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HEALTH QUALITY INNOVATORS

Maryland

DEPARTMENT OF HEALTH

Maryland Perinatal-Neonatal Quality Collaborative
Newborn Hypoglycemia Initiative

The Maryland PQC

Mission Statement

The Maryland Perinatal-Neonatal Quality Collaborative (MDPQC) is a collaboration of hospitals, perinatal care providers, neonatal care providers, community organizations, and public health professionals working together with the same goal - to make Maryland a safer and more equitable place to give birth across all levels of care. The MDPQC supports the sharing of best practices, ongoing training and education, sustained data-driven quality improvement, and alignment with other state initiatives to promote a safe birthing experience and improved outcomes for all, laying the groundwork for long-term family well-being.

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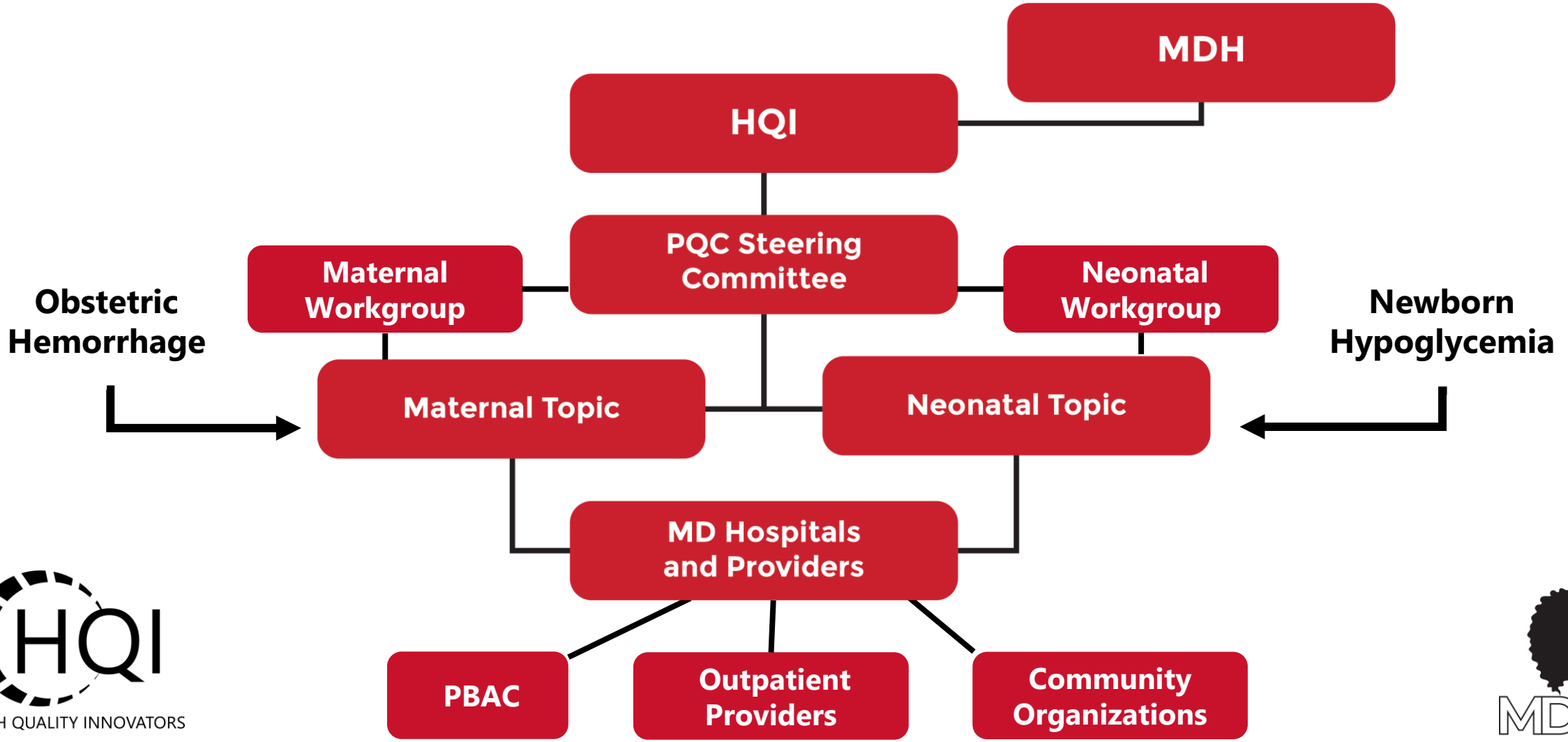
MDPQC Structure



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Why is hypoglycemia the next collaborative initiative?

- Multiple recommendations with differing criteria impacting up 33% of all infants born.
  - AAP vs. PES debate
- Glucose management strategies for at risk infants
  - Differ based on protocols
  - Differ based on unit capabilities
    - Level
    - Use of gel
- Impactful to breast feeding rates and exclusivity

Clinical signs of hypoglycemia

- Poor feeding
- Hypotonia
- Sweating
- Cyanosis
- Pallor
- Tachypnea
- Apnea
- Tremors
- Jitteriness
- Irritability
- Lethargy
- Seizures

- All of these signs crossover and can also be signs of other disease process.
  - Can we truly diagnose hypoglycemia by exam alone?
  - Are certain signs more predictive of poor neurologic outcomes?
- Significant predictors of brain injury seem to be:
  - Seizures
  - Apnea
  - Flaccid hypotonia
  - Changes in levels of consciousness
  - Coma

Who Gets Screened: Comparing the Recommendations

AAP and PES

- Late preterm (LPT; 34-36 weeks)
- Small for gestational age (SGA)
- Large for gestational age (LGA)
- Infants of diabetic mothers (IDM)

PES ADDED

- Postmature delivery
- Family history of genetic forms of hypoglycemia (such as congenital hyperinsulinism or hypopituitarism)
- Congenital syndromes (such as Beckwith-Wiedemann)
- Abnormal physical features (such as midline facial deformations, microphallus)
- Perinatal stress (birth asphyxia/ischemia, cesarean delivery, maternal preeclampsia/eclampsia or hypertension, meconium aspiration syndrome, erythroblastosis fetalis, polycythemia, hypothermia)

Screening and Management of Postnatal Glucose Homeostasis in Late Preterm and Term SGA, IDM/LGA Infants

AAP

Late Preterm Infants 34 – 36 $^{6}/_{7}$ weeks and SGA (screen 0-24 hrs); IDM and LGA ≥ 34 weeks (screen 0 -12 hrs)

Symptomatic and **<40mg/dl** → IV Glucose

ASYMPTOMATIC

Birth to 4 hours of age		4 – 24 hours of Age	
INITIAL FEED WITHIN 1 Hour Screen glucose 30 minutes after 1st feed		Continue feeds q2-3 hours Screen Glucose prior to each feed	
Initial Screen <25mg/dl		Screen <35mg/dl	
Feed and check in 1 hour		Feed and check in 1 hour	
<25mg/dl ↓ IV Glucose*	25 – 40mg/dl ↓ Refeed/IV Glucose* as needed	<35mg/dl ↓ IV Glucose*	35 – 45m/dl ↓ Refeed/IV Glucose* as needed

Target Glucose screen ≥45mg/dl prior to routine feeds

*Glucose dose = 200mg/kg (dextrose 10% at 2ml/kg) and/or IV infusion at 5 – 8mg/kg/min (80 – 100ml/kg/d) Achieve plasma glucose 40 – 50mg/dl.

Symptoms of Hypoglycemia include: Irritability, tremors, jitteriness, exaggerated moro reflex, high-pitched cry, seizures, lethargy, floppiness, cyanosis, apnea, poor feeding.

Adamkin DH COFN Clinical Report Peds 2012:127; 575

TABLE 3 POSTNATAL GLUCOSE TREATMENT TARGETS: PES

PES

High-risk newborns without a suspected congenital hypoglycemia disorder	0-48 h	>50 mg/dL
	>48 h	>60 mg/dL
Neonates with suspected congenital hypoglycemia disorder and those requiring IV glucose to treat hypoglycemia	Any time	>70 mg/dL

The PES set the above thresholds based on the following observations about the impact of specific glucose concentrations in adults:

55-65 mg/dL	Brain glucose utilization becomes limited.
50-55 mg/dL	Neurogenic symptoms (palpitations, tremor, anxiety, sweat, hunger, paresthesia) perceived.
<50 mg/dL	Cognitive function impaired (neuroglycopenia, characterized by confusion, seizures, coma).

Abbreviations: IV, intravenous; PES, Pediatric Endocrine Society.
From: Thornton PS, et al.[2]

Comparing the Recommendations

	0-4hrs*	4-24hrs	24-48hrs	>48hrs
AAP#	<25-40mg/dl	<35-45 mg/dl	<45 mg/dl	>60mg/dl
PES	< 50mg/dl	<50 mg/dl	<50 mg/dl	>60mg/dl

*Time includes normal postnatal glucose nadir, asymptomatic infants with these low values do not require treatment beyond feeding, unless values remain low after 4 hours of life.

#Any symptomatic infant with glucose concentration < 40mg/dl should receive iv dextrose (AAP)

Adamkin DH: Low blood sugar levels in the newborn infant: Do changing goal posts matter? SFNM 2021, 10,202

Neuroglycopenia: PES vs AAP approach

- PES
  - Recommendations based on data from older children and adults
  - Focused on those neonates with abnormal values that last beyond 48 hours and may have congenital hypoglycemia
  - Expanded subset of those at risk leading to a larger population being tested.
  - Recommendation of 6-8 hour fasting glucose challenge for infants whose blood glucose was abnormal and are at risk of a disorder causing persistent hypoglycemia.
  - Recommendations are from observational studies and expert opinion.
- AAP
  - Recommendations take into account the physiologic transition that occurs after birth.
  - Focused on identifying infants with profound hypoglycemia that may be out of the normal transitional ranges.
  - Limits testing of asymptomatic infants to those most at risk.
  - Recommendations based on well designed studies, observational data and expert opinion.

What is MDPQC trying to accomplish?

The goals of the initiative are to:

- Support the development and implementation of a protocol for management and care of symptomatic newborns with signs and symptoms of hypoglycemia and asymptomatic newborns at risk for hypoglycemia
- Decrease the number of newborn transfers to a higher level of care
- Decrease the number of IV infusions for hypoglycemia
- Support breastfeeding
- Decrease non-breastmilk supplementation for hypoglycemia
- Increase education among staff and families about best practices

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MDPQC Data Submission Template

Participating hospitals will be sent an excel workbook, which will be your template for monthly data submission

- **Note there are 5 tabs requiring data entry**

1. Hospital Demographics
2. Aggregate Measures
3. Sampled Measures
4. Process measures
5. Staff education

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MDPQC Data Submission Template

General Instructions:

* Each hospital participating in the Maryland Perinatal-Neonatal Quality Collaborative (MDPQC) neonatal initiative should use this spreadsheet to submit monthly data for:
    - hospital demographics (yellow tab)
    - aggregate measures (purple tab)
    - sampled measures (green tab)
    - process measures (blue tab)
    - staff education (orange tab)
* Separate workbooks should be submitted for each reporting month.
* Monthly data submissions should be uploaded to SharePoint by the end of the following month (i.e., May data is due by June 30th).
* Please upload completed form to SharePoint using your log-in credentials or fax to: 804-289-5324; Attn: Katie Richards. If you are uploading a completed form to SharePoint, please be sure to save it with file name: [Facility name_Reporting month], e.g. ABC Hospital_January_2024.
* Any questions can be directed to Katie Richards (krichards@hqi.solutions, 804-289-5355).

Instructions for Reporting:

Number of direct NICU/SCN admissions is any baby admitted directly to the NICU or Specialty Care Nursery from the delivery room without spending any time in the nursery.

Days of life is measured by birthday=day 0.

For each process measure, indicate whether you have this element in place as a regular part of your unit workflow.

For the staff education, indicate the total number by provider type that have received within the last two years a education program on hypoglycemia policies, procedures, and best practices. Measure this on a rolling basis based on the reporting month.

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MDPQC Data Submission Template

MDPQC NEONATAL HYPOGLYCEMIA DATA COLLECTION TEMPLATE

Please select your hospital from the dropdown list in cell **B10** below. Your hospital CCN will automatically populate in cell B11when you select your hospital's name. If you cannot find your hospital in the dropdown list, please contact Katie Richards for assistance.

Please select the month/year that your hospital is reporting data for in this submission in cell **B13** below.

OPTIONAL: Please provide a hospital contact name, email address and phone number for the facility you are reporting data for in cells **B15, B16** and **B17** below.

Select Hospital:	**ADVENTIST HEALTHCARE SHADY GROVE MEDICAL CENTER**
Hospital CCN:	210057
Select Month/Year of Reporting:	**Nov-2023**
Hospital Contact Name	
Contact Email	
Contact Telephone Number	

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MDPQC Data Submission Template

	Race *Based on mother's race								Ethnicity *Based on mother's ethnicity			
	White	Black or African American	American Indian or Alaska Native	Asian	Native Hawaiian or Other Pacific Islander	Other	Unknown	Total	Hispanic or Latino	Not Hispanic	Unknown	Total
# births												
# births determined at-risk for hypoglycemia												
Of infants at-risk for hypoglycemia (regardless of unit):												
# infants of diabetic mothers												
# Large for Gestational Age Infants												
# Small for Gestational Age Infants												
# Late pre-term infants												
# infants who develop hypoglycemia												
Number NICU admissions for hypoglycemia												
# internal transfers to higher level of care for hypoglycemia												
# external transfers to higher level of care for hypoglycemia												
# infants given glucose gel												
# infants receiving IV fluids for hypoglycemia concerns												
# infants with attempted breastfeed within first 60 minutes of life												
# infants who were exclusively breastfed during admission												
# infants who only received breastmilk for last 3 feeds prior to discharge												
# infants receiving skin-to-skin with first 4 hours of life												

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Please provide this information for a sample of babies who are at-risk for hypoglycemia, based on sampling instructions provided by the MDPQC team.

Baby ID	Race	Ethnicity	Gestational age at delivery	Birthweight (grams)	Diabetic mother 1-yes, 0-no	direct admit to NICU for hypoglycemia 1-yes, 0-no	Transfer to higher care internally for hypoglycemia 1-yes, 0-no	Transfer to higher care externally for hypoglycemia 1-yes, 0-no	Developed hypoglycemia 1-yes, 0-no	Received glucose gel 1-yes, 0-no	Received IV fluids for hypoglycemia concerns 1-yes, 0-no	Breastfed within first 60 minutes of life 1-yes, 0-no	Received skin-to-skin within first 4 hours of life 1-yes, 0-no	Only received breastmilk for last 3 feeds prior to discharge 1-yes, 0-no	Received donor breastmilk 1-yes, 0-no	Received formula 1-yes, 0-no

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For each process measure, indicate whether you have this element in place as a regular part of your unit workflow.	
Does your hospital have a hypoglycemia protocol that has been updated in the past 2 years?	[Yes/No]
Does your hospital have a feeding policy that has been updated in the past 2 years?	[Yes/No]
Does your hospital use donor breastmilk in the NICU/Specialty Care Nursery?	[Yes/No/Not applicable]
Does your hospital use donor breastmilk in the well-baby nursery?	[Yes/No]
Does your hospital provide education to families regarding hypoglycemia *that is documented in the EHR*?	[Yes/No]
Do you currently track outcomes by race/ethnicity in your newborn population?	[Yes/No]
Do you currently track outcomes by race/ethnicity in your NICU population?	[Yes/No/Not applicable]
Do you use standard cut-offs for large and small for gestational age infants?	[Yes/No]
Does your hospital use glucose gel?	[Yes/No]

At the end of this reporting period, what number of providers and nurses received within the last two years education on hypoglycemia policies, procedures, and best practices?

	L&D		Well-Baby		Specialty Care (i.e., NICU)	
	# Trained	Total # Providers	# Trained	Total # Providers	# Trained	Total # Providers
Physicians, NPs, PAs, and CNMs						
Nurses						

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HQI's Customer Portal

MDPQC Project Announcements

These are announcements from HQI to all facilities, and designed to provide a simple communication to all participating facilities.

Create

Message	Created On

There are no records to display.

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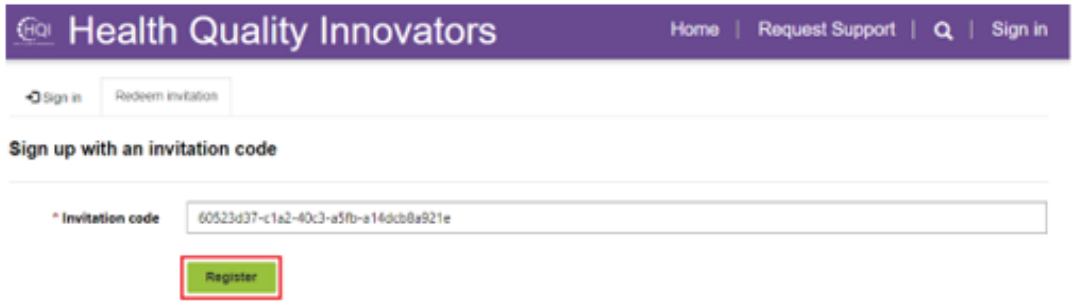
HQI's Customer Portal

HQI Customer Portal – Automated Login Process

External User

1. You will receive an email from <CRM.Admin@hqi.solutions>
2. The Subject will Say: "Redeem your Invitation to the HQI Customer Portal"
3. The Body of the message will contain important information please take note of:
    a. Redeem Access Button – This will provide you with a link directly to the HQI Portal with the invitation code embedded
    b. Username: Your Username will be your email address (the one that received this email)
    c. Password: We created your account with a unique password. You will need to reset it upon first login
4. When you click the "Redeem Access" button,
    a. You will have a browser window open to the HQI Portal
    b. The "Sign up with an invitation code" will display and a unique INVITATION CODE we be entered into the Invitation Code box. DO NOT EDIT THIS CODE
    c. This code is unique to you and can not be shared with anyone
    d. Click "Register"



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Data Reporting

- Beginning: January 2024
- Monthly data is due by the end of the following month
  - January AND February data due by March 31st
  - March data due by April 30th
- Uploaded to HQI's Customer Portal
- Benchmarking

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Next Steps

- ✓ Complete a Participation Agreement (PA)
- ✓ *Complete The HEART*
- ✓ Form your QI Team
- ✓ Initiate monthly team meetings
- ✓ Join monthly Office Hour Calls
- ✓ Join Learning Events
- ✓ Participate in Listserv discussions
- ✓ Develop data collection strategies
- ✓ Implement interventions/tools/resources, as needed
- ✓ Ask for help

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Next Events

Monthly Office Hours Calls

- 2nd Tuesdays, 12pm-1pm

Register here: https://hqin-org.zoom.us/meeting/register/tZYscumorT0sGdJ70eSQ2rC2G2rEyF52T0FP

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Contact Us

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For more information

Website: www.mdpqc.org

Listserv: md-pqc@listserv.mdpqc.org

The MDPQC Team:

- Katie Richards – krichards@hqi.solutions
- Yasmine Jackson – yjackson@hqi.solutions
- Alynna Nguyen – anguyen@hqi.solutions