Postnatal Ward - Hypoglycaemia Monitoring and Management

Guideline Responsibilities and Authorisation

Department Responsible for Guideline	NICU & Maternity Services
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Target Audience	All clinical staff, including LMC, caring for newborns.
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Guideline Review History

Version	Updated by	Date Updated	Summary of Changes
1	Lela Yap	September 2022	Combining multiple guidelines for consensus approach New registration number allocated 6483 To be reviewed in conjunction with NICU – Hypoglycaemia Monitoring and Management Hypoglycaemia - Management of 3122 & Hypoglycaemia evaluation - neonatal 1721 **Withdrawal of following guidelines:** Diagnosis of hyperinsulinism protocol Ref 1397 Hypoglycaemia evaluation – neonatal procedure Ref 1721 Hypoglycaemia – Management of, protocol Ref 3122 Screening and initial treatment for babies in NICU at risk of hypoglycaemia Ref 1900 Transfer of babies at risk of hypoglycaemia to a primary birthing unit Ref 2659
1.1	Jutta van den Boom	March 2023	Definition of long term medication , eg >48h

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1 Overview

1.1 Background

Neonatal hypoglycaemia (low blood glucose level) is currently defined as a blood glucose level < 2.6mmol/l. If untreated, low blood glucose levels (transient, severe and/or recurrent) are linked with brain injury and poor neurodevelopmental outcome.

The incidence of neonatal hypoglycaemia in otherwise healthy babies is estimated between 5-15%. Neonatal hypoglycaemia incidence further increases with known maternal risk factors such as diabetes. It is essential that babies at increased risk of hypoglycaemia are identified, screened and shown to demonstrate a normal blood glucose level >2.6mmol/L prior to discharge from Waikato Hospital.

Babies requiring blood glucose monitoring can be admitted to the ward. They are to be admitted under their named LMC during the screening period and care is provided in line with this guideline, and with the mother's consent. If there is a low blood glucose level in the baby, the LMC, or staff member providing direct care on behalf of the LMC, must recommend to the mother that the babies care involve discussions with the neonatal team and continue as per below algorithm and recommendations.

The NOC-NEWS will complement the rationale for the blood glucose monitoring and act as documentation.

1.2 Purpose

- To prevent long term neurological sequelae in infants at-risk of hypoglycaemia
- To promote breastfeeding and minimise separation of parents and baby.
- To identify and safely treat infants with episodes of hypoglycaemia.

1.3 Staff group

Registered nurses, midwives and medical staff caring for newborn babies at Te Whatu Ora Waikato.

1.4 Patient / client group

- Babies meeting criteria for postnatal ward care following birth. A blood glucose level (BGL) should be measured within 2 hours after birth and must be ac (pre-feed).
- Screen and record all at-risk babies that require BGL monitoring on the NOC-NEWS (Newborn Observation Chart and Newborn Early Warning Score)
- Preterm (<37 weeks)
- Intrauterine growth restriction/small for gestational age (<10th customized centile)
- LGA, customized centile >95th
- Infants of diabetic mothers
- Symptomatic babies i.e. not feeding well, jittery/irritable/somnolent behaviour

- For the following babies, discuss with senior medical NICU team member whether screening should be undertaken and if so, following discussion with the parents and LMC, must be recorded on the NOC-NEWS chart
  - maternal medications have well known infant hypoglycaemia risk (for example, long-term ((treatment for >48h) medicated with beta blockers, systemic steroids, sodium valproate),
  - babies with family history or suspected syndromes of neonatal hypoglycaemia
  - babies with haemolytic disease

1.5 Definitions and acronyms

ACE	Antenatal colostrum expressed
BGL	Blood glucose level (mmol/L)
dEBM	Donor expressed breast milk
EBM	Expressed breast milk
LGA	Large for gestational age >95th centile on customisedcalculator
LMC	Lead maternity career
Neonatal consultation	Discussion, which may include in-person review (though does not automatically mandate), regarding appropriate management plan of a particular newborn.
Neonatal hypoglycaemia	Blood glucose concentration < 2.6 mmol/L
NNT	Neonatal Team
NOC-NEWS	Newborn Observation Chart and Newborn Early Warning Score
PNW	Postnatal Ward
Prematurity	< 37+ 0 completed weeks gestation
SGA	Small gestational age <10th centile on customisedcalculator

2 Clinical management

2.1 Roles and responsibilities

It is the midwife (core or lead maternity carer) or nurse's responsibility to identify and document on the NOC NEWS any risk factors for neonatal hypoglycaemia identified antenatally or found during the baby's initial examination, or subsequently.

At risk babies require full neonatal assessment including, general condition, feeding, output and behavioural state.

2.2 Guideline

- See Appendix A for flowchart
- See Breastfeeding the late Pre-term Infant on the Postnatal Ward

2.3 Dextrose 40% gel - Dosage and Administration

See Dextrose Gel for Hypoglycaemia in the Neonates

Buccal dextrose gel 40% has been shown to effectively treat neonatal hypoglycaemia, reduce the separation of mother and babies and does not harm the establishment of breast feeding

Dextrose gel is therefore first-line management for neonatal hypoglycaemia. There is no current evidence in support of prophylactic use.

2.4 Important Practice Notes

- Babies without risk factors for hypoglycaemia **may** develop hypoglycaemia. If there is any suspicion/clinical concerns, please test BGL.
- All babies, especially those at risk of neonatal hypoglycaemia should be encouraged to feed within the first hour after birth.
- Breast milk substitute / formula should only be used for treatment of hypoglycaemia if dextrose gel and breastmilk do not correct hypoglycaemia, or if formula feeding is the parents' choice. Formula requires parental consent.
- Reassure family that hypoglycaemia is common and usually transient and that there is nothing wrong with their milk and if supplementation is required during this period.
- Consider early referral to the Lactation consultant for additional support.
- Warm heel prior to sampling.w
- If having difficulty obtaining a sample from local blood gas analysers after second attempt please escalate (within 10 minutes), to involve the NICU team and facilitate prompt serum glucose results.

2.5 When to call the LMC

- If the baby is admitted under the clinical responsibility of the LMC and there is a BGL <2.6mmol/L the LMC is required to be contacted to inform them of the recommendation for a specialist consultation. There is agreed awareness that specialist consultation will usually involve a combined discussion between the Postnatal and Neonatal teams and LMC.
- If the decision is made to transfer clinical responsibility to the neonatal team; the LMC, parent and NNT must have a conversation that is clearly documented in the clinical notes. This is also required when the responsibility is transferred back to the LMC.

2.6 When to Call NICU

- See Appendix A Flow Chart
- A BGL of 2.5mmol/L or below is a NOC-NEWS 2 and requires a NNT consultation and notification to the LMC
- Discuss with NICU if 2 x dextrose gel 40% administration have occurred.
- Admit to NICU if any hypoglycaemia <1.2mmol/L. Consider admission if ongoing hypoglycaemia <2.6 mmol/L despite feeds and 2 x Dextrose gel 40% in succession.

2.7 After care - when can you discontinue screening?

Babies identified on the NOC-NEWS risk factors assessment as requiring BGL monitoring must complete the NOC-NEWS observations within the prescribed timeframes on the NOC-NEWS.

Babies at risk for hypoglycaemia and/or develop hypoglycaemia should be screened over a period of 24 hours in line with the NOC-NEWS.

Babies who have had top ups that are subsequently discontinued, while an inpatient require a further 2 x pre feed blood glucose levels of ≥ 2.6mmol/L 3 hours apart.

If there is clinical concern at any time after screening has discontinued (e.g. poor feeding, jittery behaviour) a blood glucose level should be considered.

2.8 Transfer of babies at risk of hypoglycaemia to a primary birthing facility from Waikato Hospital

It is strongly recommended that babies at-risk of hypoglycaemia remain in a facility that can provide blood glucose monitoring and treatment of hypoglycaemia for the first 24-hours after birth.

Any baby who has a BGL<2.6 mmol/L during their admission must complete screening **prior** to transfer to a primary birthing facility as per 2.7.

Babies can transfer from Waikato Hospital to a primary birthing facility in the first 24 hours when **all** of the below criteria are met:

- Initial BGL at 1-2 hours following birth is > 2.6mmol/L
- At least one suckle feed observed by postnatal staff to be safe
- Axilla temperature is between 36.5 C and < 37.5 C
- There a 2 consecutive NOC-NEWS score of 0.

3 Evidence base

3.1 Bibliography

- Cornblath MD, Hawdon JM, Williams AF, Aynsley-Green A, WardPlatt MP, Schwartz R, et al. Controversies regarding definition of neonatal hypoglycemia:suggested operational thresholds. Pediatrics 2000;105: 1141-5.
- Lucas A, Morley R, Cole TJ. Adverse neurodevelopmental outcome of moderate neonatal hypoglycaemia. BMJ. 1988;297:1304-8.
- Harris DL, Weston PJ, Harding JE. Incidence of neonatal hypoglycemia in babies identified as at risk. Journal of Pediatrics 2012;161:787-91.
- Kaiser JR, Bai S, Gibson N, Holland G, Lin TM, Swearingen CJ, et al. Association between transient newborn hypoglycemia and fourth-grade achievement test proficiency: A population-based study. JAMA Pediatrics. 2015.
- Kerstjens JM, Bocca-Tjeertes IF, de Winter AF, Reijneveld SA, Bos AF. Neonatal morbidities and developmental delay in moderately preterm-born children. Pediatrics. 2012;130:265-72.
- McKinlay CJD, Alsweiler JM, Anstice NS, Burakevych N, Chakraborty A, Chase JG,et al. Association of neonatal glycemia with neurodevelopmental outcomes at 4.5 years. JAMA Pediatr. 2017;171:972-83.
- McGowan JE, Price-Douglas W, Hay WW. Glucose homeostasis. In: Merenstein GB, Gardner SL, eds. Handbook of neonatal intensive care. 6th ed. St Louis: Mosby Elsevier; 2006. p. 368-90.
- Hay WW, Raju T, Higgins R, Kalhan S, Devaskar S. Knowledge gaps and research needs for understanding and treating neonatal hypoglycaemia: workshop report from Eunice Kennedy Shriver National Institute of Child Health and Human Development. J Pediatr 2009;155:612-7.
- Harris DL, Weston PJ, Signal M, Chase JG, Harding JE. Dextrose gel for neonatal hypoglycaemia (the Sugar Babies Study): a randomised, double-blind, placebo-controlled trial. The Lancet. 2013;382:2077-83.
- Weston PJ, Harris DL, Harding JE. Dextrose gel treatment does not impairsubsequent feeding. Arch Dis Child Fetal Neonatal Ed. 2017:539-41.
- Harris DL, Gamble GD, Weston PJ, Harding JE. What happens to blood glucose concentrations after oral treatment for neonatal hypoglycemia? J Pediatr. 2017;190:136-41.
- Oral dextrose gel for the treatment of hypoglycaemia in newborn infants, March 2022, Cochrane database of systematic reviews 2022(3), retrieved 23rd March 2022.
- Hegarty JE, Harding JE, Gamble GD, Crowther CA, Edlin R, Alsweiler JM. Prophylactic Oral Dextrose Gel for Newborn Babies at Risk of Neonatal Hypoglycaemia: A Randomised Controlled Dose-Finding Trial (the Pre-hPOD Study). PLoS Med. 2016 Oct 25;13(10):e1002155. doi: 10.1371/journal.pmed.1002155. PMID: 27780197; PMCID: PMC5079625.

3.2 Associated Te Whatu Ora Waikato Documents

- Breastfeeding the Late Pre-term Infant in the Postnatal Ward guideline (Ref 3285)
- Dextrose Gel for Hypoglycaemia for neonates Drug Guideline (Ref 2906)
- Dextrose Oral Gel for Hypoglycaemia in Neonates Standing Order (Ref 6372)
- Hypoglycaemia - Management of protocol (Ref 5734)
- Screening, Treatment and Referral pathway for babies at risk of Hypoglycaemia

Appendix A – Hypoglycaemia Monitoring and Management