



Medical Directive

Title: Hypoglycemia Management of Neonates
(greater than or equal to 35 weeks gestation)

Number: 020.920.090

Activation Date: Original Date December 2015

Review due by: February 2024

Sponsoring/Contact Person(s)
(name, position, contact particulars):

Chief of Paediatrics, Neonatologist, CCS Patient Care Managers,
Professional Practice Leaders, Clinical Leaders

<p>Order and/or Delegated Procedure:</p> <ol style="list-style-type: none"> 1. This medical directive authorizes nurses in Childbirth and Children’s Services to screen all newborns (NBs), greater than or equal to 35 weeks gestation, for hypoglycemia, initiate capillary blood glucose testing and nursing interventions, as directed 2. Send a <u>STAT</u> capillary or venous glucose sample when blood glucose meter reading is less than or equal to 1.8 mmol/L 3. Apply Dextrose 40% gel, 0.5 mL/kg, onto newborn’s buccal mucosa. Follow NB Hypoglycemia Algorithm for timing of intervention at 2 hours of age and following 2nd glucose test result. *A maximum of 2 doses may be administered prior to re-assessment by Neonatologist or Paeds-on-call. <p>Note: For a NB admitted to NICU with hypoglycemia, follow NICU-specific orders</p>	<p>Appendix Attached: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Title: Small or Large for Gestational Age Infant Determination Charts, Algorithm for the Screening and Immediate Management of Newborns at Risk for Hypoglycemia</p>
<p>Recipient Patients:</p> <p>Neonates (0 – 30 days) greater than or equal to 35 weeks gestation in Childbirth and Children’s Services.</p>	<p>Appendix Attached: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Title:</p>
<p>Authorized Implementers:</p> <p>All Nurses in the Childbirth and Children’s Services, who have:</p> <ul style="list-style-type: none"> - Reviewed the Newborn Hypoglycemia Self Learning Package & completed Test in LIME - Reviewed this Medical Directive 	<p>Appendix Attached: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Title:</p>
<p>Indications:</p> <p>All newborns will be assessed for risk factors for hypoglycemia</p> <p>Newborns with the following risk factors will have capillary blood glucose monitoring completed by heel stick:</p> <ul style="list-style-type: none"> - Maternal diet- or insulin-controlled diabetes - Maternal exposure to Labetalol within 48 hrs of delivery - Maternal exposure to antenatal steroids given within 24 hrs of birth less than or equal to 37 0/7 weeks - Arterial Cord Gas pH less than or equal to 7.0 or Base Deficit greater than or equal to 16 - Small for Gestational Age (SGA) (Appendix A) - Large for Gestational Age (LGA) (Appendix A) 	<p>Appendix Attached: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Title:</p>

- Documented Intra-uterine growth restriction (IUGR) in antenatal ultra sound
- Gestation less than 37 0/7 weeks

Newborns with signs and symptoms of hypoglycemia will have immediate capillary blood glucose monitoring completed by heel stick:

- Jitteriness, tremors
- Temperature instability
- Lethargy, poor feeding
- Hypotonia, irritability
- Staring, eye rolling, seizures
- Cyanosis, apnea, irregular respiratory pattern
- Tachycardia

Contraindications:

None

Consent:

Appendix Attached: Yes No Title:

The nurse implementing this directive will provide information and obtain verbal consent from the parent/substitute decision maker (SDM), when possible, prior to implementing this medical directive in accordance with Markham Stouffville Hospitals' Health care Consent policy # 270.914.030, applicable College of Nurses of Ontario Standards of Practice, and the Health Care Consent Act.

Guidelines for Implementing the Order / Procedure:

Appendix Attached: Yes No Title:

- Encourage skin to skin contact
- Assist with early feeding, within 1 hour of birth if newborn is stable. Avoid cold stress and maintain a neutral thermal environment
- Review maternal history during labour and be ready to assess newborn for risk factors for hypoglycemia immediately following birth
- Reference Algorithm for "Management of Newborn Hypoglycemia" (Appendix B) for detailed guidance on glucose monitoring, Dextrose gel administration, feeding and documentation
- Obtain informed verbal consent from parent(s) for glucose testing and Dextrose gel administration into buccal mucosa
- Prepare weight-based dose of Dextrose gel according to detailed procedure, apply onto buccal mucosa. Encourage parents to breastfeed or supplement in addition to Dextrose gel, as indicated in algorithm
- Label Dextrose gel tube with NB's Meditech ID label; indicate date and time tube is opened. Store in dedicated space in unit medication room
Note: Dextrose gel will be discarded 24 hrs after opening
- Encourage "cue-based" feeding every 1-3 hrs as long as baby remains well
- Assess the effectiveness of each feed, reinforce parental teaching for glucose monitoring, monitor intake/output and NB weight.
- Document all assessments at a minimum of q3h

For Symptomatic newborns:

- Perform stat capillary blood glucose test with bedside meter
- Notify Most responsible Provider (MRP) of result
- Follow MRP orders
- Assess the effectiveness of each feed; provide parental teaching, and monitoring intake/output and weight. Document all assessments at a minimum of q3h, or as ordered.

For Asymptomatic newborns “At Risk for Hypoglycemia” (see Algorithm, Appendix B):

- Perform initial capillary blood glucose test **at 2 hours of age**, independent of feed time
- Continue ongoing capillary blood glucose monitoring q3h before feeds
- Encourage “cue-based” feeding q1-3 hrs regardless of glucose testing schedule
- Assess the effectiveness of each feed and document at a minimum of q3h

For the following asymptomatic newborns 12 hrs of monitoring is required (Appendix B):

1. LGA/GDM newborns (Appendix A)
 2. Infants of mothers with diet- or insulin-controlled diabetes
 3. Maternal exposure to Labetalol within 48 hrs of delivery
 4. Maternal exposure to antenatal steroids given within 24 hrs of birth less than or equal to 37 0/7 weeks
 5. Arterial Cord Gas pH less than or equal to 7.0 or Base Deficit greater than or equal to 16
- Perform capillary blood glucose monitoring every 3 hrs before feeds
 - Follow interventions indicated in Appendix B based on blood glucose result
 - Assess the effectiveness of each feed and document at a minimum of q3h
 - When 2 consecutive samples are greater than or equal to 2.6 mmol/L, continue monitoring pre-feed or every 3-6 hrs
 - Discontinue glucose monitoring **after 12 hours**, in asymptomatic babies, providing 2 consecutive pre-feed blood glucose levels remain 2.6 mmol/L or greater **AND** effectiveness of feeding has been assessed and is documented

For Asymptomatic SGA, IUGR & Preterm newborns, 36 hrs of monitoring is required (Appendix B):

- Perform capillary blood glucose monitoring every 3 hrs before feeds
- Follow interventions indicated in **Appendix B** based on blood glucose result
- Assess the effectiveness of each feed and document at a minimum q3h
- Decrease frequency of blood glucose monitoring to every 6 hours providing baby remains asymptomatic after 2 consecutive pre-feed glucose values of 2.6 mmol/L or greater
- Discontinue glucose monitoring after 36 hrs in asymptomatic babies, providing blood glucose levels remain 2.6 mmol/L or greater **AND** effectiveness of feeding has been assessed. This will include assessment and documentation of NB intake/output, overall NB status and parental health teaching/understanding

For at risk newborns with capillary blood glucose level less than 1.8 mmol/L at any time:

- Transfer baby to NICU for STAT **Lab glucose**
- Contact Neo/POC immediately for NICU specific management

Note:

Accuracy of point of care capillary blood glucose levels less than 1.8 mmol/L are not reliable. A STAT LAB (capillary or venous) glucose should be drawn and sent for Laboratory analysis

Documentation and Communication:	Appendix Attached: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Title:
<p>Documentation</p> <ol style="list-style-type: none"> 1. Document implementation of this medical directive in Newborn Routine Order Set or Physician orders. Include the name and signature of implementer, including credentials, date and time 2. Document a focus note for any: <ul style="list-style-type: none"> - Newborn assessment that is not "Within Defined Limits" - Symptomatic newborn - "At risk newborn" requiring nursing intervention, lactation consultation or MRP notification 3. Scan Dextrose 40% into MAR and document total amount applied into buccal mucosa 4. Document effectiveness of all newborn feeds at a minimum of q3h for the first 24 hrs, include intake and output and weight <p>Communication:</p> <p>Verbally report implementation of this medical directive to inter-professional team members including primary nurse and primary care provider at each transfer of accountability encounter</p>	
Review and Quality Monitoring Guidelines:	Appendix Attached: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Title:
<p>Staff identifying any untoward or unintended outcomes arising from implementation of orders under this directive, or any issues identified with it, will report these to the following:</p> <ul style="list-style-type: none"> • MRP • Patient Care Managers, OBS or Postpartum • Director of Professional Practice • Risk Manager (by completing an I-Report) 	
Administrative Approvals (as applicable):	Appendix Attached: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Title:
<p>Paediatricians Meeting (November 18, 2015; November 21, 2018; August 12 2020; Via Email: Feb 9, 2021 Childbirth Operations (December 9, 2015; December 12, 2018; Date Sept 1, 2020; Jan 19, 2021) NICU Operations (December 8, 2015; November 20, 2018; Sept 3, 2020; Jan 12, 2021) Drugs & Therapeutics Committee: Feb 11, 2021 Medical Advisory Committee (December 16, 2015; January 23, 2019; Sept 23, 2020; Feb 24 2021)</p>	
Approving Physician(s) / Authorizer(s):	Appendix Attached: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Title:
<p>All Paediatricians/Neonatologist</p>	

Appendix A

SMALL OR LARGE FOR GESTATIONAL AGE INFANT DETERMINATION CHART

MALES

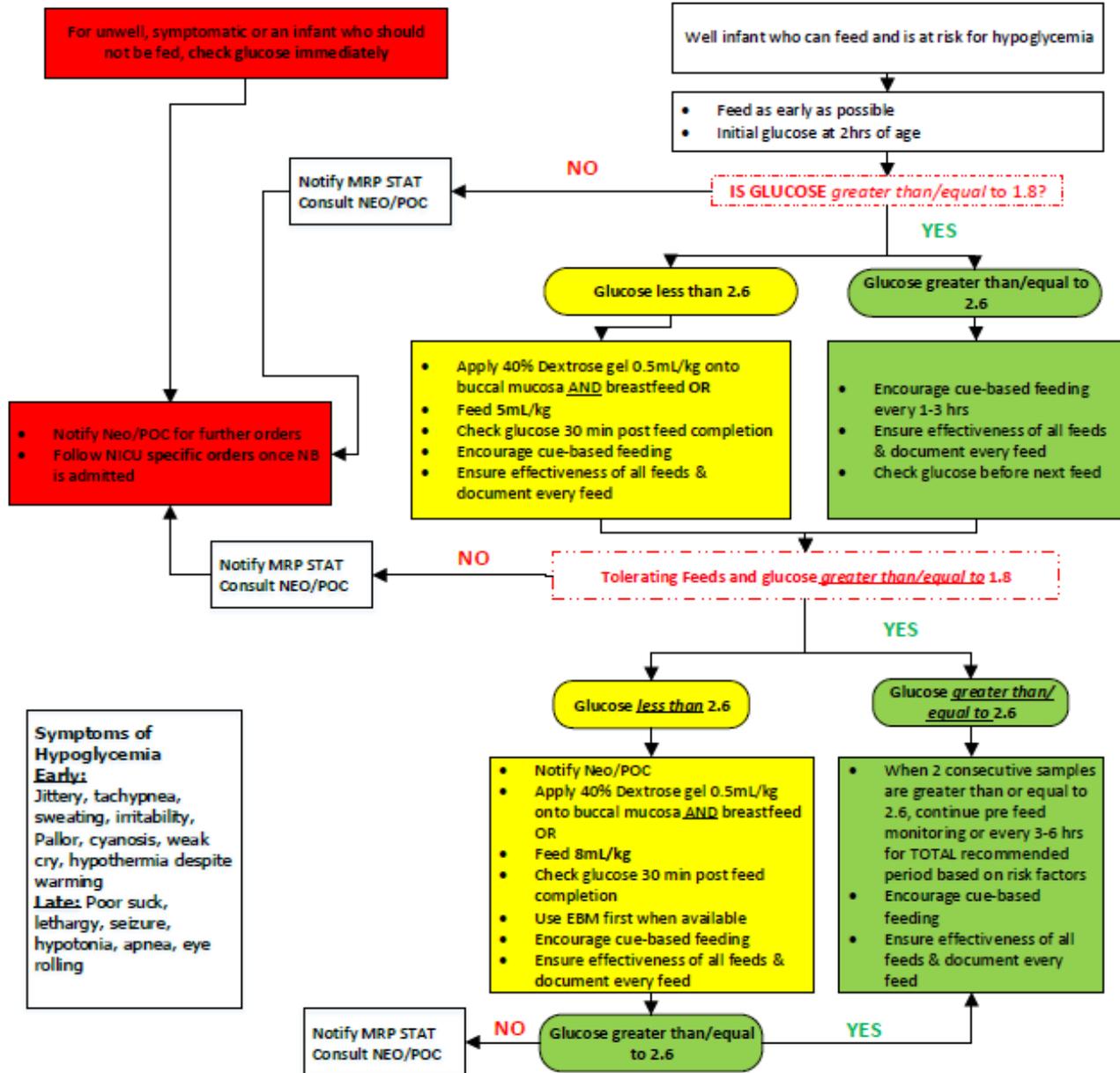
Age (weeks)	SGA (grams)	LGA (grams)
30	<1099	>1837
31	<1259	>2069
32	<1444	>2319
33	<1648	>2580
34	<1866	>2851
35	<2091	>3132
36	<2321	>3411
37	<2552	>3665
38	<2766	>3877
39	<2942	>4049
40	<3079	>4200
41	<3179	>4328

FEMALES

Age (weeks)	SGA (grams)	LGA (grams)
30	<1022	>1783
31	<1168	>2004
32	<1346	>2242
33	<1548	>2494
34	<1768	>2761
35	<1998	>3037
36	<2227	>3307
37	<2452	>3543
38	<2658	>3738
39	<2825	>3895
40	<2955	>4034
41	<3051	>4154

Adapted from: Kramer MS, Platt RW, Wen SW, Joseph KS, Allen A, Abrahamowicz M, Blondel B, Breart G and for the Fetal/Infant Health Study Group of the Canadian Perinatal Surveillance System. A new and improved population-based Canadian reference for birth weight for gestational age. *Pediatrics*, Volume 108 Pages e35-e41. Copyright 2001 by the American Academy of Pediatrics

Appendix B: Management of Neonatal Hypoglycemia Algorithm



Point of care testing with glucose meter is an accurate result UNLESS meter identifies technical error. DO NOT perform second glucose meter test routinely. MRP order is required for repeat testing; lab glucose may be preferred.

- At-risk for hypoglycemia = SGA, IUGR, LGA, IDM, GA < 37 0/7 weeks, Cord pH less than or equal to 7.0 or base deficit greater than or equal to 16, maternal exposure to labetalol within 48 hrs of delivery, antenatal steroids given within 24hrs of birth less than 37 0/7 gestation.
- Feed (in order of preference) mother's expressed milk, donor milk or formula, and document all intake
- Duration of surveillance for well NB and feeding is established; 12 hrs of glucose monitoring for LGA/GDM/Cord pH/antenatal steroids/Labetalol exposure; 36 hrs of glucose monitoring for SGA/IUGR & Preterm birth

Abbreviations: GA - gestational age, IDM - infants of diabetic mothers, IUGR - intrauterine growth restriction, LGA - large for gestational age, SGA - small for gestational age, Neo = Neonatologist, POC= Paediatrician on call