Preventing Maternal Mortality and Morbidity

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Acknowledgments

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- Thank you to Sonia Baeva, MA, Debra Saxton, MS, and Natalie Archer, PhD, in Office of Program Decision Support (DSHS) for the statistical and geographic analyses presented here
Overview

1) Maternal morbidity and mortality data
2) AIM and AIM bundles overview
3) AIM Oklahoma program
Maternal Death Data Trends

Maternal Mortality Rate: Texas and the United States

Prepared by: Office of Program Decision Support, Division for Family and Community Health, Texas Department of State Health Services. Data Sources: Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death and Natality public use data 2005-2015 on CDC WONDER Online Database. MMR computed within 42 days following the end of pregnancy, using ICD-10 codes A34, O00-O95, O98-O99.
Maternal Death Data Trends (cont’d)

MATERNAL MORTALITY RATES BY RACIAL/ETHNIC GROUP, 2006-2015

Prepared by: Office of Program Decision Support, Division for Family and Community Health Services, Texas Department of State Health Services, 07/21/2017.
Data Source: Death and Birth Files, Center for Health Statistics, Texas Department of State Health Services.
MMR - computed within 42 days following the end of pregnancy, using ICD-10 codes A34, O00-O95, O98-O99.
Top Causes of Confirmed Maternal Death: Within 1 Year Following End of Pregnancy

Top Causes of Maternal Death, Occurring During Pregnancy or up to 365 Days Postpartum
Confirmed Maternal Deaths, 2012-2015

- Drug overdose (n=65): 17.0%
- Cardiac event (n=55): 14.4%
- Homicide (n=22): 11.0%
- Suicide (n=23): 8.6%
- Infection/Gestational (n=32): 8.4%
- Cerebrovascular event (n=27): 7.1%
- DIC/Hemorrhage (n=20): 5.2%
- Other non-obstetric cause (n=20): 5.2%
- Hypertension/ eclampsia (n=18): 4.7%
Top Causes of Maternal Death: During Pregnancy & Within 7 Days Postpartum

Top Causes of Maternal Death, Occurring During Pregnancy or up to 7 Days Postpartum
Confirmed Maternal Deaths, 2012-2015

- DIC/Hemorrhage (n=15): 19.0%
- Cardiac event (n=14): 17.7%
- Anoxic asphyxia (n=10): 12.7%
- Cerebrovascular event (n=8): 10.1%
- Hypertension/ eclampsia (n=7): 8.9%
- Pulmonary embolism (n=5): 6.3%
Severe Maternal Morbidity: Top Causes

Severe Maternal Morbidity (SMM) in Texas Overall and Top Causes, 2014

<table>
<thead>
<tr>
<th>Cause</th>
<th>Cases per 10,000 deliveries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Texas SMM rate</td>
<td>195.2</td>
</tr>
<tr>
<td>Hemorrhage*</td>
<td>129.8</td>
</tr>
<tr>
<td>DIC</td>
<td>25.8</td>
</tr>
<tr>
<td>Cardiac Event</td>
<td>20.4</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>13.9</td>
</tr>
<tr>
<td>Eclampsia*</td>
<td>7.1</td>
</tr>
</tbody>
</table>

*AIM Patient Safety Bundle is available for this condition.

Data Source: Hospital Inpatient Discharge Public Use Data File, 2014
Prepared by: Maternal & Child Health Epidemiology
Obstetric Hemorrhage Rates by Race/Ethnicity (Maternal Morbidity)

ICD-9 procedure code 99.0x (Blood and Blood Component Transfusion) was used to estimate/calculate rates of severe maternal morbidity due to hemorrhage in obstetric hospitalizations.

Data Source: Hospital Inpatient Discharge Public Use Data File, 2005-2014
Prepared by: Maternal & Child Health Epidemiology
Obstetric Hemorrhage Rates by County (Maternal Morbidity)
Frequency of Obstetric Hemorrhage by County

Source: Texas Hospital Inpatient Discharge Public Use Data File (HIDF), 2010-2014.
COD-9 Procedure Code 99.6x (Blood and Blood Component Transfusion) was used for frequency of hemorrhage in delivery hospitalizations. Prepared by: Office of Program Decision Support, 8/17/2017.
Obstetric Hypertension Rates by Race/Ethnicity (Maternal Morbidity)

ICD-9 diagnosis code 642.xx was used to calculate proportions of hypertensive disorders in delivery hospitalizations.

Data Source: Hospital Inpatient Discharge Public Use Data File, 2005-2014
Prepared by: Office of Program Decision Support
Hypertensive Disorder Rates by County (Maternal Morbidity)

Hypertensive disorders complicating pregnancy, 2010-2014
Hypertension, pre-eclampsia, and eclampsia during delivery hospitalization

Legend
Proportion of deliveries
- 0.1 - 10.2% (at or below state average)
- 10.3 - 14.4% (+1 SD)
- 14.5 - 18.5% (+2 SD)
- 18.6 - 22.7% (+3 SD)
- 22.8% and above
- 0 cases or <100 deliveries

Source: Texas Hospital Inpatient Discharge Public Use Data File (PUDF), 2010-2014
ICD-9 Diagnostic Code 642 (Hypertension Complicating Pregnancy, Childbirth, and the Puerperium) was used to calculate proportions of hypertensive disorder in delivery hospitalizations.
Frequency of Hypertensive Disorders by County

Frequency of hypertensive disorders complicating pregnancy, 2010-2014
Hypertension, pre-eclampsia, and eclampsia during delivery hospitalization

Legend
Number of cases
- 1 - 100
- 101 - 1,000
- 1,001 - 5,000
- 5,001 - 10,000
- 10,001 and above
- 0 cases

Source: Texas Hospital Inpatient Discharge Public Use Data File (HPUD), 2010-2014.
ICD-9 Diagnosis Code 403.xx (Hypertension Complicating Pregnancy, Childbirth, and the Puerperium) was used for frequency of hypertensive disorder in delivery hospitalizations. Prepared by: Office of Program Decision Support, 8/17/2017, (3b).
Maternal Morbidity and Mortality are Preventable

From: Main et al. Obstet Gynecol 2015;125(4):938-947
Hemorrhage Safety Bundle Implementation – Positive Results

• A recent study by Main et al. (2017) observed that among hospitals who implemented the national hemorrhage safety bundle, women with obstetric hemorrhage experienced a 20.8% reduction in severe maternal morbidity from baseline (prior to implementation).

• Hospitals who implemented the hemorrhage safety bundle had an 11.7% decrease in severe maternal morbidity among all obstetric patients (compared to baseline).
Mortality Reduction – Hypertension Protocol

- Hospital Corporation of America instituted a protocol of antihypertensive therapy any time specific blood pressure thresholds were exceeded.

- Resulted in 80% reduction in deaths from pre-eclampsia (p=0.02).

Importance of Protocols and Checklists

• ACOG Committee Opinion #629 recommends/encourages the use of checklists and protocols, which are two major features of AIM bundles

• Use of protocols and checklists:
  • Help practitioners perform critical tasks the same way every time, which can reduce error
  • Have been shown to reduce patient harm through improved standardization
  • Have been clearly demonstrated to improve outcomes
AIM Program

Purpose:
• To equip, empower, and embolden every state, perinatal quality collaborative, hospital system/birth facility, and maternity care provider to significantly reduce severe maternal morbidity and maternal mortality through proven implementation of consistent maternity care practices

Approach:
• These best practices are outlined/implemented using maternal safety bundles
• Bundles are developed and endorsed by national multidisciplinary organizations
AIM and AIM Bundles
Overview

Barbara S. Levy MD, FACOG, FACS
Vice President, Health Policy
American Congress of Obstetricians and Gynecologists
AIM Goal
Eliminate Preventable Maternal Mortality and Severe Morbidity in Every U.S. Birth Center

AIM Strategies
• Broad partnership
• Tools & TA
• Implementation training
• Real time data
• Build on existing initiatives
• Incremental bundle adoption
Partners to Improve Healthcare
What’s a Bundle?

*bun·dle: /ˈbәndl/  
noun: a collection of things, or a quantity of material, tied or wrapped up together

Collection of 10-13 best practices for improving safety in maternity care that have been vetted by experts in practice

Goal: Move established guidelines into practice with a standard approach within your institution

• **NOT**: National protocols  
• **NOT**: New science, new RCTs
AIM Bundle Particulars

Four Sections or Domains
• READINESS
• RECOGNITION & PREVENTION
• RESPONSE
• REPORTING & SYSTEMS LEARNING

• Developed by official representatives from provider organizations, public health, patient advocates.
• Vetted by the Council on Patient Safety in Women’s Health
• Reviewed semiannually for updates
• Commentaries co-published in journals of the organizations developing bundles
AIM Safety/Quality Improvement Bundles

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

Safety Tools
- Maternal Early Warning Criteria
- SMM Case Review Forms
- Maternal Mental Health
- Reducing Disparities in Maternity Care
- Postpartum Care Basics
- Interconception Care Coming Soon

www.safehealthcareforeverywoman.org
AIM State Teams Include

- Official representatives from:
  - ACOG
  - SMFM
  - AWHONN
  - ACNM
  - AAFP
  - State hospital association(s)

- Perinatal Quality Collaborative (implementation)

- Other important partners:
  - Title V Leadership, Epidemiologist(s), Risk Management, Patient Advocates, MOD, SOAP, WHNP, Medicaid, Health and Liability Insurers, WIC
AIM Participation: July 2017

AIM States
- Enrolled (11+)
- Recently Joined
- Serious Interest
- AIM Impact

Annual Births
1,520,000+
AIM Implementation Tools

• Support state teams
  • Monthly and ad hoc calls with team members
  • Mentorship between state teams
  • Identify and address common issues – Examples:
    • Treating severe level HTN
    • Shortages and misappropriations of critical pharmaceuticals
    • Supporting quantification of blood loss

• Coming Soon: Tool Kit
• E-modules
• Resource platform – Contact AIM
• Safety Action webinars
AIM Annual Meeting
April 2017, Baltimore, MD
132 participants / 23 state teams
Resource and Story Sharing with Partners and State Teams
States Focusing on Opioids

Strategies for Opioid Bundle

• Develop 3-5 state collaborative of new and existing AIM states.
• Build the tools
  • Current resources
  • Identify needs – adaptations
  • New ACOG CO
• Support training
  • MAT platform for physicians, NPs and PAs
  • Add in interactive live bundle training
  • Develop webinar bundle training
• Coordinate with ASAM and SAMHSA
Why an AIM Data Center?

- Data-driven / Data-supported Quality Improvement
- Follow your own progress and compare to other “like” facilities in your state and other states (all de-identified)
- The State Collaborative leaders can track how you are doing and provide help and nudges where appropriate
- Everyone can track overall progress towards the state and national goals
AIM Data Center Now Live with Cross-Collaborative Comparisons

• Bundle Measures (Outcome, Structure and Process)

• Handling Data Challenges when you are dealing with 11 states, >200 hospitals (not counting California)...

  • Andrew Carpenter, Critical Juncture LLC, Lead for AIM Data Center
  • Elliott Main, MD, AIM Implementation Director
## Outcome Measures

<table>
<thead>
<tr>
<th></th>
<th>Severe Preeclampsia</th>
<th>Obstetric Hemorrhage</th>
<th>Supporting Vaginal Birth/Reducing Primary CS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Severe Maternal Morbidity</td>
<td>Severe Maternal Morbidity</td>
<td>Severe Maternal Morbidity</td>
</tr>
<tr>
<td>2</td>
<td>Severe Maternal Morbidity (excluding transfusion codes)</td>
<td>Severe Maternal Morbidity (excluding transfusion codes)</td>
<td>Severe Maternal Morbidity (excluding transfusion codes)</td>
</tr>
<tr>
<td>3</td>
<td>Severe Maternal Morbidity among Preeclampsia Cases</td>
<td>Severe Maternal Morbidity among Hemorrhage Cases</td>
<td>C/S Delivery Rate among Nulliparous, Term, Singleton, Vertex (NTSV) Population</td>
</tr>
<tr>
<td>4</td>
<td>Severe Maternal Morbidity (excluding transfusion codes) among Preeclampsia Cases</td>
<td>Severe Maternal Morbidity (excluding transfusion codes) among Hemorrhage Cases</td>
<td>C/S Delivery Rate among Nulliparous, Term, Singleton, Vertex (NTSV) Population after Labor Induction</td>
</tr>
</tbody>
</table>

All derived from HDD or BC (via state agency) quarterly
Cross-Collaborative Comparisons

The graph below shows cross-collaborative comparison data for the selected measure. The dropdown parameters can be used to alter the graph’s display. The graph and data below are in draft form and should not be shared.

Severe Maternal Morbidity among All Delivering Women
Aggregate Collaborative Average

Dotted lines show data prior to collaborative kickoff date
• Collecting structure measures by asking for approximate date completed

• Also tracking explicit “Not in place”
Cross-Collaborative Comparisons

The graph below shows cross-collaborative comparison data for the selected measure. The dropdown parameters can be used to alter the graph's display. The graph and data below are in draft form and should not be shared.

Dotted lines show data prior to collaborative kickoff date
Cross-Collaborative Comparisons

The graph below shows cross-collaborative comparison data for the selected measure. The dropdown parameters can be used to alter the graph's display. The graph and data below are in draft form and should not be shared.

Timely Treatment of Severe HTN
Percentage of Collaborative Hospitals with Rate $\geq 80.0\%$

Dotted lines show data prior to collaborative kickoff date.
Timely Treatment of Severe HTN
Percentage of Collaborative Hospitals with Rate ≥ 80.0%

Timely Treatment of Severe HTN: Data Completeness
Percentage of Collaborative Hospitals Who Have Submitted Data for This Measure

Dotted lines show data prior to collaborative kickoff date.
Eliminate Preventable Maternal Mortality and Severe Morbidity
Creating a culture of excellence in perinatal care
The Landscape of Perinatal Care
In Oklahoma

51 birthing hospitals
58% rural
42% urban

~52,000 annual births
69% in urban hospitals
31% in rural hospitals
From 80 – 4700 annual births
~60% covered by Medicaid

48 hospitals signed on to participate in AIM Kick-Off in April 2015
42/51 actively participating (90% of births)
OB Hemorrhage Bundle and Severe HTN Bundle
Structure - OPQI

• Office of Perinatal Quality Improvement – OUHSC College of Medicine
  • Director – RN, 1.0 FTE
  • 2 Program Managers – RNs, total 1.4 FTE
  • Administrative Assistant – 1.0 FTE
  • Medical Director – Chad Smith, MD – 0.1 FTE
  • Neonatal Consultants – 0.1 FTE
    • Anne Wlodaver, MD
    • Arlen Foulks, DO
Structure - OPQIC

• Formal launch in 2014
• Website launched in 2015
• OPQI administers all activities of OPQIC
• OPQIC Leadership Team members
  • Oklahoma State Department of Health
  • Oklahoma Health Care Authority
  • March of Dimes
  • Oklahoma Hospital Association
  • Oklahoma Family Network
  • ACOG
  • AWHONN
  • AAP
History of AIM in Oklahoma

• 2015
  • Every Mother Counts launched in response to National Partnership for Maternal Safety call to action and Oklahoma Maternal Mortality Review/CDC data
    • Hospitals recruited via email and telephone
    • Kick-Off April 2015
  • AIM getting started simultaneously
    • Oklahoma first state to join
    • Resources and data portal would assist in bundle implementation
    • Oklahoma implementing OB Hemorrhage and Severe HTN/Preeclampsia bundle
    • AIM Baseline Survey
    • Individual hospital calls for data portal began in Q4 2015 – data portal operational
History of AIM in Oklahoma

• 2016
  • January 1, 2016 – process measures open for entry for Q4 2015
  • HDD through 2014 submitted
  • Calls continued with hospitals
  • Webinars
  • Presentations
  • Data analysis
  • National Involvement
    • Other states
    • Monthly calls
    • Data Portal refinement
    • In person meeting
History of AIM in Oklahoma

• 2017
  • Continue with data entry, acknowledgement emails, reminders
  • HDD through 2015 submitted; partial 2016
  • Calls continued with hospitals for staff changes
  • Webinars
  • Presentations
  • Data analysis
  • National Involvement
    • Other states
    • Developed quarterly reports to increase awareness
    • Monthly calls
    • In person meeting
    • Data portal enhancement
5 Areas of Priority Identified in 2016/2017

- Management Plan for Postpartum Hemorrhage
- Management Plan for Severe Hypertension
- Postpartum Hemorrhage Risk Assessment
- Quantitative Blood Loss
- Timely Treatment of Severe Hypertension
What are challenges and barriers?

• RN responses:
  • 100% stated biggest barrier is lack of provider compliance with protocols
    • “Physicians are not aware of protocol and bundles. We can’t mandate education”
    • “They don’t buy-in. What do we do when a physician states they don’t believe our QBL amount and they’re going to give a different EBL amount? This creates conflict and a dilemma.”
    • “We hear a lot of, “Those are just recommendations, not hard, fast rules.”
    • “There must be a physician champion aware of evidence supporting change and willing to speak up and promote change – not often a popular or sought after role.”
What are challenges and barriers?

• RN responses:
  • “Time; especially with multiple priorities.”
  • “Need for bundles to be physician driven instead of nursing driven.”
What are challenges and barriers?

• MD responses:
  • Biggest barrier is lack of awareness of bundles/protocols
    • “Don’t assume they know about the bundles.”
  • Time constraints
  • Need evidence to support change
    • “In my opinion, we’re skeptics by nature. So, if someone can’t give me a really good reason for why I’m going to change the “way I’ve always done things”, it’s hard for me to change.”
Keys to Success

• OPQIC Website
  • Access to resources in one place

• AIM Data Portal
  • Requires in-depth understanding of measures by OPQI staff
  • OPQI staff educated hospital team/data leads on data portal
    • Measures – many are new to QI
    • Understanding of how to gather data for measures
    • Data entry – A LOT of reminders
  • OSDH sends HDD to AIM Data Lead who enters into data portal

• National AIM Leadership and Resources
Keys to Success

• Creating awareness
  • Face-to-Face Meetings
    • Annual OPQIC Summit
    • Quarterly OPQIC Meetings
    • AWHONN conference
    • OPNF meetings
    • Hospital meetings – OB Medical Staff meetings, PCEP meetings
    • Any time we get a chance!
  • Email
    • Monthly OPQIC email
  • Social Media
  • National attention
Lessons Learned

• HTN is easier for hospitals to implement but hardest for data collection
  • Create log of patients
    • Allows for identification of patients
    • Enhances investigation of cases
• Easy wins for OB Hemorrhage Bundles
  • Hemorrhage Cart
  • Hemorrhage Risk Assessment
• Simulation drives improvement and sustainment
• Be creative
• Be persistent
OUR MISSION IS TO PROVIDE LEADERSHIP AND ENGAGE INTERESTED STAKEHOLDERS IN A COLLABORATIVE EFFORT TO IMPROVE THE HEALTH OUTCOMES FOR OKLAHOMA WOMEN AND INFANTS USING EVIDENCE-BASED PRACTICE GUIDELINES AND QUALITY IMPROVEMENT PROCESSES.

Check out our Featured Resource of the month.

INITIATIVES
See initiatives facilitated by the Oklahoma Perinatal Quality Improvement.

CONTACT US TODAY

COURSES
View a list of courses offered by the Office of Perinatal Quality Improvement.

RESOURCES
Find resources for perinatal health care providers.
QUESTIONS?
Thank you