



GUIDELINE

Tiny Baby Protocol (<25 weeks gestation): IVH prevention and care in first week of life

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NICU KEMH, NICU PCH, NETS WA

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations.

Read the full statement here:

[**CAHS Child Safe Organisation Commitment Statement**](#)

This document should be read in conjunction with this [disclaimer](#)

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Aim

To outline the planning and management to achieve maximum cardiovascular and respiratory stability for preterm infants, born less than 25 weeks gestational age, in the first week of life.

Risk

This group of infants are at high risk of intraventricular haemorrhage (IVH) and pulmonary haemorrhage, mortality and long-term neurodevelopmental morbidities.

Antenatal Planning

Discussions between the Obstetric and Neonatal teams are needed if proactive management and care is planned. Early antenatal steroid and magnesium is recommended if time allows, even if there is uncertainty about care pathway, then suggest antenatal steroids are commenced if delivery possible.

Discussion with Obstetric staff about delivery mode if there is the potential for delivery “en caul”

Antenatal counselling and discussion with the parents regarding zone of parental discretion is needed as soon as possible. See [Extreme Prematurity: Perivable Gestations \(22-23 weeks\)](#) and offer Parent Information leaflets:

- [Babies born at 22-week gestation at King Edward Memorial Hospital](#)
- [Babies born at 23-week gestation at King Edward Memorial Hospital](#)

Golden Hour and IVH prevention principles

Golden hour principles and an IVH prevention bundle (management within the first 72-hours), have been associated with improved outcomes at these gestations.

- Consultant/Senior nurse led care
- Delayed cord clamping/physiological cord clamping
- Airway, breathing, circulation stabilisation
- Thermoregulation
- Intravenous access and commencing fluids (and antibiotics if indicated)
- Aiming for cardiovascular and respiratory stability first 72 hours
- Minimal handling first 72 hours

Preparation for the birth is recommended if time permits, refer to:

[Appendix 1: Resuscitation and Golden Hour Checklist for Infants < 27 weeks MR form](#)

[Appendix 2: IVH Prevention Bundle Flow Chart](#)

Resuscitation

- Use NEOHELP™ whilst on the perineum or operating field
- Consider resuscitation on the cord if not spontaneously breathing (if SVD and feasible)
- Delayed cord clamping 30-60 seconds
- Senior/experienced staff to intubate
- ETT at 5.5-6cm for <24 weeks
- Transfer SCN by 15 mins if possible (once stabilised)
- Temp prior to leaving delivery room and record on MR410 (if less than 36.5°C then use chemical mattress plus shuttle for transfer)
- Parent hold if stable and secure ETT on case-by-case basis

Admission/Golden hour

Admission SCN and handover to include systematic plan including Resp/ CVS/Fluids and feeding and sepsis risk/management (Handover/admission guideline)

- Assess Airway/breathing and ventilation settings with volume guarantee
- Weigh baby on admission
- Venous access within 15 minutes of admission. Preference for UAC/UVC insertion (if no time delay)
- Senior staff to insert UVC/UAC, as indicated, lines to be pre-prepared and staff member pre-gowned and gloved
- If inserting UVC then commence fluids/antibiotics prior to the x-ray if Senior Doctor happy with UVC position i.e. line bleeding back well as desired depth or low lying UVC)
- Commence TPN in Golden hour.
- Commence antibiotics, if indicated in Golden hour
- OGT insertion size 5fg < 750gms Polyurethane enteral tube (warm and moisten with sterile N/S size 5fg PUR prior to insertion)
- X-ray -CXR AXR AP/lat Do not lift baby for x-rays (x-ray cassette to go inside incubator tray)
- Complete MR488.03 Resuscitation and Golden Hour Checklist for Infants < 27 weeks form and commence Tiny Baby registry

IVH prevention in the first 72 hours

Aiming for Cardiovascular/respiratory stability with minimal handling thereby reducing risk of IVH which is a major cause of mortality and morbidity.⁴

Respiratory

- Aiming for pCO₂ stability (pH7.3-7.4; pCO₂ 40-55) and lung protective strategies.
- Volume guarantee ventilation is recommended if using conventional ventilation, if unable to achieve pCO₂ control on volumes >6ml/kg then consider HFOV +VG.
- For air leaks including Pulmonary Interstitial Emphysema (PIE) then consider High Frequency Jet Ventilation

Cardiovascular

- Normal Saline bolus/Blood/FFP should be given in small aliquots over longer periods (i.e. N Saline 5-10mL/kg over 1-2 hours, Blood 10mL/kg over 3 hours unless active bleeding)
- Slow drawing and flushing of lines especially arterial lines (i.e. 1mL in 45sec)
- Cardiac USS (CCPU) at 24 hours for ductal assessment if stable, or earlier for rising lactate/low BP/poor urine output (by experienced team member where possible)
- Treat low output/poor contractility initially with dobutamine +/- hydrocortisone
- Further Cardiac USS to assess filling, contractility and ductal status at Consultant discretion (can be targeted if full scan done previously)
- Ductal management with [Paracetamol](#) or Indomethacin depending on contraindications (including care using hydrocortisone and indomethacin together) See [Patent Ductus Arteriosus](#).

Fluids and Nutrition

- 100mL/kg/day on Day 1
 - TPN + UVC 5% or 2.5% glucose in second lumen UVC+heparin
 - UAC half sodium acetate+heparin see [Sodium Acetate Neonatal](#)
- Feeds commenced 0.5mL-1mL EBM 4-6 hourly as per consultant. Include oral mouthcare 0.2ml in plan. See Fluid and Nutrition Requirements, and Enteral Feeding grading up daily if trophic feeds tolerated (15-20ml/kg/d)
- After initial admission weight, only weigh at 72 hours (unless Consultant requests weight).
- Targeting fluids volumes with Na+
 - (aiming for <150mmol.l), monitor urine output and filling on Cardiac USS findings; Consider increasing humidity for high Na+ as well as total fluid.
- <4mmol/kg day Na (most likely as acetate) in TPN and adjust to blood gas/serum Na levels

- Daily senior review of TPN
- Glycerol suppository, if necessary, from day 2

Nursing Care

- Admit to Omnibed and nurse with head elevated (10-15°).
- Thermoregulation and humidification:
 - nurse baby on servo/baby mode with set temp 36.8 °C. Commence immediately on admission
 - commence humidification at 80% and consider increasing to 85-90% humidity to help control Na⁺ or if infant has recurrent hypothermia
 - Use bubble wrap on outside of incubator if there is rain out or increasing incubator temperature
 - Remove rain out with dry clean cloth during cares
 - Weaning of humidification as per [Thermoregulation](#)
- Skin and infection prevention
 - use soft gauze for all skin care
 - position UVC/UAC lines with brown tape off skin
 - apply coconut oil up to 4 times a day
 - commence Chlorhexidine Wash Procedure after 72 hours (or earlier if PICC line needed)
 - Consider fluconazole prophylaxis due to higher risk of fungal infection especially if mother colonised or infant on broad spectrum antibiotics
 - Escalate concerns to CNC for wound management plans early and consider Stratamed™
- Minimal handling 6-8 hourly cares. Use Nesting techniques as per
 - [Appendix 3: Creating a Nest](#)
 - [Appendix 4: Positioning, Nesting and Hand Cuddles](#)
- Nappy changes without raising legs (can use soft gauze in nappy so do not need to change whole nappy if clean), two person cares with vertical lift to if nappy to be replaced
- Involve parents with “hand cuddles” and cares at all opportunities
- Minimise noise (doors, chart, tapping, alarms), shield eyes and encourage sleep
- Minimise lights (eye shield, decrease ambient lighting, incubator cover with one flap lifted asap after admission)

Day 4-7

Respiratory

- Given the higher risk of re-ventilation in this patient group extubate only if:
 - good respiratory effort (CPAP test on ETT), CPAP prong size can achieve an adequate fit
 - duct trivial/closed.
- Consider higher caffeine
- Optimise Hb (see [Extubation: Planned and Unplanned](#))
- Consideration [High Frequency Jet Ventilation](#) for evolving lung disease if not able to extubate

CVS

- ongoing ductal review and management - see [Patent Ductus Arteriosus](#)

Fluids and nutrition

- UVC can remain in situ up to 7 days.
- If feeds not tolerated/BNO regular glycerol BD.
- Grade up feeds as tolerated 15-20ml/kg/day
- Baby can be weighed on day 4 then every other day (or as by Consultant request)
- Optimise TPN daily

Nursing

- First skin to skin to occur when baby stable in discussion between senior medical/nursing staff.
- Continue other FiCARE opportunities (hand cuddles, nappy cares etc)
- Skin care as above

Related CAHS internal policies, procedures and guidelines

[Chlorhexidine Wash Procedure](#)

[Extreme Prematurity: Perivable Gestations \(22-23 weeks\)](#)

[Extubation: Planned and Unplanned](#)

[Fluid and Nutrition Requirements, and Enteral Feeding](#)

[High Frequency Jet Ventilation](#)

[Indometacin](#)

[Paracetamol](#)

[Patent Ductus Arteriosus](#)

[Sepsis](#)

[Skin Care](#)

[Sodium Acetate Neonatal](#)

[Thermoregulation](#)

References and related external legislation, policies, and guidelines

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12. Kurimoto T, Ibara S, Ishihara C, Naito Y, Hirakawa E, Yamamoto T. Incubator humidity and temperature control in infants born at 22-23 weeks' gestation. Early Hum Dev. 2022 Mar; 166:105550. doi: 10.1016/j.earlhumdev.2022.105550. Epub 2022 Jan 31. PMID: 35151106

13. Mishra, U., August, D., Walker, K. et al. Thermoregulation, incubator humidity, and skincare practices in appropriate for gestational age ultra-low birth weight infants: need for more evidence. *World J Pediatr* 20, 643–652 (2024). <https://doi.org/10.1007/s12519-024-00818-x>

Useful resources (including related forms)

Parent Information leaflets:

[Babies born at 22-week gestation at King Edward Memorial Hospital](#)

[Babies born at 23-week gestation at King Edward Memorial Hospital](#)

Resuscitation and Golden Hour Checklist for Infants < 27 weeks MR488.03

This document can be made available in alternative formats on request.

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Reviewer / Team:	Neonatology		
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Standards Applicable:	NSQHS Standards:  Child Safe Principles: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10		

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Healthy kids, healthy communities

Compassion

Excellence

Collaboration

Accountability

Equity

Respect

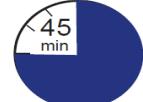
Appendix 1: Resuscitation and Golden Hour Checklist

MR488

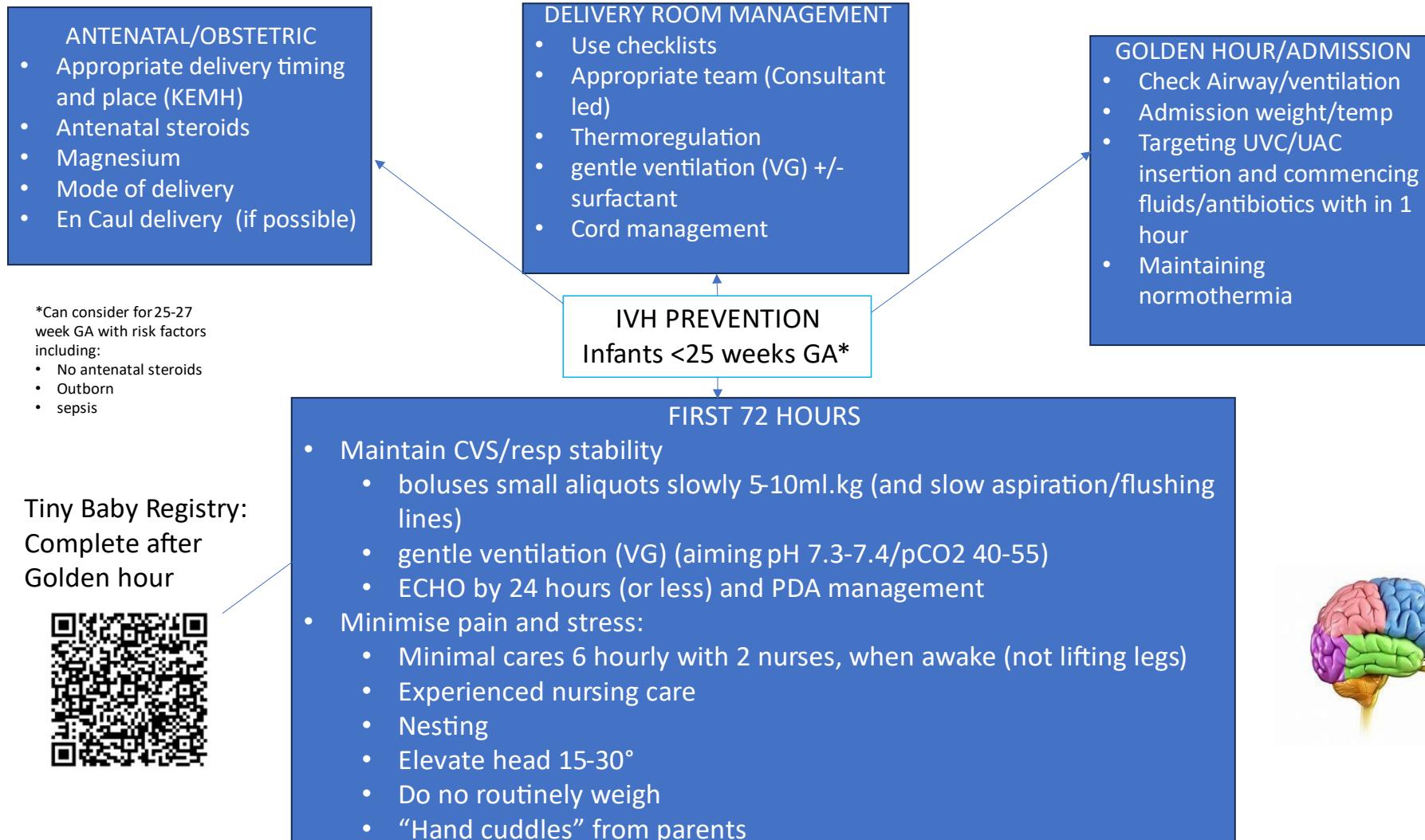
CHILD AND ADOLESCENT HEALTH SERVICE NEONATOLOGY		Med Rec. No:
RESUSCITATION AND GOLDEN HOUR CHECKLIST FOR INFANTS < 27 WEEKS		Surname:
		Forename:
		Gender: D.O.B.
PRE-BRIEF		
LOCATION	<input type="checkbox"/> SCN3	<input type="checkbox"/> LABOUR AND BIRTH SUITE / THEATRE
PRESENT	NURSING: <input type="checkbox"/> SCN3 COORDINATOR <input type="checkbox"/> CODE AND FLOAT NNT <input type="checkbox"/> ADMISSION NURSE	MEDICAL: <input type="checkbox"/> SCN2 CONSULTANT <input type="checkbox"/> SCN2 SENIOR REGISTRAR <input type="checkbox"/> SCN3 CONSULTANT <input type="checkbox"/> SCN3 SENIOR REGISTRAR <input type="checkbox"/> REGISTRAR <input type="checkbox"/> RMO
	<input type="checkbox"/> TEAM LEADER <input type="checkbox"/> RECEIVING INFANT <input type="checkbox"/> AIRWAY	<input type="checkbox"/> CIRCULATION <input type="checkbox"/> THERMOREGULATION <input type="checkbox"/> TIMEKEEPER + SCRIBE
DISCUSSION	ANTENATAL COUNSELLING	<input type="checkbox"/> YES <input type="checkbox"/> NO
	PPROM	<input type="checkbox"/> YES <input type="checkbox"/> NO
	FETAL DISTRESS / COMPROMISE	<input type="checkbox"/> YES <input type="checkbox"/> NO
	INDICATION FOR DELIVERY	
	ESTIMATED FETAL WEIGHT	(g)
	OTHER ISSUES	
DELIVERY AND ADMISSION PLAN	OMNIBED READY	<input type="checkbox"/> YES <input type="checkbox"/> NO Bed no.
	ANTIBIOTICS INDICATED	<input type="checkbox"/> YES <input type="checkbox"/> NO Prepared by:
	IV ACCESS TROLLEY TO PREPARE	<input type="checkbox"/> PIVC <input type="checkbox"/> UVC+/-UAC Prepared by:
	FLUIDS	<input type="checkbox"/> 5% TPN <input type="checkbox"/> 8% TPN <input type="checkbox"/> 10% DW <input type="checkbox"/> UAC <25 weeks half strength sodium acetate and heparin 0.5 u/mL infusion <input type="checkbox"/> UAC 25-27 weeks 0.45% Sodium chloride and heparin 0.5 u/mL infusion TFI: Prepared by:
PRE-DELIVERY EQUIPMENT AND ENVIRONMENT CHECKLIST		
FIRST TO ARRIVE	RESUSCITATION TROLLEY PRESENT	<input type="checkbox"/> YES <input type="checkbox"/> NO
	AMBIENT TEMPERATURE SET TO 25°	<input type="checkbox"/> YES <input type="checkbox"/> NO
	CHECK COT (suction, cylinders, etc.)	<input type="checkbox"/> YES <input type="checkbox"/> NO
LEADER	INTRODUCTION TO PARENTS	<input type="checkbox"/> YES <input type="checkbox"/> NO
	REVIEW TEAM PRE-BRIEF	<input type="checkbox"/> YES <input type="checkbox"/> NO
AIRWAY	T-PIECE 25/5	<input type="checkbox"/> YES <input type="checkbox"/> NO
	FIO2 0.3	<input type="checkbox"/> YES <input type="checkbox"/> NO
	INTUBATION EQUIPMENT AVAILABLE	<input type="checkbox"/> YES <input type="checkbox"/> NO ETT size: Blade size:
CN / NNT	THERMOREGULATION EQUIPMENT	<input type="checkbox"/> NEOHELP <input type="checkbox"/> BEANIE <input type="checkbox"/> THERMOMETER <input type="checkbox"/> SHUTTLE
	SURFACTANT +/- DRAWN UP	<input type="checkbox"/> CUROSURF (2.5ml/kg) <input type="checkbox"/> SURVANTA (4ml/kg)

**RESUSCITATION AND GOLDEN HOUR CHECKLIST
FOR INFANTS < 27 WEEKS**

MR488.03

CHILD AND ADOLESCENT HEALTH SERVICE NEONATOLOGY RESUSCITATION AND GOLDEN HOUR CHECKLIST FOR INFANTS < 27 WEEKS		Med Rec. No: Surname: Forename: Gender: D.O.B. <i>AFFIX LABEL HERE</i>
GOLDEN HOUR: LABOUR AND BIRTH SUITE / THEATRE		
TIME OF BIRTH	(hr): (min)	
DELAYED CORD CLAMPING	(seconds)	
INTUBATED <input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> IN LBS / THEATRE <input type="checkbox"/> IN SCN3 Time to intubation: (mins) No. of attempts:	
SURFACTANT GIVEN <input type="checkbox"/> YES <input type="checkbox"/> NO	Method: <input type="checkbox"/> LISA <input type="checkbox"/> InSurE <input type="checkbox"/> IPPV Time to surfactant: (mins)	
OXYGEN	SaO2 @ 5mins: % SaO2 @ 10mins: % Max FiO2: %	
RESPIRATORY SUPPORT (via mask)	<input type="checkbox"/> IPPV Total time of IPPV: (mins) <input type="checkbox"/> CPAP	
TEMPERATURE IN LBS / THEATRE		
PARENTS AND FiCare	<input type="checkbox"/> Cuddle / Hold <input type="checkbox"/> Cot cuddle / Touch <input type="checkbox"/> Seen <input type="checkbox"/> No contact <input type="checkbox"/> Parents updated <input type="checkbox"/> Photo	
EXPRESSING BREASTMILK	<input type="checkbox"/> Discussed with Midwife <input type="checkbox"/> Discussed with Mother <input type="checkbox"/> Not discussed	
GOLDEN HOUR: ADMISSION		
ADMISSION TIME	(hr): (min)	
ADMISSION TEMPERATURE	°C	
FIRST IV ACCESS <input type="checkbox"/> UVC <input type="checkbox"/> PIVC	Time to first IV access: (mins) No. of attempts:	
TIME TO COMMENCING IV FLUIDS	(mins)	
TIME TO COMMENCING ANTIBIOTICS	(mins)	
TEMPERATURE at 1 hour	°C	
TINY BABY REGISTRY COMPLETED (REDCap number)	<input type="checkbox"/> YES <input type="checkbox"/> NO	
Completed by: _____ Name / Signature / Designation _____ Date _____		

Appendix 2: IVH Prevention Strategies



Appendix 3: Creating a Nest

Rolling a two sheet wrap

Step One: Make a single roll



Step Two: Now start a double roll (just do one turn of the double roll)



Step Three: Make a nest and tuck sides in to omnibed mattress



Appendix 4: Positioning, Nesting and Hand Cuddle

Nest plus 2 sheet wrap: ensuring umbilical catheters not touching abdomen



2 person nappy change: ensuring legs/abdomen not elevated above head and slipping in new nappy



Positioning 15 degree angle:



Hand Cuddles

