Whittington Health NHS

Hypoglycaemia:

Detection and Prevention in the Newborn Infant

Subject:	Detection and Prevention of Hypoglycaemia in the Newborn Infant
Policy Number	N/A
Ratified By:	Maternity Clinical Guidelines and Audit Group
Date Ratified:	August 2015
Version:	V8
Policy Executive Owner:	F.Eben. WCF Director.
Designation of Author:	Dr R Blumberg and Ms J Laking - Midwife
Name of Assurance Committee:	Maternity Clinical Guidelines and Audit Group
Date Issued:	August 2015
Review Date:	3 years hence
Target Audience:	Midwives, Neonatal nurses, Paediatricians, Obstetricians
Key Words:	Hypoglycaemia, neonate, blood sugar

Version Control Sheet

Version	Date	Author	Status	Comment
V6	29 April 2012	R Blumberg and J Laking		Addition of checking of infants whose mothers have had Labetalol New Template
V7	8 May 2013	R Blumberg and J Laking		Addition of flow chart
V8	17 August 2015	R Blumberg and J Laking		Extra paragraph concerning initiation of observations for low blood glucose following need for resuscitation

➢ Criteria for use

To be used for the prevention, early detection , correction and management of neonatal hypoglycaemia

➢ Background/ introduction

In the healthy, term, well grown (appropriate for gestational age) newborn baby, early and exclusive breastfeeding will meet nutritional requirements and routine blood glucose testing is not required.

Particular groups of newborn infants are at greater risk of hypoglycaemia and need observation and testing. These groups include infants who are premature, small for gestational age, infants of diabetic or gestational diabetic mothers and mothers who have received certain medication.

Infants who are unwell may have low blood glucose, and infants who have low blood glucose may have abnormal signs and symptoms.

➢ Inclusion/ exclusion criteria

All newborn infants

Clinical management

➢ Term infants who are unwilling to feed

Blood glucose may be low in babies who are unwell and as a result do not feed
Low blood glucose may be the cause of abnormal symptoms and signs

Assess these infants clinically. Review their birth history. Look for the following signs and symptoms:

- Irritability / Lethargy/ Coma
- Excessive Jitteriness
- Seizures
- Apnoea / Cyanotic spells
- Hypotonia and Limpness
- Poor latching and sucking
- Persistent Vomiting
- Rapid respiratory rate

If any deviation from the norm is noted in the assessment, measure blood glucose and call for assistance – Bleep the Neonatal SHO (Bleep 3100)

➢ Term infants who are unwilling to feed and appear unwell

Call the Neonatal SHO (Bleep 3100) if:

A term infant is unwilling to feed and appears unwell
Blood glucose is 1 – 1.9 mmol/L

Blood glucose is less than 1.0 mmol/L or reads **"LOW" on glucose meter**
These infants should be transferred to the Neonatal Unit for investigation

➢ Term infants who have had a difficult delivery and required resuscitation

Check the blood glucose: If blood glucose is < 2mmol/L

Feed immediately and initiate regular pre-feed glucose monitoring - 3 hourly and feed by nasogastric tube or bottle with formula at 100ml/kg/day. Pre-feed blood glucose monitoring and vital signs should be performed for a minimum of 24 hours and reviewed by paediatric and postnatal staff.

➢ Infants at greater risk of clinically significant hypoglycaemia

SGA and Preterm Infants on the Postnatal / Transitional care wards (35 - 36 weeks gestation)

See Flow Chart Appendix 2 :

Small for gestational age infants (37 – 40 weeks) <2nd centile on weight chart or appears clinically wasted

	37 weeks	*38 weeks*	*39 weeks*	*40 weeks*
<2nd centile *Boys*	< 2.2 kg	< 2.3 kg	< 2.5 kg	< 2.7 kg
<2nd centile *Girls*	< 2.1 kg	< 2.2 kg	< 2.4kg	< 2.6 kg

These babies require early attention to feeding

1. Feed these infants within an hour of birth and check the blood glucose between 2 – 4 hours of age. Breast-feed if mothers choice; encourage kangaroo care and unlimited access to breast. If formula fed, calculate at 60ml/kg/day, every 4 hours.

2. Start to measure pre-feed blood glucose before all feeds for the first 24 hours and follow the guide below

Call the Neonatal SHO urgently day or night if blood glucose is ever 1.0mmol/L or less, or reads "LOW" or if there are abnormal symptoms or signs or if infant appears unwell.

(see abnormal signs and symptoms listed on page 3)

1. **If 1st pre-feed blood glucose 1 - 1.9 mmol/L** and infants is well: feed immediately at 100ml/kg/day with EBM or formula by bottle,cup or tube. Feed at 3 hourly intervals. Continue to offer breast first.

Check the blood glucose before the next feed 3 hours later. **If 2nd pre-feed blood glucose remains between 1 – 1.9 mmol/L**, give a feed and call neonatal SHO to arrange admission to the neonatal unit for more frequent tube feeds and intravenous glucose.

2. **If pre-feed glucose ≥ 2.0 mmol/L**, offer a breastfeed or formula feed on demand at least 4 hourly and continue to measure pre-feed blood glucose.

3. **If pre-feed blood glucose ≥ 2.5 mmol/L** on two consecutive occasions, stop monitoring (this might be before the 24 hour period is complete.

➢ Infants of diabetic mothers

Infants of diabetic and gestational diabetic mothers are at risk of clinically significant hypoglycaemia.
Infants of diabetic mothers with poor control are at even greater risk.

Babies should be fed within 30 minutes of birth. Offer feeds at least 2 – 3 hourly by breast, cup, bottle or tube. If formula feeds, begin at 60 ml/kg/day

Check all pre-feed blood glucose for a complete 24 hours, after which monitoring may be stopped if sugars are stable (> 2.0mmol/L)

If blood sugar is ever less the 2.0mmol/L feeds must be supplemented either by cup, bottle or tube at 100/ml/kg/day at 3 hourly intervals

Call the Neonatal SHO if:

- **Blood glucose fails to rise or cannot maintain at or > 2.0mmolL**
- **Blood glucose reads "LOW"**
- **Infant appears unwell**
- **There are abnormal signs and symptoms**

These infants will require admission to the Neonatal Unit

- **Large for dates (Girls > 4.0kg, Boys > 4.2Kg**

Do not need routine blood glucose checks following birth

In almost all cases, early and exclusive breastfeeding will meet nutritional requirements

A few infants may have had a difficult birth or be infants of mothers with undiagnosed gestational diabetes or neonatal hyperinsulinism.

If they show signs of poor feeding or any abnormal symptoms, check their blood glucose and call the neonatal SHO

See section on 'Term infants who are unwilling to feed' and 'abnormal signs and symptoms' listed on page 2

➢ Infants of mothers who have received Labetalol antenatally for Hypertension

Infants whose mothers who are receiving LABETALOL, the antihypertensive agent, are at increased risk of hypoglycaemia.

These infants require glucose testing after birth, prior to feeds 4 hourly for 24 hours. If blood sugars are consistently > 2mmol/L, then testing can be discontinued after 24 hours.

CALL the paediatric SHO if the sugar is ever less than 2 mmol/L for assessment and supplementation of feeds.

➢ Documentation

In all cases that a baby requires monitoring for hypoglycaemia, a feeding chart must be completed and used to document blood glucose results and management.

See Appendix 1 – glucose monitoring and feeding chart

➢ Further information

Discuss any concerns with neonatal staff – see contacts below.

➢ Contacts (inside and outside the Trust including out-of-hours contacts)

Neonatal SHO : Bleep 3100
Neonatal SpR : Bleep 3322
Neonatal Consultant : Please go through hospital switchboard

➢ References (evidence upon which the guideline is based)

1. Cornblath M, Hawdon JM et al Controversies regarding definitions of neonatal hypoglycaemia: suggested operational thresholds. Pediatrics. 2000;105(5):1141-5
2. NICE Guidelines, Diabetes in Pregnancy March 2008

3. De Rooy and Hawdon, Nutritional factors that affect the postnatal metabolic adaptation of full-term small and large-for-gestational-age infants. Pediatrics. 2002 mar. 109(3): E42
4. Robertson's Textbook of Neonatalogy 4th
5. Drugs in Lactation and Pregnancy. 7th Edition. Briggs, Freeman & Yaffe pages 885-887

- **Compliance with this guideline (how and when the guideline will be monitored e.g. audit and which committee the results will be reported to) Please use the tool provided at the end of this template**

Appendix A

Plan for Dissemination and implementation plan of new Procedural Documents

To be completed and attached to any document which guides practice when submitted to the appropriate committee for consideration and approval.

Acknowledgement: University Hospitals of Leicester NHS Trust

Title of document:	**Detection and Prevention of Hypoglycaemia in the Newborn Infant**		
Date finalised:	**August 2015**	**Dissemination lead: Print name and contact details**	**R Blumberg – Dept of Paediatrics. Ms J Laking Midwife – Women's Health**
Previous document already being used?	**Yes**		
If yes, in what format and where?	**On Intranet**		
Proposed action to retrieve out-of-date copies of the document:	**Remove from intranet**		
To be disseminated to:	**How will it be disseminated/implemented, who will do it and when?**	**Paper or Electronic**	**Comments**
All paediatric/neonatal staff, all obstetricians and midwives	**New guideline will be launched with prior notice to staff in poster format.**	**Both**	
	Message of the week		
	Announcement at weekly perinatal meeting		
Is a training programme required?	**No**		
Who is responsible for the training programme?	**N/A**		

Appendix B

Equality Impact Assessment Tool

To be completed and attached to any procedural document when submitted to the appropriate committee for consideration and approval.

Impact (= relevance) 1 Low 2 Medium 3 High	Evidence for impact assessment (monitoring, statistics, consultation, research, etc	Evidential gaps (what info do you need but don't have)	Action to take to fill evidential gap	Other issues
Race	**1**			
Disability	**1**			
Gender	**1**			
Age	**1**			
Sexual Orientation	**1**			
Religion and belief	**1**			

Once the initial screening has been completed, a full assessment is only required if:

- The impact is potentially discriminatory under equality or anti-discrimination legislation
- Any of the key equality groups are identified as being potentially disadvantaged or negatively impacted by the policy or service
- The impact is assessed to be of high significance.

If you have identified a potential discriminatory impact of this procedural document, please refer it to relevant Head of Department, together with any suggestions as to the action required to avoid/reduce this impact.

Appendix C Auditable Standards

Standard 1	**All babies who are of greater risk of Hypoglycemia are correctly identified**	Assessment	Time frame
	Documented in the baby notes	By case note audit □ yes □ no	Yearly

Standard 2	**All babies who are identified as at risk have a infant feeding chart**	Assessment	Time frame
	Feeding chart in Baby notes and filled in and completed	By case note audit □ yes □ no	yearly

Standard 3	**Correct care plan regarding blood glucose monitoring documented in the notes**	Assessment	Time frame
	Care plan documented in Baby notes	By case note audit □ yes □ no	yearly

Standard 4	**Overall care**	Assessment	Time frame
	Overall was the care given appropriate and in accordance with the guideline	By case note audit □ yes □ no	yearly

Standard 5	**Documentation Process**	Assessment	Time frame
	Overall was the documentation process adhered to	By case note audit □ yes □ no	yearly

Appendix D Monitoring Tool

Element to be monitored	Lead	Tool	Frequency	Reporting arrangements	Acting on recommendations and Lead(s)	Change in practice and lessons to be shared
Ensure that the care given appropriate and in accordance with the guideline Ensure that the documentation process adhered to	Dr Raoul Blumberg, Consultant Neonatologist Jenny Cleary, Head of Midwifery	An annual audit	Findings to be presented in the form of a report which will be presented annually,	These reports will be reviewed by the Maternity Clinical Guidelines and Audit Group. It is there responsibility to monitor the findings from each report. Evidence to support this will be found in the form minutes. Key factors to be noted are: -Audit findings -Deficiencies -Whether this is improvement from previous audit findings -Action planning with a named person who is responsible -Next date where an update will be given and by whom	Jenny Cleary is responsible for ensuring that any action Individual objectives/dates of review will be identified as required	Required changes to practice will be identified and actioned as soon as possible, specific dates to be identified in the action plan Rachel Ambler is responsible for ensuring that this happens Findings will be disseminated to staff via already established routes eg email, audit days, perinatal meetings, newsletters, notice-boards. This audit will be presented at the next Labour Ward Forum (quarterly meeting) which has user representation in attendance

Appendix 1

GLUCOSE MONITORING CHART

Name:…… DOB:……. Time of birth:……

Birth weight:…….. Gestation:……. Date:…….

This baby is at risk of hypoglycaemia because ……

Supplementary feeding for hypoglycaemic infants:
Start at 100ml/kg/day – 3 hourly feeds = …….. mls 3 hourly

➢ ***DATE/ TIME***	Pre-feed Blood glucose	Feed taken Time (Breast) Volume (mls)	Comment / Observations

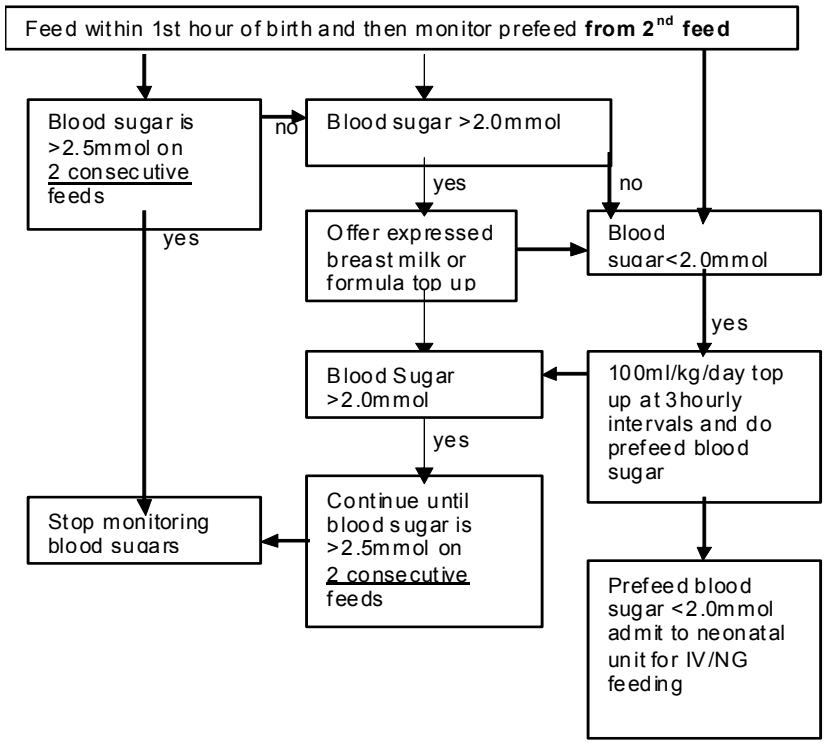
HYPOGLYCAEMIA – Detection & Management

Ask yourself - Why are we monitoring sugars? – Is the patient high risk or symptomatic?

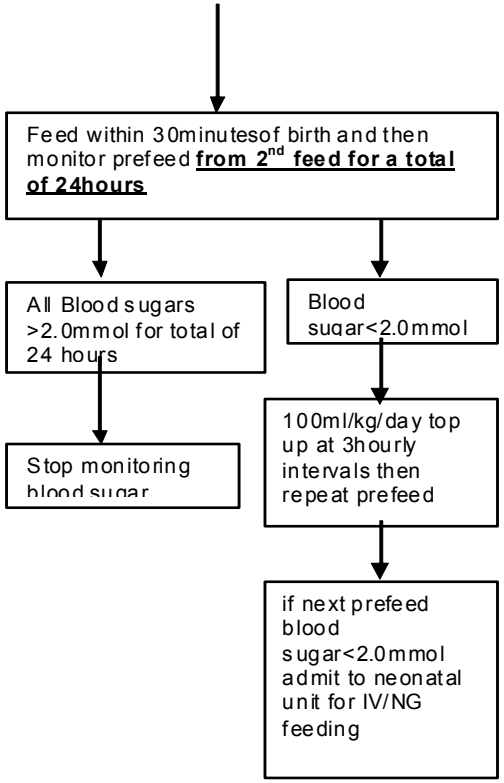
Large for dates (girls >4.0kg, Boys > 4.2kg – DO NOT need routine prefeed BMs unless symptomatic

Small babies/Preterm 35-37/40:

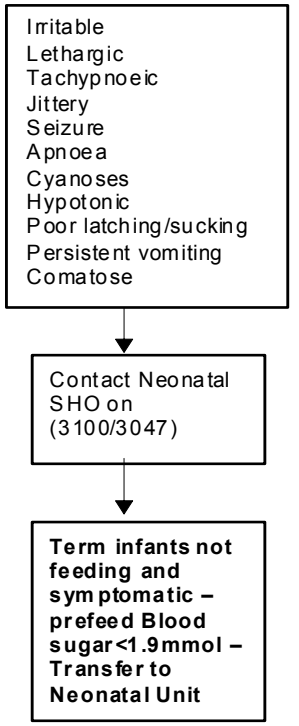
	37 weeks	*38 weeks*	*39 weeks*	*40 weeks*
<2nd centile *Boys*	< 2.2 kg	< 2.3 kg	< 2.5 kg	< 2.7 kg
<2nd centile *Girls*	< 2.1 kg	< 2.2 kg	< 2.4kg	< 2.6 kg



Diabetic Mother/ Maternal Labetalol



Symptomatic:



Dr. Raoul Blumberg & Dr. Adeeb Ahmed