Glucose Target Values

- Infants 0 and < 4 hours of age, blood glucose levels should be ≥ 40mg/dL
- Infants ≥ 4 and < 24 hours of age, blood glucose levels should be ≥ 45 mg/dL
- Infants ≥ 24 hours of age, blood glucose levels should be ≥ 50 mg/dL

Screening

Data suggests asymptomatic infants with persistent or recurrent hypoglycemia are at risk for delayed neurodevelopment. Screening high-risk infants combined with appropriate management to meet operational glucose levels is essential in the newborn period.

All High Risk Infants will be screened by 90 minutes of birth:
- Infants born to insulin dependent diabetic mothers or mothers with gestational diabetes
- Infants < 2.5 kg
- Infants > 4 kg
- LGA infants (>90% ile as plotted on Fenton curve)
- SGA infants (< 10% ile as plotted on Fenton curve)
- Gestational age < 37 weeks
- Discordant twin (weight 10% below larger twin)
- Newborns suspected of sepsis or born to mother suspected of having chorioamnionitis
- Newborns exposed to any beta-blocker medications

Newborns with symptoms suggestive of hypoglycemia as follows:
- Jitteriness, tachypnea, hypotonia, poor feeding, apnea, temperature instability, lethargy,
- Seizures: Neonatal seizures are often subclinical. Infants with seizures may only appear intermittently lethargic and not feed well. Clinical seizures in newborns are typically characterized by rhythmic jerking of an extremity that may also be associated with eye deviation and oxygen desaturation. Neonatal seizures do not typically appear as a tonic-clonic seizure.

Other indications for screening include the following:
- Infants with significant perinatal distress or with five minute APGAR scores < 5
- Infants with mothers on terbutaline or beta-blockers
- Infants with suspected inborn errors of metabolism
- Infants with hepatomegaly, microcephaly, anterior midline defects, gigantism, macroGLOSSia
- Infants with hemihypertrophy or microphallus

See Algorithm for monitoring and management options

Remember to follow blood glucose levels anytime there is a change in intervention (i.e. following gel treatment or transitioning from IV glucose and/or supplemental feedings). Infants with a respiratory rate > 60/minute may need nasogastric gavage feedings. Infants that are not responding to your intervention, or those that present with hypoglycemia AFTER 12 hours of age, strongly consider other causes (sepsis, inborn errors of metabolism, or endocrine problems). Consider Neonatology consult to assist with diagnoses.

References
AAP Clinical Report- Postnatal Glucose Hemeostasis in Late-Preterm and Term Infants, Pediatrics, 127 (3), March 2011
Newborn Nursery ≥ 36 weeks Hypoglycemia Algorithm for the first 24 hours after delivery

<table>
<thead>
<tr>
<th>Symptomatic Infant</th>
<th>Birth to 4 hours of Age</th>
<th>Asymptomatic Infant</th>
<th>4-24 hours of Age</th>
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<td>Any Age in Hours</td>
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**Symptomatic Infant**

1. Draw a Serum / Lab Glucose
2. If serum / lab glucose < 40 mg/dl:
   - Call Neonatology (662-0069) to assess infant and determine treatment plan (Consider IV GLUCOSE*).
3. Call PCP after serum / lab glucose result.

**Birth to 4 hours of Age**

- If Initial Serum / Lab Glucose Screen within 30-60 min of age **:
  - 26-39 mg/dl
    - Feed infant**
  - ≥ 40 mg/dl
    - Check serum / lab glucose in 30-60 minutes if infant asymptomatic (if baby becomes symptomatic, see left panel for management)

**Asymptomatic Infant**

1. Continue breastmilk feeding/colostrum feeds q3-3hrs or feed per parental choice (3-10 ml/kg) **.
2. Target glucose levels should be ≥ 45 mg/dl - Consult NICU if unable to maintain or for recurrent hypoglycemia.

**4-24 hours of Age**

- Check Serum / Lab Glucose every 3 hours, if result:
  - ≤ 35 mg/dl
    - 1. Give Glucose Gel ***
      - Call Neonatology (662-0069); alert PCP
      - 3. Repeat serum / lab glucose 30 min
      - 4. Initiate IV GLUCOSE if <35 mg/dl
  - 36-44 mg/dl
    - 1. Give Glucose Gel ***
      - 2. Feed Infant ** Q3-3 hours
      - 3. Contact PCP
      - 4. Check serum / lab glucose 30 min after gel
  - ≥ 45 mg/dl
    - 1. Feed Infant ** Q3-3 hours
      - 2. Check serum / lab glucose q3hrs

**Discontinuation Criteria**

- Serum glucose > 50 mg/dl
- Negative clinical signs

**Symptoms suggestive of hypoglycemia as follows:**
- Jitteriness, tachypnea, hypotonia, poor feeding, apnea, temperature instability, lethargy, & Seizures*

*Neonatal seizures are often subclinical. Infants with seizures may only appear intermittently lethargic and not feed well. Clinical seizures in newborns are typically characterized by rhythmic jerking of an extremity that may also be associated with eye deviation and oxygen desaturation. Neonatal seizures do not typically appear as a tonic-clonic seizure.

Infants that present with hypoglycemia AFTER 12 hours of age, strongly consider other causes (sepsis, inborn errors of metabolism, or endocrine problems).

**Length of Glucose Screening is Risk Dependent**

- < 37 wks GA, term 5GA infants, and infants < 2.5 kg should have glucose levels monitored at least 24 hrs
- All other at risk infants should have glucose levels monitored at least 12 hrs.

**IV GLUCOSE* INFO:**

1. D10W - 2 ml/kg over 1-2 min then
2. Maintenance IV D10W (80 ml/kg/day)
3. Repeat blood serum / lab glucose 30 minutes after IV glucose initiated

**Feed Infant:**

- Breastfeed, latch at breast and actively sucking for 10+ minutes per feeding
- Express colostrum, feed any droplets available, ideally 1mL-10mL per feeding
- Donor milk: 2mL-10mL per feeding in first 24 hours (see policy)

**Formula, by parental request, 3-10mL/kg per feeding**

*****Glucose Gel:** Dextrose 40% gel (200mg/kg) does of 0.5ml/kg massaged into buccal mucosa**

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<tr>
<th>Dosing Guidelines</th>
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<td>5 kg</td>
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**MAX GLUCOSE GEL = 2 DOSES TOTAL**

**Disclaimer:** Algorithms are not intended to replace providers’ clinical judgment or to create a single protocol. Some clinical problems may not be adequately addressed in this guideline. As always, clinicians are urged to document management strategies. Revised March 2020
**Newborn Hypoglycemia**

**IV Glucose Weaning Algorithm**

Criteria for stability:
- AC glucose > 50 mg/dL without IV glucose bolus
- Without increase in IV glucose infusion
- Maintaining thermoregulation, RR<60

Bottle feeding minimum of 10 mls / kg q 3 hrs and/or breastfeeding with lactation consulting

- Wean IV rate by 25% of original rate q 3-6 hrs
- Maintain and assess feeding q 3 hrs
- Assess criteria for stability and notify physician if not maintaining **

**Blood Glucose q 3 hrs ac while weaning**
- Notify Physician if any blood glucose <50**

**Consider Neonatology Consult at any point for difficult to wean babies**

**IV glucose Wean**

- Saline lock IV

**Blood Glucose q 3 hrs ac x 2 over minimum 6 consecutive hrs after wean complete**
- Notify physician of any ac glucose < 50 and if not maintaining criteria for stability

Follow up glucose

- Yes
- Notify physician for further treatment and testing

- No

**Proceed to Neonatal Hypoglycemia Feeding Algorithm**

**Newborn Hypoglycemia Feeding Algorithm**

Supplemental Feeds

- Yes
- No

Wean Supplement

- Yes
- No

**Blood Glucose q 3 hrs ac while weaning**
- Notify Physician if any blood glucose < 45 on day 1 or < 50 on day 2 or beyond

Home feeding plan established

- Yes
- No

**Blood Glucose q 3 hrs ac x 2 over 6 hrs On home feeding regimen**

- Glucose >45 day 1
- >50 day 2
- Notify physician for further treatment and testing

- Yes
- No

**Proceed to Normal Newborn Pathway**

This algorithm is intended to be a reference for clinicians caring for Newborns with Neonatal Hypoglycemia and is a part of the Newborn Hypoglycemia Clinical Guideline. Algorithms are not intended to replace providers’ clinical judgment or to create a single protocol. Some clinical problems may not be adequately addressed in this guideline. As always, clinicians are urged to document management strategies. (revised March 2020. For questions regarding this guideline, please contact the Medical Director of the Newborn Nursery).