



Maternal Webinar Series:

**“Quantification versus Estimation in Obstetrical Blood Loss”**

November 5, 2024



# Maternal Updates



- Next GaPQC Maternal Webinar Tuesday, December 3rd at 2:00 PM EST  
Dr. Monika Sanghavi – guest speaker – “Cardiac Care in the 4<sup>th</sup> Trimester through Text Messaging and Telemedicine”
- Data
  - Q1 Jan – March – submission due by April 30<sup>th</sup>
  - Q2 April – June – submission due by July 31<sup>st</sup>
  - Q3 July –Sept. – submission due by October 31<sup>st</sup>**
  - Q4 Oct. – Dec. – submission due by January 31<sup>st</sup>
- Hypertension will be going into sustainability in the Spring 2025.
- **2025 GaPQC Annual Conference** – Mark Your Calendar & SAVE THE DATE  
Thursday and Friday, April 24<sup>th</sup> & 25<sup>th</sup> 2025– Emory Conference Center

GEORGIA PERINATAL QUALITY COLLABORATIVE



THE FOURTH TRIMESTER:  
**The Forgotten Phase**

2025 ANNUAL MEETING  
APRIL 24 & 25, 2025

EMORY CONFERENCE  
CENTER HOTEL  
1615 CLIFTON RD

ATLANTA, GEORGIA

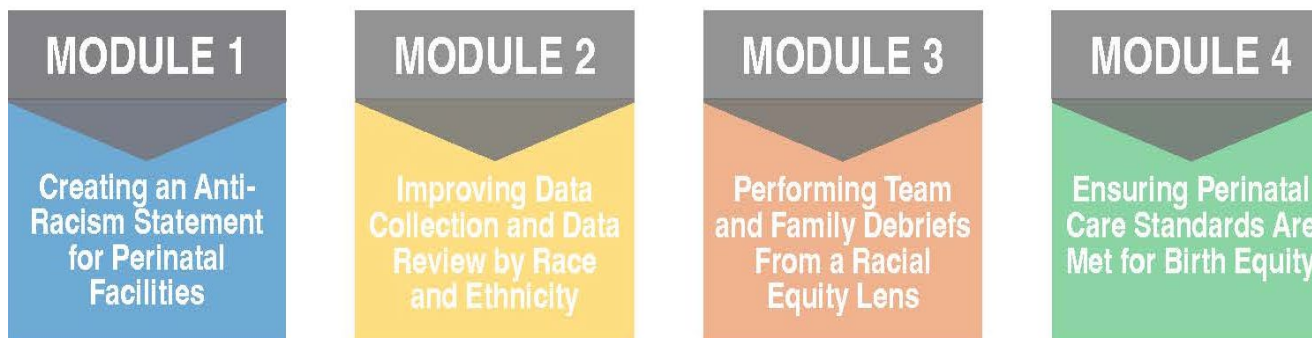


THE "FORGET ME NOT" FLOWER HONORS THOSE IMPACTED BY PREGNANCY AND REPRODUCTIVE LOSS AND RAISES AWARENESS FOR THE MILLIONS OF PEOPLE IMPACTED.

# INSTITUTE FOR PERINATAL QUALITY IMPROVEMENT



THE BIRTH EQUITY MODULES COURSE INCLUDES FOUR MODULES:



**Please complete ALL Modules ASAP**

**PERINATAL QUALITY IMPROVEMENT**  
www.perinatalQI.org

## Birth Equity Modules Course, v1.2a

### Modules 1-4

Black and Indigenous birthing people are two to three times more likely to die of pregnancy-related causes. More than 80% of pregnancy-related deaths have been determined to be preventable (CDC, 2022). Black birthing people are twice as likely to experience severe maternal morbidity (Hoyert, 2019).

With the launch of the Alliance for Innovation on Maternal Health (AIM) Consensus Bundle on the Reduction of Peripartum Racial and Ethnic Disparities, perinatal professionals are seeking actionable solutions to resolve the longstanding maternal morbidity and mortality crisis and bridge the health disparity divide. There are also preventable disparities in neonatal outcomes that must be eliminated.

THE BIRTH EQUITY MODULES COURSE INCLUDES FOUR MODULES:



### ● To Receive 3.0 Continuing Nursing Education Credits (CNE):

You are required to review the entire course and complete all knowledge checks. Continuing education credit will be awarded to those who achieve a score of 100% on the knowledge checks. You may re-attempt questions without penalty until the correct answer is chosen.

### ● To Access the FREE Education:

1. Visit PQI's Store at <https://www.perinatalqi.org/store/>.
2. Add Birth Equity Modules Course, v1.2a to your cart.
3. Proceed through checkout using your work email address.
4. Enter the promo code **GAPQCBEMS100%** at checkout.
5. Once you complete the check-out process, check your work email inbox. You will receive an email with instructions on how to access the modules through the online education platform, EasyGenerator.

#### Notes:

- The promo code will expire on September 23, 2024.
- You must complete the modules by September 30, 2024.
- This offer is only available to professionals in Georgia.





## NEEDS YOUR HELP!

To reduce severe morbidity & mortality related to maternal cardiac conditions in Georgia & support optimal care in pregnancy & postpartum.



CARDIAC CONDITIONS IN  
OBSTETRICAL CARE

### WHO WE ARE?

aPQC is a network of perinatal stakeholders working together to improve the quality of care and outcomes for Georgia mothers and babies.

aPQC leads statewide implementation of quality improvement initiatives through technical assistance, quality improvement training, education, and data support to hospitals.

### ENROLL TODAY



SUPPORT THE CARDIAC  
CONDITIONS IN OB CARE  
INITIATIVE

<https://georgiapqc.org/cardiac-conditions>

### GaPQC's CARDIAC INITIATIVE

Cardiac conditions were the leading cause of pregnancy related deaths in Georgia between the years of 2010-2014.

Georgia will be the first state in the country to implement the Alliance for Innovation on Maternal Health's (AIM) Cardiac Conditions in Obstetrical Care patient safety bundle.

The aPQC partners with AIM to support best practices that make birth safer, improve maternal health outcomes and save lives.

<https://www.georgiapqc.org>

[gapqc@dph.ga.gov](mailto:gapqc@dph.ga.gov)

## Cardiac Conditions in Obstetrical Care

### Enrollment Form



Hospital Name\*

Indicate your level of participation :

☐ Learning Collaborative

Please provide your contact information

Name

Email

Phone

Credentials

☐ Active Improvement Team

Please complete the rest of the form

Initiative Champions	Name	Email	Include on GaPQC Emails	Phone	Credentials
Physician or Advance Practice Provider Champion	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
Project Champion	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
Data Lead	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>

Additional Multidisciplinary Champions	Name	Email	Include on GaPQC Emails	Phone	Credentials
Specialty (e.g. Cardiology, Emergency Medicine, Anesthesiology, Labor and Delivery, etc.)	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>
	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="text"/>	<input type="text"/>

By signing below, I acknowledge my understanding of the goals and expectations of Georgia Perinatal Quality Collaborative and commit to full participation in the mutually agreed upon initiative(s).

Physician or Advance Practice Provider Champion

Signed:

Date:

Name:

Project Champion

Signed:

Date:

Name:

\*Please check this box if you would like to join the Learning Collaborative as an individual and not as a representative of a hospital ☐

Email your completed enrollment form to:

Lisa Ehle  
Maternal Quality Improvement  
[Lisa.Ehle@dph.ga.gov](mailto:Lisa.Ehle@dph.ga.gov)

# Resources and Opportunities







These sessions will focus on various data-related topics.

Occur every other month starting January 2025

Topic	Month
Which Data Collection Platform Fits Your Needs? An Overview of QI Data Collection Platforms	January 2025
Uploading Your Data to the AIM Data Center	March 2025
Visualizing Your Patient Safety Bundle Implementation Data: Practical Tips for REDCap, Excel, and Tableau	May 2025
Severe Obstetric Complications: What You Need to Know About PC-07	July 2025

*More Information coming soon!*

**2025 AIM Data Lunch & Learns**



## Lived Experience Integration into QI Community of Learning



The Lived Experience Integration into Quality Improvement (QI) Community of Learning (COL) offers guidance for QI teams on how to effectively build a patient engagement culture, and perform work that integrates patients and those with lived experience into Patient Support Bundle implementation and QI work.

### Topics Include



- Our Philosophy
- Culture Change
- Get Prepared
- Recruiting Patients
- Onboarding
- Feedback Tools
- Reporting & Data

Register for one of our fall  
2024 cohorts today!


[www.mommasvoices.org/col](http://www.mommasvoices.org/col)



Cohort	Session Dates
Cohort 1 (PQCs)	Sept 3 - Sept 24
Cohort 2 (Hospitals)	Oct 7 - Oct 28
Cohort 3 (PQCs)	Jan 14 - Feb 4
Cohort 4 (Hospitals)	Feb 25 - March 18





 Northeast Georgia Health System  
CENTER FOR SIMULATION AND INNOVATION  
675 White Sulphur Road, Building B  
Gainesville, GA 30501

## Join Us for the Obstetric Patient Safety (OPS) Workshop - 3rd Edition

### Hospitals in Georgia,

send your obstetric and emergency department staff  
for a comprehensive learning experience.

Don't miss this opportunity to improve patient safety and outcomes. Enhance  
your skills in managing obstetric emergencies through simulation and debriefing.

- Learning Outcomes:**
- Identify high-risk factors for obstetric emergencies.
  - Demonstrate effective management of pregnant and postpartum individuals during obstetric emergencies.
  - Engage in role-playing simulations with a multidisciplinary team.

Workshop Dates:	June 5	September 18 and 19
	July 25	October 24
	August 19	December 4 and 5

For Registration and Inquires Contact: Tasha Murchison at [Tasha.Murchison@nghs.com](mailto:Tasha.Murchison@nghs.com)

The Association of Women's Health, Obstetric and Neonatal Nurses is accredited with distinction as a provider of nursing continuing professional development by the American nurses Credentialing Center's Commission on Accreditation. Accredited status does not imply endorsement by AWHONN or the ANCC of any commercial products displayed or discussed in conjunction with an educational activity. AWHONN is approved by the California Board of Registered Nursing, Provider #CEP580.

Physicians, this activity was planned and implemented in accordance with the accreditation requirements and policies of the Accreditation Council for Continuing Medical Education (ACCME) through the joint providership of AffinityCE and AWHONN. AffinityCE is accredited by the ACCME to provide continuing medical education for physicians. AffinityCE designates this live activity for a maximum of 10.75 AMA PRA Category 1 Credits™. Physicians, physician assistants, and nurse practitioners should claim only the credit commensurate with the extent of their participation in the activity.

<sup>1</sup> This program is supported by the Health Resources and Services Administration (HRSA) of the U.S. Department of Health and Human Services (HHS) as part of an award totaling \$5,170,233 with zero percentage financed with non-governmental sources. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the U.S. Government

# Key Driver Diagram: Maternal Cardiac Conditions

## GOAL:

To reduce severe morbidity & mortality related to maternal cardiac conditions in Georgia.

## SMART AIM:

By 02/6/2026, **National Wear Red Day**, to reduce harm related to existing and pregnancy related cardiac conditions through the 4<sup>th</sup> trimester by **20%**.

## Key Drivers

**Readiness:** EVERY UNIT - Implementation of standard processes for optimal care of cardiac conditions in pregnancy and post-partum.

**Recognition & Prevention:** EVERY PATIENT - Screening and early diagnosis of cardiac conditions in pregnancy and post-partum.

**Response:** EVERY UNIT - Care management for every pregnant or postpartum woman with cardiac conditions in pregnancy and post-partum.

**Reporting/System Learning:** EVERY UNIT - Foster a culture of safety and improvement for care of women with cardiac conditions in pregnancy and post-partum.

**Respectful, Equitable, and Supportive Care** — EVERY UNIT/PROVIDER/TEAM MEMBER - Inclusion of the patient as part of the multidisciplinary care team.

## INTERVENTIONS

- ☐ Train all obstetric care providers to perform a basic Cardiac Conditions Screen.
- ☐ Establish a protocol for rapid identification of potential pregnancy-related cardiac conditions in all practice settings to which pregnant and postpartum people may present.
- ☐ Develop a patient education plan based on the pregnant and postpartum person's risk of cardiac conditions.
- ☐ **Establish a multidisciplinary "Pregnancy Heart Team" or consultants appropriate to their facility's designated Maternal Level of Care to design coordinated clinical pathways for people experiencing cardiac conditions in pregnancy and the postpartum period. S1**
- ☐ Establish coordination of appropriate consultation, co-management and/or transfer to appropriate level of maternal or newborn care.
- ☐ Develop trauma-informed protocols and training to address health care team member biases to enhance quality of care
- ☐ Develop and maintain a set of referral resources and communication pathways between obstetric providers, community-based organizations, and state and public health agencies to enhance quality of care. \*

- ☐ Obtain a focused pregnancy and cardiac history in all care settings, including emergency department, urgent care, and primary care.
- ☐ **In all care environments assess and document if a patient presenting is pregnant or has been pregnant within the past year. S2**
- ☐ Assess if escalating warning signs for an imminent cardiac event are present.
- ☐ Utilize standardized cardiac risk assessment tools to identify and stratify risk.
- ☐ Conduct a risk-appropriate work-up for cardiac conditions to establish diagnosis and implement the initial management plan.

- ☐ Facility-wide standard protocols with checklists and escalation policies for management of **cardiac symptoms**.
- ☐ Facility-wide standard protocols with checklists and escalation policies for management of people **with known or suspected cardiac conditions**.
- ☐ Coordinate transitions of care including the discharge from the birthing facility to home and transition from postpartum care to ongoing primary and specialty care.
- ☐ Offer reproductive life planning discussions and resources, including access to a full range of contraceptive options in accordance with safe therapeutic regimens. \*
- ☐ **Provide patient education focused on general life-threatening postpartum complications and early warning signs, including instructions of who to notify if they have concerns, and time and date of a scheduled postpartum visit.**

- ☐ For pregnant and postpartum people at high risk for a cardiac event, establish a culture of multidisciplinary planning, admission huddles and post-event debriefs.
- ☐ **Perform multidisciplinary reviews of serious complications (e.g. ICU admissions for other than observation) to identify systems issues. S4**
- ☐ Monitor outcomes and process data related to cardiac conditions, with disaggregation by race and ethnicity due to known disparities in rates of cardiac conditions experienced by Black and Indigenous pregnant and postpartum people. **Process Measures – 1-5**

- ☐ Screen for structural and social drivers of health that might impact clinical recommendations or treatment plans and provide linkage to resources that align with the pregnant or postpartum person's health literacy, cultural needs, and language proficiency.
- ☐ Engage in open, transparent, and empathetic communication with pregnant and postpartum people and their identified support network to understand diagnoses, options, and treatment plans.
- ☐ **Include each pregnant or postpartum person and their identified support network as respected members of and contributors to the multidisciplinary care team. \*S5**



**Kristi Gabel, DNP, CNS, RNC-OB, C-EFM, C-ONQS**

Clinical Nurse Specialist

AWHONN Chapter Coordinator, Southern Missouri





# **QUANTIFICATION VERSUS ESTIMATION OF BLOOD LOSS AFTER DELIVERY**



Kristi Gabel, DNP, CNS, RNC-OB, C-EFM, C-ONQS

November 5, 2024

Georgia Perinatal Quality Collaborative



# LEARNING OBJECTIVES

1

Define hemorrhage and list terms and techniques to describe blood loss

2

List 2 reasons quantification is more accurate than estimation

3

Describe differences between gravimetric, volumetric, and colorimetric methods for measuring blood loss

*“Because of the failure to recognize the extent of haemorrhage, its true importance in morbidity and mortality tends to be missed”*

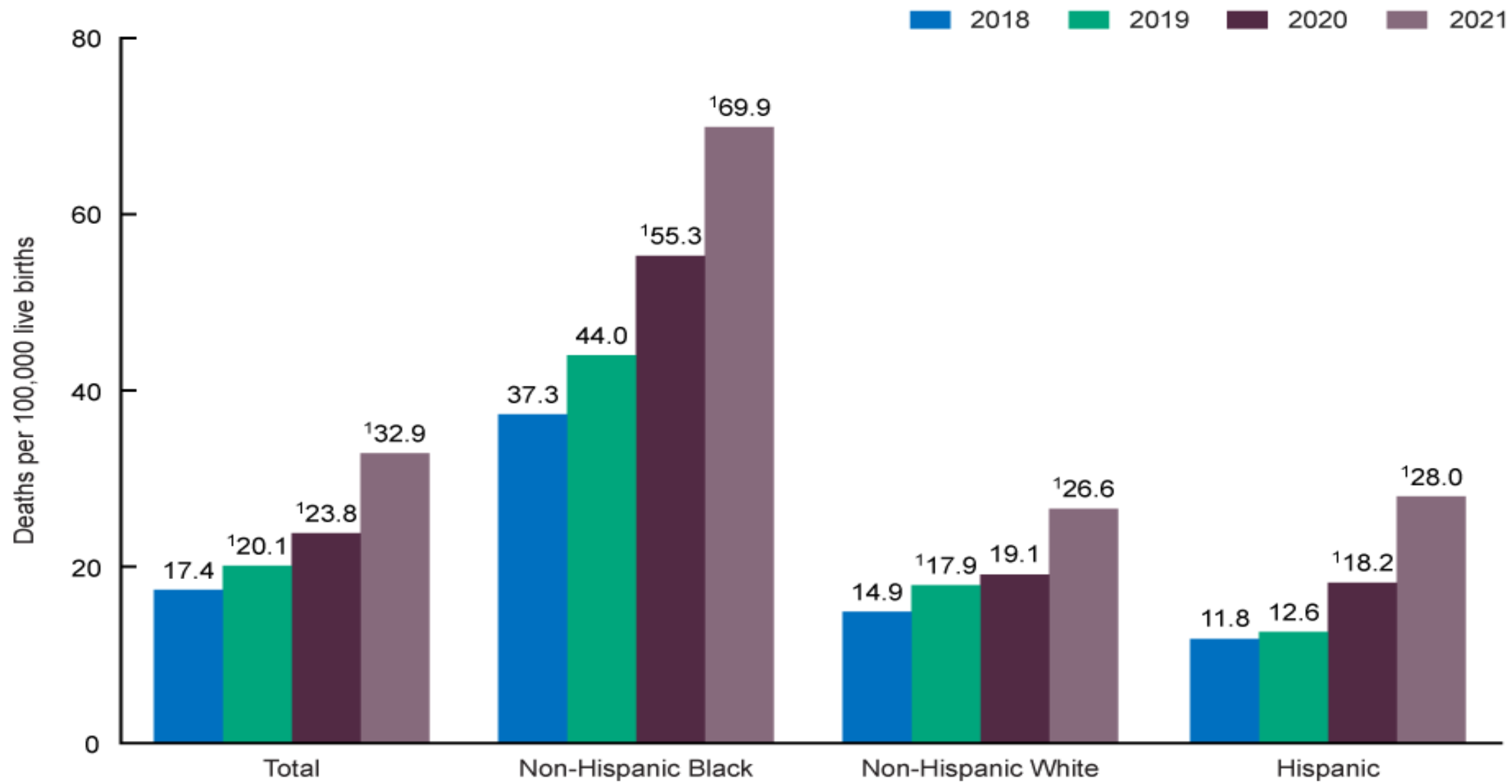
*(Brant, 1967)*



Patient Safety



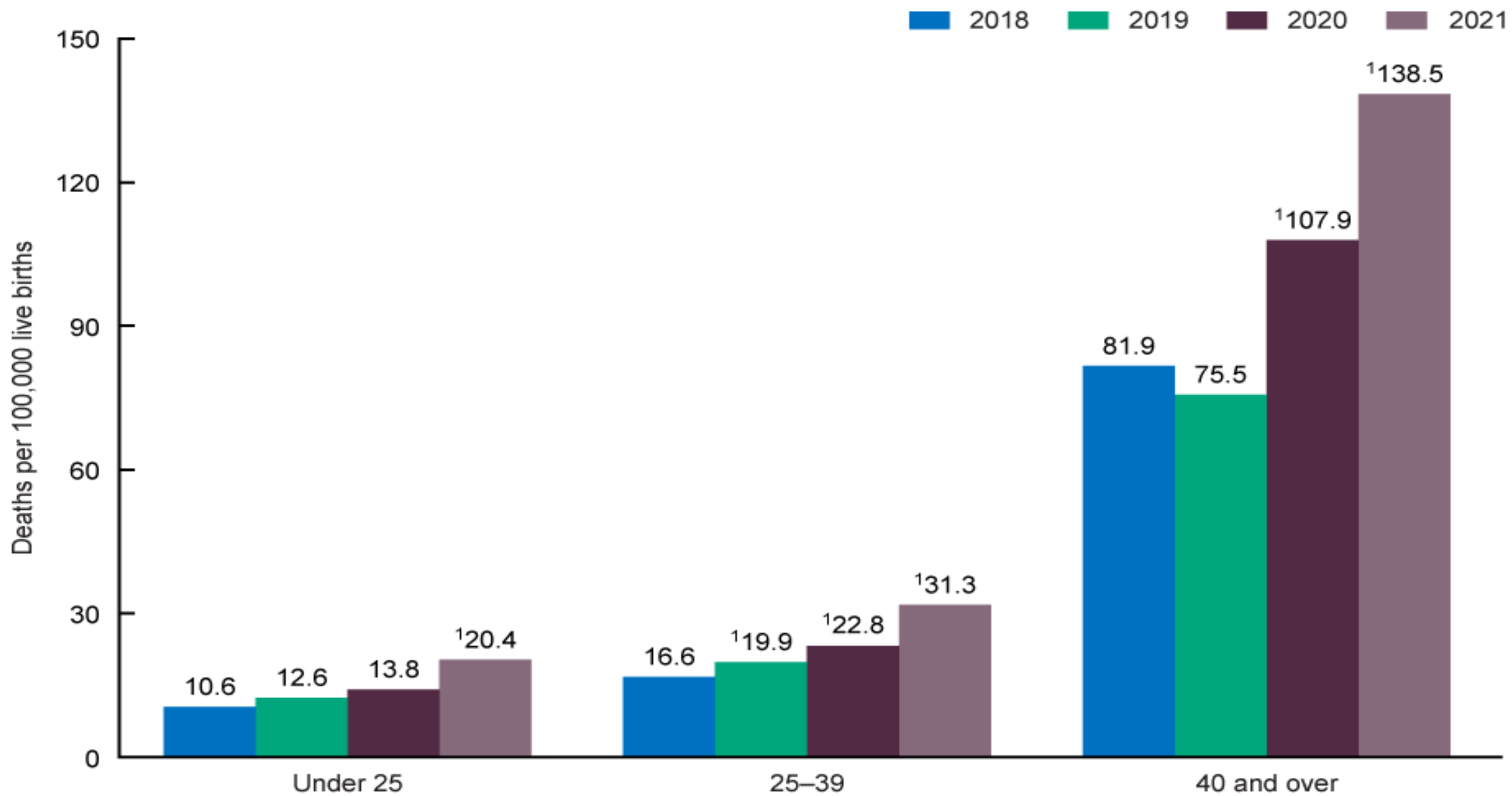
TIME  
FOR  
ACTION



<sup>1</sup>Statistically significant increase from previous year ( $p < 0.05$ ).

NOTE: Race groups are single race.

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.



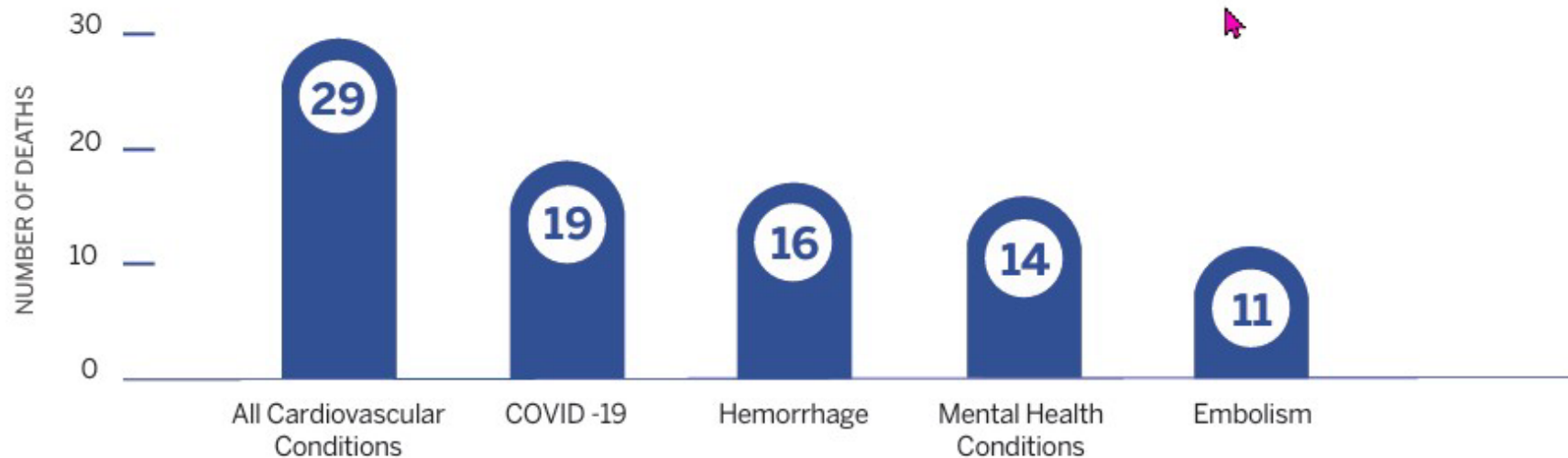
<sup>1</sup>Statistically significant increase from previous year ( $p < 0.05$ ).

SOURCE: National Center for Health Statistics, National Vital Statistics System, Mortality.

# GEORGIA 2019-2021

# MATERNAL MORTALITY

## LEADING CAUSES OF PREGNANCY-RELATED DEATHS 2019 - 2021



- **18 of the 19 deaths due to COVID-19 occurred in 2021.** COVID-19 vaccination was recommended for pregnant women on July 30, 2021 by the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine, and on August 11, 2021 by the Centers for Disease Control & Prevention.
- **84.96% of pregnancy-related deaths** were determined by the Maternal Mortality Review Committee to be **preventable**.
- **All cardiovascular** conditions includes **cardiomyopathy** and **cardiovascular + coronary conditions**, excluding hypertensive disorders of pregnancy and cerebrovascular accidents (e.g., stroke).

### PREGNANCY-RELATED:

A death during pregnancy or within one year of the end of pregnancy from a pregnancy complication, a chain of events initiated by pregnancy, or the aggravation of an unrelated condition by the physiologic effects of pregnancy.

### PREVENTABLE:

A death is considered preventable if the Maternal Mortality Review Committee determines that there was at least some chance of the death being averted by one or more reasonable changes to patient, family, provider, facility, system and/or community factors.

# GaPQC Maternal Goals

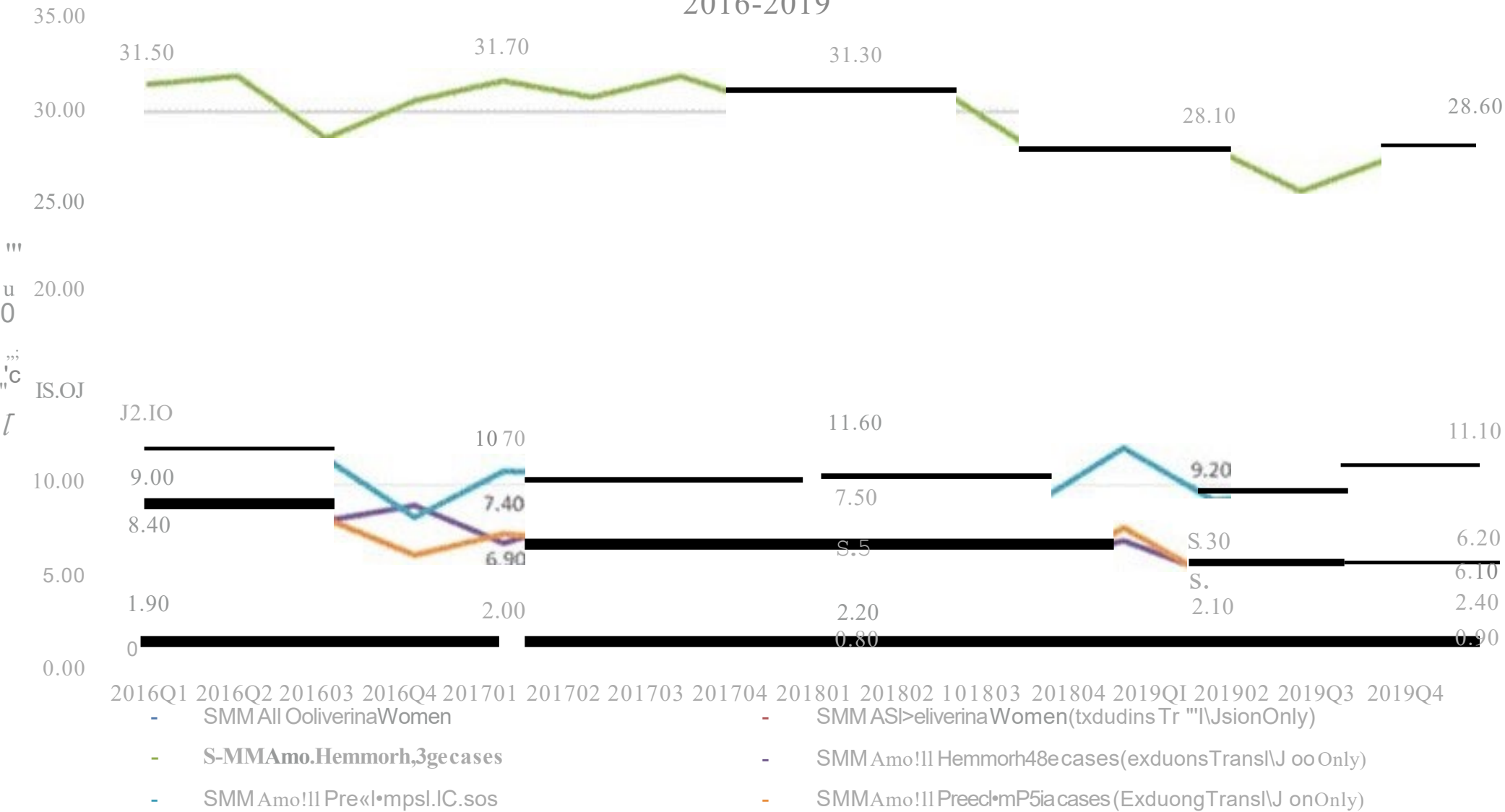


## Maternal Hemorrhage

- Reduce the rate of women with severe maternal morbidities among hemorrhage cases by **20% by 12/2020**
- Perform hemorrhage risk assessment to **100% of women** with risk level assigned at least once between admission and birth
- Debriefs on **100% cases** requiring  $\geq 4$  units RBCs or admission to the ICU
- Quantified blood loss of **100% of women** who had blood loss measurement from birth through recovery period



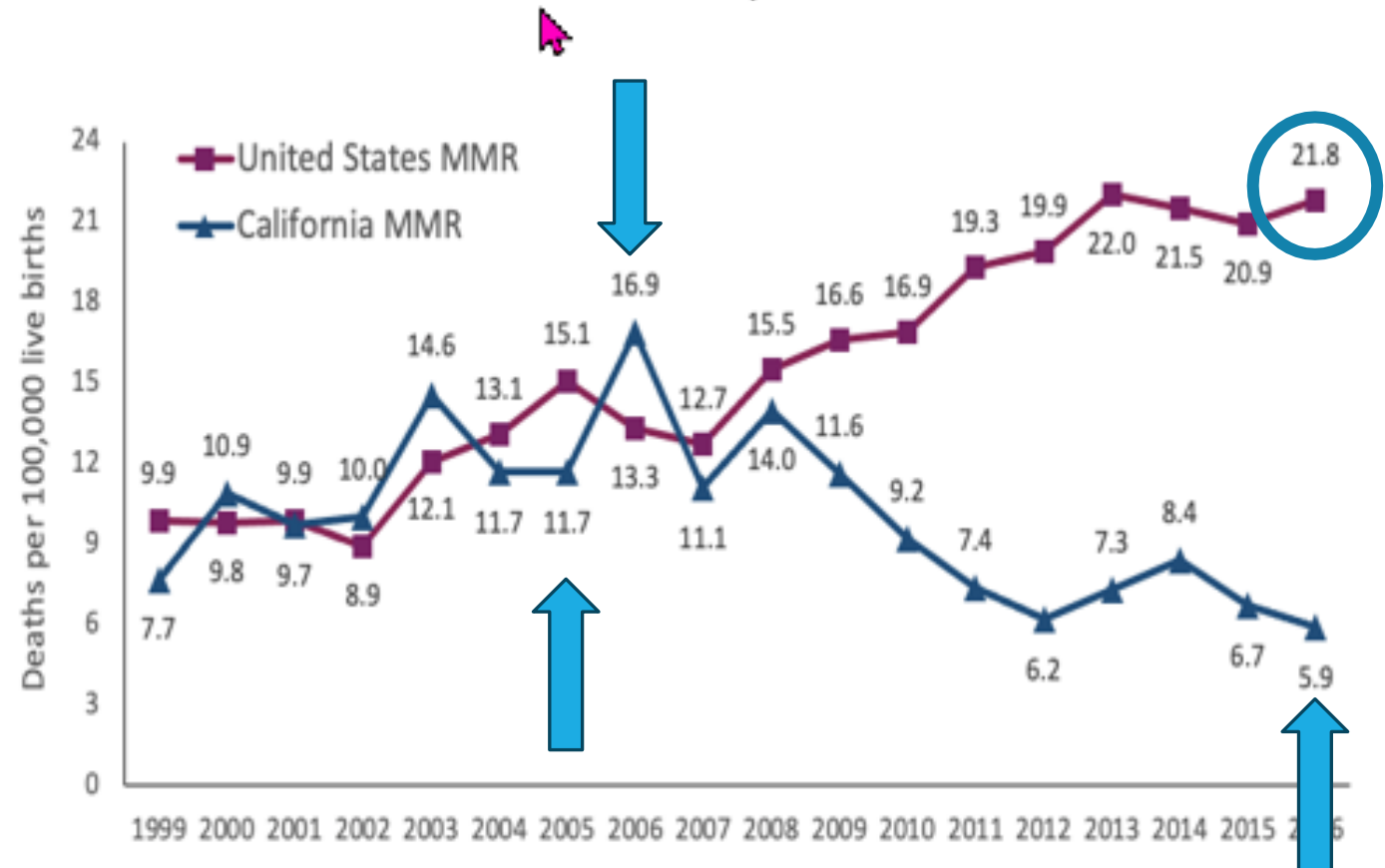
# Georgia Collaborative Wide Rate of Severe Maternal Morbidity (SMM) 2016-2019





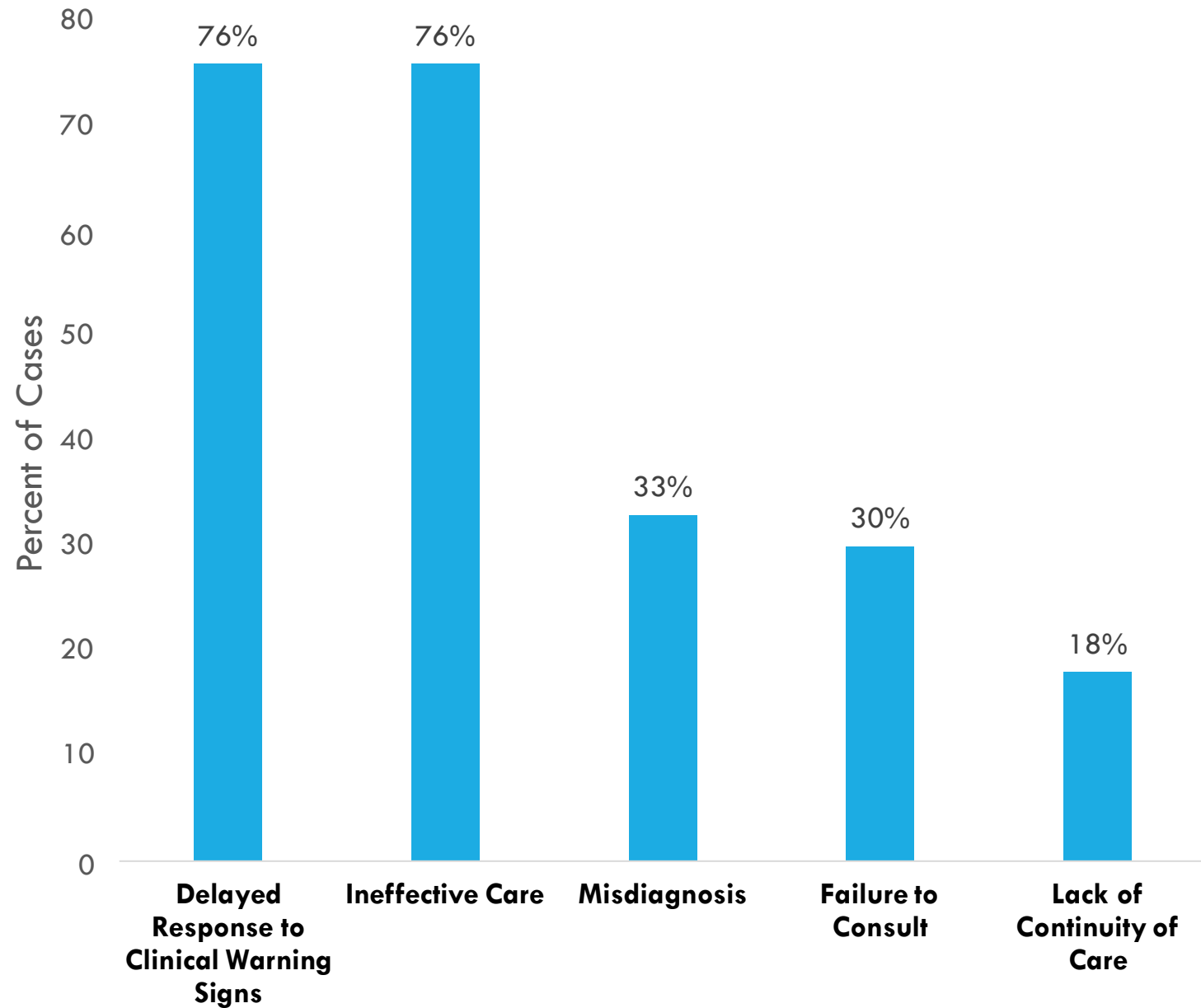
CMQCC

## Maternal Mortality Ratios in U.S. and California, 1999-2016



CA-PMSS Surveillance Report: Pregnancy-Related Deaths in California, 2008-2016. Sacramento: California Department of Public Health, Maternal, Child and Adolescent Health Division. 2021.

HEALTH CARE PROVIDER  
FACTORS CONTRIBUTING  
TO PREGNANCY-RELATED  
DEATHS FROM OBSTETRIC  
HEMORRHAGE, CA-PAMR,  
2002-07, N=33 CASES

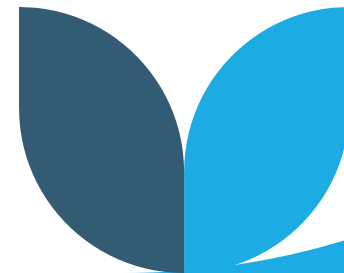


# DEFINING OBSTETRIC HEMORRHAGE









Cumulative blood loss  $\geq 1000$  mL for either vaginal or cesarean birth OR blood loss accompanied by S/S of hypovolemia within 24 hours after birth

$\geq 500$  mL in vaginal birth is abnormal



# Terms and Techniques of Describing Blood Loss

EBL		<b>ESTIMATED BLOOD LOSS:</b> Traditional estimation of blood loss by looking at the items such as sponges, drapes, blood in containers and determining blood loss. Tends to be normalized by over-estimating small losses and under-estimating large losses.	EBL measurements typically done at the end of the case by multiple observers. Research has shown training can improve the technique but that accuracy fades unless repeatedly trained.
QBL  Gravimetric		<b>QUANTITATED BLOOD LOSS BY GRAVIMETRIC TECHNIQUE:</b> The blood loss is determined by weighing items and subtracting the dry weight of the sponge, gauze or contained to determine weight.	The method of QBL measurement has been made easier by imbedded calculation tools in the electronic record and by making sure scales are readily available.
QBL Volumetric		<b>QUANTITATED BLOOD LOSS BY VOLUMETRIC TECHNIQUE:</b> The blood loss is determined by observing the total amount of volume containing blood and subtracting the volume represented by amniotic fluid or irrigation.	QBL measurement can be made more accurate and easier if workflow observations, such as brief determinations of volumes of amniotic fluid collection before blood suctioning at CS or before shoulders delivered in vaginal delivery.
QBL Colorimetric		<b>QUANTITATED BLOOD LOSS BY COLORMETRIC TECHNIQUE:</b> The blood loss is determined by a device which scans items or containers and estimates the amount by the size of spot (pixels) and intensity of color.	The method of QBL measurement requires specialized equipment and training. Workflow adjustments should be made to ease staff work in the OR and postpartum units.
CBL		<b>CUMULATIVE BLOOD LOSS:</b> The ongoing blood loss is determined by adding up the individual EBL or QBL measurements for the events and is used to drive management steps and transfusion.	CBL is the best term to communicate the patient's blood loss and should be visible in the patient electronic record and verbalized in communication between providers during events and handoffs.

## Rationale for Routine Quantification of Blood Loss

- *Delay in diagnosis of obstetric hemorrhage remains the most significant factor in patients being at higher risk of severe morbidity*
- If QBL is performed only in severe cases, staff may be unfamiliar with the procedures and less likely to obtain valid data
- Expecting QBL at each delivery removes opportunity for disagreement about initiating the processes
- Incorporating QBL into every delivery emphasizes the importance of interdisciplinary communication
- When hemorrhage happens outside of the delivery room (AP, IP, PP), underestimation of blood loss is particularly common
- Quantitative intake and output measurement should be documented/communicated regularly during active bleeding and in the first 4-6 hours after arrest of active blood loss

**WHY?**



# QBL IS PART OF OBH BUNDLE

## Analysis of cases during MMR

- Missed signs and symptoms; delays or errors in diagnosis  
(Seacrist, et al., 2019)

## QBL is one component of a bundle

- Reduction in severe maternal morbidity

(Main, et al., 2017; Shields, et al., 2015; Shields, et al., 2011)



### ***Readiness-Every Facility***

- Preparations/supplies
- Medication access
- MTP and emergency blood release
- Education/Simulations



### ***Recognition & Prevention-Every Patient***

- Assessment, diagnosis and classification
- Measurement of quantitative, cumulative blood loss
- Active management 3<sup>rd</sup> stage



### ***Response-Every Hemorrhage***

- Unit-standard, stage-based emergency management plans with checklists
- Support for patients, families and staff



### ***Reporting & Systems Learning-Every Unit***

- Established huddle culture including debriefs
- Multidisciplinary reviews
- QI measures
- Outcome monitoring and process metrics
- Documentation and coding



### ***Respectful, Equitable, & Supportive Care-Every Unit/Provider/Team Member***

- Involve patient and family in huddles and debriefs
- Open communication

# ACOG RECOMMENDATIONS

## (ACOG COMMITTEE OPINION NUMBER 794-QUANTITATIVE BLOOD LOSS IN OBSTETRIC HEMORRHAGE, 2019)

*QBL is more accurate than visual estimation*



```
graph TD; A[QBL is more accurate than visual estimation] --> B[Visual underestimates when high and overestimates when low]; B --> C[Implementation includes use of direct measurement and protocols for collecting and reporting cumulative blood loss]; C --> D[Develop protocols for all providers by an interdisciplinary team]; D --> E[Implement obstetric hemorrhage bundle];
```

*Visual underestimates when high and overestimates when low*

*Implementation includes use of direct measurement and protocols for collecting and reporting cumulative blood loss*

*Develop protocols for all providers by an interdisciplinary team*

*Implement obstetric hemorrhage bundle*

# ASSOCIATION FOR WOMEN'S HEALTH, OBSTETRIC, AND NEONATAL NURSES (AWHONN)

Quantification of Blood Loss Practice Brief Number 13 Recommendations (2021)

## Implement OBH bundles

**QBL** increases escalation of care

**QBL** is objective

**QBL** reduces inaccuracies

**QBL** may decrease use of additional interventions

**QBL** increases team awareness

# CALIFORNIA MATERNAL QUALITY CARE COLLABORATIVE (CMQCC)

## Use a standard clinical definition of obstetric hemorrhage

- QBL  $\geq$  1000 mL OR blood loss accompanied by S/S of hypovolemia within 24 hours after birth

## Implement QBL at ALL births

- Scales in all delivery rooms to weigh and measure
- Under-buttocks calibrated drapes
- Weigh all blood-soaked materials
- Weigh and measure amounts in the OR using suction cannisters and lap sponge holders

## Implement standardized protocols and safety bundles

- Monitor clinical triggers
- When to call RRT

## Provide training

# THE JOINT COMMISSION (TJC)



Effective July 1, 2020, new elements of performance for TJC accredited hospitals

Improve quality and safety of care

Worsening maternal morbidity and mortality

Requirements include:

- Risk assessment
- Evidence-based procedures for stage-based management to include identification of hemorrhage
- Supply kit
- Role specific education
- Drills
- Review of cases
- Patient Education

**R' Report** Requirement, Rationale, Reference

Issue 24, Aug. 21, 2019

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Provision of Care, Treatment, and Services standards for maternal safety

Provision of Care, Treatment, and Services chapter

Standard PC.06.01.01: Reduce the likelihood of harm related to maternal hemorrhage.



# VISUAL ESTIMATION

**Al Kadri, et.al., (2011)**

## **Methods**

- Prospective cohort study
- All women who delivered vaginally
- Postpartum blood loss was visually estimated
- Compared between methods

## **Results**

- 150 patients were included in this study
- Significant difference between calculated blood loss and estimation
- Tendency to underestimate the loss by about 30%.

# VISUAL ESTIMATION

**Larsson, et al., (2009)**

## **Methods**

- Visual estimation for 29 elective cesarean sections and 26 vaginal deliveries
- Compared to extraction of hemoglobin using the alkaline hematin method

## **Results**

- Estimated loss in comparison with measured loss resulted in an over-estimation
- No correlation for vaginal delivery, however, CD correlation was moderate

## **Conclusions**

- The standard procedure of estimation of obstetric bleeding was found to be unreliable
- Blood loss was over-estimated in cesareans

# VISUAL ESTIMATION

**Patel, et al., (2006)**

## **Objective**

- Compared visual estimation using blood collection drape with the drape estimate using a measurement of blood loss by photospectrometry

## **Methods**

- Randomized controlled study
- 123 women delivered in India
- Randomized to visual or drape estimation of blood loss
- Subsample of 10 drape estimates compared with photospectrometry results

## **Results**

- Visual estimate of blood loss 33% less than the drape estimate.

## **Conclusion**

- Drape estimation of blood loss is more accurate

# **VISUAL ESTIMATION**

## **SIGNIFICANT**

**Underestimation of large  
volume blood loss by 33-  
50% when compared to  
direct measurement**

*[Bose, et al., (2006), Dildy, et al., (2004), Patel, et al., (2006). Al Kadri, et al., (2011), Toledo, et al., (2007)]*

***Blosser, Smith, & Poole, 2021***

Retrospective observational study all deliveries before and after change from EBL to QBL

QBL outperformed EBL for predicting blood transfusions for both CD and vaginal

QBL more sensitive test than EBL

Leads to earlier recognition of hemorrhage and intervention

**QBL IMPROVES DETECTION OF PPH**

# VISUAL VS OBJECTIVE QUANTIFICATION

***Lertbunnaphong, et al., (2016)***

286 patients, term, low-risk, vaginal delivery

Drapes placed under-buttocks after infant delivered

Compared visual estimate with quantified amount in drape

Significant difference with EBL vs QBL

Visual is inaccurate-underestimation and not optimal

QBL recommended



Cumulative blood Loss (CBL) should not be used in isolation to confirm or rule out obstetric hemorrhage. It is *one* parameter of many that should be given equal emphasis as key changes occur in vital signs over time ( $\uparrow$  HR,  $\downarrow$  BP,  $\downarrow$  urine output) and alterations in key hematological and biochemical indices. Patient or family concerns should be part of the criteria to identify concealed hemorrhage.



# Quantification of Blood Loss



Every Birth

# GRAVIMETRY AND VOLUMETRY

## ***Gravimetry***

Weighing all blood-soaked materials

Need dry weights for subtracting (paper or EMR)

Difficult to calculate blood loss on floor or clothing

## ***Volumetry***

Use of calibrated under buttocks drapes

Use of suction cannisters for CD

{ Combination of both is standard }

# QBL FOR VAGINAL DELIVERY

$$\begin{array}{r} \text{Wet item (gm)} \\ - \\ \text{Dry Item (gm)} \\ = \\ \text{mLs of blood} \end{array}$$



## List of dry weights

Begin after delivery of baby prior to placenta

- Record amount of fluid in calibrated drape
- Subtract irrigation if used

Record total volume

- Subtract preplacental fluid from post-placenta fluid

Weigh all blood-soaked materials

Add volume in drape with weighed materials

After Delivery of Infant



After Delivery of Placenta





## Appendix P: Sample Paper Calculators for Quantifying Blood Loss

Note: This is a SAMPLE developed for a particular facility as an example to work from. You may need to adjust based on the individual circumstances of your facility

Vaginal QBL	
Volume	Calculations/Totals
Total Drape Volume (Completion of Delivery)	
Volume before Placenta Delivery (mostly amniotic fluid)	(Subtract amniotic fluid)
<b>Drape QBL #1</b>	<b>=</b>
Additional Drape Volumes:	
Bloody Lap Sponges, Total weight in grams	
Number of lap sponges _____ x _____ grams	(Subtract dry weight)
<b>Lap Sponges QBL</b>	<b>=</b>
Other bloody item, weight in grams	
Dry item, weight in grams	(Subtract dry weight)
<b>Other item QBL</b>	<b>=</b>
(From above: Drape QBL + Lap Sponge QBL + Other item QBL) <b>Total Delivery QBL</b>	
Bloody Standard Postpartum Perineal Pack in grams (Peripad + quilted blue under pad)	
Dry weight in grams	(Subtract dry weight)
Hospital Standardized Dry Weights in Grams	
Item	Dry Weight in Grams
Lap Sponge	
Standard Postpartum Perineal Pack (peripad + quilted blue under pad)	
Peripad	
Quilted blue under pad	
Blue Towel	
Baby Blanket	
Sheet	
Gown	

# QBL FOR CESAREAN DELIVERY

Begin when ROM or after delivery of baby

Suction and measure all amniotic fluid before placenta

After placenta, measure amount in the cannister and weighed materials

Note any amount of irrigation

Can use two separate cannisters

Weigh all blood-soaked materials





Cesarean Section QBL	
Volume in Canister (before irrigation preferably)	Calculations/Totals
Volume in Canister before Placenta Delivery (mostly amniotic fluid)	(subtract amniotic fluid)
Irrigation (IF included in canister volume)	(subtract irrigation)
<b>Canister QBL #1</b>	=
Additional Canister Volumes:	
Bloody Lap Sponges + sponge bag holders, Total weight in grams	
Number of lap sponges weighed _____ x _____ grams	(Subtract dry weight)
Number of sponge counter bag weighed _____ x _____ grams	(Subtract dry weight)
<b>Lap Sponges QBL</b>	
Dry item, weight in grams	(Subtract dry weight)
<b>Other item QBL (if applicable)</b>	=
(From above: Canister QBL + Lap Sponge QBL + Other item QBL)	
<b>Total Delivery QBL</b>	
Bloody Standard Postpartum Perineal Pack, weight in grams. (Peripad + quilted blue under pad)	
Dry standard postpartum perineal pack, weight in grams	(Subtract dry weight)
<b>Recovery QBL</b>	

Hospital Standardized Dry Weights in Grams	
Item	Dry Weight in Grams
Lap Sponge	
Sponge Counter Bag	
Standard Postpartum Perineal Pack (peripad + quilted blue under pad)	
Peripad	
Quilted blue under pad	
Blue Towel	
Baby Blanket	
Sheet	
Gown	

(Used with permission of Jennifer McNulty, MD)



# COLORIMETRICS WITH ARTIFICIAL INTELLIGENCE

Triton

Uses extraction technology with color algorithm to calculate hemoglobin mass

Studies validated accuracy

Can't account for larger materials such as drapes and sheets

Offers highest degree of accuracy in blood loss estimation



Holmes, et al., (2014); Konig, et al., (2014); Gerdessen, et al., (2020)



# QUALITY IMPROVEMENT PROJECTS

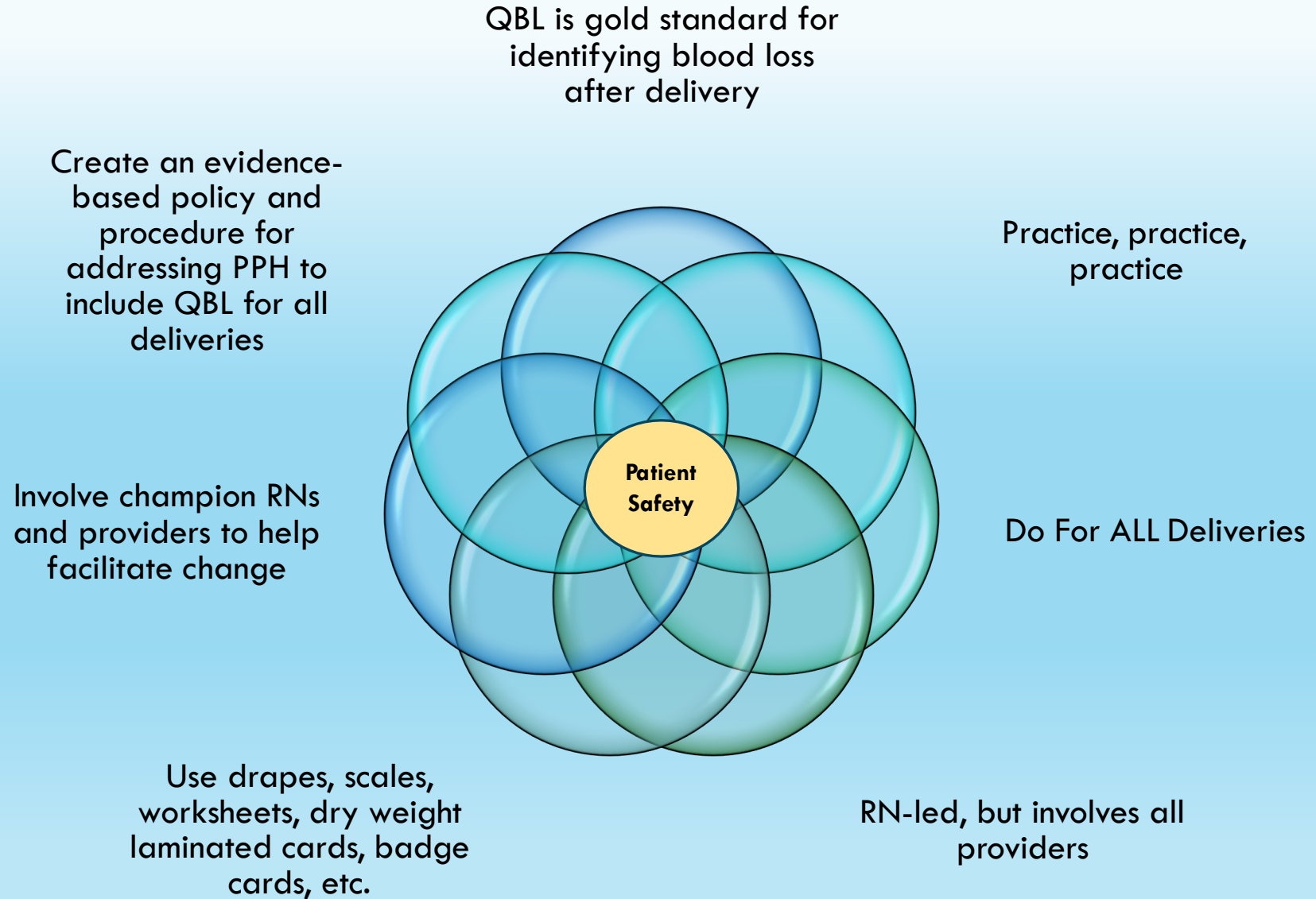
## *Ladouceur & Goldbort, 2019*

Changed practice from EBL to QBL  
Started with vaginal deliveries – 67 births  
Buy in from staff, providers, and administration  
Audited compliance for documented QBL (91%)  
Met resistance with some providers – but later supported the change

## *Steinberg, 2019*

To increase the % of cases for QBL documented  
Use scorecard feedback to stimulate performance  
Run chart posted  
Discussed during huddles  
Increased documentation from 22.7% to 80%  
Engaged multidisciplinary team to be consistent with measurement of QBL

# REVIEW



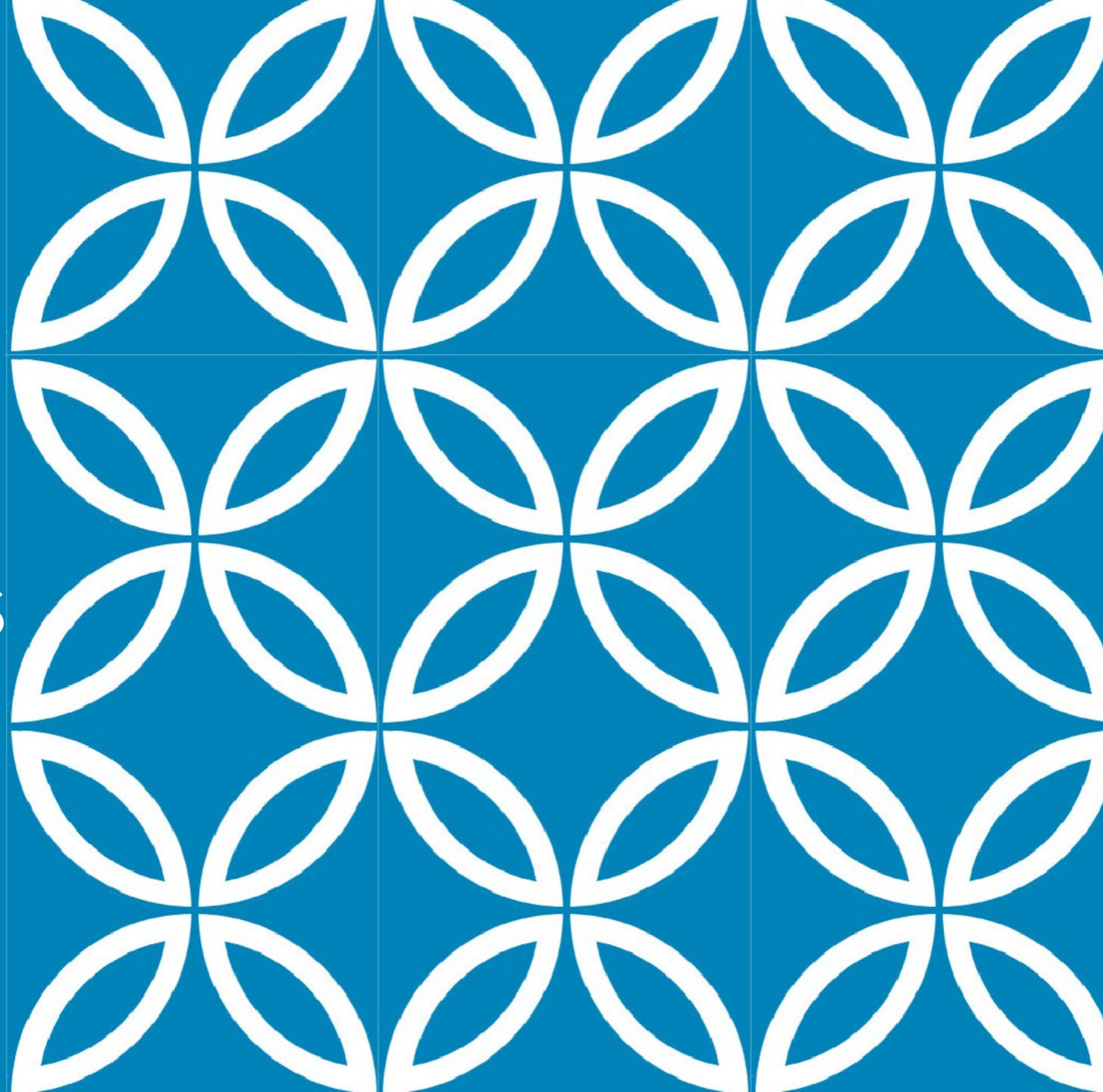
# THANK YOU

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Kristi Gabel, DNP, CNS,  
RNC-OB, C-EFM, C-ONQS

[ktgabel@gmail.com](mailto:ktgabel@gmail.com)

References available upon request





**Questions?**

**[gapqc@dph.ga.gov](mailto:gapqc@dph.ga.gov)**