Revisiting the Adoption of a Hemorrhage Bundle at a Single Tertiary Center: A Delphi Survey Assessment of Compliance and Continued Barriers to Implementation

Yalda Toofan, MD, MS; Noor Raheel, MD, MPH; Karen Manganaro, DNP, RNC-OB; Daniela Carusi, MD, MSc; Michaela Farber, MD, MS

- Hemorrhage is the leading cause of severe maternal morbidity and preventable mortality
- 2015: NPMS released consensus bundle on obstetric hemorrhage for all maternity units
- 2019: Initial Delphi survey identified practice deficiencies and barriers at our labor and delivery unit

Hypothesis: 7 years later, barriers may persist for bundle implementation. Recognizing these barriers enables focused, more urgent prioritization.

Objective: Re-evaluate NPMS hemorrhage bundle compliance and identify continued barriers

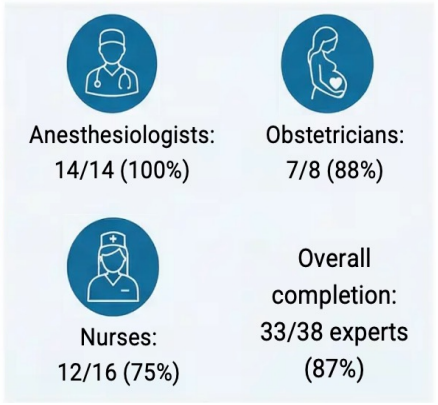
Study Design & Methods

Study Design

Design: Repeat prospective, cross-sectional, consensus building Delphi study

Comparison: Results compared to 2019 survey data

Delphi Process



Key Methodology Points

Sequential questionnaires building professional consensus

Multidisciplinary expert panel approach

Longitudinal comparison over 7-year period

Results

Of 13 NPMS bundle elements, 5 (38.5%) remain persistently deficient

Significant improvement from 61.5% deficient in 2019

✓ Successfully Implemented Since 2019

- Immediate access to hemorrhage medications
- Assessment of hemorrhage risk
- Establishing response team protocols

⚠ Persistent Deficiencies (5 Elements)

- Culture of huddles/post-event debriefs
- Support programs for patients, families, and staff
- Emergency management plan with checklists
- Measurement of cumulative blood loss
- Unit education and unit-based drills

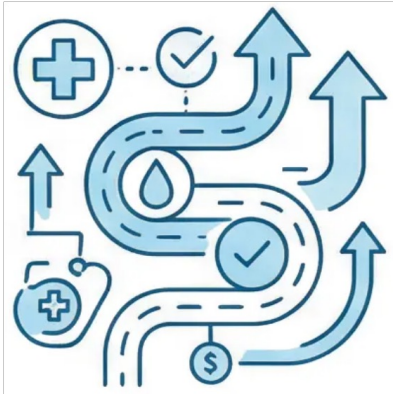
Key Barriers

- Limited time for night-shift inclusion
- Insufficient time/staffing for comprehensive programs
- High staff turnover and clinical volume
- Technology reliability issues (QBL machines)

Conclusions & Discussion

Key Findings

- Persistent deficiencies in NPMS hemorrhage bundle remain
- Delphi technique effectively reveals successes and ongoing implementation barriers
- Focused effort needed for persistently deficient elements



Recommendations

- Targeted quality improvement initiatives for 5 remaining deficient elements
- Structural solutions for night-shift inclusion
- Automated support mechanisms for staff engagement and patient programs
- Technology reliability improvements (QBL machines)

Clinical Significance

As maternal hemorrhage is the leading cause of preventable maternal morbidity, addressing persistent deficiencies in preparedness and response is warranted.