Improving Perinatal Outcomes—
National and State-wide Initiatives for Maternal Quality and Safety

Elliott K. Main, MD
Medical Director, CMQCC
Clinical Professor, Obstetrics and Gynecology
University of California, San Francisco, and Stanford University, Medical School
Objectives:

- Describe the initiatives in improve perinatal/maternal mortality and severe morbidity
- Describe the current quality measures being rolled out state and nation-wide
- Describe California Maternal Data Center and how it can be used for benchmarking and driving maternal QI efforts.

Presenter Disclosure(s):

- None
Our 3 Overlapping but Non-identical Frameworks

- Different professional groups with different trainings and “world views”
- Different agendas and priorities
- Different frames and models

Far and away the greatest impact occurs when we work together!!

= Outcomes

CMQCC: Transforming Maternity Care
CollN to Reduce Infant Mortality

• Reduce elective delivery at less than 39 weeks of pregnancy by 33%;
• Expand access to inter-conception care (between pregnancies) through Medicaid; change policy is 5-8 states;
• Reduce smoking among pregnant women by 3%;
• Increase infant safe sleep practices by 5%;
• Improve perinatal regionalization-- increase the number of mothers delivering at appropriate facilities by 20%
The Maternity Quality and Safety Landscape
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- Risk Mgmt
  - Shoulder Dystocia
  - Oxytocin Vacuum
  - Teamwork and Communications

- Quality Indicators
  - Identify cases for peer review:
  - ACOG, IHI Adverse Events
The Maternity Quality and Safety Landscape

**Risk Mgmt**
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**Quality Indicators**
- Identify cases for peer review: ACOG, IHI Adverse Events

**Outcome Measures**
- Maternal Mortality/Severe Morbidity
- Birth Injuries
- Neonatal Mortality

**Process Measures**
- Antibiotics, VTE Prevention, Antenatal Steroids, <30min Emergent CS

**Other Measures**
- Utilization (over/under)
- Access Disparity

Oxytocin

Teamwork and Communications
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**Level of Release**
- Public, Confidential, Internal Benchmarking

**Level of Measurement**
- Hospital, Medical Group, Provider, Population

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**Additional Measures**
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- **Risk Mgmt**
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  - Sentinel Event, RCA, FMEA
  - OPPE, FPPE

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- **No Harm Event / Near Miss Analyses**

- **Vacuum Shoulder Dystocia**

- **Teamwork and Communications**

- **Oxytocin**

- **Process**

- **Risk Mgmt**

- **Quality Indicators**

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CMQCC and CPQCC

Mission: Data-driven QI for mothers and newborns

California Perinatal Quality Care Collaborative (CPQCC)
- Established 1996
- >95% of all Neonatal Intensive Care Units in California
- Secure data center—pioneer for data driven QI
- Model of working with state agencies to provide data of value

California Maternal Quality Care Collaborative (CMQCC)
- Established 2006
- California Maternal Mortality Review Committee (Title V, MCAH)
- QI toolkits: Elective Delivery <39wks, Hemorrhage, Preeclampsia
- Large-scale QI Collaboratives: Hemorrhage, Preeclampsia
- Statewide Maternal Data Center (CDC and CHCF supported)
CPQCC/ Neonatal and Perinatal Toolkits and Collaboratives

Toolkits:
• Antenatal Corticosteroid Therapy
• Improving Initial Lung Function: Early CPAP, Surfactant
• Postnatal Steroid Administration
• Nutritional Support of the Very Low Birth Weight Infant
• Prevention of Perinatal Group B Streptococcus Disease Toolkit -
• Severe Hyperbilirubinemia Prevention (SHP)
• Perinatal HIV Prevention
• Delivery Room Management of the VLBW Infant
• Neonatal Hospital Acquired Infection Prevention
• Care and Management of the Late Preterm Infant

Current Collaboratives:
• Prevention of Central line infections
• Reduction of VLBW LOS

www.cpqcc.org
CMQCC Key Partner/Stakeholders

State Agencies:
- MCAH, Dept Public Health
- OSHPD Healthcare Information Division
- Office of Vital Records (OVR)
- Regional Perinatal Programs of California (RPPC)
- DHCS, Medi-Cal

Public Groups
- California Hospital Accountability and Reporting Taskforce (CHART)
- Kaiser Family Foundation
- March of Dimes (MOD)
- Pacific Business Group on Health

Professional groups
- American College of Obstetrics and Gynecology (ACOG)
- Association of Women’s Health, Obstetric and Neonatal Nurses (AWHONN)
- American College of Nurse Midwives (ACNM)
- American Academy of Family Physicians (AAFP)

Key Medical and Nursing Leaders
- University and Hospital Systems
- Kaisers, Sutter, Sharp, CHW, Scripps, Public hospitals,
CMQCC Toolkits and Collaboratives

- Maternal Mortality and Morbidity
  - Hemorrhage
  - Preeclampsia
  - CV Disease*
  - DVT Prevention*

- National Quality Measures
  - Early Elective Delivery
  - Antenatal Steroids
  - First Birth Cesarean Delivery*

*Currently under development
Maternal Mortality Rate, California and United States; 1999-2010

SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1999-2010. Maternal mortality for California (deaths ≤ 42 days postpartum) was calculated using ICD-10 cause of death classification (codes A34, O00-O95, O98-O99) for 1999-2010. United States data and HP2020 Objective were calculated using the same methods. U.S. maternal mortality rates are published by the National Center for Health Statistics (NCHS) through 2007 only. Rates for 2008-2010 were calculated using NCHS Final Birth Data (denominator) and CDC Wonder Online Database for maternal deaths (numerator). Accessed at http://wonder.cdc.gov/ucd-icd10.html on Apr 17, 2013 8:00:39 PM. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, April, 2013.
Maternal Mortality Rates by Race/Ethnicity, California Residents; 1999-2006

Maternal Deaths per 100,000 Live Births

THE CALIFORNIA PREGNANCY-ASSOCIATED MORTALITY REVIEW

Report from 2002 and 2003 Maternal Death Reviews

This project was supported by federal Title V block grant funds received from the California Department of Public Health; Center for Family Health; Maternal, Child and Adolescent Health Division

April 2011
## Maternal Mortality and Severe Morbidity

Approximate distributions, compiled from multiple studies

<table>
<thead>
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Everyone’s nightmare...
Open Access Toolkit of Best Practices

- Guidelines, protocols, checklists, sample policies, support materials
- Series of “Best Practice” discussions on all OB hemorrhage topics, from Accreta to Jehovah’s Witness to Uterotonic agents
- www.CMQCC.org
QI Topic 1: OB Hemorrhage
CMQCC QI Efforts

• Statewide CMQCC OB Hemorrhage QI Taskforce
  – Large, multi-disciplinary, overlap with PAMR
  – Funded by CDPH-MCAH, completed in 2009

• California OB Hemorrhage QI Toolkit (published 2010)
  – Best practices, guidelines, hemorrhage cart and med kit, blood bank integration, and drill scenarios
  – www.cmqcc.org (in top 5 on Google for “OB hemorrhage”)

• CMQCC OB Hemorrhage QI Collaboratives
  – 2010: 30 hospitals (~100,000 births)
  – 2011: 24 hospitals (~85,000 births)
  – 2011-on: multiple hospital systems, Los Angeles County
### Obstetric Hemorrhage Care Guidelines: Table Chart Format

<table>
<thead>
<tr>
<th>Stage 0</th>
<th>Every woman in laboring birth</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assessments</strong></td>
<td><strong>Meds/Procedures</strong></td>
</tr>
<tr>
<td>Stage 0 focuses on risk assessment and active management of the third stage.</td>
<td></td>
</tr>
<tr>
<td>Assess every woman for risk factors for hemorrhage</td>
<td>Ongoing quantitative evaluation of blood loss on every birth</td>
</tr>
<tr>
<td>Stage 1 Blood loss: &gt;500 mL vaginal or &gt;1000 mL Cesarean, or V5 changes (by &gt;15% or HR ≥110, BP ≥85/45, O2 sat &lt;95%)</td>
<td>Active Management: Oxytocin 1 IU infusion or 10u IM, Fundal Massage vigorous, 15 seconds min</td>
</tr>
<tr>
<td>Stage 1 is short: activate hemorrhage protocol, initiate preparations and give Methylene Blue</td>
<td>IV Access: at least 16gauge</td>
</tr>
<tr>
<td>Stage 2 Continued with total blood loss under 1500mL</td>
<td>Increase Oxytocin rate, and repeat fundal massage</td>
</tr>
<tr>
<td>Level 2: If transfusion is needed, consult blood bank</td>
<td>Methylene 0.2mg IM (if not hypertensive)</td>
</tr>
<tr>
<td>May repeat if good response to first dose, but otherwise move up to 2mg</td>
<td></td>
</tr>
<tr>
<td>Vaginal and uterine cavity, placenta</td>
<td>Empty bladder: straight cath or place Foley with urinometer</td>
</tr>
<tr>
<td><strong>Stage 2</strong></td>
<td><strong>Continued with total blood loss under 1500mL</strong></td>
</tr>
<tr>
<td>OB back to bedside (if not already there)</td>
<td>2nd Level Uterotonic Drugs: Hematene 250 mg IM or Misoprostol 600-1000 mcg PR</td>
</tr>
<tr>
<td>Extra help: 3rd OB, Rapid Response Team (get Ancillary, assign roles)</td>
<td></td>
</tr>
<tr>
<td>VS &amp; cumulative blood losses ≤10 mL</td>
<td>Vaginal Birth: (typical order)</td>
</tr>
<tr>
<td>Weigh bloody materials</td>
<td>Move to OR</td>
</tr>
<tr>
<td>Complete evaluation of vaginal wall, cervix, placenta, uterine cavity</td>
<td>Repair any tears</td>
</tr>
<tr>
<td>Send additional labs, including DIC panel</td>
<td>DSC: no retained placenta</td>
</tr>
<tr>
<td>If in Postpartum: Move to L&amp;D/ OR</td>
<td>Place intrauterine balloon</td>
</tr>
<tr>
<td>Evaluate for special cases</td>
<td>Selective Embolization (Interventional Radiology)</td>
</tr>
<tr>
<td>Uterine Inversion</td>
<td>Continuous Pneumatic Compression (PM)</td>
</tr>
<tr>
<td>Amn. Fluid Embolism</td>
<td>Uterine Artery Ligation</td>
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### CMQCC California Hemorrhage Guidelines

**OBSTETRIC HEMORRHAGE CARE GUIDELINES: FLOW CHART FORMAT**

**Pre-Admission**
- Identify patients with special considerations (Placenta previa/corda, Bleeding disorder, or those who decline blood products)
- Follow appropriate workup, planning, preparing of resources, counseling and notification

**Screen All Admissions for hemorrhage risk:**
- Low Risk, Medium Risk and High Risk

**Time of Admission**
- Blood loss: ≤500 mL vaginal or ≤1000 mL Cesarean
  - Oxytocin IV infusion 10 units IM, vigorous fundal massage for 15 seconds minimum
- Blood loss: >1000-1500 mL
  - Increase IV Oxytocin Rate
  - Methylene 0.2 mg IM (if not hypertensive) Complete Pneumatic compression, keep warm
  - Adrenaline 0.1 to maintain Sat ≥95%
  - Rule out HELLP, Preeclampsia, Hypertension

**Stage 0: All births**
- Order Type & Crossmatch 2 Units PRBCs if not already done

**Stage 1: Active Hemorrhage Protocol**
- Blood Loss: >500 mL Vaginal or >1000 mL Cesarean
  - Bring 2 Units PRBCs to bedside, transfuse per clinical signs – do not wait for lab values
  - Use blood warmer for transfusion
  - Consider transfusing 2 FFP (takes 35 min.), use if transfusing >2u PRBCs
  - DATerna availability of additional RBCs and other Coag products

**Stage 2: Sequentially Advise through Medications & Procedures**
- Blood loss: 1000-1500 mL
  - Vaginal Birth
  - Hematene Pneumatic Pressure
  - DSC: retained placenta
  - Continuous Uterine Compression
  - Uterine Artery Ligation
  - If failure, request bleed control
  - Order Type & Crossmatch 2 Units PRBCs if not already done

**Stage 3: Active Massive Hemorrhage Protocol**
- Blood loss: >1500 mL
  - 1. Uterine Artery Ligation
  - 2. Uterine compression pack
  - 3. Cesarean Section
  - 4. Fibrinogen Dose
  - 5. Definitive Surgery

These are open access tools being utilized across CA and the world.
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<tr>
<td>Every woman in labor/giving birth</td>
<td>• Assess every woman for risk factors for hemorrhage</td>
<td>Active Management 3&lt;sup&gt;rd&lt;/sup&gt; Stage:</td>
<td>• If Medium Risk: T&amp;Scr</td>
</tr>
<tr>
<td></td>
<td>• Ongoing quantitative evaluation of blood loss on every birth</td>
<td>• Oxytocin IV infusion or 10u IM</td>
<td>If High Risk: T&amp;C 2 U</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Fundal Massage-vigorous, 15 seconds min.</td>
<td>If Positive Antibody Screen (prenatal or current, exclude low level anti-D from RhoGam): T&amp;C 2 U</td>
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Stage 0 focuses on risk assessment and active management of the third stage.

### Stage 1
Blood loss: >500 ml vaginal or >1000 ml Cesarean, or VS changes (by >15% or HR ≥110, BP ≤85/45, O₂ sat <95%)

Stage 1 is short: activate hemorrhage protocol, initiate preparations and give Methergine IM.

- Activate OB Hemorrhage Protocol and Checklist
- Notify Charge nurse, Anesthesia Provider
- VS, O₂ Sat q5'
- Calculate cumulative blood loss q5-15'
- Weigh bloody materials
- Careful inspection with good exposure of vaginal walls, cervix, uterine cavity, placenta
- IV Access: at least 18gauge
- Increase Oxytocin rate, and repeat fundal massage
- Methergine 0.2mg IM (if not hypertensive)
  May repeat if good response to first dose, BUT otherwise move on to 2<sup>nd</sup> level uterotonic drug (see below)
- Empty bladder: straight cath or place foley with urimeter
- T&C 2 Units PRBCs (if not already done)

### Stage 2
Continued bleeding with total blood loss under 1500ml

- [Assessments](#)
- [Meds/Procedures](#)
- [Blood Bank](#)
## Stage 2: Continued bleeding with total blood loss under 1500ml

<table>
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<td>OB back to bedside (if not already there)</td>
<td>• Extra help: 2nd OB, Rapid Response Team (per hospital), assign roles</td>
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<td>• VS &amp; cumulative blood loss q 5-10 min</td>
<td>• Weigh bloody materials</td>
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<td>Bimanual massage</td>
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<tr>
<td>• Inspect broad lig, posterior uterus and retained placenta</td>
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<tr>
<td>• B-Lynch Suture</td>
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<td>• Place intrauterine balloon</td>
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## Stage 3: Total blood loss over 1500ml, or >2 units PRBCs given or VS unstable or suspicion of DIC

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<td>2nd Anesthesia Provider</td>
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<td>Laparotomy:</td>
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<td>Place intrauterine balloon</td>
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<tr>
<td>Transfuse Aggressively</td>
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<tr>
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<tr>
<td>• Near 1:1 PRBC:FFP</td>
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<td>• 1 PLT:thaw in pack</td>
<td>• 1 PLT:thaw in pack</td>
</tr>
<tr>
<td>• Place intrauterine balloon</td>
<td>• Place intrauterine balloon</td>
</tr>
</tbody>
</table>

Stage 3 is focused on the Mission.
### STAGE 1: OB Hemorrhage

**Cumulative Blood Loss**: >500ml vaginal birth or >1000ml C/S - OR - Vital signs >15% change or HR >110, BP <85/45, O2 sat <95% - OR - Increased bleeding during recovery or postpartum

#### MOBILIZE

**Primary nurse, Physician or Midwife** to:
- Activate OB Hemorrhage Protocol and Checklist

**Primary nurse** to:
- Notify obstetrician (in-house and attending)
- Notify charge nurse
- Notify anesthesiologist

#### ACT

**Primary nurse**:
- Establish IV access if not present, at least 18 gauge
  - Increase IV fluids rate (Lactated Ringers preferred) and increase Oxytocin rate (500 mL/hour of 10-40 units/1000mL solution); Titrate Oxytocin infusion rate to uterine tone
- Continue vigorous fundal massage
- Administer Methergine 0.2 mg IM per protocol (if not hypertensive); give once, if no response, move to alternate agent; if good response, may give additional doses q 2 hr
- Vital Signs, including O2 sat & level of consciousness (LOC) q 5 minutes
- Weigh materials, calculate and record cumulative blood loss q 5-15 minutes
- Administer oxygen to maintain O2 sat at >95%
- Empty bladder: straight cath or place Foley with urimeter
- Type and Crossmatch for 2 units Red Blood Cells STAT (if not already done)
- Keep patient warm

**Physician or midwife**:
- Rule out retained Products of Conception, laceration, hematoma

**Surgeon (if cesarean birth and still open)**
- Inspect for uncontrolled bleeding at all levels, esp. broad ligament, posterior uterus, and retained placenta

#### THINK

Consider potential etiology:
- Uterine atony
- Trauma/Laceration
- Retained placenta
- Amniotic Fluid Embolism
- Uterine Inversion
- Coagulopathy
- Placenta Accreta
- Uterine Rupture

**Once stabilized**: Modified Postpartum management with increased surveillance

If: Continued bleeding or Continued Vital Sign instability, and <1500 mL cumulative blood loss

**proceed to STAGE 2**

### UTEROTONIC AGENTS for POSTPARTUM HEMORRHAGE

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Route</th>
<th>Frequency</th>
<th>Side Effects</th>
<th>Contraindications</th>
<th>Storage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitocin® (Oxytocin)</td>
<td>10-40 units per 1000 mL</td>
<td>IV infusion</td>
<td>Continuous</td>
<td>Usually none</td>
<td>Hypersensitivity to drug</td>
<td>Room temp</td>
</tr>
<tr>
<td></td>
<td>10 units/mL</td>
<td></td>
<td></td>
<td>Nausea, vomiting, hyponatremia (“water intoxication”) with prolonged IV admin. ↓ BP and ↑ HR with high doses, esp IV push</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Methergine® (Methylergonovine)</td>
<td>0.2 mg</td>
<td>IM (not given IV)</td>
<td>Q 2-4 hours</td>
<td>Nausea, vomiting Severe hypertension, esp. with rapid administration or in patients with HTN or PIH</td>
<td>Hypertension, PIH, Heart disease Hypersensitivity to drug Caution if multiple doses of ephedrine have been used, may exaggerate hypertensive response w/possible cerebral hemorrhage</td>
<td>Refrigerate Protect from light</td>
</tr>
<tr>
<td>Hemabate® (15-methyl PG F2a)</td>
<td>250mcg</td>
<td>IM or intra-myometrial (not given IV)</td>
<td>Q 15-90 min</td>
<td>Nausea, vomiting, Diarrhea Fever (transient), Headache Chills, shivering Hypertension Bronchospasm</td>
<td>Caution in women with hepatic disease, asthma, hypertension, active cardiac or pulmonary disease Hypersensitivity to drug</td>
<td>Refrigerate</td>
</tr>
<tr>
<td>Cytotec® (Misoprostol)</td>
<td>0.5 - 10.0 mcg/tablet</td>
<td>Per rectum (PR)</td>
<td>One time</td>
<td>Nausea, vomiting, diarrhea Shivering, Fever (transient) Headache</td>
<td>Rare Known allergy to prostaglandin Hypersensitivity to drug</td>
<td>Room temp</td>
</tr>
</tbody>
</table>
QI Topic 2: Preeclampsia

• Quality Improvement Opportunity Examples from PAMR:
  – Missed triggers: high BP (systolic and diastolic), pain, altered mental status, O2 saturation, fetal distress
  – Underutilization of Magnesium SO4 and anti-hypertensive medications
  – Difficulties getting physician to the bedside, and obtaining consultations
  – Location of care issues involving ED and PACU

• Key Supports:
  – ACOG Committee Opinion #514: Emergent Therapy for Acute-Onset, Severe Hypertension with Preeclampsia or Eclampsia (Dec 2011)
What should we do? (2)

- **Cardiovascular / Cardiomyopathy**: 3 “pearls”
  - Obesity + HTN = High Risk for Cardiomyopathy (esp if African American and >35yo)
  - Known underlying cardiovascular disease: should be followed by a multi-disciplinary team, strongly consider tertiary center
  - 3rd Trimester onset of wheezing: this is not likely to be asthma but rather Cardiac in origin, refer for evaluation
Sentinel Event Alert

Issue 44, January 26, 2010

Preventing Maternal Death

The goal of all labor and delivery units is a safe birth for both newborn and mother. A previous Alert(1) reviewed the causes of death and injury among newborns with normal birth weight and suggested risk reduction strategies. This Alert addresses the equally tragic loss of mothers. Unfortunately, current trends and evidence suggest that maternal mortality rates may be increasing in the U.S., despite the rarity of the incidence of maternal death – deaths that occur within 42 days of birth or termination of pregnancy. Since 1996, a total of 84 cases of maternal death have been reported to The Joint Commission’s sentinel event database, with the largest
Joint Commission Sentinel Alert: Improvement Opportunities

- Better recognition and treatment of hemorrhage especially following Cesarean birth
- Better control of BP in hypertensive women
- Better diagnosis and treatment pulmonary edema in women with preeclampsia
- Closer attention to vital signs, use of “triggers”
- Greater use of pneumatic compression devices and low molecular weight heparin in high risk patients undergoing a Cesarean birth
- Education of ED staff to complications of pregnancy and the postpartum period
Editorial:

Maternal Mortality
Time for National Action

122(4):735-736, October 2013

For many American obstetricians, maternal mortality has been considered a problem of the past, successfully put to bed, with asepsis and antibiotics conquering childbirth fever and blood transfusions saving mothers from hemorrhage. The impressive decline of U.S. maternal deaths from 850 per 100,000 live births in 1900 to 7.4 per 100,000 in 1986 would have supported that interpretation. However, during the past 20 years, the United States has seen a reversal in this trend. The U.S. maternal mortality ratio has doubled to 14.5, with rates among African American women reaching 37.7, which is threefold to fourfold higher than rates among white women. We do not fare well when compared with other high-resource countries, and some see this as evidence of serious problems in the American system of maternity care.

The study in this issue by Saucedo and colleagues examining French maternal deaths from 1998 to 2007 provides an opportunity for comparison. In their population, maternal deaths did not increase from the first 5-year period (8.8 per 100,000) to the last 5 years (8.4 per 100,000) despite an increase in prevalence of advanced maternal age, obesity, and cesarean delivery (though the rates of the last 2 years are still considerably lower than in the United States). This is important as Americans analyze their national statistics because the increase in maternal comorbidities often is blamed for the increase in mortality.

Counting maternal deaths on a population basis is, surprisingly, very difficult. The rarity and multiple potential locations of death beyond the obstetric service require the use of death certificates. However, careful studies have estimated that up to 38% of maternal deaths have been unidentified on death certificates. This under-reporting has led all juris-
National Maternal Health Initiative: Strategies to Improve Maternal Health And Safety
May 5th 2013
New Orleans, LA
“What every birthing facility in the US should have…”
Many Streams of Activity Came Together in New Orleans: ACOG ACM May 2013
Many Streams of Activity Came Together in New Orleans: ACOG ACM May 2013

Examples of Current Large-scale Projects Addressing Maternal Mortality & SMM

ACOG/CDC Maternal Mortality Action Committee

State Quality Improvement Collaboratives

SMFM: “M back in MFM group”

AWHONN

HRSA: MCH-B

CDC

AMCHP
Maternal Safety Bundles
SMFM/ACOG/AWHONN workgroups

• Obstetric Hemorrhage
• Hypertension in Pregnancy
• Prevention of VTE in Pregnancy

---Strong support that every hospital needs to have “a” protocol and bundle, not “the” protocol

---Each safety bundle is designed with key components / tools with example materials
ACOG/CDC workgroups on Maternal Safety Bundles

- Maternity Care QI: Importance of Process – David Lagrew
  Common issues in introducing change (safety bundles)
- Maternal Early Warning Criteria - Jill Mhyre
  Criteria to identify women who require immediate bedside assessment by an MD
- Severe Maternal Morbidity Facility Review – Sarah Kilpatrick,
  Every case should be reviewed by a multidisciplinary team with a goal of systems improvement
- Staff, Family and Patient Support – Cynthia Chazotte
  Support resources for all those involved in a severe maternal morbidity or mortality
Council for Patient Safety in Women’s Health
ACOG/AWHONN/ACNM/SMFM/AAFP

• Washington DC, July 29, 2013
• Formal Support and Endorsement of National Partnership for Maternal Safety
• Will coordinate dissemination and Implementation among the following agencies:
Creating the Collaborative for Change

Maternal Safety

Obstetricians (ACOG/SMFM/ACOOG)
Nurses (AWHONN)
Midwives (ACNM)
Nurse Practitioners (NPWH)
Birthing Centers (AABC)
Hospitals (AHA, VHA)

Perinatal Quality Collaboratives (many)
Blood Banks (AABC)
OB Anesthesia (SOAP)
Family Practice (AAFP)

Federal (MCH-B, CDC, CMS/CMMI)
State (AMCHP, ASTHO, MCH)

Direct Providers

Safety, Credentials (TJC)
Obstetric Hemorrhage Safety Bundle

Readiness:
- Hemorrhage Cart / with Procedural Instructions (balloons, stitches)
- Partnership with Blood Bank
- Regular unit-based drills (with debriefs)
- Ensure rapid availability of medications
- Establish easily availability for special case resources
- Unit Education to protocols

Recognition:
- Assessment of hemorrhage risk on admission and late in labor
- Early Warning Tool for vital signs and symptoms
- Assessment of semi-quantitative CUMMULATIVE blood loss

Response:
- Unit-standard OB Hemorrhage Protocol with checklists

Prevention / Learning:
- Universal use of Active Management of 3rd Stage
- Establish a culture of Post-event Debrief / Huddle
- Review all serious cases for systems issues (mini RCA format)
The Maternity Quality and Safety Landscape

**Risk Mgmt**
- Shoulder
- Dystocia
- Vacuum
- Teamwork and Communications

**Quality Indicators**
- Identify cases for peer review:
  - ACOG, IHI Adverse Events

**Oversight**
- Sentinel Event
- RCA, FMEA
- OPPE, FPPE

**Process Measures**
- Antibiotics, VTE Prevention, Antenatal Steroids, <30min Emergent CS

**Outcome Measures**
- Maternal Mortality/Severe Morbidity
- Birth Injuries
- Neonatal Mortality

**Level of Release**
- Public, Confidential, Internal Benchmarking

**Level of Measurement**
- Hospital, Medical Group, Provider, Population

**Other Measures**
- No Harm Event / Near Miss Analyses
- Utilization (over/under)
- Access Disparity

**Process Measures**
-KOJUOFTERMAL
- Antibiotics, VTE Prevention, Antenatal Steroids, <30min Emergent CS

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**Other Measures**
- No Harm Event / Near Miss Analyses
- Utilization (over/under)
- Access Disparity
“No mother (or baby) left behind”

- CMS (Medicare) has had “adult” measures for many years
- Not a single measure concerns pregnancy or children
- Commercial payers also use CMS measures
- NQF is now the inter-agency “clearinghouse” for new measures
- Suddenly, “everyone” wants W&C measures

- “Big Kahuna” for vetting all quality measures
- Hospital accreditor and major proponent of quality measures
- Employer Group that drives public reporting of quality measures
- Medicare and Medicaid pay for ~50% of births and they want quality measures!
- Program to develop provider-level metrics
#0469 Elective delivery prior to 39 weeks
• #0470 Episiotomy rate
• #0471 Cesarean rate for low-risk first births
• #0472 Prophylactic antibiotics for Cesarean birth (within 1 hr)
• #0473 DVT prophylaxis for women having a Cesarean birth
• #0475 Hepatitis B Vaccine for all newborns
• #0476 Rate of antenatal steroids for under 34 week births
• #0477 Infants under 1500g (VLBW) not delivered at Level III
• #0480 Exclusive breastfeeding at hospital discharge
• #0716 Healthy Term Newborn (aka Unexpected Newborn Complications)
• #1402 Newborn Hearing Screening
• #1746 Intrapartum GBS antibiotic prophylaxis

★ Measures that are highest value (Quality + Savings)

JC Core Measure Set  Leapfrog Group Measures
• #0304  Late sepsis/meningitis in VLBW (VON)
• #1731  Healthcare-associated sepsis (TJC)
• #0478  Neonatal blood stream infection (AHRQ)
• #0483  Screening for Retinopathy of prematurity (22-29 weeks)
Elective Delivery (PC-01)
The Joint Commission / HCA

- Patients with elective vaginal deliveries or elective cesarean sections at $\geq 37$ and $< 39$ weeks of gestation completed
  - Denominator: Patients delivering singleton livebirths from 37+0 to 38+6 weeks of gestation
  - Exclusions: Patients with a medical or obstetric indication (from a TJC standard list of ICD9 codes or documented classical CS or myomectomy)
  - Numerator: Patients with elective* deliveries

*Elective: Induction or Cesarean section in absence of active labor or rupture of membranes
Key Resource for Implementation

www.CMQCC.org/

www.marchofdimes.com/

Formally supported by ACOG (California and several other Districts), AHWONN, ACNM
Cesarean Section (PC-02)  
The Joint Commission / CMQCC

• Nulliparous women with a term, singleton baby in a vertex position delivered by cesarean section
  – Denominator: Nulliparous women with a live term singleton newborn in vertex presentation
  – Numerator: Those with cesarean sections
  – Exclusions: none
  – Risk Adjustment: none
Importance of NTSV population to the CS rate

- 98% of inter-institutional variation in overall CS rates can be attributed to NTSV (TSCN)

- >60% of the rise in CS rates over the last 10 years can be attributed to NTSV (TSCN)

Total CS Rate Among 251 California Hospitals 2011-2012
(Source: CMQCC--California Maternal Data Center combining primary data from OSHPD and Vital Records)

Range: 15.0—71.4%
Median: 32.5%
Mean: 32.8%
Low-Risk First-Birth (Nuliparous Term Singleton Vertex) CS Rate
(endorsed by NQF, TJC PC-02, CMS, HP2020)
Among 249 California Hospitals: 2011-2012
(Source: CMQCC--California Maternal Data Center combining primary data from OSHPD and Vital Records)

Range: 10.0—75.8%
Median: 27.0%
Mean: 27.7%

National Target = 23.9%

36% of CA hospitals meet national target

July 24, 2013
Reporting Mandates Coming

- ED<39 weeks measure included in Hospital IQR Program for FY 2015 payment determination: data collection beginning with January 2013 discharges
- The Joint Commission will require reporting of perinatal set for hospitals that perform >1100 deliveries per year beginning in 2014
- Medicaid Adult Measure Set published; state Medicaid Quality Dashboards under development
Data Collection Cost is the Biggest Barrier

- As many of the outcomes are low frequency it is best to collect data on ALL births
- Birth Certificates offer additional information not in Patient Discharge Diagnosis data sets (ICD9 codes)
- A number of states have moved to use Birth Certificates for this purpose and make them rapidly available
- Identified a need for data quality improvement efforts for both BC and ICD9
The California Maternal Data Center (CMDC) Project Vision

- Build a statewide data center to collect and report timely maternity metrics—in a way that is low cost, low burden and high value for hospitals
- Produce metrics that will support QI and L&D service line management
- Improve quality of administrative data
- Facilitate reporting to national performance organizations
- Over time, publicly report select set of robust measures to inform decisions of childbearing women
CMQCC Maternal Data Center: Data Flow

PDD--Discharge Diagnosis File (ICD9 codes)

Birth Certificate File (Clinical Data)

1. Links Birth Data to OSHPD file
2. Runs exclusions
3. Identifies CS and Inductions
4. Prints list of charts for review

Limited manual data entry for this measure

Calculates all the Measures

REPORTS
Benchmarks against other hospitals
Sub-measure reports

Mantra: “If you use it, they will improve it”
CMQCC: Transforming Maternity Care

CMDC Measures

Labor and Birth Measures
- Elective Delivery <39 Weeks (PC-01)*
- Episiotomy Rate
- OB Trauma (3/4th Laceration)-Cesarean Delivery (AHRQ EXP-2)
- OB Trauma (3/4th Laceration)-Vaginal Delivery w/ Instrument (AHRQ PSI 18)
- OB Trauma (3/4th Laceration)-Vaginal Delivery w/o Instrument (AHRQ PSI 19)
- Cesarean Section—Nulliparous, Term, Singleton, Vertex (PC-02)
- Cesarean Section—Nulliparous, Term, Singleton, Vertex, Age Adjusted (PC-02)
- Cesarean Section—Term, Singleton, Vertex (AHRQ IQI 21)
- Cesarean Section—Primary (AHRQ IQI 33)
- Total Cesarean Rate
- Induction Rate
- Failed Induction Rate
- Appropriate DVT Prophylaxis in Women Undergoing C-Section (Leapfrog)*
- Vaginal Birth After Cesarean (VBAC) Rate, All (AHRQ IQI 34)
- Vaginal Birth After Cesarean (VBAC) Rate, Uncomplicated (AHRQ IQI 22)

Newborn Measures
- Newborn Bilirubin Screening Prior to Discharge (Leapfrog)*
- 5 Minute APGAR <7 Among All Deliveries >39 weeks (HEN)
- 5 Minute APGAR <7 in Early Term Newborns (HEN) Birth Trauma - Injury to Neonate (AHRQ PSI 17)
- Unexpected Newborn Complications (NQF)

Prematurity Measures
- Antenatal Steroids (PC-03)
- Antenatal Steroids-Leapfrog
- VLBW (<1500g) NOT delivered at a Level III NICU

*Requires additional limited chart review
• Each measure is displayed graphically and as a data table
• Each measure can be downloaded either as an image for use in presentations or as a data file to be used in reports

Select quality measure to display

Select comparison group(s) for your hospital

Download this measure

Click on rate to “Drill Down” to see the numerator cases
Drill Down Information

• Can drill down to see case-level information
• Hover boxes show definitions for ICD-9 codes
REPORTS

Period: Mar - May 2013 (3 months)

Clinical Quality Measures

- Elective Delivery <39 Weeks (PC-01) 0.0%
- Cesarean Section Rate-Nullip, Term, Singleton, Vertex (PC-02) 26.1%
- Vaginal Birth After Cesarean (VBAC) Rate, Uncomplicated (AHRQ IQI 22) 25.0%

View all 19 Clinical Quality Measures
View Provider-Level Quality Measures

Data Quality Measures

- Missing / Inconsistent Delivery Method 1.8%
- Missing / Inconsistent V27 (Outcome of Delivery) 1.2%

View all 7 Data Quality Measures

Clinical Practice Indicators

- Total Cesarean Section Rate 35.1%
- Operative Vaginal Delivery 6.5%
- Failed Induction 29.3%

View all 6 Clinical Practice Indicators

Data Entry

View detailed data entry status.

Data Entry Next Steps

IT staff
- Submit June 2013 admin data file

Clinical/QI Staff
- Review January 2012 charts for Antenatal Steroids
- Review January 2012 charts for Bilirubin Screening
- Review January 2012 charts for DVT Prophylaxis

Hospital Statistics

- Demographic Statistics
- Delivery Statistics
- Maternal Comorbidity Statistics
- Baby/Prematurity Statistics
- Utilization Statistics
NEW!

CMDC Drill-Down Tools for Primary Cesareans

Background

- C-section rates continue to rise in CA and nationwide (2012 CA rate: 33.2%)
- Tremendous variation in CS rates across hospitals (and across providers within hospitals)
- The Nulliparous, Term, Singleton Vertex (NTSV) population has accounted for the largest portion of the 50% increase in the overall Cesarean birth rate in the last decade and accounts for > 90% of the variation seen among hospital primary cesarean birthrates.
Period: Jul 2012 - Jun 2013 (12 months)

What Drives Our Primary CS Rate?

The Primary CS rate (Denominator=all mothers without a prior CS; Numerator=among those mothers, who had a CS) is comprised of 3 major, mutually exclusive sub-populations. Nulliparous term singleton vertex (NTSV), multiparous term singleton vertex (MTSV) and mothers who have a preterm, multiple, or non-vertex pregnancy. NTSV is the component that has driven the 50% increase in primary CS in the last decade, is typically the largest component, and has the greatest variation among hospitals. This graph helps you determine what drives your primary CS rate. Each component tells you what percentage of your women with no prior CS has a CS for these populations.

<table>
<thead>
<tr>
<th></th>
<th>NTSV</th>
<th>MTSV</th>
<th>Preterm/Multiples/Breech</th>
<th>Total Primary CS Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Community NICUs</td>
<td>16.3%</td>
<td>2.2%</td>
<td>8.7%</td>
<td>27.3%</td>
</tr>
<tr>
<td>(2012)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Statewide</td>
<td>11.5%</td>
<td>3.3%</td>
<td>6.5%</td>
<td>21.3%</td>
</tr>
<tr>
<td>(2012)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
How do Our Hospital’s Primary CS Sub-population Rates Compare?

In contrast to the above bar graph, this figure shows the specific rates for each of the 3 patient sub-populations. For example, what percentage of your NTSV population did you perform a CS on? This allows comparison of hospital performance between hospitals and to benchmarks for a specific indication.

**Nulliparous Term Singleton Vertex**
- Iota Beta Hospital: 32.7%
- All Pi-Level NICUs (2012): 27.8%
- Statewide (2012): 27.6%

**Multiparous Term Singleton Vertex**
- Iota Beta Hospital: 6%
- All Pi-Level NICUs (2012): 7.2%
- Statewide (2012): 7%

**Preterm/Multiples/Breech**
- Iota Beta Hospital: 68.1%
- All Pi-Level NICUs (2012): 51.8%
- Statewide (2012): 52.2%
How do Our Hospital’s Primary CS Sub-population Rates Compare?

What Drives Our Nulliparous Term Singleton Vertex (NTSV) CS Rate of 32.7%?

The NTSV CS rate is comprised of 3 major, mutually exclusive sub-populations (Spontaneous labor resulting in CS, Induced Labor Resulting in CS, and CS with no Labor). This breakdown of the NTSV CS rate should help determine where QI efforts can best be applied. The most common issue among most hospitals is a high rate of CS during NTSV spontaneous labor. Some hospitals have also have a high rate during induced labor.

![NTSV CS Rate Divided into 3 Major Components](image)

<table>
<thead>
<tr>
<th>Component</th>
<th>Spontaneous Labor</th>
<th>Induced Labor</th>
<th>No Labor</th>
<th>Total NTSV CS Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Community NICUs (2012)</td>
<td>15.4%</td>
<td>7.4%</td>
<td>4.9%</td>
<td>27.8%</td>
</tr>
<tr>
<td>Statewide (2012)</td>
<td>15.6%</td>
<td>7.3%</td>
<td>4.8%</td>
<td>27.6%</td>
</tr>
</tbody>
</table>

How do our hospital’s NTSV CS Sub-population Rates Compare?
How do our hospital’s NTSV CS Sub-population Rates Compare?

In contrast to the above bar graph, these figures show the specific CS rates for each of the 3 NTSV sub-populations with further divisions into CS indications based on ICD9 codes. For example, what proportion of your NTSV Spontaneous Labor population had a CS with the indication of Fetal Distress? A similar approach is taken for Induced Labor. However, for the No Labor sub-population, the denominator is the entire NTSV population. Note: the No labor sub-population often has significant documentation and coding issues.

The comparison to similar facilities and the state as whole may help you identify which area have the most improvement opportunity. Further detail can be obtained by clicking on a label to see trends and other benchmarks. If you continue clicking you can drill down to the individual numerator cases to better understand the findings.
Primary CS: NTSV No Labor: Indication -- Macrosomia / Unengaged

Discharge Dates: 04/01/2013-06/30/2013

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Delivery Date</th>
<th>Gest. Age</th>
<th>BW</th>
<th>Diagnoses</th>
<th>Procedures</th>
<th>Opportunities for Improvement</th>
<th>Comments</th>
<th>Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>65a34b7dea</td>
<td>05/23/2013</td>
<td>38</td>
<td>2750</td>
<td>658.11, 652.51, 659.61, V27.0</td>
<td>74.1</td>
<td>D C P</td>
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</tr>
<tr>
<td>eafa457099</td>
<td>06/03/2013</td>
<td>39</td>
<td>2980</td>
<td>656.61, V27.0, V06.1</td>
<td>74.1</td>
<td>D C P</td>
<td>OK</td>
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<tr>
<td>cf3685268e</td>
<td>05/04/2013</td>
<td>40</td>
<td>3028</td>
<td>658.41, 652.51, V27.0</td>
<td>74.1</td>
<td>D C P</td>
<td>OK</td>
<td></td>
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<tr>
<td>6ecf11ba26</td>
<td>05/21/2013</td>
<td>39</td>
<td>3099</td>
<td>652.51, 648.01, 659.51, 663.11, 250.00, V45.85, V27.0</td>
<td>74.1, 96.49</td>
<td>D C P</td>
<td>OK</td>
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</tr>
<tr>
<td>90bceeb17</td>
<td>05/18/2013</td>
<td>39</td>
<td>3629</td>
<td>652.51, V27.0, V06.1</td>
<td>74.1</td>
<td>D C P</td>
<td>OK</td>
<td></td>
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<tr>
<td>4b4ef53d7c</td>
<td>05/30/2013</td>
<td>41</td>
<td>3634</td>
<td>656.61, V27.0</td>
<td>74.1</td>
<td>D C P</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>feba899f3e1</td>
<td>04/11/2013</td>
<td>40</td>
<td>357</td>
<td>656.61, 659.51, 648.91, 625.1, 648.21, 285.9, V06.1, V27.0</td>
<td>74.1</td>
<td>D C P</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>e95b8e10a8</td>
<td>05/25/2013</td>
<td>41</td>
<td>3700</td>
<td>659.51, 652.51, 645.11, V27.0, V06.1</td>
<td>74.1</td>
<td>D C P</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>0527149bf</td>
<td>04/09/2013</td>
<td>40</td>
<td>3799</td>
<td>645.11, 659.51, 656.61, V06.1, V27.0</td>
<td>74.1</td>
<td>D C P</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>59e209071e</td>
<td>06/28/2013</td>
<td>40</td>
<td>3836</td>
<td>656.61, V27.0</td>
<td>74.1, 72.79</td>
<td>D C P</td>
<td>OK</td>
<td></td>
</tr>
</tbody>
</table>
Data Quality Reports

- Identify discrepancies or missing data in Birth Certificate and Discharge data files
- Use to target data performance/quality improvement
Data Quality Reports

- Identify discrepancies or missing data in Birth Certificate and Discharge data files
- Use to target data quality improvement

<table>
<thead>
<tr>
<th>Discharge Dates: 01/01/2011–12/31/2011 (N=10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Displaying all 10 numerator cases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Delivery Date</th>
<th>Parity (BC)</th>
<th>Delivery Route (BC)</th>
<th>Diagnoses</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>667ada0f1a</td>
<td>01/2011</td>
<td>0</td>
<td>Cesarean -- primary</td>
<td>654.21</td>
<td>BC parity is 0, but admin data documents a prior CS</td>
</tr>
<tr>
<td>a61cbfe44c</td>
<td>01/2011</td>
<td>1</td>
<td>Cesarean -- repeat</td>
<td>659.51</td>
<td>BC indicates prior deliveries, but admin data says this is her first pregnancy (primigravida)</td>
</tr>
<tr>
<td>67fcb85d8a</td>
<td>02/2011</td>
<td>0</td>
<td>Cesarean -- primary</td>
<td>654.21</td>
<td>BC parity is 0, but admin data documents a prior CS</td>
</tr>
<tr>
<td>d4d9c786ed</td>
<td>03/2011</td>
<td>0</td>
<td>Cesarean -- primary</td>
<td>654.21</td>
<td>BC parity is 0, but admin data documents a prior CS</td>
</tr>
<tr>
<td>7fd5d4ff87</td>
<td>03/2011</td>
<td>0</td>
<td>Cesarean -- primary</td>
<td>654.21</td>
<td>BC parity is 0, but admin data documents a prior CS</td>
</tr>
</tbody>
</table>
Maternal Mortality Rate, California and United States; 1999-2010

SOURCE: State of California, Department of Public Health, California Birth and Death Statistical Master Files, 1999-2010. Maternal mortality for California (deaths ≤ 42 days postpartum) was calculated using ICD-10 cause of death classification (codes A34, O00-O95,O98-O99) for 1999-2010. United States data and HP2020 Objective were calculated using the same methods. U.S. maternal mortality rates are published by the National Center for Health Statistics (NCHS) through 2007 only. Rates for 2008-2010 were calculated using NCHS Final Birth Data (denominator) and CDC Wonder Online Database for maternal deaths (numerator). Accessed at http://wonder.cdc.gov/ucd-icd10.html on Apr 17, 2013 8:00:39 PM. Produced by California Department of Public Health, Center for Family Health, Maternal, Child and Adolescent Health Division, April, 2013.
Thank You!
## AMA-PCPI ACOG/NCQA Maternity Care Measures Under Testing

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prenatal</strong></td>
<td>Establishment of Gestational Age: Best EDD established by US before 20 wks</td>
</tr>
<tr>
<td></td>
<td>Prenatal Care Screening: HIV, Hep B, Urine C&amp;S, GDM, GBS screening</td>
</tr>
<tr>
<td></td>
<td>Behavioral Health Risk Assessment: Tobacco, Alcohol, Drug, Depression, and Partner Violence screening performed</td>
</tr>
<tr>
<td></td>
<td>BMI Assessment and Weight Gain Recommendations: BMI calculated and appropriate weight gain recommended</td>
</tr>
<tr>
<td></td>
<td>Elective Delivery Before 39 Weeks: &lt;&lt; Same as NQF measure &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>Cesarean Delivery for Low-Risk Nulliparous Women: &lt;&lt; Same as NQF measure &gt;&gt;</td>
</tr>
<tr>
<td></td>
<td>Episiotomy: &lt;&lt; Same as NQF measure &gt;&gt;</td>
</tr>
<tr>
<td><strong>Birth / Hospital</strong></td>
<td>Spontaneous Labor and Birth: Spontaneous onset of labor and spontaneous birth (non-operative)</td>
</tr>
<tr>
<td></td>
<td>Care Coordination: Prenatal Record Present at Time of Delivery: Prenatal record available at delivery facility at time of birth (&gt;35 weeks)</td>
</tr>
<tr>
<td><strong>Post</strong></td>
<td>Post-Partum Follow-up: Including: Breast feeding evaluation, depression screening, glucose screening (if appropriate) and family planning</td>
</tr>
</tbody>
</table>