Mitigating Maternal Mortality: Implementing an Innovative Approach for Case Reviews in an Electronic Database

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Background and Problem

Background and Significance:

- Defining and understanding maternal mortality is a national issue
- In 2018-2021, maternal mortality rates in North Carolina were 26.5 rate higher than the 23.5 rate for the United States (CDC, 2023a)
- In 2019 – 2023, there were 27 maternal mortalities occurring in the healthcare system region

Problem Statement:

The clinical problem is the inability to effectively and efficiently measure preventability and opportunity to alter outcomes within the current maternal mortality review process due to the lack of utilizing an evidence-based, structured maternal mortality case review tool in an electronic platform.

PICO Question:

In maternal mortality case reviews, does implementation of a standardized, evidence-based electronic case review tool improve recognition of preventable maternal deaths and modifiable factors with identification of the opportunity to alter outcomes?

Purpose

The purpose of this project was to:

- Explore the value of developing and implementing an automated database
- Convert manual process to a standardized evidence-based tool
- Assist clinicians in identifying preventability trends impactable by practice change

Objectives

- **Expand Review Questions**: Increase maternal mortality review questions to align with the Maternal Mortality Review Committee Decision Form (CDC, 2024) by November 1, 2024.
- **Automate Case Reviews**: Transition from manual to electronic case reviews using REDCap® by December 1, 2024.
- **Conduct Retrospective Reviews**: Review 100% of maternal mortality cases from 2021-2024 using the new form by March 1, 2025.

Method and Models

Theoretical and Improvement Frameworks:

- John Kotter's Change Theory (Kotter, 1995)
- Model for Improvement using Plan, Do, Study, Act (PDSA) cycles (Associates for Process Improvement, 1996)

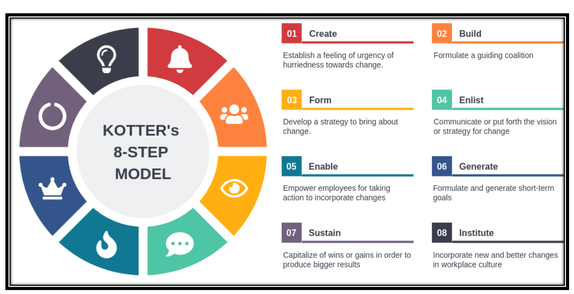

Figure 1 *John Kotter's (1995) Change Theory Model*

Setting and Population:

- Largest North Carolina region of the organization
- Maternal mortality cases identified using operational definition abstracted by the Clinical Quality Analytics team

Evidence-Based Practice Intervention

Based on an extensive literature review:

- Comprehensive review tool implemented in the REDCap® database

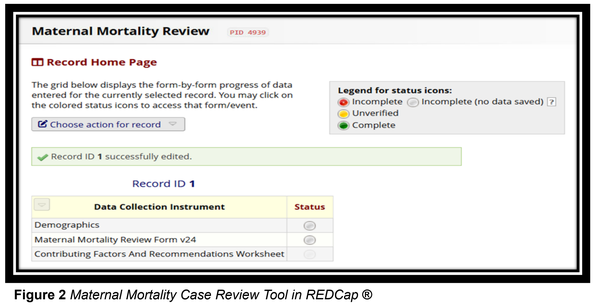

Figure 2 *Maternal Mortality Case Review Tool in REDCap ®*

Scan to Review Tool

Results

Table 1 *Overarching Measurable Outcomes*

Measurable Outcomes	*n*	%
Eligible maternal mortality case reviews performed using new tool	12	100
Capture of preventability for eligible inclusion cases	4	100
Capture of chance to alter outcomes for eligible inclusion cases	4	100

Table 2 *Inclusion and Exclusion Determination of Maternal Mortality Population*

Criteria Type	*n*	%
Inclusion	4	33.3
Include pregnancy-related	3	75
Include pregnancy-associated, but unable to determine pregnancy-relatedness[a]	1	25
Exclusion	8	66.6
Exclude pregnancy-associated, but not related	4	50
Exclude[b]	4	50

Note. $N = 12$.
[a] Includes cases with an unknown cause of death as a part of operational definition.
[b] Discovered on report, no pregnancy noted in medical record.

Table 3 *Preventability and Chance to Alter Outcomes in Eligible Maternal Mortality Case Reviews*

Criteria Type	*n*	%
Preventability		
Yes	1	25
No	0	0
Committee unable to determine	3	75
Chance to alter outcomes		
Good chance	1	25
Some chance	1	25
No chance	1	25
Committee unable to determine	1	25

Nursing Implications and Lessons Learned

The American Association of Colleges of Nursing (AACN, 2021) ten core competencies were intertwined throughout the project's implementation with an intense focus on:

- Population Health
- Quality and Safety
- Systems-Base Practice
- Informatics and Healthcare Technologies

Nursing Implications:

- Improve timeliness and efficiency of maternal mortality reviews informs rapid cycle practice change
- Identification of opportunities to improve quality of care, increase safety, and reduce harm for maternity patients
- Standardization of tracking and analysis inform decisions to prevent poor maternal outcomes

Lessons Learned:

- Emotional intensity of case review process
- Establishing operational definitions are crucial for data consistency and reliability
- Access to electronic database resources facilitates timely review
- Engagement of a strong clinician and leadership team is vital to success
- Cost-benefit analysis validates a budget-neutral approach by leveraging existing technology

Discussion and Recommendations

This evidence-based practice project has demonstrated the critical importance of implementing standardized, electronic maternal mortality review processes to identify two main components:

- Preventability
- Chance to alter outcomes

The process can be easily scaled and spread to varying patient populations using the following key concepts and framework:

- Identify a key stakeholder team to drive adoption
- Research evidence-based case review tools
- Create a multidisciplinary case review team
- Leverage technology integrating conditional logic and artificial intelligence
- Monitor and evaluate outcomes to ensure sustainability

References

Scan to Review Tool