MATERNITY AND NEONATAL UNIT

GUIDELINE:

MANAGEMENT OF INFANTS AT RISK OF HYPOGLYCAEMIA OR WITH HYPOGLYCAEMIA OF THE NEWBORN INFANT

SCOPE:
Maternity and Neonatal Unit

AUTHOR:
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PURPOSE:
To provide safe and effective management for infants of at risk of or who develop hypoglycaemia.

DEFINITIONS:
Glucose is an essential nutrient for the brain. Abnormally low levels can cause long term neurological developmental impairment.

There is controversy over the definition of a ‘safe’ blood glucose concentration. The WHO recommends that blood sugar concentrations should be maintained at 2.6mmol/L or above in newborns at risk of hypoglycaemia.

GUIDELINE:
Symptomatic hypoglycaemia does not usually occur in well, full term babies. The physiological dip in blood glucose is compensated by the production of ketones which are used as a fuel for metabolism. However, if the baby is not feeding adequately the ability to generate ketones will be eventually exhausted and the baby will become at risk of hypoglycaemia.

For all babies, the aim should be to ensure that needs are met as far as possible by breast feeding, or by using expressed colostrum/breast milk (EBM). Exclusive breast feeding optimises health outcomes. Also it appears that breast milk may enhance the baby’s ability to counter-regulate whereas large volumes of infant formula suppress this ability.

It is essential that planning and evaluation of observations and management of the infant at risk of hypoglycaemia are recorded.

The greatest risk of hypoglycaemia is in the first few hours of life. After 24 hours of life control has usually stabilised.

Pre-term infants (<37 weeks gestational age) are at greater risk than term infants for neurological developmental impairment due to hypoglycaemia.
Infants at risk of hypoglycaemia include:

- Infants of diabetic mothers (see separate guideline)
- Infants who are small for gestational age (less than 10\textsuperscript{th} centile on a Customised Birth Weight Centile (BWC) calculation)
- Infants who are large for gestational age (i.e. more than 95\textsuperscript{th} centile) by Customised BWC calculation and possibility of diabetes in pregnancy has not been excluded; OR; if BWC cannot be calculated infants who weigh more than 4500gms and the possibility of diabetes in pregnancy has not been excluded. Preterm infants (less than 37 weeks gestational age)
- Others at risk include neonates exposed to:
  - Hypothermia
  - Intrapartum asphyxia
  - Low Apgar scores or abnormal cord blood gases
  - Infection/other illness in the baby
  - Maternal use of beta-blockers such as Labetalol
  - Congenital heart conditions
  - Maternal medications – SSRI Anti depressives (Selective Serotonin Reuptake Inhibitors)

CLINICAL SIGNS AND SYMPTOMS OF HYPOGLYCAEMIA

- Irritability, tremors or jitters. Jitteriness is excessive repetitive movements of one or more limbs which are unprovoked and usually relatively fast. It is important to be sure that this movement is not simply a response to stimuli.
- Exaggerated Moro reflex
- High pitched cry
- Lethargy, limpness, hypo tonus
- Apnoea or irregular breathing
- Cyanosis
- Hypothermia, temperature instability
- Poor or inadequate sucking reflex
- Seizures

ASSESSMENT OF THE BABY

Frequent monitoring of the baby’s well being is essential. The baby should be assessed prior to feeds and at least 3 hourly for the following:

- Level of consciousness
- Tone
- Temperature
- Respirations
- Colour/perfusion

Observations should be recorded on the baby’s feeding chart and in the clinical notes.
MANAGEMENT OF ALL INFANTS AT RISK OF HYPOGLYCAEMIA OF THE NEWBORN

1. Skin to skin care will help baby achieve early respiratory and thermal stability and will enhance successful breast feeding (see Hauora Tairawhiti Breast feeding Policy).

2. Encourage the baby to feed in the first hour of life and thereafter at least 3 hourly.

3. All infants at risk of hypoglycaemia should have an initial feed by 3 hours of age.

4. If the infant is pre-term (less than 37 completed weeks gestation), discuss the management plan with the neonatal service and document in the clinical notes.

5. All infants at risk of hypoglycaemia will be assessed and have observations of temperature and respirations recorded hourly for the first 3 hours and subsequently 3 hourly and charted for at least 24 hours.

6. If the baby is unwell or has any clinical signs and symptoms of hypoglycaemia, the blood glucose should be measured immediately and the baby referred to the neonatal service.

7. Appropriate management for infants to avoid environmental temperature instability [temperature less than 36 degrees C or more than 37.5 degrees C] is vital. Maintenance of body temperature reduces energy demands that contribute to hypoglycaemia.

8. If the baby is not interested in feeding, encourage skin to skin contact and expressing. Any EBM will be given to the baby.

9. If the mother has chosen to formula feed, the baby should be formula fed in the first hour of life and thereafter 2-3 hourly approximately 60 mls./kg/day with her choice of formula (see formula feeding guideline).

10. Monitor blood glucose after 2 hours of age and prior to the second feed. All babies should have blood glucose testing by 4 hours of age. Bed side testing is performed with Optimum Xceed or Hemocue monitor. It is important to ensure that the foot is warm and the first drop of blood is wiped away prior to sampling. This acts as a screening device. If the test result is displayed as “LO” the blood glucose level may be lower than 1.1 mmol/L. If required I-Stat machine samples are collected in capillary tubes. Blood glucose samples are processed in the laboratory are collected in a gold top SST Microtainer.

11. Continue to monitor the blood sugar 3 hourly prior to feeds until the level is 2.6mmol/L or above three times and the baby is asymptomatic and feeding.

12. If the level is less than 2.6mmol/L at any stage see below.

13. Infants at risk of hypoglycaemia should not be discharged until they are feeding well and their condition is stable.
MANAGEMENT OF INFANTS OF WITH BLOOD GLUCOSE LESS THAN 2.6mmol/L

1. The management of hypoglycaemia will depend on the clinical condition of the baby and the severity of the hypoglycaemia.

2. If the baby is unwell or has symptoms of hypoglycaemia he/she should be referred promptly to the neonatal service for further management.

3. Very low blood sugar levels below 1.2mmol/L require immediate referral to the neonatal service and may require treatment with IV Glucose infusion or 40% Dextrose gel may be given while waiting for review aimed at raising blood glucose levels to 2.6mmol/L. A laboratory sample or I-Stat sample may be taken but instigation of treatment will not be delayed whilst awaiting results.

4. If the Optimum Xceed or Hemocue blood glucose level is less than 2.6mmol/L and the baby is asymptomatic, give the baby 0.5ml/kg 40% Dextrose Gel and encourage feeding and recheck in 30 minutes as per Oral Dextrose gel to treat Hypoglycaemia Flow Chart (2015). If the baby remains asymptomatic and blood glucose improves to 2.6mmol/L or more, observe the baby closely and recheck blood glucose prior to next feed/in 3 hours.

5. If still hypoglycaemic repeat the 40% Dextrose Gel and recheck the blood sugar level after a further 30 minutes. If the Blood glucose is 2.6 mmol/L or more continue routine care and repeat blood glucose measurements 3 hourly prior to feeds until for at least 12 hours after last low level and the baby is feeding well. The aim is that the baby maintains pre-feed blood glucose levels and does not revert to low levels prior to each feed.

6. If the Optimum Xceed or Hemocue monitor blood glucose is less than 2.6mmol/L after the second treatment with oral dextrose gel, the baby should be assessed by the neonatal service.

7. Infant formula is given if medically indicated and following consultation and informed verbal consent from the mother (see supplementing the breast fed infant guideline).

Management of hypoglycaemia may include IV Glucose 10%. A bolus of 2 mls/kg IV Glucose 10% may be ordered if blood glucose <1.2mmol/L. Blood glucose will be rechecked one hour after instigating IV management, and frequency of testing reduced when the blood glucose is stable.

If there are any concerns about the baby consult with the NNU nurse or a paediatrician for advice.
Glucose screening
It is important to note that bedside monitoring using the Optimum Xceed acts as a rapid screening method. At low glucose concentrations the Optimum Xceed is less reliable. It is essential that an appropriate technique is used for neonatal blood samples and that the site is cleaned and dried before lancing and the first drop of blood is wiped away. (see procedure)

Weaning baby from supplementary feeding
When baby’s pre-feed blood sugars are stable (>2.6mmol/L) for three consecutive feeds then no further blood sugar checks need to be done provided the feeding regimen remains the same. If the feeding regimen is altered (e.g. reduction or stopping of top-ups) then blood sugar monitoring should be restarted and should continue until three satisfactory levels are obtained. With any subsequent change in the feeding regimen blood sugar levels should be rechecked.

ASSOCIATED DOCUMENTS:
Oral Dextrose Gel to treat Neonatal Hypoglycaemia Flow Chart and Guidelines 2015 University of Auckland
Women, Child and Youth Guideline – Formula Feeding
Women, Child and Youth Guideline -Referral of inpatient neonates to paediatric service
Organisational Policy – Breastfeeding
Procedure: Heel stick blood sampling for blood glucose testing
Women, Child and Youth Guideline Supplementing the breast fed infant
Weight percentile charts

APPENDICES:
1. Standing order for 40% Oral Dextrose gel
2. Oral dextrose gel to treat neonatal hypoglycaemia flow chart

REFERENCES:
www.babyfriendly.org.uk/pdfs/hypo policy

Up to date literature review Neonatal Hypoglycaemia August 2017 www.uptodate.com

Acceptable medical reasons for supplementation.

WHO Hypoglycaemia of the Newborn. Review of Literature. 1997

Date of Approval: December 2017
Next Review Date: December 2020
APPENDIX 1

STANDING ORDER FOR 40% DEXTROSE GEL FOR TREATMENT OF NEONATAL HYPOGLYCAEMIA

Oral 40% Dextrose Gel dose 0.5 ml/kg may be given in accordance with this guideline by nurses and Midwives Gisborne Maternity Unit.

Authorised by;

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Dr Shaun Grant
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Date of approval; __________________