Perinatal-Neonatal Quality Improvement Network of Massachusetts

TOOLKIT

The Birth Equity Journey
Optimizing Management of Obstetric Hemorrhage

May 11, 2021 - 12-1:30pm

Housekeeping

Welcome

- Please write your name and institution in the chat
- Please mute yourselves when not speaking
- Please write your questions in the chat during the webinar
- We will record this session and upload the recording and webinar slides to our website after the call

Objectives

1. Describe the OB Hemorrhage bundle components

2. Describe bundle implementation, data collection steps and timeline

3. Understand requirements and logistics of participation

Presenters have nothing to disclose relevant to this presentation

Agenda

• 12:00 - 12:20pm	Welcome and Call to Action	Audra Meadows & Ron Iverson
• 12:20 -12:50pm	PNQIN OB Hemorrhage Safety Bundle	Emily Reiff
• 12:50 - 1:00pm	Champion Story	Shirley Hamill
• 1:00 - 1:10pm	PNQIN Participation Logistics	Kali Vitek
• 1:10 - 1:25pm	OB HEM Bundle Q&A Panel	PNQIN Team
• 1:25 - 1:30pm	Closing, Acknowledgements & Thanks	Audra Meadows & Ron Iverson

Welcome

On behalf of the PNQIN

(Perinatal-Neonatal Quality Improvement Network of MA)

MA AIM Initiative to improve maternal outcomes,

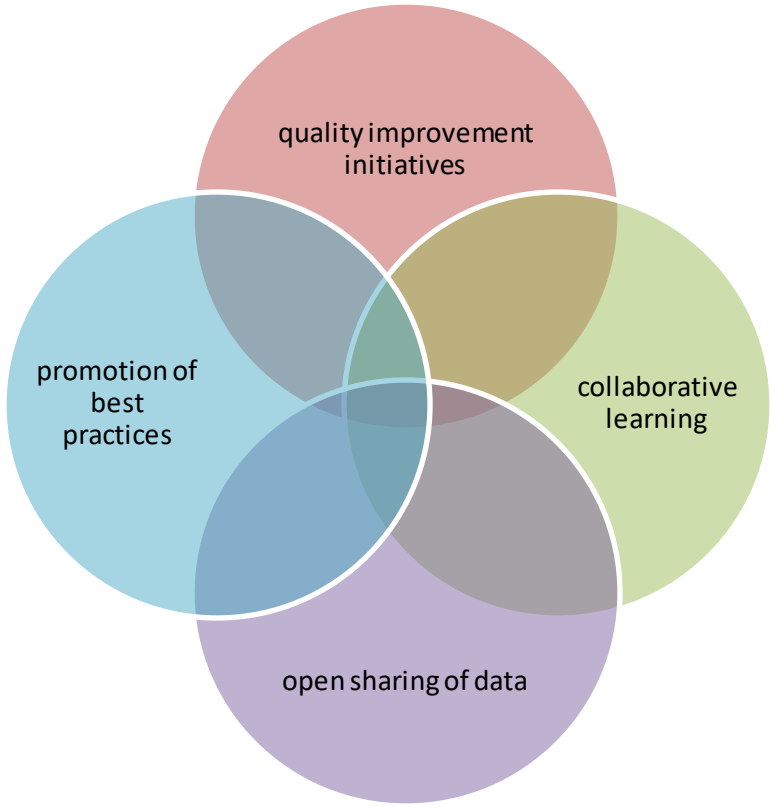
we are pleased to introduce to you

The Birth Equity Journey:

Optimizing Management of Obstetric Hemorrhage.

PNQIN Mission Statement

Through open sharing of data and promotion of best practices, PNQIN will achieve measurable improvements in perinatal health outcomes while eliminating health disparities and improving health equity among Massachusetts mothers, newborns, and their families.



PNQIN HEM Advisory Group – we are still growing!

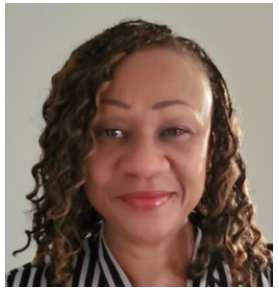
Arthur Chyan
Dept OB ANES, BWH

Audra Meadows, MD, MPH
PNQIN

Bonnell Glass, RN, MN
UMass Dartmouth

Emily Reiff, MD
MFM, BWH

Glenn Markenson, MD
CMH/BUSM/BMC



Hafsatou "Fifi" Diop, MD, MPH
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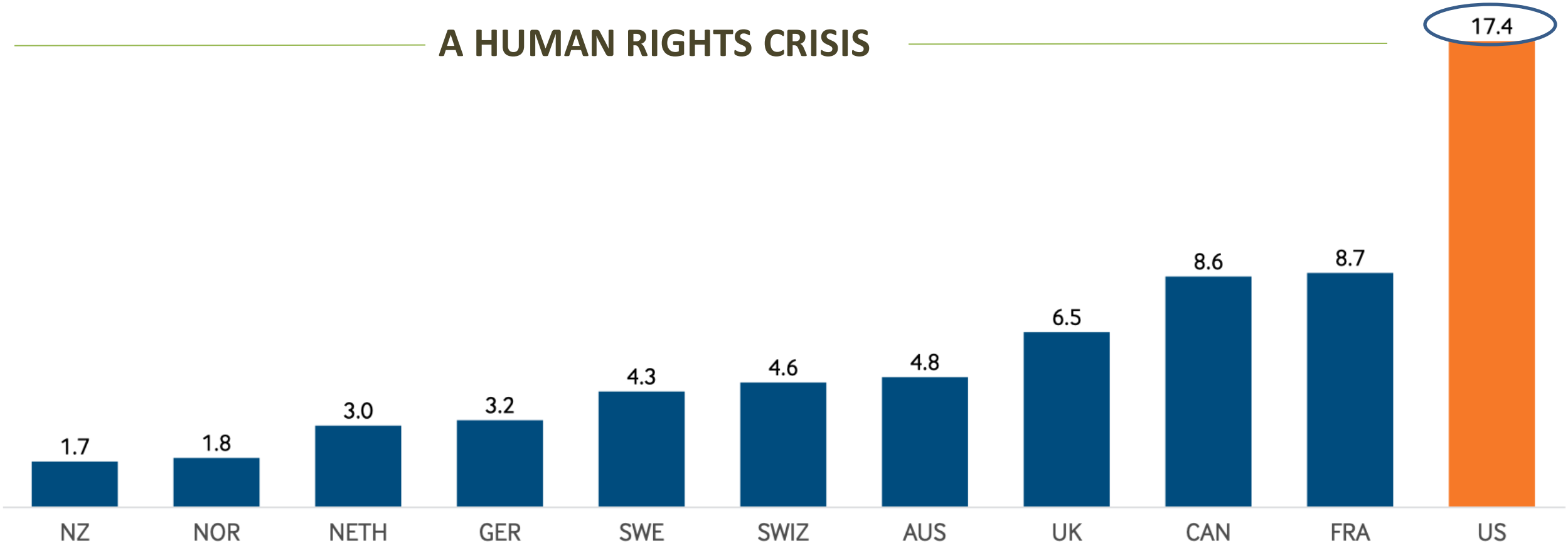
Ron Iverson, MD, MPH
BMC/PNQIN

Maternal Mortality Ratios in Selected Countries, 2018 or Latest Year

Deaths per 100,000 live births

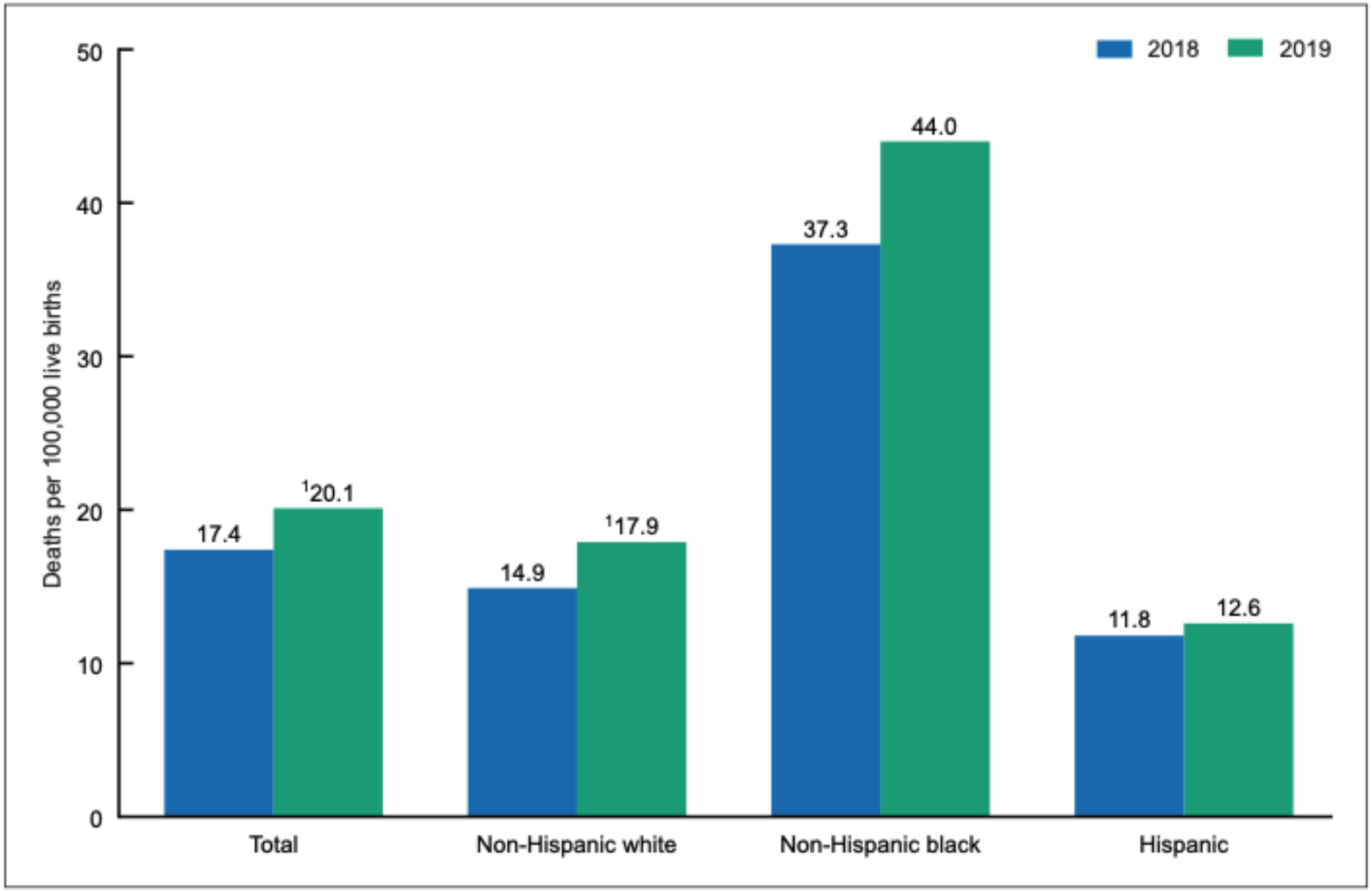
*In 2019 US Rate Rose to 20.1

A HUMAN RIGHTS CRISIS



Source: Roosa Tikkanen et al., Maternal Mortality and Maternity Care in the United States Compared to 10 Other Developed Countries (Commonwealth Fund, Nov. 2020).

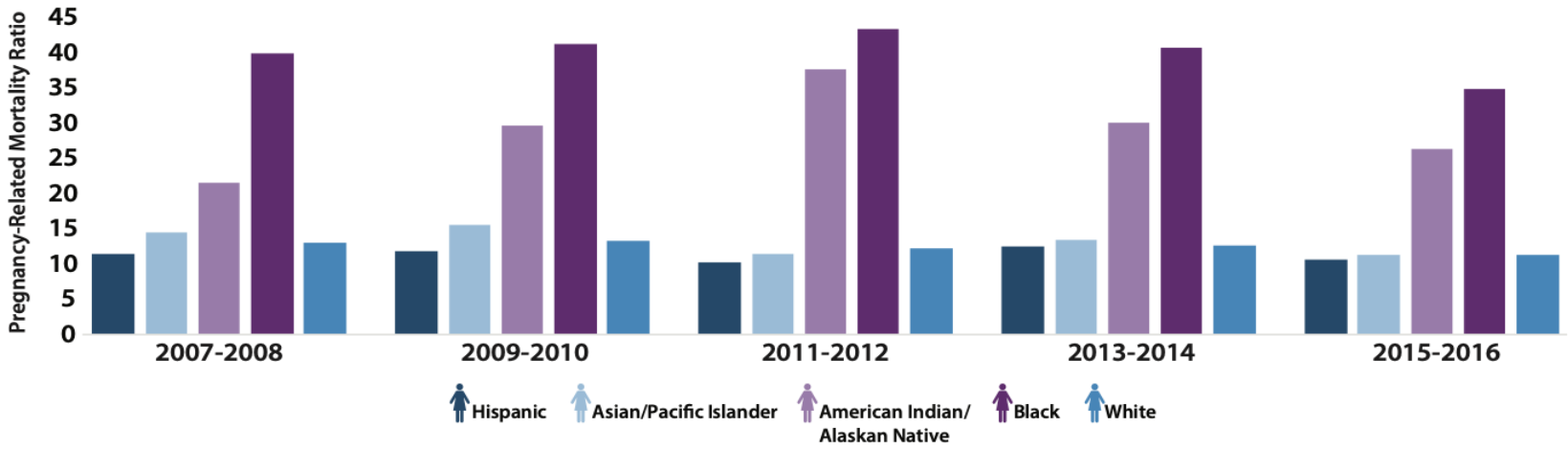
Figure 1. Maternal mortality rates, by race and Hispanic origin: United States, 2018–2019



[1]Statistically significant increase in rate from 2018 to 2019 ($p < 0.05$).
NOTE: Race groups are single race.
SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

Racial/Ethnic Disparities in Pregnancy-Related Deaths — United States, 2007–2016

Data confirms significantly higher pregnancy-related mortality ratios among Black and American Indian/Alaskan Native women. These gaps did not change over time.



700 About 700 women die each year in the U.S. as a result of pregnancy or its complications.

2-3x American Indian/Alaska Native and Black women are 2 to 3 times as likely to die from a pregnancy-related cause than white women.

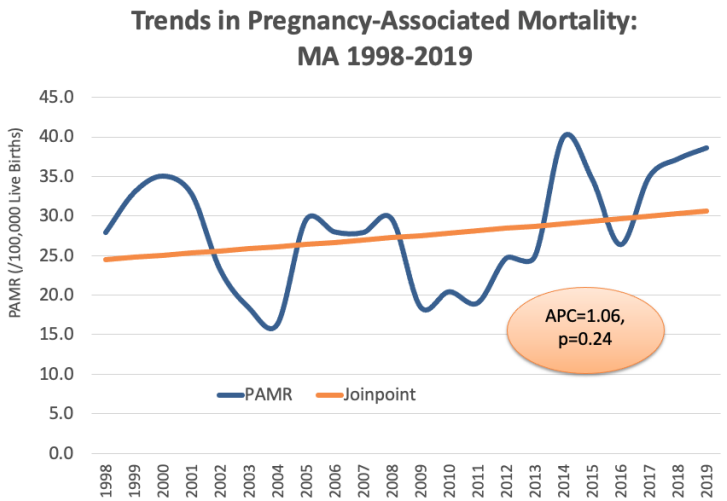
www.cdc.gov/reproductivehealth/maternal-mortality/index.html.

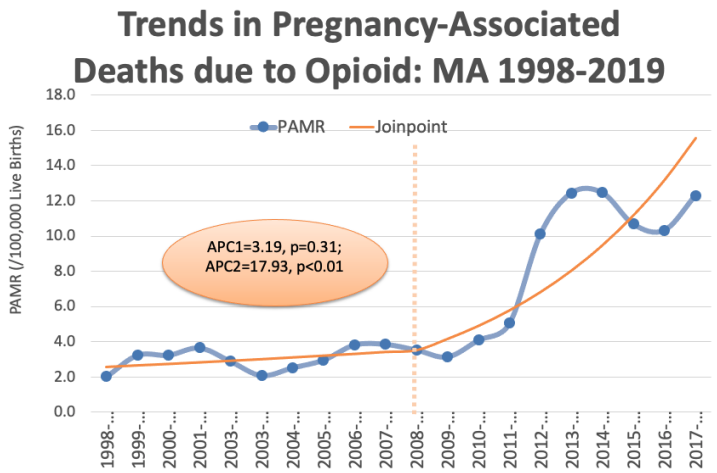
MA AIM Initiative

AIM
ALLIANCE FOR INNOVATION ON MATERNAL HEALTH

- AIM is a national, data-driven maternal safety and quality improvement initiative with a focus on implementation of ”safety bundles” to improve maternal care and safety, reduce morbidity and prevent mortality
- MA AIM Initiative (began September 2018, launched May 2019 with OUD)
- Obstetric Care for Women with Opioid Use Disorder (OUD) Bundle 2019-2022
- Now - Optimizing Management of Obstetric Hemorrhage Toward Achieving Birth Equity
- Coming Soon
  - Severe Hypertension in Pregnancy (Jan 2022)
  - Reduction of Peripartum Racial and Ethnic Disparities (2022)

MA AIM OUD Bundle





- Opioid-related deaths increased significantly 2008-present
- PNQIN responded by launching AIM OUD 2019
- Engaged over 30 birth facilities

Pregnancy

1. Identify opioid-use-disorder in pregnancy and ensure women are in treatment, including MAT

Newborn

2. Strive for family-centered care in the hospital, including rooming-in and non-pharmacologic care

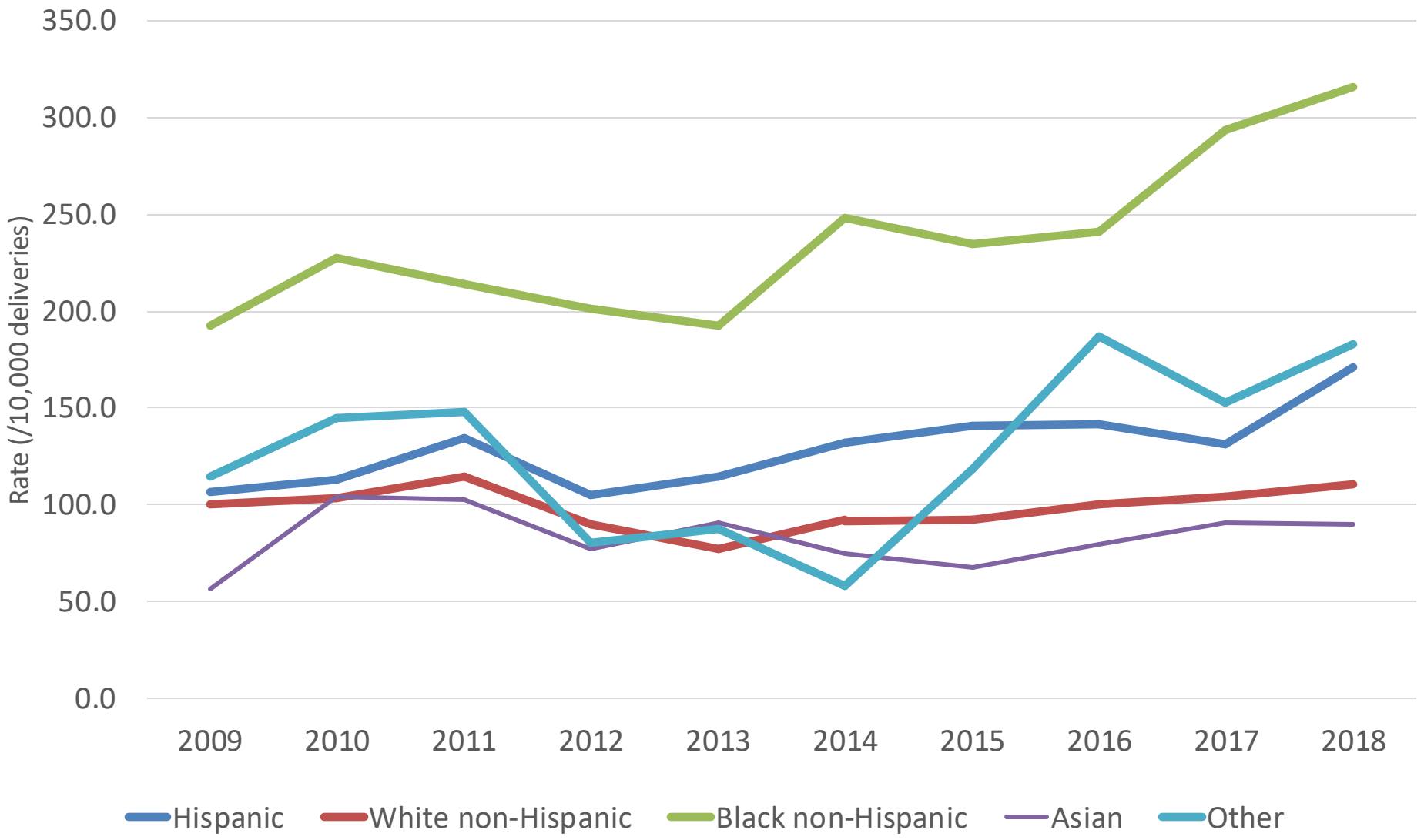
Post-Discharge

3. Improve support and follow-up after discharge, including enrollment in Early Intervention

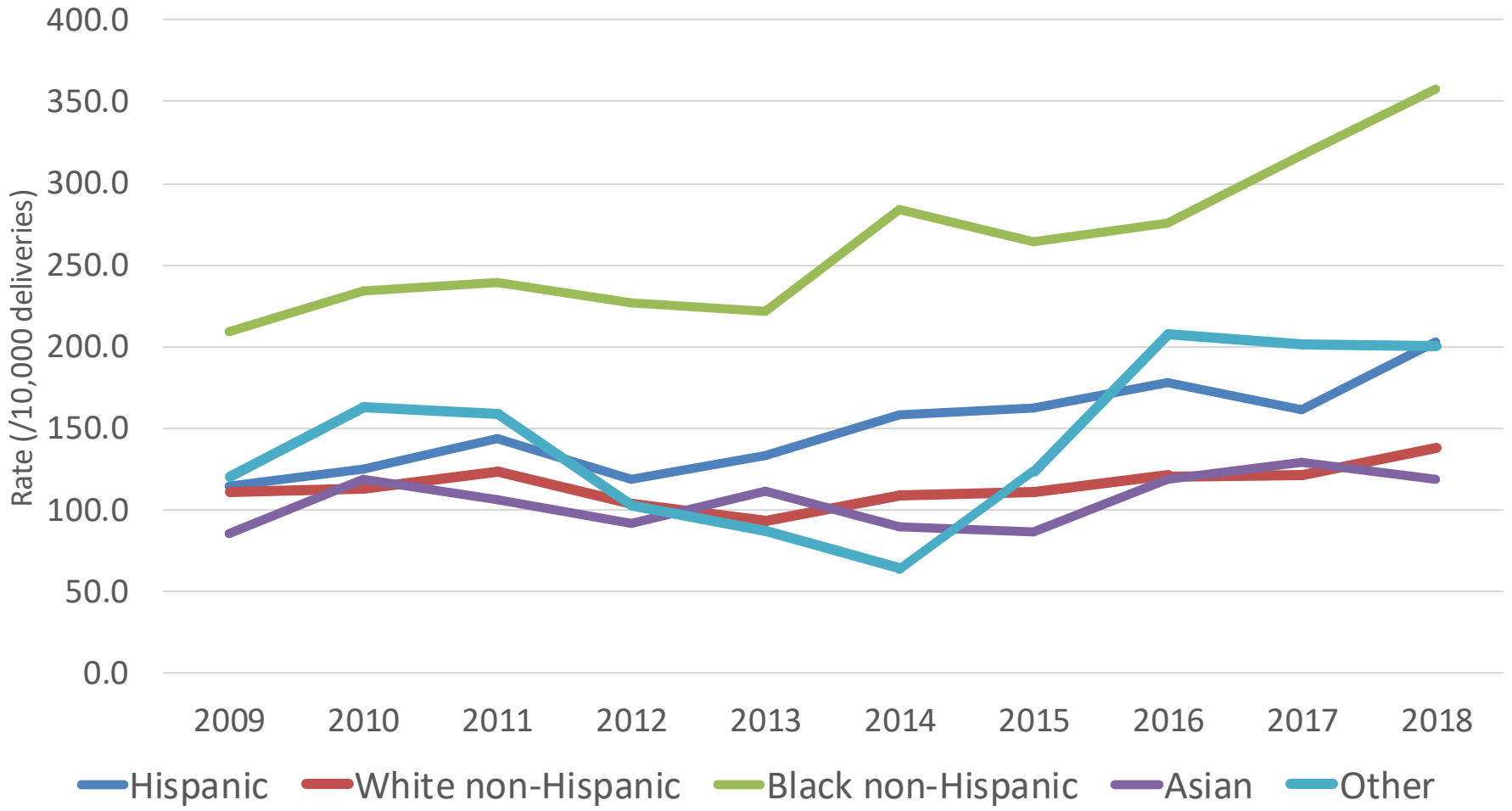
Successes of AIM OUD

- AIM OUD in Pregnancy Bundle
  - Universal screenings -> SBIRT trainings
  - Access to care -> MAT waiver trainings
  - Preparation -> Plans of safe care
  - Improving care -> Pain management protocols
- Stigma, bias, equity and trauma-informed care trainings
  - 187 providers at 15 hospitals trained so far
- Integrated care programs
  - e.g. Moms Do Care, MCPAP for Moms, others
- Successes
  - 50 additional providers trained in buprenorphine waiver
  - 31 out of 40 hospitals participated in OUD bundle

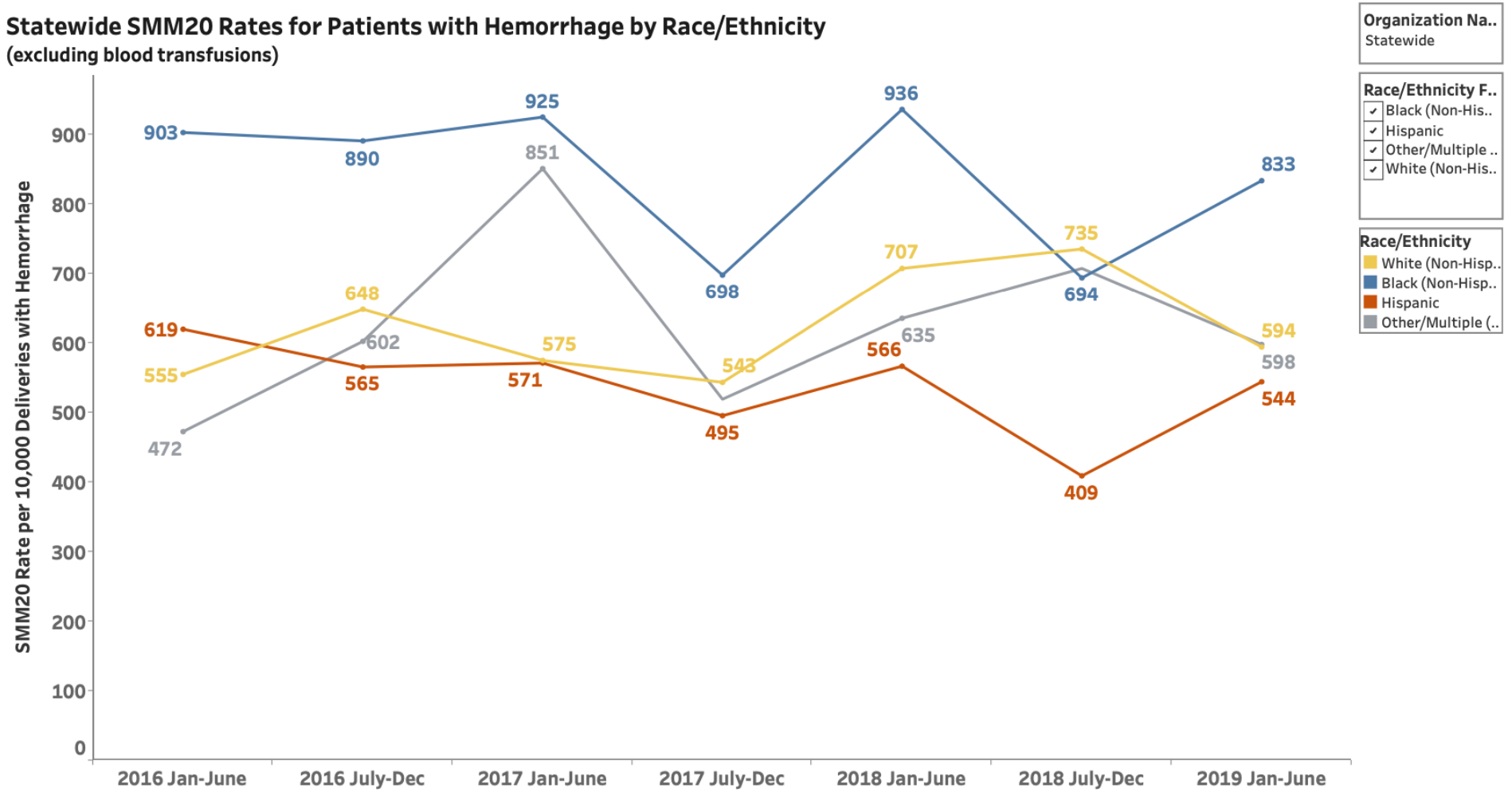
SMM20 among Deliveries in MA, 2009-2018



SMM21 among Deliveries in MA, 2009-2018



MA OB Hemorrhage SMM 20 Rates by Race Ethnicity



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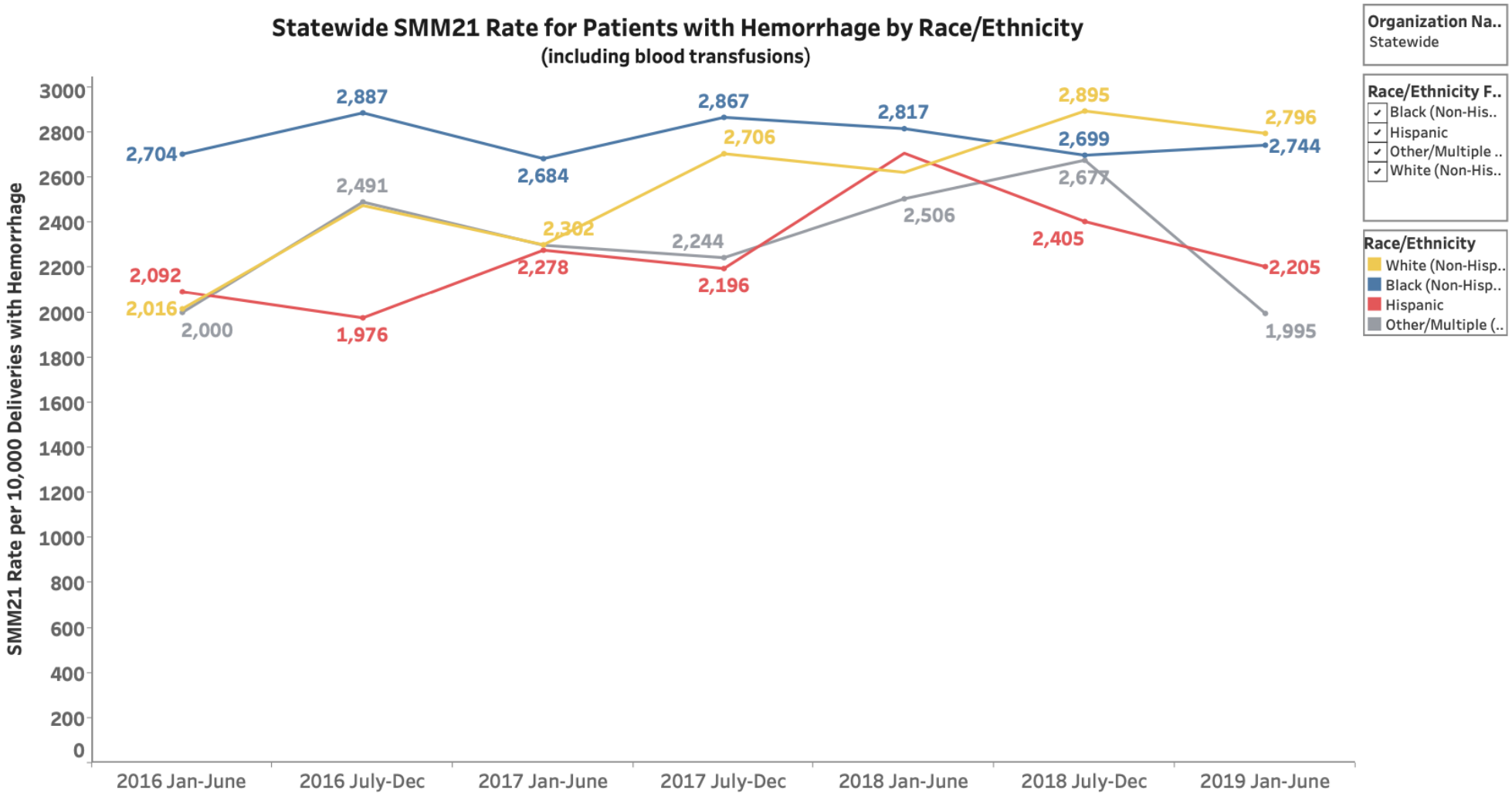

— JOINT STATEMENT —

Obstetrics and Gynecology: Collective Action Addressing Racism

As our nation confronts systemic racism and consequences of persistent inequities and disparate outcomes in health care, our organizations—which include the leading professional organizations in the fields of obstetrics and gynecology—are committed to changing the culture of medicine, eliminating racism and racial inequities that lead to disparate health outcomes, and promoting equity in women's health and health care. Our commitment to a

Equality and Equity

Assumption: Everyone benefits from the same (equal) support

Everyone gets the support they need to attain their full health potential

The Birth Equity Journey: Optimizing Management of Obstetric Hemorrhage

Emily Reiff, MD
Brigham & Women's Hospital

- Obstetric Hemorrhage Background (ACOG and AIM)
- Algorithms, Checklists, Protocols
  - Risk Assessment
  - Obstetric Comorbidity Index
  - Postpartum Hemorrhage Checklist
  - Quantitative Blood Loss
  - Obstetric Variance
  - Obstetric Hemorrhage Stage-Based Algorithm
  - Uterotonic Medications
  - Blood Product Replacement
  - Obstetric Team Debriefing Form
- Target Bundle Metrics
- Participation Logistics
  - Webinar Dates
  - PNQIN / BLC Memorandum of Understanding

The Importance

- 90% of all OB HEM related deaths are preventable!
- Hemorrhage is a leading cause of preventable morbidity and mortality in pregnancy
- We have effective therapies; denial and delay in diagnosis and management lead to poor outcomes and death
- Black women **are not more likely** to have an obstetric hemorrhage
- Black women **are more likely to die** if they hemorrhage

- Della Torre et al. Assessing Preventability for Obstetric Hemorrhage. American Journal of Perinatology (2011)
- California Department of Public Health Pregnancy Associated Mortality Review: Report from 2002 and 2003 Maternal Death Reviews (2011)
- Berg CJ et al. Preventability of pregnancy-related deaths: results of a state- wide review. Obstetrics and Gynecology (2005)

AIM Obstetric Hemorrhage Bundle

Maternal Hemorrhage

Cumulative blood loss of greater than or equal to 1,000 mL or blood loss accompanied by signs or symptoms of hypovolemia within 24 hours after the birth process

Source: ACOG Practice Bulletin #183 Oct 2017

COUNCIL ON PATIENT SAFETY IN WOMEN'S HEALTH CARE
safe health care for every woman

PATIENT SAFETY BUNDLE

Obstetric Hemorrhage

READINESS

Every unit

- Hemorrhage cart with supplies, checklist, and instruction cards for intrauterine balloons and compressions stitches
- Immediate access to hemorrhage medications (kit or equivalent)
- Establish a response team - who to call when help is needed (blood bank, advanced gynecologic surgery, other support and tertiary services)
- Establish massive and emergency release transfusion protocols (type-O negative/uncrossmatched)
- Unit education on protocols, unit-based drills (with post-drill debriefs)

RECOGNITION & PREVENTION

Every patient

- Assessment of hemorrhage risk (prenatal, on admission, and at other appropriate times)
- Measurement of cumulative blood loss (formal, as quantitative as possible)
- Active management of the 3rd stage of labor (department-wide protocol)

RESPONSE

Every hemorrhage

- Unit-standard, stage-based, obstetric hemorrhage emergency management plan with checklists
- Support program for patients, families, and staff for all significant hemorrhages

REPORTING/SYSTEMS LEARNING

Every unit

- Establish a culture of huddles for high risk patients and post-event debriefs to identify successes and opportunities
- Multidisciplinary review of serious hemorrhages for systems issues
- Monitor outcomes and process metrics in perinatal quality improvement (QI) committee

Standardization of health care processes and reduced variation has been shown to improve outcomes and quality of care. The Council on Patient Safety in Women's Health Care disseminates patient safety bundles to help facilitate the standardization process. This bundle reflects emerging clinical, scientific, and patient safety advances as of the date issued and is subject to change. The information should not be construed as dictating an exclusive course of treatment or procedure to be followed. Although the components of a particular bundle may be adapted to local resources, standardization within an institution is strongly encouraged.

The Council on Patient Safety in Women's Health Care is a broad consortium of organizations across the spectrum of women's health for the promotion of safe health care for every woman.

May 2015

For more information visit the Council's website at www.safehealthcareforeverywoman.org

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Hemorrhage
Algorithms, Checklists, Protocols

Algorithms, Checklist, Protocols

Prevent	Risk Assessment Form
Diagnose	Postpartum Hemorrhage Checklist Quantitative Blood Loss
Manage	OB HEM Management Algorithm Uterotonic Meds/ Blood Products
Debrief	Obstetric Team Debriefing Form

Risk Assessment Tables

Labor & Delivery Admission

	Medium Risk	High Risk
RISK FACTORS	☐ Prior cesarean, uterine surgery, or multiple laparotomies	☐ Placenta previa/low lying
	☐ Multiple gestation	☐ Suspected accreta/percreta
	☐ > 4 prior births	☐ Platelet count < 70,000
	☐ Prior PPH	☐ Active bleeding
	☐ Large myomas	☐ Known coagulopathy
	☐ EFW > 4000 g	☐ 2 or more medium risk factors
	☐ Obesity (BMI > 40)	/
	☐ Hematocrit < 30% & other risk	/
INTERVENTION	☐ **Type & SCREEN, review protocol**	☐ **Type & CROSS, review protocol**

Intrapartum

	Medium Risk	High Risk
RISK FACTORS	☐ Chorioamnionitis	☐ New active bleeding
	☐ Prolonged oxytocin > 24 hours	☐ 2 or more medium (admission and/or intrapartum) risk factors
	☐ Prolonged 2nd stage	/
	☐ Magnesium sulfate	/
INTERVENTION	☐ **Type & SCREEN, review protocol**	☐ **Type & CROSS, review protocol**

OhioHealth

Risk Assessment

Low Risk	Medium Risk	High Risk
Singleton Pregnancy	Multiple gestation	Previa/Accreta/Increta/Percreta
<4 prior deliveries	>4 prior deliveries	Hct <30; Plt <100,000
Unscarred uterus	Prior Cesarean or uterine surgery	Active Bleeding
No hx prior PPH	History of PPH	History of >1 PPH
No known bleeding disorder	LGA (>4kg)	Known coagulopathy
	Large Uterine Fibroids	Hemodynamic instability (Tachycardia/Hypotension)
	Obesity (BMI>40)	Suspected Abruption
	Polyhydramnios	Uterine Inversion
	Fetal Demise	
	Magnesium Sulfate use	***2+ medium risk factors***
	Induction/Prolonged oxytocin use	
	Prolonged 2nd Stage	
	Chorioamnionitis	
	Operative Vaginal Delivery	
	Precipitious Delivery	
	Shoulder Dystocia	
	Extensive Laceration	
Intervention: ** TYPE AND SCREEN	**** TYPE AND SCREEN**	**** TYPE AND CROSS**

**Ongoing assessment: ADMISSION, INTRAPARTUM and POSTPARTUM*

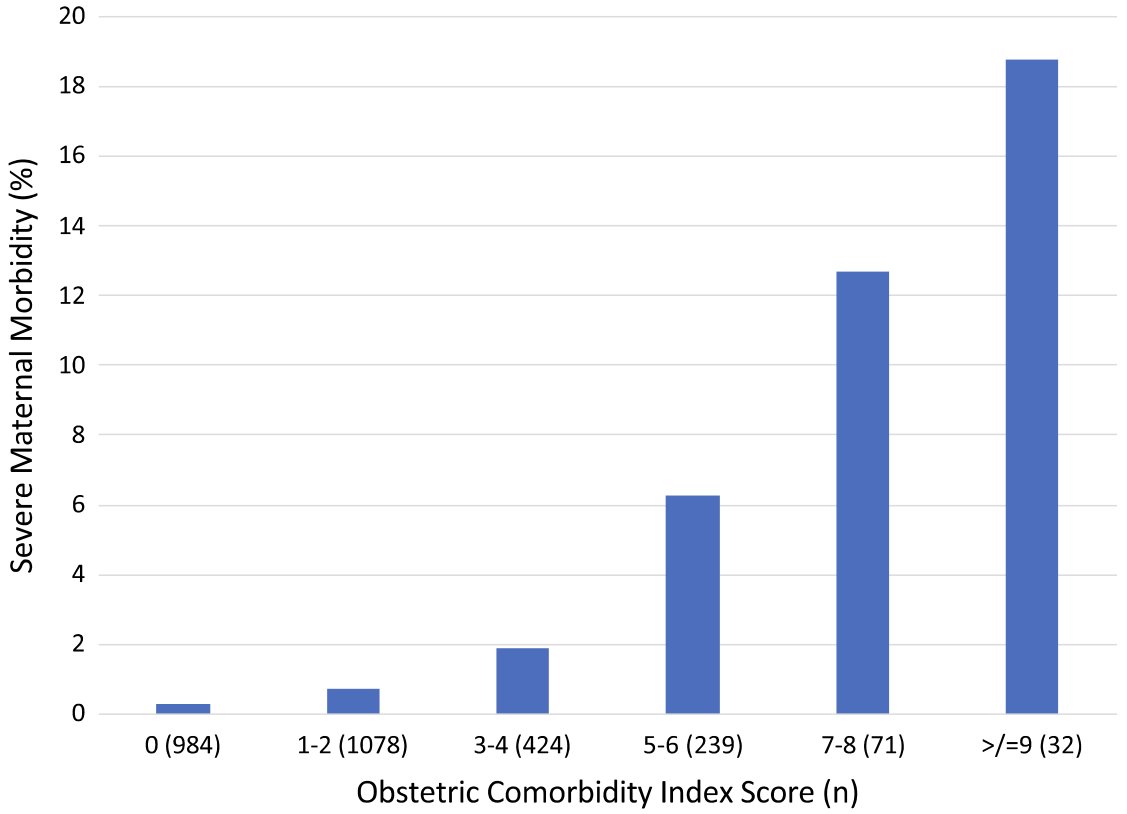
The Obstetric Comorbidity Index (OB-CMI)

Obstetric Comorbidity Index Score[1]

Patient Sticker Here

Maternal Condition	Points	Comments
Preeclampsia with Severe Features* or Eclampsia	5	
Preeclampsia / Gestational / Chronic Hypertension	2	
Congestive Heart Failure	5	
Pulmonary Hypertension	4	
Ischemic Heart Disease / Cardiac Arrhythmia	3	
Congenital Heart and/or Valvular Disease	4	
Multiple Gestation	2	
Intrauterine Fetal Demise	2	
Placenta Previa / Suspected Accreta / Abruption	4	
Previous Cesarean Delivery / Myomectomy	1	
Autoimmune Disease / Lupus	2	
HIV/AIDS	2	
Sickle Cell Disease / Bleeding Disorder / Coagulopathy / Anticoagulation	3	
Epilepsy / Cerebrovascular Accident / Neuromuscular Disorder	2	
Chronic Renal Disease	1	
Asthma	1	
Diabetes on Insulin	1	
Maternal Age > 44	3	
Maternal Age 40-44	2	
Maternal Age 35-39	1	
Substance Use Disorder	2	
Alcohol Abuse	1	
BMI > 50	3	
BMI > 40	2	
*Severe Features: Systolic BP ≥ 160, diastolic BP ≥ 110, creatinine > 1.1, oliguria (<30 cc/hr), elevated AST or ALT, platelets < 100,000, persistent epigastric pain, headache, or scotomata, placental abruption. ***See back of sheet for more details on hypertension.***	**Total:**	**MD Notified:**

FIGURE 2
Rate of severe maternal morbidity according to obstetric comorbidity index score



The frequency of severe maternal morbidity increased from 0.41% for those with a score of 0—18.75% for those with a score ≥9.

Easter et al. OB-CMI for maternal risk assessment. Am J Obstet Gynecol 2019.

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Multiple Gestation	2	
Intrauterine Fetal Demise	2	
Placenta Previa / Suspected Accreta / Abruption	4	
Previous Cesarean Delivery / Myomectomy	1	
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HIV/AIDS	2	
Sickle Cell Disease / Bleeding Disorder / Coagulopathy / Anticoagulation	3	
Epilepsy / Cerebrovascular Accident / Neuromuscular Disorder	2	
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Asthma	1	
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Maternal Age 35-39	1	
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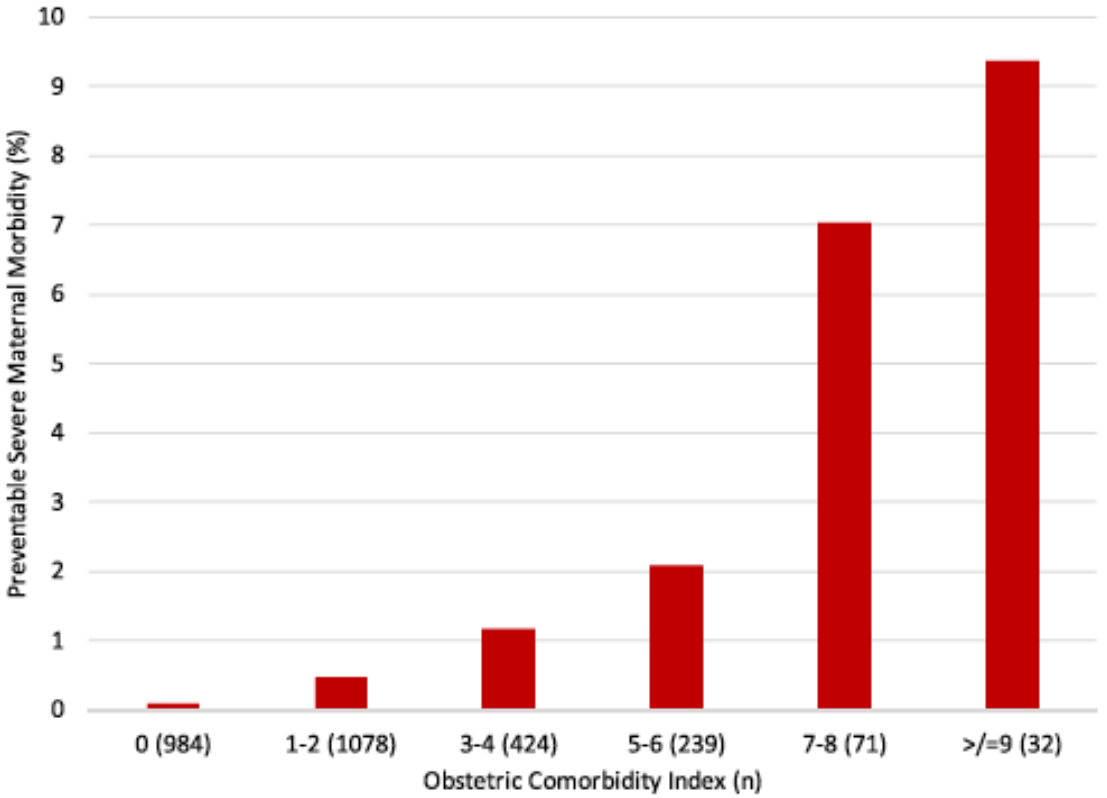
*Severe Features: Systolic BP ≥ 160, diastolic BP ≥ 110, creatinine > 1.1, oliguria (<30 cc/hr), elevated AST or ALT, platelets < 100,000, persistent epigastric pain, headache, or scotomata, placental abruption. ***See back of sheet for more details on hypertension.***	**Total:**	**MD Notified:**

FIGURE 3
Preventability of cases of severe maternal morbidity according to obstetric comorbidity index score



Risk of likely or possibly preventable severe maternal morbidity increased with an increasing obstetric comorbidity index score. The risk of preventable severe maternal morbidity ranged from 0.10% for those with an obstetric comorbidity index score of 0–9% for those with an obstetric comorbidity index score ≥9.

Easter et al. OB-CMI for maternal risk assessment. Am J Obstet Gynecol 2019.

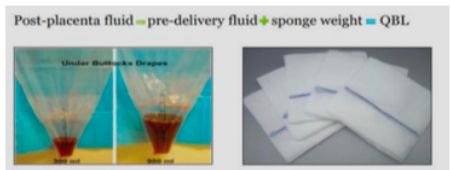
Quantitative Blood Loss

Quantification of maternal blood loss (QBL) after birth

Vaginal birth:

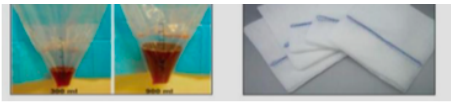
1. Begin immediately after birth of the neonate.
2. *Record* the amount of fluid collected in a calibrated under-buttocks drape or suction canister immediately after the neonate's birth (prior to delivery of the placenta). This fluid is generally amniotic fluid, urine, or feces.
3. *Record* the total volume of fluid collected in the calibrated under-buttocks drape or suction canister after the delivery of the placenta (generally blood) minus the amount of amniotic fluid, urine, or feces.
4. Avoid using irrigation until after the birth QBL is measured.
5. *Weigh* all blood-soaked materials and clots to determine cumulative volume and subtract the dry weight of the materials

   (1 g weight = 1 ml blood loss volume).



Cesarean birth:

SUCTION BLOOD



1. *Between delivery of infant and placenta:*
   I. OB suctions drape of amniotic fluid
   II. Scrub staff directs Circulator to change suction tubing to second canister
   III. *Omit canister switch if minimal amniotic fluid (patient is post AROM/SROM, in labor)*

   **If not using a 2nd canister- NOTE amniotic fluid amount, THEN any Blood amounts, SUBTRACT irrigation fluid amounts and amniotic fluid amount to derive TOTAL blood loss. (Keep track of fluids on OR count sheet or white board):

   TOTAL AMOUNT – AMNIOTIC VOLUME – IRRIGATION = BLOOD LOSS

2. *Prior to Irrigation*:
   I. Circulator records volume in second canister OR total blood loss calculated from single canister in EPIC calculator
      i. Record before irrigation used (BEST) **OR**
      ii. **IF** irrigation used and suctioned, Scrub staff communicates amounts to Circulator to be subtracted from canister

SPONGES

1. During case bloody lap sponges passed off by Scrub staff
2. Circulator places in hanging lap sleeve bags (10 sponges/sleeve)
3. Circulator weighs bloody sponges and lap sleeve bags all together (BEST: weight after each bag is full)

Total weight, #sponges -- entered in EPIC QBL calculator

Obstetrical Hemorrhage Stage Based Algorithm

OhioHealth

STAGE	TREATMENT
Stage 0 All Births	**Risk Assessment** (*ongoing*) T&S (*T&C with high risk)* **ACTIVE MANAGEMENT 3rd STAGE** • Oxytocin IV 10-40u infusion or 10u IM • Controlled traction on cord • Uterine massage after delivery of placenta
Stage 1 SVD: >500ml C-Sec: >1000ml	***Activate Hemorrhage Protocol*** • Open PPH Narrator • Increase Oxytocin rate • Fundal massage, foley catheter, keep warm • Insert 2nd IV line (16-18g) Send labs: **CBC, PT/PTT/INR and Fibrinogen** Examine: **Rule out retained POC, lac, hematoma** *Consider* **Uterotonics:** • **Methergine** 0.2mg IM *(repeat after 2-4hrs)* • **Hemabate** 250mcg IM (repeat after 15-90min) • **Cytotec** 600-800mcg SL/PO, 800-1000mcg PR ****Type and Cross 2u**
Stage 2 1000-1500ml	Continue Stage 1 **Uterotonics** Vaginal Delivery: • Bimanual Fundal Massage • Retained POC: **D&C** • LUS/Implantation/Atony: **Intrauterine Balloon** • Laceration: Pack and **repair** • *Consider* **VIR** Cesarean Delivery: • Atony: **B-Lynch/Compression suture, Intrauterine Balloon, Uterine Artery Ligation** **Tranexamic Acid** 1g IV over 10min *(repeat in 30min prn)* ****Consider* TRANSFUSE 2u pRBCS** *(thaw 2u FFP)*
Stage 3 >1500ml	***To OR*** • B-Lynch, Intrauterine Balloon, Uterine Artery Ligation, Hypogastric Artery Ligation • **VIR** • **Hysterectomy** ** *Consider* **MTP:** Transfuse Aggressively • 4:4:1 (pRBCs/FFP/plts) – early CRYO

Ongoing Cummulative Blood Loss

Obstetric Variance

Obstetric Variance: any situation in which there is concern for the patient.
Who calls it: any member of the team.
Who responds to it? Primary OB/Midwife, Anesthesia TL, and NIC
When should it be called: for any concern, or for any pre-defined trigger

Stage I **- Routine notification** -Initiated by any team member.	**Action** Notify: -primary OB -midwife OB coverage -Anesthesia staff and fellow TL -NIC	**Trigger Examples** 1) Operative vaginal delivery 2) Perineal repair more than a simple second degree 3) Retained placenta 4) More than 500 mL blood loss after vaginal birth, more than 1000 mL after cesarean delivery 5) BP > 170/110, < 80/40 6) Pulse > 120 7) O2 saturation < 95% 8) Administration of intravenous antihypertensives 9) Altered maternal mental status	**Key Questions** 1) Is anesthesia adequate? 2) Are any laboratory investigations necessary? 3) Are any medications indicated? 4) Are blood products needed? 5) Would it be helpful to move to a different location? Need to escalate management and/or arrange back-up coverage? → **proceed to STAGE II**
Stage II **-"All Hands On Deck"** -Initiated by NIC, Anes MD, or OB.	**Action** Notify: -all OB and OB anesthesia staff in hospital, OB Chief Resident called to West Nursing Station.	**Trigger Examples** 1) An unstable patient a. Uncontrolled hemorrhage b. Septic shock c. Cardiac arrest 2) Failure to deliver at caesarean section 3) Surgical complication needed additional attending level help 4) An obtunded patient with no diagnosis	**Key Questions** 1) Should the mass transfusion protocol be activated? 2) Is specialized surgical help required? Need to escalate to emergent specialized surgical or medical back-up? → **proceed to STAGE III**
Stage III **-Crisis Management** -Initiated by NIC, Anes MD, or OB.	**Action** Notify: -MFM if not already present -Anesth backup Other specialties as needed: -GYN Onc -trauma - gen surg -urology -IR -Medicine	**Trigger Examples** 1) Worsening instability *(Aneshthesia back-up)* a. Massive hemorrhage b. Refractory cardiac arrest 2) Surgical complication needed additional attending level help a. Complicated GYN surgery *(GYN Onc)* b. Need for aortic crossclamp *(trauma)* c. Bowel injury *(gen surg)* d. Baldder or ureteral injury *(urology)* e. Stability but no hemostasis *(IR)* f. Sepsis, pneumonia, ventilation req *(Medicine)*	**Key Questions** 1) Ultimate diagnosis? 2) Definitive management complete? → **Disposition to ICU:** **SICU** **MICU** a. reassess patient stability prior to transfer b. transport monitoring as per anesthesia c. anesthesia and OB MD transport to ICU

OhioHealth

Uterotonic Medications

	Dosing	Onset of Action	Frequency	Contraindications	Side Effects
Pitocin *(Oxytocin)*	IV: **10-40U**/1L IV IM: 10u	1-6min; 3-5min	continuous	hypersensitivity	Hypotension, tachycardia, water intoxication (hyponatremia)
Methergine *(Methylergonovine)*	IM: **0.2mg** (1 ampule)	2-5min	q2-4hrs **may repeat if adequate response to 1st dose, otherwise move to 2nd level uterotonic	HTN	Nausea/vomiting
Hemabate *(Carboprost/PGF2a)*	IM: **0.25mg** (1 ampule)	30min	q15-90min *(max 8 doses)*	Asthma; active liver or cardiac dz	Nausea/vomiting/diarrhea, fever, bronchospasm
Cytotec *(Misoprostol PGE1)*	SL/PO: 600-800mg PR: **800-1000mg**		Single dose	hypersensitivity	Diarrhea, shivering, fever, HA
Tranexamic Acid	**1g** in 100ml NS (IVPB) or IVP over 10min ***May use concurrently with other uterotonic meds*		May repeat after 30min *(max dose 2g)* *Give within 3hrs of bleeding*	Active clot	Rapid infusion can cause hypotension

Blood Product Replacement

Product	Dosing	Contents	Volume	Expected response	When to transfuse
pRBCs **first line product	1 unit	Red Blood Cells	300ml	Inc **Hgb 1g**/dL per unit; **Hct 30%**	Hgb <7
Platelets	1 pack	Platelets	300ml (6u)	Inc **plt 30-60,000**/mm^3 per pk	Plt <50
FFP*	1 unit	All clotting factors	250ml	Inc **Fibrinogen 10ml**/dL per unit	Fibrinogen <200 PTT >1.5 control
Cryoprecipitate*	1 unit	Fibrinogen, vWF, Factors VIII/XIII	10ml	Inc **Fibrinogen 10mg**/dL per unit	Fibrinogen <200

*Frozen and must be thawed = 30-45min

APPENDIX C: CMQCC ACUTE ADVERSE EFFECTS OF TRANSFUSION

BLOOD PRODUCT REPLACEMENT: OBSTETRIC HEMORRHAGE, From Holli Mason, MD

Acute Adverse Effects of Transfusion (Onset within minutes or hours)

Type of Reaction	Incidence	Usual Cause	Signs or Symptoms
Hemolysis-Immunologic (Acute Hemolytic transfusion reaction)	1:25,000	Red cell incompatibility, usually ABO	Fever, chills, renal failure, DIC, pain, hypotension, tachychardia, anxiety, hemoglobinemia, hemoglobinuria, cardiac arrest.
Hemolysis-Physical or Chemical	Unknown	Overheating, freezing, addition of hemolytic drugs or solutions.	Asymptomatic hemoglobinuria, rarely DIC, renal failure, hypotension
Febrile Nonhemolytic	0.5-1.5%	**Recipient** antibodies to donor leukocytes; or preformed cytokines in blood product	Fever, chills
Anaphylaxis	1:20,000-47,000	IGA deficient recipient with antibodies to IgA in donor plasma; antibodies to other plasma proteins, WBCs and platelets.	Respiratory obstruction and cardiovascular collapse, angioedema, anxiety, chills, agitation.
Urticarial	1-3%	Antibody to donor plasma proteins	Pruritis and hives
Transfusion Related Acute Lung Injury (TRALI, Noncardiogenic Pulmonary Edema)	Reported 0.001%, 0.02%, 0.34%	**DONOR** antibody to recipient leukocytes or patient antibody to donor specific HLA or granulocytes	Respiratory distress, pulmonary edema and hypoxemia with normal wedge pressures. "White out" on CXR
Congestive Heart Failure	Unknown	Volume overload	Respiratory distress
Septic Complication	1:1000-7:1000	Bacterial contamination	Usually gram negative sepsis when the transfusion is red cells, gram positive cocci are most common in platelet transfusion
Hypothermia	Unknown	Rapid infusion of cold blood	Chills without fever
Hyperkalemia	Unknown	**RAPID** infusion of stored red cell	Cardiac dysfunction (usually problematic only in infants or those with compromised renal function)
Hypocalcemia	Unknown	**RAPID AND MASSIVE** transfusion of stored blood **Prophylactic administration of Calcium is not recommended**.	Cardiac dysfunction (usually problematic only in patients with **SEVERE** hepatic insufficiency or neonatal massive exchange transfusion)

Obstetric Team Debriefing Form

Remember: Debriefing is meant to be a learning experience and a way to address both human factors and systems issues to improve the response for next time. There is to be no blaming/finger-pointing.

Type of event: _____ **Date of event:** _____

Location of event: _____

Members of team present: (check all that apply)

- ☐ Primary RN
- ☐ Primary MD
- ☐ Charge RN
- ☐ Resident(s)
- ☐ Anesthesia personnel
- ☐ Neonatology personnel
- ☐ MFM leader
- ☐ Patient Safety Officer
- ☐ Nurse Manager
- ☐ OB/Surgical tech
- ☐ Unit Clerk
- ☐ Other RNs

Thinking about how the obstetric emergency was managed,

Identify what went well: (Check if yes)

- ☐ Communication
- ☐ Role clarity (leader/supporting roles identified and assigned)
- ☐ Teamwork
- ☐ Situational awareness
- ☐ Decision-making
- ☐ Other: _____

_____

Identify opportunities for improvement: "human factors" (Check if yes)

- ☐ Communication
- ☐ Role clarity (leader/supporting roles identified and assigned)
- ☐ Teamwork
- ☐ Situational awareness
- ☐ Decision-making
- ☐ Other: _____

_____

Identify opportunities for improvement: "systems issue" (Check if yes)

- ☐ Equipment
- ☐ Medication
- ☐ Blood product availability
- ☐ Inadequate support (in unit or other areas of the hospital)
- ☐ Delays in transporting the patient (within hospital or to another facility)
- ☐ Other: _____

_____

Quality Improvement Guide

- Aim Statement
- Driver Diagram
- Key Change Idea Mapping
- PDSA Planning
- Measurement Strategy

Aim Statement

What are we trying to accomplish?

What? What's the problem or opportunity?

To prevent denial and delay in diagnosis of OB HEM, we will implement and use a QBL system for all deliveries.

How much? By how much will you improve? Or "how good" to you want to get?

Increase from baseline of 25% of deliveries to 100% of deliveries

By When? What is the date by which you will achieve the level of improvement you've set out to accomplish?

In 6 months (by November 1, 2021)

For Whom? Who is the customer or population who will benefit from the improvement?

All women on our labor and delivery unit giving birth

Where? What are the boundaries of the process or system you're trying to improve? Where does it begin and end?

In the Labor and Delivery Unit at ABC Hospital

Complete aim statement:

To prevent denial and delay in the diagnosis and management of obstetric hemorrhage, we will increase the percentage of births using QBL to measure blood loss from 25% to 100% by November 1, 2021.

Ask a colleague to check your work and recommend improvements:

- ❑ Is the problem or opportunity clearly stated?
- ❑ Do you know what the team is going to do about the problem?
- ❑ Has the team set a numerical goal to quantify the amount of improvement they'd like to make?
- ❑ Do you know the calendar date by which the team plans to achieve the goal?
- ❑ Is it clear who will benefit from the improvement?
- ❑ Is the scope of the project clear?
- ❑ Do you know why this improvement effort is important?

What? What's the problem or opportunity?

How much? By how much will you improve? Or "how good" to you want to get?

By When? What is the date by which you will achieve the level of improvement you've set out to accomplish?

For Whom? Who is the customer or population who will benefit from the improvement?

Where? What are the boundaries of the process or system you're trying to improve? Where does it begin and end?

Complete aim statement:

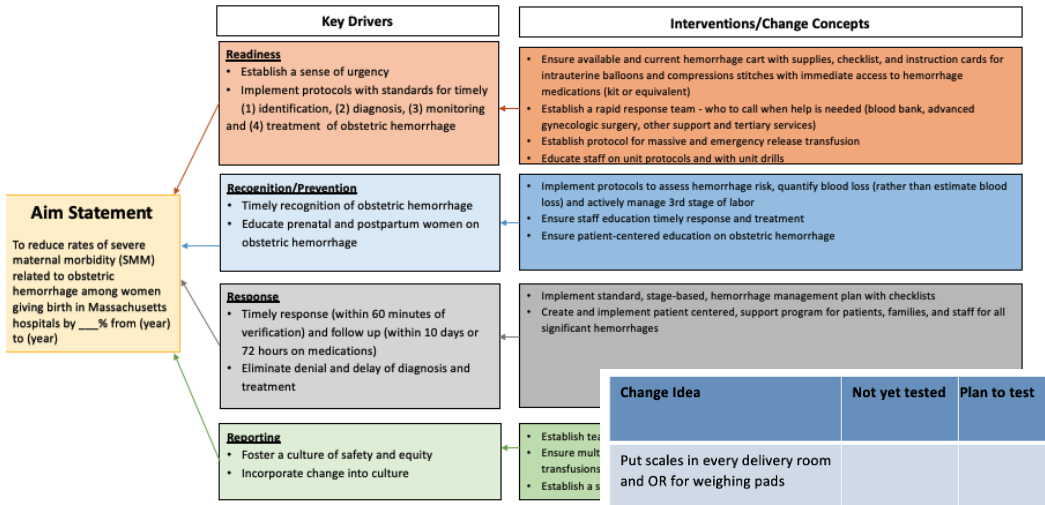
Ask a colleague to check your work and recommend improvements:

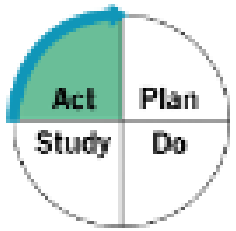
- ❑ Is the problem or opportunity clearly stated?
- ❑ Do you know what the team is going to do about the problem?
- ❑ Has the team set a numerical goal to quantify the amount of improvement they'd like to make?
- ❑ Do you know the calendar date by which the team plans to achieve the goal?
- ❑ Is it clear who will benefit from the improvement?
- ❑ Is the scope of the project clear?
- ❑ Do you know why this improvement effort is important?

Additional QI Resources

- Driver Diagram
- Key Change Idea Mapping
- Fishbone Diagrams
- Process Mapping
- PDSA Planning
- Measurement Strategy
- Run Chart Support and more

Driver Diagram for Obstetric Hemorrhage
(Based on AIM Bundle)





Change Idea	Not yet tested	Plan to test	Currently testing	Implemented
Put scales in every delivery room and OR for weighing pads				X
Conduct quarterly, unit-wide hemorrhage simulation drills		X		
Build hemorrhage cart and identify reliable process for re-			X	

Measure Type	Characteristics	Recommended Number
Outcome	• Voice of the customer or patient • How is the system performing? • What is the result? "so what" measure • Always links back to your aim	1-2

Process	• Voice of the workings of the system
	• Are the parts/steps in the system performing as planned?
	  ○ Can be an early indication of improvement in the outcome
	  ○ Careful not to over do the number
		3-5

Balancing	• Looking at a system from different directions/dimensions
	• Looks at the impact a change may have on other parts of the system
	  ○ Unintended consequences
	  ○ Upstream/downstream
	• Optional, but wise
		1-2

PNQIN Champion Story

Shirley Hamill, MSN, RN, IBCLC, LCCE
Nurse Manager
The Birthplace
Baystate Franklin Medical Center

Baystate Franklin Medical Center
AIM Statement

By June 30, 2021, 100% of all cesarean births will include Quantitative Blood Loss (QBL) measure done and documented in the EMR.

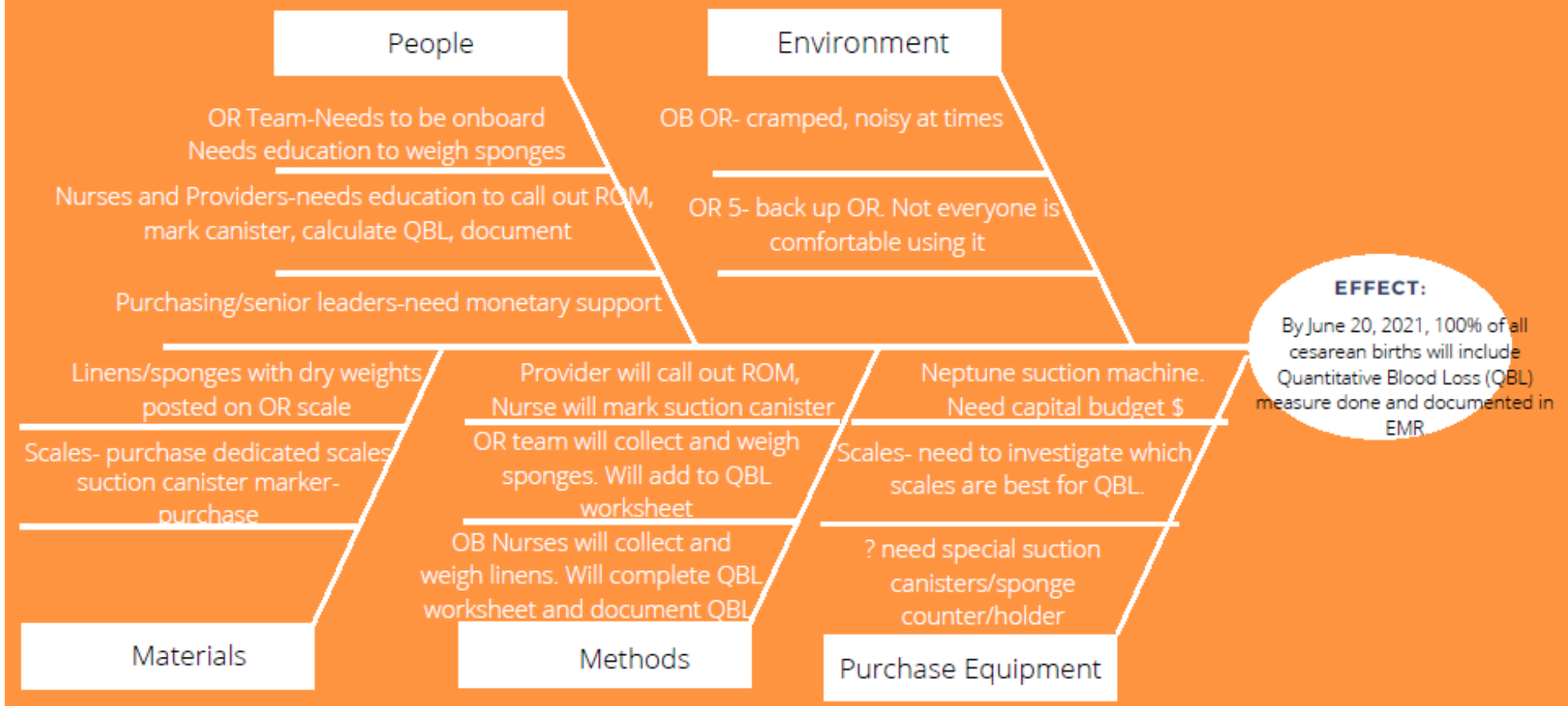
Baystate Franklin Medical Center, Assignment #2

	Team response	
Project AIM	By June 30, 2021, 80% of all cesarean births will include Quantitative Blood Loss (QBL) measure done and documented in the EMR	
Stakeholders (list roles)	Obstetricians from Pioneer Women's Health- surgeons Certified Nurse Midwives from Pioneer Women's Health- 2nd assist RNs from the Birthplace- Primary Nurse for mother and baby RNs from BFMC OR- circulator Surgical Techs from BFMC OR- surgical tech Unit managers and ANM/educators from the Birthplace and OR Clinical Engineering- provide and maintain scales	
Measures & baseline data	**Structure measure:** % of times Appendix B of the Hemorrhage Obstetrical Clinical Care Guideline will be utilized to measure QBL Numerator: # of C/S pts where PPH guideline Appendix B was utilized Denominator: Total # of C/S pts Data Collection: Chart review **Process measure:** % of QBL calculation sheets completed by nurses Numerator: # of calculation sheets collected Denominator: # of total C/S Data Collection: Collect QBL calculation sheet for all patients that had QBL measured **Process measure:** % of times that QBL is documented in EMR by provider Numerator: # of pts that have QBL documented in EMR Denominator: # of total C/S Data Collection: Chart review of QBL documentation	Measure 1 baseline data Measure 2 baseline data Measure 3 baseline data  **Extra Credit: Balancing Measure:** OR team (OR nurse and Surg tech) c/o having to do extra work to measure QBL Numerator:?? Denominator: ?? Data Collection Baseline data:

Measures & baseline data, cont'd	**Outcome measure:** By June 30, 2021, 80% of all cesarean births will include Quantitative Blood Loss (QBL) measure done and documented in the EMR Numerator: # of C/S pts where QBL was measured Denominator: Total # of C/S pts Data Collection: Chart review for documentation of QBL on all C/S patients	

Cause and Effect

FISHBONE_DIAGRAM



Participation Logistics

Kali Vitek, MPH
PNQIN Project Manager

Site Team Expectations

Step 1 Teaming

- Identify improvement team
- Send team to PNQIN Admin
- Gather, review, upload your baseline data (S/P measures)
- Review your site OB HEM policies

Step 2 Designing

- Complete your AIM statement
- Identify key drivers specific to your site/data, priority matrix
- Identify interventions to address drivers

Step 3 Operationalizing

- Create workflow to implement change ideas
- Model for Improvement/ PDSA /Measure
- Attend webinars

Build a Plan for Improvement

- **Phase One**
  - Understand the need for change
  - Enlist a core team
  - Develop a vision and strategy
- **Phase Two**
  - Create a sense of urgency
  - Communicate the vision often
  - Empower others to act on the vision
  - Inspire and celebrate small wins
- **Phase Three**
  - Maintain interest in the improvement
  - Create systems so the process is less dependent on the leader

Building an Improvement Team (CAST)

Champion – individual who believe in change but have no authority

Agent – individual who is responsible for implementing change

Sponsor – individual with authority who can express, model and reinforce

Target – individual to whom change is happening

MA AIM _ Obstetric Hemorrhage Bundle Webinars

- May 11, 2021 12-1:30pm Kickoff Webinar
- June 22, 2021 12-1pm Team Webinar #1
- July 20, 2021 12-1pm Team Webinar #2
- Aug 17, 2021 12-1pm Team Webinar #3
- Sep 21, 2021 12-1pm Team Webinar #4
- Oct 19, 2021 12-1pm Team Webinar #5
- Nov 16, 2021 12-1pm Team Webinar #6

*CME/CEU for webinars

COMING JAN 2022 - MA AIM Severe Hypertension in Pregnancy Bundle

Your HEM Bundle landing page

The Massachusetts Perinatal Quality Collaborative

Home | About Us | Meetings and Events | Obstetrical Projects | Team Resources | PNQIN COVID-19 Response | Contact Us

PNQIN Massachusetts AIM Initiative Obstetric Hemorrhage Safety Bundle

Please feel free to email Kali Vitek at PNQINAdmin@pnqinma.org with any questions!

On behalf of the Perinatal-Neonatal Quality Improvement Network of Massachusetts (PNQIN)'s MA AIM Initiative to improve maternal outcomes, **we are thrilled to begin implementation of the AIM OB Hemorrhage Bundle in June 2021.** PNQIN launched the Massachusetts AIM Initiative (Alliance for Innovation on Maternal Health) in 2019 to answer the national call to action to prioritize and improve maternal health and safety for all.

Rising maternal morbidity and mortality rates and the stark, persistent racial and ethnic disparities among birthing populations are alarming. In 2021, the National Center for Health Statistics reported the maternal mortality rate for 2019 as 20.1 deaths per 100,000 live births. **Inequities persist as well: Black and Indigenous people remain three to four times more likely than others to die from pregnancy-related causes.** A rate of 44.0 is reported for non-Hispanic Black birthing people; a 2.5 to 3.5 times higher than non-Hispanic White (17.9) and Hispanic birthing people (12.6). Maternal death is a tragic and key sentinel event, and although total numbers are small, there is no acceptable number. **Investigators estimate that more than 60% of all maternal deaths are preventable.** Eliminating preventable deaths and the Black-White gap in mortality is a public health priority.

HEM Bundle Onboarding

MPQC
Massachusetts Perinatal Quality Collaborative

The Massachusetts Perinatal Quality Collaborative

Home | About Us | Meetings and Events | Obstetrical Projects | Team Resources | PNQIN COVID-19 Response | Contact Us

AIM OB Hemorrhage Bundle:
Onboarding Form

This brief (7 minute) survey asks you to provide contact information for:

1. Your hospital's AIM Hemorrhage Bundle team (OB, RN, and CNM)

2. The person in your department/hospital who is responsible for signing data use agreements (DUA) or memorandums of understanding (MOU).

Click the "Fill out the form" link below to complete!

HEM Toolkit Page

AIM OB Hemorrhage Bundle: *Toolkit*

Perinatal-Neonatal Quality Improvement Network of Massachusetts
TOOLKIT

Optimizing Management of Obstetric Hemorrhage and Birth Equity

This page is home to the PNQIN AIM **Optimizing Management of Obstetric Hemorrhage and Birth Equity Toolkit**.

Click the links below to view or download the entire toolkit or individual resources.

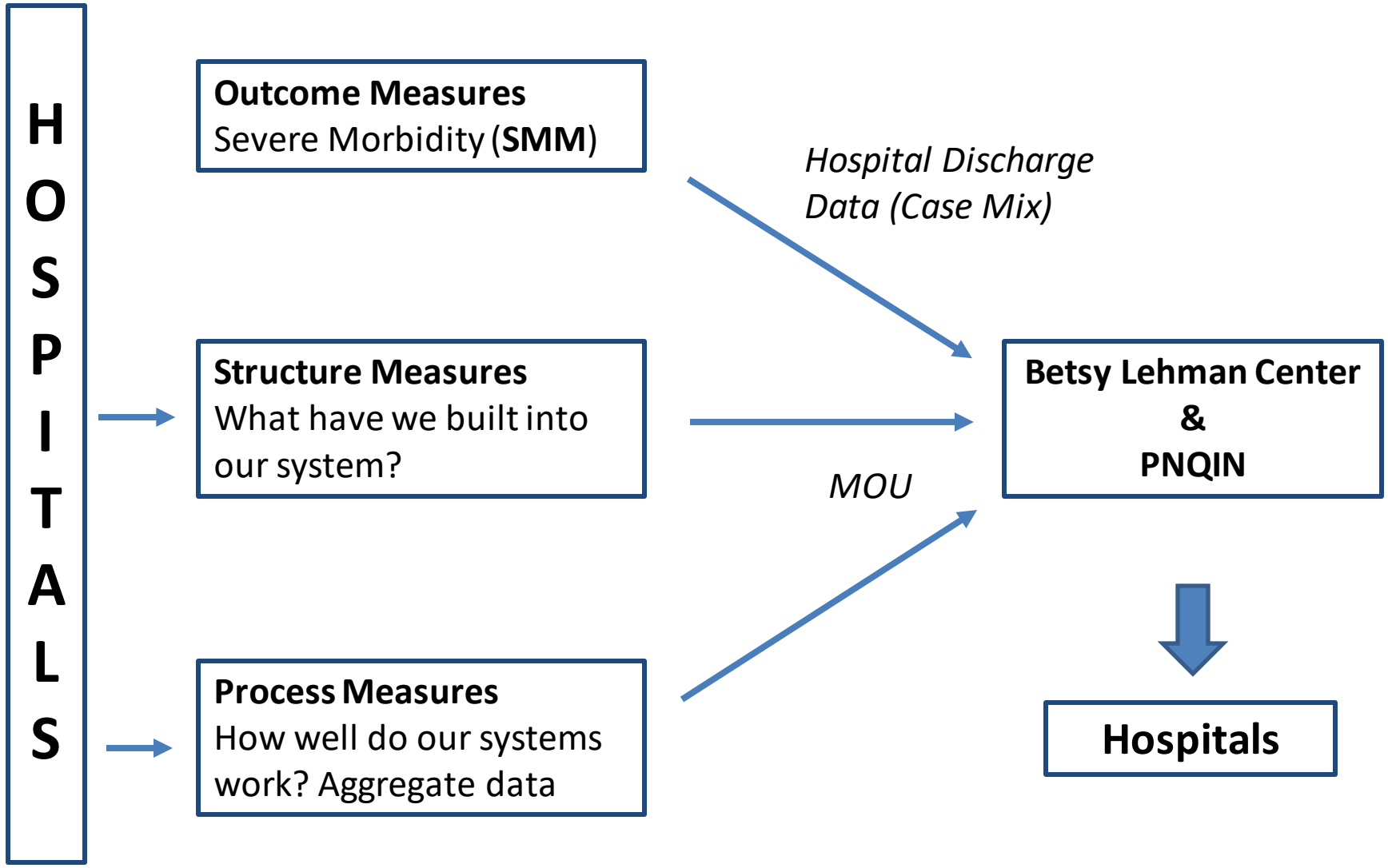
If you have resources from your hospital to share with other teams, feel free to email them to PNQINAdmin@pnqinma.org!

AIM HEM Onboarding | HEM Toolkit | QI Resources

Hemorrhage Toolkit

01 Click here to download the full HEM Toolkit!

Data Flow


HOSPITALS
Outcome Measures
Severe Morbidity (SMM)
Structure Measures
What have we built into our system?
Process Measures
How well do our systems work? Aggregate data
Hospital Discharge Data (Case Mix)
MOU
Betsy Lehman Center & PNQIN
Hospitals

OB HEM Bundle Measures collected monthly

Structure Measures

1. Has your hospital developed OB specific resources and protocols to support patients, family and staff through major OB complications?
2. Has your hospital established a system in your hospital to perform regular formal debriefs after cases with major complications?
3. Has your hospital established a process to perform multidisciplinary systems-level reviews on all cases of severe maternal morbidity (including, at a minimum, birthing patients admitted to the ICU or receiving ≥ 4 units RBC transfusions)?
4. Does your hospital have OB hemorrhage supplies readily available, typically in a cart or mobile box?
5. Does your hospital have an OB hemorrhage policy and procedure (reviewed and updated in the last 2-3 years) that provides a unit-standard approach using a stage-based management plan with checklists?
6. Were some of the recommended OB Hemorrhage bundle processes (i.e., order sets, tracking tools) integrated into your hospital's Electronic Health Record system?

Process Measures

1. How many OB drills (In Situ and/or Sim Lab) were performed on your unit for any maternal safety topic? What topics were covered in the OB drills?
2. What cumulative proportion of OB physicians and midwives has completed (within the last 2 years) an education program on Obstetric Hemorrhage that includes unit-standard protocols and measures?
3. What cumulative proportion of OB nurses has completed (within the last 2 years) an education program on Obstetric Hemorrhage that includes unit-standard protocols and measures?
4. What cumulative proportion of mothers had a hemorrhage risk assessment with risk level assigned, performed at least once between admission and birth and shared among the team?
5. What proportion of mothers had measurement of blood loss from birth through the recovery period using quantitative and cumulative techniques?

Data Collection

- Hospitals voluntarily submit data monthly
  - Information your department may already collect
- Survey Questions
  - Basic information about your hospital and AIM Team
  - Obstetric Hemorrhage Bundle
    - 6 structure measures
    - 5 process measures
- Data entered in REDCap at BLC (MOU needed)
- Option to download a copy of your responses (highly recommended!)

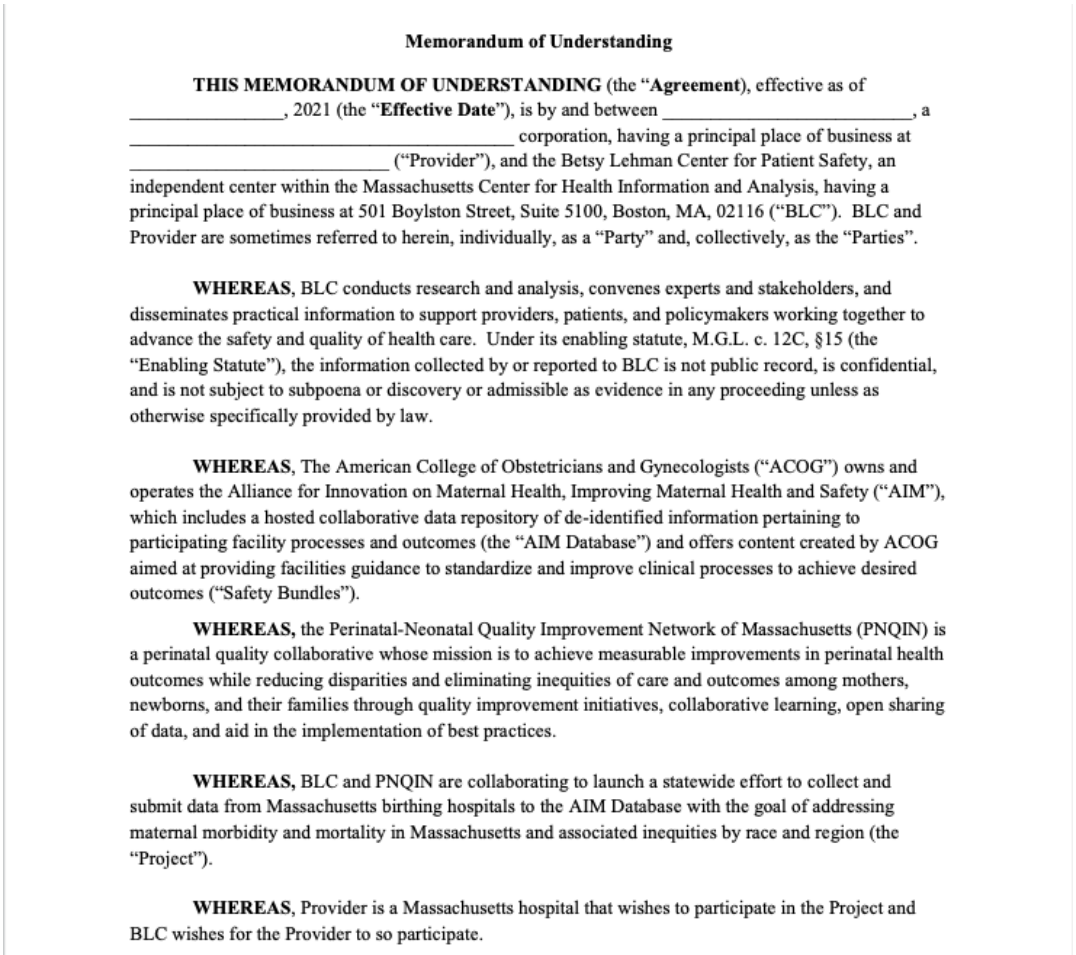
MOU -- PNQIN and BLC's Responsibilities

1. BLC will host a REDCap password-protected database that stores the data submitted by your hospital via REDCap survey. Participating hospitals will not be able to view each other's data.

2. BLC will submit data on your hospital's behalf to the AIM Database. Hospital data will remain de-identified in the AIM Database.

3. BLC will share the data, including your hospital's name, with PNQIN so that we may collaborate in supporting QI efforts.

4. BLC, in its reasonable discretion and in collaboration with PNQIN, may publish aggregate and de-identified data and analyses. Your hospital is also free to publish your own data.



Memorandum of Understanding

THIS MEMORANDUM OF UNDERSTANDING (the "**Agreement**), effective as of _____, 2021 (the "**Effective Date**"), is by and between _____, a _____ corporation, having a principal place of business at _____ ("Provider"), and the Betsy Lehman Center for Patient Safety, an independent center within the Massachusetts Center for Health Information and Analysis, having a principal place of business at 501 Boylston Street, Suite 5100, Boston, MA, 02116 ("BLC"). BLC and Provider are sometimes referred to herein, individually, as a "Party" and, collectively, as the "Parties".

WHEREAS, BLC conducts research and analysis, convenes experts and stakeholders, and disseminates practical information to support providers, patients, and policymakers working together to advance the safety and quality of health care. Under its enabling statute, M.G.L. c. 12C, §15 (the "Enabling Statute"), the information collected by or reported to BLC is not public record, is confidential, and is not subject to subpoena or discovery or admissible as evidence in any proceeding unless as otherwise specifically provided by law.

WHEREAS, The American College of Obstetricians and Gynecologists ("ACOG") owns and operates the Alliance for Innovation on Maternal Health, Improving Maternal Health and Safety ("AIM"), which includes a hosted collaborative data repository of de-identified information pertaining to participating facility processes and outcomes (the "AIM Database") and offers content created by ACOG aimed at providing facilities guidance to standardize and improve clinical processes to achieve desired outcomes ("Safety Bundles").

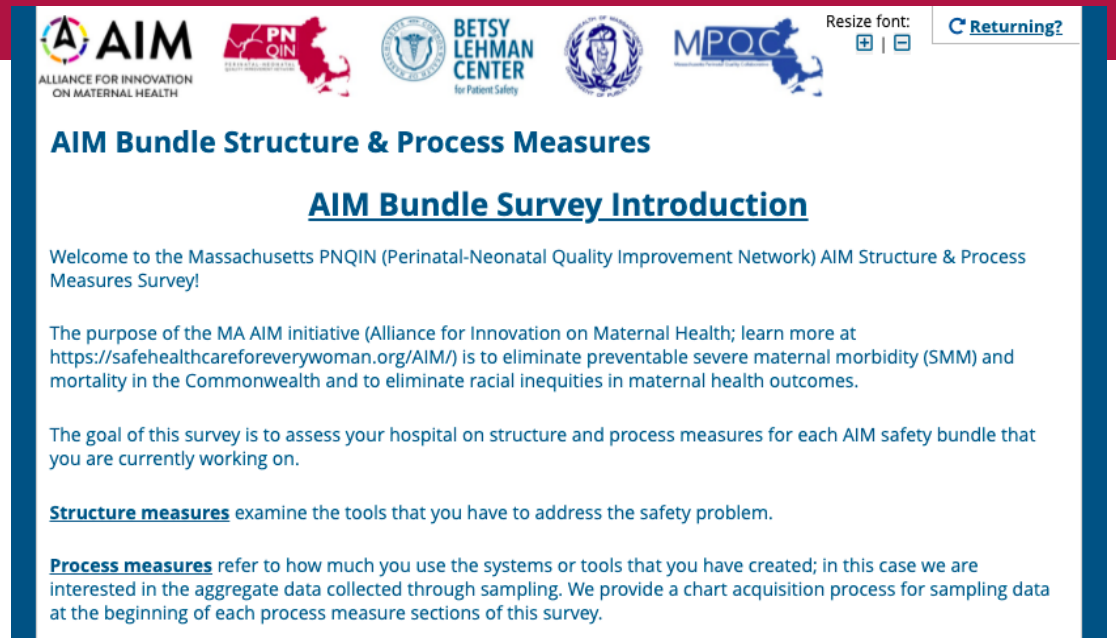
WHEREAS, the Perinatal-Neonatal Quality Improvement Network of Massachusetts (PNQIN) is a perinatal quality collaborative whose mission is to achieve measurable improvements in perinatal health outcomes while reducing disparities and eliminating inequities of care and outcomes among mothers, newborns, and their families through quality improvement initiatives, collaborative learning, open sharing of data, and aid in the implementation of best practices.

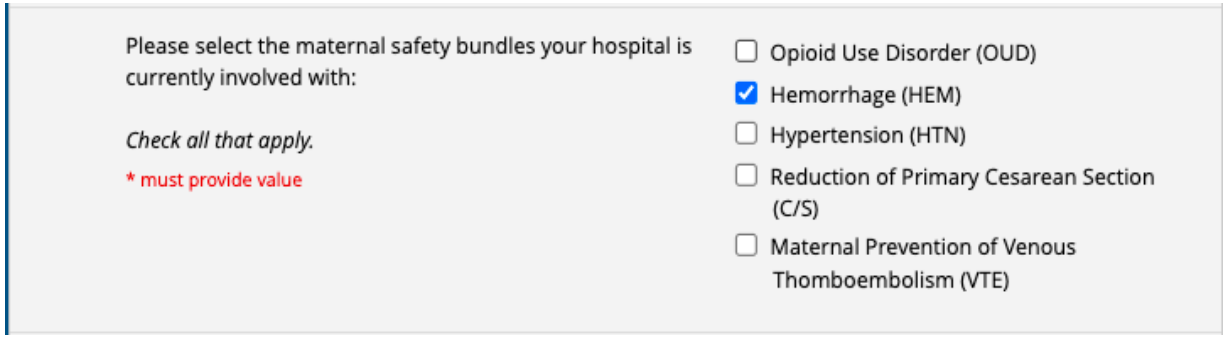
WHEREAS, BLC and PNQIN are collaborating to launch a statewide effort to collect and submit data from Massachusetts birthing hospitals to the AIM Database with the goal of addressing maternal morbidity and mortality in Massachusetts and associated inequities by race and region (the "Project").

WHEREAS, Provider is a Massachusetts hospital that wishes to participate in the Project and BLC wishes for the Provider to so participate.

AIM Bundle Measures Survey

- Assesses structure and process measures related to all AIM Bundles
- **Your hospital will submit data ONLY for the AIM bundles you are working on/sustaining:**
  - OB Hemorrhage (June-Nov 2021)
  - Opioid Use Disorder (May 2019-May 2021)
- Completed by your AIM Hemorrhage OB, RN, or CNM Champion
- Betsy Lehman Center REDCap database





REDCap
Research Electronic Data Capture

RedCap Survey

Hemorrhage Bundle: Structure Measures

All structure measures collected monthly.

S1. Has your hospital developed OB specific resources and protocols to support patients, family and staff through major OB complications?

* must provide value

- ○ Yes
- ○ No
- ○ In progress

reset

S2. Has your hospital established a system in your hospital to perform regular formal debriefs after cases with major complications?

* must provide value

- ○ Yes
- ○ No
- ○ In progress

reset

S3. Has your hospital established a process to perform multidisciplinary systems-level reviews on all cases of severe maternal morbidity (including, at a minimum, birthing people admitted to the ICU, receiving ≥4 units RBC transfusions)?

* must provide value

- ○ Yes
- ○ No
- ○ In progress

reset

Hemorrhage Bundle: Process Measures

All process measures collected monthly.

P1.1. In the last quarter, how many OB drills (In Situ and/or Sim Lab) were performed on your unit for any maternal safety topic?

* must provide value

Please provide number of drills.

P1.2. In the last quarter, what topics were covered in the OB drills?

* must provide value

Expand

P2. In the last quarter, what cumulative proportion of ***OB physicians and midwives*** completed (within the last 2 years) an education program on Obstetric Hemorrhage that includes unit-standard protocols and measures?

Please round up your answer.

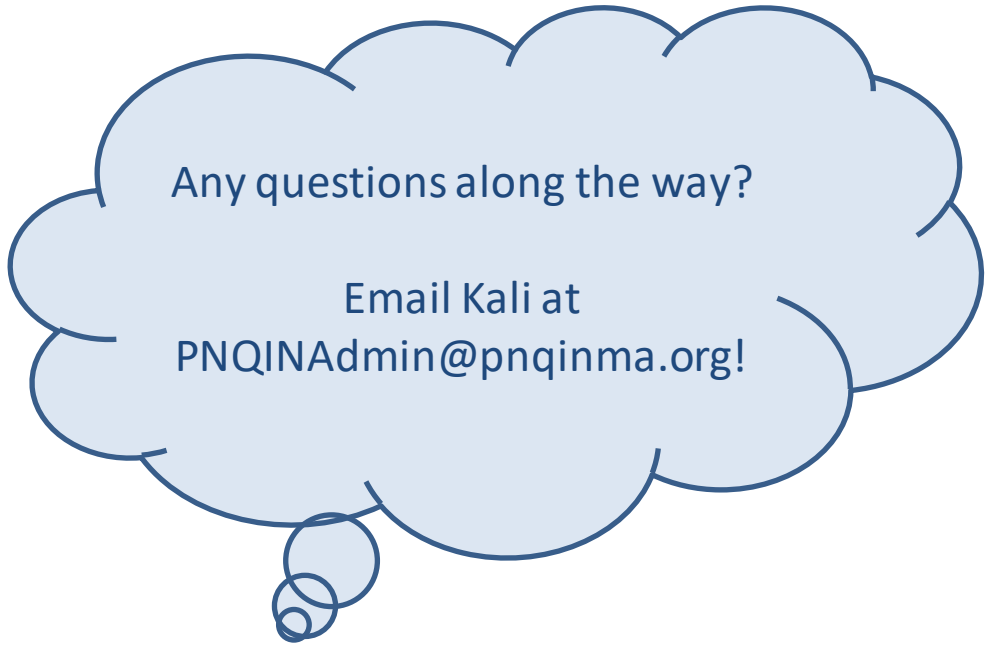
* must provide value

- ○ 10%
- ○ 20%
- ○ 30%
- ○ 40%
- ○ 50%
- ○ 60%
- ○ 70%
- ○ 80%
- ○ 90%
- ○ 100%

reset

Participation Logistics

1. Step 1 Team Readiness and Data
   - Complete Team Onboarding form on PNQIN website
   - Complete a brief team readiness survey
   - Complete first Redcap survey when prompted (will serve as baseline data)
2. Step 2 Training & Collaboration
   - Join monthly webinars
   - PNQIN TA Sessions to support teams
   - CME/CEU Available
3. Step 3 Data Submission
   - Complete BLC/PNQIN Memorandum of Understanding
   - Onboarding form: who should receive & sign the MOU
   - Enter monthly data into Redcap



Q&A Panel

Fifi Diop
Bonnie Glass
Ron Iverson
Karen Manganaro
Audra Meadows
Kali Vitek

Closing, Acknowledgements & Thanks

Our Massachusetts Partners

Our AIM Partners

Thank you!


PN
QIN
OF MASSACHUSETTS
PERINATAL-NEONATAL
QUALITY IMPROVEMENT NETWORK