Pregnancy Associated Mortality and Morbidity: What Is It and What are We Doing About It?

Perinatal Bereavement Training
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Disclaimers:

1. Resolve Through Sharing (RTS): **Mothers Memory Box**: I helped develop the materials. My name is on product but I have never nor will I ever receive any financial gain from selling or promotion of this product.

2. I work on FL DOH PAMR project as lead abstractor. Slides in this presentation with information representing FL DOH will show the **Florida Health** logo.
Introductions
Objectives

• Recall purpose of Maternal Mortality Reviews and Florida PAMR project
• Discuss 2 main causes of death of maternal mortality in Florida and 2 current prevention initiatives
• Recall efforts to decrease maternal mortality and morbidity
• Discuss family/staff bereavement needs after a maternal death
Maternal Mortality is an International Issue
Maternal Mortality & Morbidity

- 830 die every day from pregnancy or childbirth
- 99% of maternal deaths occur in developing countries
- For every woman who dies, there are 20 or 30 who have complications

Most Common Causes of Maternal Mortality Worldwide

- Severe bleeding
- Infections
- Preeclampsia and eclampsia
- Complications from delivery
- Unsafe abortion

Source: WHO, 2015
US Maternal Mortality: 1900-2010

Deaths per 100,000 live births

- The graph shows a significant decline in maternal mortality rates from 1900 to 2010.
- There was a sharp increase in deaths per 100,000 live births in the early 1900s, which peaked around 1920.
- From 1930 onwards, there is a steady decrease, with the rate stabilizing in the early 2000s.
- The death rate per 100,000 live births was around 1000 in 1900, decreasing to nearly 0 by 2010.
Recent US Maternal Mortality Rate Increasing

![Graph showing maternal mortality rates in developed countries, Germany, Japan, United States, and Britain from 1990 to 2013. The United States has the highest rate, indicating an increasing trend. Source: Kassebaum et al, Lancet.](image-url)
Why is US Maternal Mortality Rising?

- Improved Vital Statistics
- Increased maternal age at delivery
- Increased prevalence maternal chronic diseases: hypertension, diabetes, obesity
- Social factors
- Factors related to health care systems and access to quality care

What’s the Problem?
*Data Doesn’t Tell All the Story*

- Late prenatal care, obesity, C/S
- Hemorrhage, HTN, Infection, Cardiovascular
- Demographics

2013: 25.1 Pregnancy – related deaths per 100,000 live births
Background for Maternal Mortality Reviews

- CDC’s publications confirm underreporting
- Per studies, no decrease in maternal mortality since 1982
- Questions about changes in health care systems
- Observed cluster of deaths

Source: 1997-1st quarter 1999, Florida PAMR Report
Background for Florida’s Pregnancy Associated Mortality Review (PAMR)

- Florida Department of Health (FDOH), 1996
- Surveillance and analysis of maternal deaths
- Case sensitive process aimed at reducing Florida’s maternal mortality
- Modeled after Fetal Infant Mortality Reviews
- Definition used:
  
  **Pregnancy associated death:** “the death of a woman while pregnant or within 1 year of termination of pregnancy irrespective of cause.”

Source: CDC maternal Mortality Study Group, American College of Obstetricians and Gynecologists
Florida PAMR

- Public/private statewide review process
- Housed at FDOH
- Funded through Title V
- Organizational structure and core data elements have remained constant
- Specific data elements periodically added
“The purpose of maternal mortality reviews is not to assign blame or even calculate a maternal mortality ratio. Rather, it is to learn lessons and identify what could have been changed to reduce the risk of maternal death.”

BERG, C. FROM IDENTIFICATION AND REVIEW TO ACTION: MATERNAL MORTALITY REVIEWS IN THE UNITED STATES, SEMINARS IN PERINATOLOGY 36, 1-13, 2012.
PAMR Team Membership

- Physicians
- Nurses
- Social Workers
- Certified Nurse Midwives
- Maternal Fetal Medicine Specialists
- Researchers
- Professors
- DOH Title V Director
- DOH MCH and data staff
Identification of Pregnancy-Associated Death

- Matching Birth Certificate
- Matching Fetal Death Certificate
- Matching Healthy Start Screen
- Maternal Death Certificate
  - ICD 10 code
  - Pregnancy Check Box
Selection of Pregnancy Related Deaths (PRD)

- Case selection team
  - Pregnancy Related
  - Possibly Pregnancy Related
  - Not Pregnancy Related
PAMR Data Sources for Case Abstraction

- Medical Examiner
- Hospitals
- County Health Departments
- Healthy Start
- Clinics
- Private Providers
- Other
PAMR Review Process

- Review medical and psychosocial details of the case
- Determine Cause of Death
- Determine Improvement Categories
- Determine Chance to Alter Outcome for each factor (strong, possible, none)
- Determine whether factors “definitely” or “probably” contributed to outcome
- Develop Recommendations
Case Review

After review, the team gives a final classification to each case as:

• pregnancy-related,
• possibly pregnancy-related, or
• not pregnancy-related.

“If she had not been pregnant, would she have died?”
Florida’s PAMR Definitions

**Pregnancy- Associated Death:** the death of a woman from any cause while she is pregnant or within one year of termination of pregnancy regardless of the duration and site of pregnancy.

**Pregnancy Related Death:** a pregnancy associated death resulting from one or more of the following 1) Complications of the pregnancy itself; 2) the chain of events initiated by the pregnancy that led to death; 3) aggravation of an unrelated condition by physiologic effects of the pregnancy that subsequently causes death.

**Possibly Pregnancy-Related:** a death identified using case identification methods where determination of the death, following team review, could not be conclusively classified as either related or not related to the pregnancy.

**Not Pregnancy- Related:** the death of a woman, while pregnant or within one year of termination of pregnancy, from a cause unrelated to pregnancy.

Source: FLDOH PAMR Report 1997-1st quarter 1999
Issues Identified

- Nutrition issues
- Access to prenatal care (including funding issues)
- Substance use/abuse
- Absence of prenatal risk assessment
- Lack of social support
- Problems with housing
- Mental health problems

- Family violence or neglect
- Social issues
- Access to transportation
- Problems with provision or design of services
- Environmental or occupational hazards
- Concerns about family planning access or contraceptive method
Florida Data
Pregnancy-Associated Mortality Ratios and Pregnancy-Related Mortality Ratios — Florida 1999-2013

Ratio per 100,000 Live Births


PAMR
PRMR

Florida HEALTH
Healthy People Goal 2020

To reduce the rate of maternal mortality to 11.4 maternal deaths per 100,000 live births.

Florida’s pregnancy-related ratio from 1999-2013 averaged 18.9 deaths per 100,000 live births

Much work is still needed for Florida to meet the Healthy People goal.
Figure. Pregnancy-Related Mortality Ratios (PRMRs) by Race/Ethnicity
Florida, 1999-2013

PRMR per 100,000 Live Births


- Total
- Non-Hispanic White
- Non-Hispanic Black
- Hispanic
Figure. Distribution of Pregnancy-Related Deaths by Timing of Death Florida, 1999-2012 (n=561) and 2013 (n=54)
Distribution of Pregnancy-Related Causes of Death Florida, 1999-2012 and 2013

- Hemorrhage: 25.9%
- Hypertensive disorder: 20.4%
- Infection: 18.5%
- Cardiovascular: 15.5%
- Thrombotic embolism: 12.7%
- Amniotic fluid embolism: 10.2%
- Cardiomyopathy: 6.4%
- Cerebrovascular accident*: 3.7%
- Anesthesia: 1.9%
- Other: 1.6%
- Unknown: 4.1%
- 2013
- 1999-2012
Florida PAMR Findings

- Maternal deaths are at least two times more likely to affect Black women as opposed to White women.
- Overweight and obesity (BMI >24.9) is associated with an increased risk of pregnancy-related death.
- 68.5% of pregnancy-related deaths occurred in the postpartum period.
- Hemorrhage and Hypertensive disorders remain top causes of PRD.
- In 2013, there were 124 surviving children of mothers who died of PRDs.
Previous PAMR Actions

- Support for evidence-based initiatives promoting preconception health
- Racial disparity noted in PAMR review support: “Closing the Gap” outreach programs
- Promotion of autopsies in unexplained maternal deaths
- Promotion of postpartum danger signs for postpartum discharge teaching
- Support for DVT prophylaxis in pregnancy, labor and delivery, postpartum
- Recommendation for Hemorrhage drills and Massive Transfusion Protocols (MTP)
Recommendations to Action

- Partnership with Florida Perinatal Quality Collaborative (FPQC)
  - Obstetric Hemorrhage Initiative
    - Instituting system changes through hospital-based implementation of evidence-based guidelines
  - Hypertension in Pregnancy Initiative
    - Implementation of quality improvement processes to prevent, diagnose and treat hypertension in pregnancy
Recommendations to Action

- Community Driven **Preconception Peer Educator** Program in historically black colleges through REACHUP, Inc./Every Mother Initiative

- **PAMR Action Subcommittee:** Urgent Maternal Mortality Messages for distribution to community partners
Hemorrhage is the leading cause of Pregnancy-Related maternal death in Florida. (1)

Placental disorders (including placenta previa, accreta/increta/percreta) accounted for 21% of hemorrhage related deaths > 20 weeks gestation. (1)

With the rising cesarean rate, the incidence of placenta accreta has increased. (2)

Urgent Maternal Mortality Message to Providers

Diagnosis is essential before delivery
- If placental disorder suspected, get a Maternal-Fetal Medicine consultation.
- Ultrasonography with supplemental MRI when necessary.
- No imaging modality is perfect. If you suspect an issue—transfer to tertiary facility.

Risk factors
- Discuss pregnancy and delivery risks with patient and family.
- The risk of accreta increases with repeat cesarean sections, myomectomy, presence of placenta previa, multiparity, repetitive dilatation and curettage and with advanced maternal age.
- A low lying anterior placenta may be ominous with multiple prior cesarean sections.

Readiness
- Develop and discuss with the patient, family and hospital staff an individual delivery plan.
- Consider early transfer to a tertiary center for access to sufficient blood bank supply and subspecialties.
- Let patients know there is a high risk for bleeding due to placental disorders that can occur after having multiple cesarean sections.
- Contingency plan should be made for emergency delivery.

Implementation of hemorrhage protocols in all Florida delivery hospitals is essential, and should include a massive transfusion protocol, simulation drills and hemorrhage carts. For details on implementing a hemorrhage initiative see Florida Perinatal Quality Collaborative’s Toolkit. (3)

Essential elements of delivery plan
- Preoperative counseling regarding risks.
- Timing of admission and delivery. See ACOG guidelines, may vary if patient unstable.
- Consult with neonatologist regarding corticosteroid administration, if applicable.
- Place blood bank on alert for potential massive transfusion protocol.
- When delivery is scheduled, discuss timing with a multispecialty team to optimize expert surgical and anesthesia assistance.
- Do not try to remove the placenta. Hysterectomy is usually the best option.
- If you have called for help and cannot control the bleeding surgically, compress the aorta or uterine vessels while waiting for help to arrive.

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Example PAMR Finding to Action

**Finding:** 74% of pregnancy-related deaths occurred in the postpartum period.

**Issue:** Lack of documentation in education to call provider for persistent headache in postpartum period.

**Recommendation:** “Postpartum discharge teaching should include education for women on the importance of alerting a health care provider if they experience a severe or prolonged headache during the postpartum period.”

**Action:** L&D discharge education incorporated severe or prolonged headache in postpartum “danger signs”.

Source: PAMR Report Florida Department of Health 2003
Example PAMR Finding to Action

Findings:
• Gap in documentation of bereavement support to family
• Maternal mortality impact to children: each quarter 20-30 children left without a mother
• Need for bereavement support protocols for families and staff after maternal deaths.

Recommendation: develop bereavement support protocols for families and staff after maternal deaths

Source: PAMR recommendations 1999-2000
For more information about Florida PAMR

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Maternal Death: Providing Support

- Young families not prepared for loss
- When to bring up topic of maternal death during prenatal care?
- Complex grief needs: significant other, children, parental grief for adult child
- Importance of communication with families - designate spokesperson
- Critical timing organ donation
- Support family holding baby when possible
- Avoid indications blame

Husband’s Reaction

“I started crying harder than I have ever cried. An intense heat was emanating from my body, but I was freezing. I trembled so violently that I thought I was having a seizure. I felt like I was going to vomit and keep vomiting for the rest of my life. I thought I had gone deaf, because all I could hear was nothing. The only fact I could comprehend was that my heart was beating and Liz’s wasn’t.”

RTS: A Mother’s Memory Box

“A mother dies and her baby lives. She may have been your wife, life partner, mother, daughter or sister. What do you do next? “
(RTS Brochure: A Mother’s Memory)

To preserve memory/keepsakes for surviving children:

- Mother handprint, lock of hair
- Child/children can look in it whenever she/he is ready
- Photos of mother’s life and during pregnancy
- Remembrance stories from family and friends
- RTS Handprint poem
- →Can accommodate several hands
- →Place for hands joined

*Materials translated in English/Spanish
Staff Support after Maternal Death

- Shock and disbelief of staff
- Immediate staffing needed to care for other patients
- Utilize hospital chaplains, social workers, managers
- Assistance completing charting
- Critical incident support for health care workers; importance of decompressing
- Don’t forget about grief support for ancillary services (lab, nutrition etc.)

The “Second Victim”

- Health care providers involved in unanticipated adverse event
- 1/2 of health care providers will experience impact as “second victim”
- Provision emotional support critical for recovery
- Support provided at individual or organizational level
- Available immediate, middle and long term

Ripple Effect: The Pebble Analogy

“ I think about maternal mortality as a sentinel event similar to tossing a pebble into a pond of still water. It begins with a maternal event that expands with ever enlarging ripples impacting the child, her partner and other siblings, her other children, her extended family, then her physicians, nurses, and other health care providers, her employer and coworkers, society at large and last but not least, the mother should she survive, to live a life saddled with the lifelong burdens of medical morbidity.”

King, J. Maternal Mortality in the united states-Why is it Important and what are we doing about it? Seminars in Perinatology
An estimated 1,200 women in the United States suffer fatal complications during pregnancy or childbirth each year.

60,000 suffer near-fatal complications.

Meanwhile, costs of maternity care exceeded $60 billion in 2012.

- Information from World Health Organization
Severe Maternal Morbidity

**Definition:** physical and psychological conditions resulting or aggravated by pregnancy and having adverse effect on woman’s health

- Affects more than 65,000 women in the US
- Identified by hospital data
- Internal morbidity reviews
- Forms [aim@acog.org](mailto:aim@acog.org)

- Source: Kilpatrick, S., Berg, C., Bernstein, P, Bingham, C., et al, Standardized severe maternal mortality review rationale and process. JOGNN. 2014, 00:1-6,
Severe Maternal Morbidity: Clarification of New Joint Commission Sentinel Event Policy, Jan 28, 2015

• Revised OB Sentinel event: Severe maternal morbidity defined as receiving 4 or more units of blood and/or ICU admission.”
• Recommendation: review adverse events, not to be punitive but to learn and improve outcome.”
• Encourage all cases of severe maternal morbidity undergo credible multisystemic comprehensive review.”
The “Good News” for Maternal Mortality and Morbidity

• Approximately half of all maternal deaths and 30-40% of near misses in US are preventable

• Source: APPHA, Reducing US Maternal Mortality as a Human right, Nov. 1, 2011, Policy 201114
Many Efforts in Process to Decrease Maternal Mortality and Morbidity in US

• Increased number of states with MM reviews
• National Safety Bundles
• CDC Surveillance System
• Merck for Mothers/AWHONN/ Alliance for Innovation on Maternal Health (AIM)/ Council on Patient Safety in Women’s Health Care
Maternal Safety Bundles: “What Every Delivery Hospital Should Have”

- Obstetric Hemorrhage Bundle
- Maternal VTE Prevention Safety Bundle
- Safe Reduction of Primary Cesarean Births Bundle
- Severe Hypertension in Pregnancy Bundle
- Patient, Family and Staff Support Bundle
- Prevention of Surgical Site Infections Bundle
- Maternal Mental Health Patient Safety Bundle

Source: Council on Patient Safety in Woman’s Health Care
Merck for Mothers: “to help create a world where no woman dies giving birth”

- 500 million dollars over 10 years
- 6 million in US
- Collaboration national and local organizations (ex. CDC/AMCHP/AWHONN/CMQCC)
- Enhancing community initiatives
- Strengthening data collection
- Implementing programs
Lessons Learned from Abstracting

- The death of a mother most often comes as a surprise to caregivers.
- Providers grieve maternal deaths.
- Not all communities are the same or have same resources.
- Risks assessments/drills help caregivers prepare for the worst scenarios.
- The importance of a multidisciplinary team for case review.
- The importance of confidentiality.
- Sometimes in case reviews it feels like the same woman is dying over and over again.
- Recommendations to improve maternal care are happening!

Source: Noell, 2014
1 Woman Dies Every 2 Minutes
Thank you!

For more information contact

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