
- Provide non-pharmacologic and / or pharmacologic measures to reduce pain for all stressful and/or painful procedures.
- Avoid Midazolam, if possible.
- If pain relief is required use Fentanyl Fentanyl for neonates (ref 2916).

## B8 LIGHTING & VISUAL STIMULATION

- Minimise light levels where appropriate. Protect infant's eyes from bright light during cares.
- Reduce exposure to light in incubators by using a Giraffe ™ incubator cover or drape. Provide eye protection for infants receiving phototherapy, shield light from infants in adjacent incubators / cots.
- Visual toys and pictures are not appropriate for this gestational group. Ensure toys and pictures are not placed within direct visual space.

**B9 SOUND AND HEARING**

- Minimise environmental noise.
- Be aware of sound / noise levels in NICU (talk softly at the bedside).
- Observe **NICU quiet times** (1330hrs-1430hrs) - no disturbance unless for emergency / resuscitation.
- Attend to alarms promptly and set alarm volume as low as is clinically safe.
- Decrease volume / tone of telephone ring and no radios in rooms.
- Close incubator doors quietly. Do not tap or bang on incubator.
- Discourage the use of the top of the incubator as a writing surface and or storage area.
- Ensure CPAP and ventilator tubing is regularly cleared of water condensation.
- Audio tapes are not recommended for this gestational group.

**B10 NUTRITION**

- Encourage hand to mouth contact.
- No pacifier unless sucking cues evident.
- Use fresh not frozen EBM for mouth care. Refer to Te Whatu Ora Waikato NICU Medical Procedure: Oral Immune Therapy in NICU (Ref: 6169).
- Trophic feeds with EBM if available from Day 1.
- Start Probiotics - either with adequate amounts of EBM or - if EBM unavailable - sterile water may be used to mix probiotic. Probiotic (Infloran) for neonates (ref 2931)
- Commence peripheral iv Glucose10% while waiting on line confirmation to maintain blood glucose - change to Reg96, SMOFlipid, and Glucose 10%, once UVC/CVAD is in correct position - fluid changes as prescribed.
- Advance oral feeds as per NEC protocol guideline/ enteral standard feeding guideline (link)
- Fluid management Fluid Orders for Neonates (Ref 5439)

**B11 SMELL AND TASTE**

- Commence Oral Immune Therapy Oral Immune Therapy in the Newborn Intensive Care Unit (NICU… (Ref 6169) as soon as EBM available - parents may familiarise their infant with the smell of breast milk by using milk soaked gauze prior to available OIT and discard the used gauze immediately after use.

# 3 Audit

## 3.1 Indicators

Yearly IVH Outcome Data and quarterly process audit if possible

## 3.2 Tools

ELBW Database.

# 4 Evidence base

## 4.1 Bibliography


- Blackburn, S. (2016) Brain Injury in Preterm Infants: Pathogenesis and Nursing Implications. Newborn and Infant Nursing Reviews. Volume 16, Issue 1, March 2016, Pages 8-12
- Christchurch: Small Baby Protocol- Guidelines for the <28 Week Neonate (Feb 2020) https://cdhb.health.nz/wp-content/uploads/6b3b83bb-neonatal-handbook-gln0001-235777.pdf
- David G Sweet et al. (2013) European Consensus guidelines on the management of neonatal RDS in Preterm Infants- update. Neonatology 2013;103:353-368
- Jonathan P M et al. (2018). Cerebral oxygenation during umbilical arterial blood sampling in very low birth weight neonates. Journal of Perinatology (2018) 38:368–3
- Malusky S, Donze A. (2011) Neutral Head Positioning in premature infants for IVH Prevention: An Evidence Based Review: Neonatal Network. Vol 30 No 6, 381-96.
- Martin, J B. (2011) Prevention of Intraventricular Hemorrhages and Periventricular Leukomalacia in the Extremely Low Birth Weight Infant: Newborn & Infant Nursing Reviews, Sep Vol 11, No. 3 141-152.
- Milesi C et al (2018). Nasal midazolam vs ketamine for neonatal intubation in the delivery room: a randomised trial. Arch Dis Child Fetal Neonatal Ed. 2018 May;103(3):F221-F226
- New Zealand Consensus statement on the care of Mother and Baby(ies) at Periviable Gestations (Feb 2019)New Zealand Newborn Clinical Network (NZCYCN)
- NICU IVH bundle for all infants below 30 weeks GA. Mt Sinai Hospital, Toronto: Promoting Brain Health. (Nov 2016) https://www.mountsinai.on.ca
- Rabe et al (2012)Effect of timing of umbilical cord clamping and other strategies to influence placental transfusion at preterm birth on maternal and infant outcomes (Review): The Cochrane Library
- Reuter S, Messier S, Steven D. (2014) The Neonatal Golden Hour: Interventions to improve the quality of care of the ELBW Infant. South Dakota Medicine Journal; pp 397-405

- Reuter S, Messier S & Stevens D.( October 2014)The Neonatal Golden Hour – Intervention to improve quality of care of the ELBW infant South Dakota Medicine .
- Schmid MB, Reister F, Mayer B, Hopfner RJ, Fuchs H, Hummler HD. (2013) Prospective Risk Factor Monitoring Reduces ICH rates in Preterm Infants: Disc Arztebl Int;110(29-30):489-96

### 4.2 Associated Te Whatu Ora Waikato Documents

- Admission to Level 3 Intensive Care Nursery in NICU (Ref 4571)
- Arterial Line: Catheterisation and Set Up Umbilical and Peripheral Arterial catheter in NICU (Ref 1637)
- Arterial Lines in Neonates – Sampling, Nursing Management and Removal (Ref 1638)
- Blood transfusion: Threshold for top up in Newborn Intensive Care Unit (Ref 1645)
- Caffeine Citrate for neonates drug guideline (Ref. 0591).
- Fentanyl for neonates (ref 2916).
- Fluid Orders for Neonates (Ref 5439)
- Intraventricular Haemorrhage and Post-Haemorrhagic Hydroceph… (Ref 6457)
- Lippincott Procedures - Developmental support, Neonatal
- Neonatal pain and sedation: Assessment and nursing management in NICU (Ref 1684)
- Oral Immune Therapy in the Newborn Intensive Care Unit (NICU… (Ref 6169)
- Probiotic (Infloran) for neonates (ref 2931)
- Resuscitation of Marginally Viable Infants (Ref 5773)
- Temperature Control of infants in NICU (Ref 1476)

**Appendix A**

Golden Hour Algorithm for ELBW babies

Patient Sticker

**Prepare**

- Fellow/Registrar/Coordinator – to notify each other
- Assign a team ( Leader/SMO, Provider NNP/NNS/Registrar, RN x2)
- Prepare Equipment for Resuscitation, Set up Delivery area & NICU bed
- Ensure Delivery room/ OT temp is raised to 26 C
- Collect Curosurf and rewarm to body temperature
- Remind Obs team to do delayed cord clamping &collect Cord blood for AbG

**0 Min**

Delivery

**Resuscitate & Stabilise**

- Delayed cord clamping 1 min
- Neohelp & Pulse Oximetry, gamgee
- Resusc – As per guideline
- Vit K
- Resp. Support as per Resp Suppot guideline
- Surfactant as per Resp Support guideline(if tubed, wait till arrival in NICU for X ray confirmation of the position, unless urgent)
- Show the baby to parents
- Note APGAR Scores

Information for Audit

Birth Time:

GA: Birth Weight:

DS/OT temp set for 26 C: Y / N

PIV placed in DS/OT: Y / N

Surfactant in DS/OT: Y/ N

If Yes, Method: ET /LISA/ INSURE

No. of Intubation attempts:

ET tube: Oral/ Nasal

Intubated by:

First Temp:

First Blood Glucose:

Any dextrose gel use: y / N

**<10 Min**

Call &Transfer to NICU

**Admission**

- Coordinator/RN – Check BW (using Incubator scale) transfer to radiant warmer & Place Temp. probe & NG tube
- Connect to appropriate Resp. Support & adjust settings

**Access, Labs, drugs, Fluids, Resp Support**

- Place PIV (two attempts max), collect bloods for lab & connect 10% Dextrose to run at 60 mL/kg/day
- Initial Assessments( Vitals, measurements HC, Length, Examination)
- UVC/ UAC line placement, restrict to one attempt by the most skilled hand on the floor, if difficult may choose to do only UVC and wait till after the Golden Hour for further line options)
- Collect bloods for CBC, cortisol, blood culture, Blood gas, Order X Ray
- Commence Drugs(Antibiotics, Caffeine, Hydrocortisone as per protocol)
- Change to IVN once line position is confirmed
- If intubated orally, avoid changing for first 72h, unless absolutely essential
- Always keep an eye on baby's temperature
- Minimal handling all the time as possible

**60 Min**

When the Axillary Temp is>36.5 C Close & set Humidify in Incubator to 90%. Continue care as per ELBW guideline