Safe Deliveries Roadmap
Learning Collaborative Webcast
July 16, 2015

Safe Deliveries Roadmap
Advancing Safety for Mothers and Babies
A Roadmap from Pre-pregnancy to Postpartum

Presented at Washington State Hospital Association Safe Table Webcast 6/18/2015
• Hear Dr. Dale Reisner from Swedish Medical Center present the findings from their investigation of Chorioamnionitis.

• Examine the relationship between the Safe Deliveries Roadmap labor management recommendations and Chorioamnionitis.

• Get updates on the Safe Deliveries Roadmap project.
**WSHA Labor Management Roadmap Outcome Measures and Partnership for Patients Measures:**

**Measure Definitions with Numerator and Denominator Specifications**

This document is intended for the following hospital options for source of measurement data:

1. **WSHA-CMDC** system: Hospitals submit administrative Patient Discharge Data (PDD) and Core Clinical Maternal and Newborn Data to WSHA-CMDC which then calculates measure rates based on definitions below and provides secure web-interface for focused supplemental chart review where indicated for selected measures. Core Clinical Maternal and Newborn data files are special names given to supplemental data files with specific data elements required for submission of data to WSHA-CMDC.

2. **WSHA-QBS** system: Hospitals submit to WSHA-QBS System their own numerator and denominator values for each measure based on definitions below, internal hospital data analyst support and supplemental chart review data where indicated. WSHA will calculate measures 4.a., 5.a, 9.a., and 9.c. using CHARS. Hospitals will not need to collect/submit data for these measures.

**Changes since July 23, 2014 version (v18):**

- Measures 3a and 3b (p. 2-3): Failed induction codes added to the denominator definition.

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Numerator Description</th>
<th>Denominator Description</th>
<th>Definition Source</th>
<th>Data Source</th>
<th>Numerator Specifications</th>
<th>Denominator Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nulliparous Term Singleton Vertebr Cesarean Section Rate (NTSV) Unadjusted and Age-Adjusted</td>
<td>All cesarean deliveries among the denominator</td>
<td>Nulliparous (first birth) women ≥ 37 weeks.</td>
<td>Joint Commission PC-02 current for the time period</td>
<td>Patient Discharge Data</td>
<td>Cases among the denominator who had cesarean delivery</td>
<td>Nulliparous patients delivering live term singleton newborn in vertex presentation. WSHA-CMDC: NTSV denominator cases are also divided into Joint Commission Age Range groupings for age adjusted rates. WSHA-QBS: will not be providing age adjusted rates.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exclusions: breech or transverse presentation, preterm births, fetal deaths, and multiple gestations.</td>
<td>Plus state additions to exclusion list: planned place of birth and transfer to higher level of care when birth certificate data available</td>
<td>Gestational Age at Delivery, And Parity From either: Core Clinical Maternal data OR Birth Certificate data</td>
<td>Included Populations: ICD-9-CM Principal Procedure Code or ICD-9-CM Other Procedure Codes for cesarean section as defined in Appendix A, Table 11.06.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>When birth certificate data is available additional exclusions</td>
<td></td>
<td></td>
<td>Excluded Populations: None</td>
<td></td>
</tr>
</tbody>
</table>

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Revised
<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>Numerator Description</th>
<th>Denominator Description</th>
<th>Definition Source</th>
<th>Data Source</th>
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<th>Denominator Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>3a. C-Section rate for Term</td>
<td>All cesarean deliveries among the denominator</td>
<td>Nulliparous women whose labor was induced</td>
<td>Safe Deliveries Roadmap</td>
<td>Patient Discharge Data Plus Gestational</td>
<td>Discharges among the denominator with either: DRG, MS-DRG, or ICD-9-CM procedure codes for cesarean delivery</td>
<td>Include all delivering women identified by DRG, MS-DRG or ICD-9-CM codes below with Parity = 0 Gestational Age &gt;= 39 weeks at delivery</td>
</tr>
</tbody>
</table>

Inductions of Labor in Nulliparous women >= 39 weeks gestation at delivery

Age at delivery and Parity From either: Core Clinical Maternal data: or Birth Certificate data.

Cesarean delivery
DRG codes: 370 Cesarean w/cc
371 Cesarean c/o cc OR
MS-DRG codes: 765 Cesarean w/cc/mcc
766 Cesarean w/o cc/mcc OR
ICD-9-CM Cesarean Delivery Procedure Codes: 74.0 Classical cesarean
74.1 Low cervical cesarean
74.2 Extraperitoneal cesarean
74.4 cesarean NEC
74.99 Cesarean NOS

who had at least one of three induction of labor procedure codes:
73.01 induction by artificial rupture of membrane
73.1 other surgical induction of labor
73.4 medical induction of labor code by definition excludes medication to augment active labor or:
At least one of six Failed induction diagnosis codes: 659.00, 659.01, 659.03 Failed mechanical induction of labor
659.10, 659.11, 659.13 Failed medical or unspecified induction of labor

DRG Codes:
370 Cesarean w/cc, 371 Cesarean w/o cc, 372 Vaginal del w/cc, 373 Vaginal del w/o cc, 374 Vaginal del w sterilization &/or D&C, 375 Vaginal del w OR proc except steril &/or D&C OR Delivery MS-DRG codes:
765 Cesarean w/cc/mcc, 766 Cesarean w/o cc/mcc, 767 Vaginal del w sterilization &/or D&C 768 Vaginal del w OR proc except steril &/or D&C 774 Vaginal del w/cc, 775 Vaginal del w/o cc OR ICD-9-CM Codes: See Joint Commission Appendix A: Tables 11.01, 11.02, 11.03, 11.04

Inductions of Labor in Nulliparous women >= 39 weeks gestation at delivery

All cesarean deliveries among the denominator

Safe Deliveries Roadmap

Patient Discharge Data Plus Gestational Age at delivery and Parity From either: Core Clinical Maternal data: or Birth Certificate data.

Discharges among the denominator with either: DRG or MS-DRG codes for Cesarean delivery; or Any listed ICD-9-CM procedure codes for Cesarean delivery

Cesarean Delivery DRG codes: 370 Cesarean w/cc
371 Cesarean c/o cc OR
Cesarean Delivery MS-DRG codes:
765 Cesarean w/cc/mcc
766 Cesarean w/o cc/mcc

who had at least one of three induction of labor procedure codes:
73.01 induction by artificial rupture of membrane
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At least one of six Failed induction diagnosis codes: 659.00, 659.01, 659.03 Failed mechanical induction of labor
659.10, 659.11, 659.13 Failed medical or unspecified induction of labor
Checking in with Hospitals

Uptake

<table>
<thead>
<tr>
<th>Group</th>
<th>% Practices Implemented</th>
<th>% Providers Implementing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10%</td>
<td>4%</td>
<td>6%</td>
</tr>
<tr>
<td>Between 25%-50%</td>
<td>8%</td>
<td>3%</td>
</tr>
<tr>
<td>Between 50%-75%</td>
<td>19%</td>
<td>21%</td>
</tr>
<tr>
<td>Over 75%</td>
<td>35%</td>
<td>38%</td>
</tr>
<tr>
<td>Pending</td>
<td>33%</td>
<td>33%</td>
</tr>
</tbody>
</table>

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The Tipping Point

We are here

The spread of new ideas typically follows a non-linear, s-curve.

% Adoption of an Innovation

0%

50%

100%

Time

Tipping point at 10-20% adoption

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Featured Presentation
CHORIOAMNIONITIS
I have no financial disclosures which would impact the content of this presentation.

DALE REISNER, MD
If Only the Stork Really Did Deliver!

No Chorio…

but then we’d have hypothermia!
What To Expect From Today’s Presentation

- Definitions of Chorioamnionitis
- Risk Factors
- Epidemiology
- Challenges of How We Determine Rates
- Maternal and Neonatal Complications
- Management in Labor & PP
- How this Relates to the Safe Deliveries Roadmap

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CHORIOAMNIONITIS

- Intra-amniotic infection (IAI) w/acute inflammation of membranes and chorion
- Usually an ascending bacterial infection, often with ROM, but may occur with intact membranes
- Occasionally from hematologic spread, eg Listeria infection

DEFINITIONS OF CHORIOAMNIONITIS

Clinical Chorioamnionitis

- Fever: $T \geq 38^\circ C (100.4^\circ F) \times 2 \text{ or } >101^\circ$
- Fetal tachycardia $>160$ bpm
- Maternal tachycardia $>100$ bpm
- Elevated maternal WBC $>15,000$
- Amniotic fluid foul odor/purulence (severe inf.)
- Uterine tenderness – uncommon

c/w ACOG reVitalize & Perinatal Care Guidelines definitions

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DEFINITIONS OF CHORIOAMNIONITIS

Occult Chorioamnionitis
- Evidence of IAI by amniocentesis w/o clinical symptoms

Histologic Chorioamnionitis
- Post delivery placental and cord pathology exam

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RISK FACTORS

- **Prolonged labor** (Active phase >12 hrs RR 4.0 and Second stage >2 hrs RR 3.7)
- **Prolonged ROM** (>12 hrs RR 5.8 & >18 hrs RR 6.9)
- **Multiple vaginal exams** (with ROM, RR ≥2.0)
- **Intrauterine devices** – eg, IUPC (RR 2.0)
- **GBS colonization or Bacterial Vaginosis** (RR 1.7)
- **Meconium** (RR 1.4-2.3)
- **Tobacco, drugs or alcohol use** (RR 7.9)

1–6% clinical chorioamnionitis in term US births

Rates vary by diagnostic criteria, risk factors and gestational age at delivery

40–70% of preterm births have clinical and/or histologic chorioamnionitis

12% of term laboring primary C/S – mostly failure to progress associated with ruptured membranes

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Hospital Coding —

Is dependent on clinical provider documentation specifying dx of chorioamnionitis for coders (eg. ICD9 762.7 = chorioamnionitis affecting fetus or newborn)

Chart Abstraction —

Tends to detect more cases if done by RN or other clinically oriented person who looks at the documented findings c/w chorio dx
What do I mean by this?

- More cases may have a clear **documented dx** of chorioamnionitis if the asymptomatic neonate is able to have IV antibiotic coverage in Mom’s room while being assessed (VS, cultures pending, etc)

- Some providers may be hesitant to diagnose maternal fever as chorioamnionitis if baby would need transfer to NICU or to another hospital
MATERNAL COMPLICATIONS

- 2 to 3-fold increased risk for cesarean delivery

- 2 to 4-fold increase in endometritis, wound infection, pelvic abscess, bacteremia

- 2 to 4-fold increase in PPH, due to dysfunctional muscle resulting inflammation

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FETAL & NEONATAL COMPLICATIONS

- Fetal demise
- In utero exposure can lead to early-onset neonatal infection and/or FIRS (Fetal Inflammatory Response Syndrome)
- Perinatal death or asphyxia
- Neonatal sepsis, septic shock, pneumonia
- Intraventricular hemorrhage (IVH) and/or cerebral white matter damage
- Potential long-term disability including cerebral palsy

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Prompt IV antibiotic therapy is essential to prevent both maternal and fetal complications

- Neonatal sepsis is reduced by up to 80% with timely intrapartum IV antibiotic therapy
- Once IV antibiotics have been started, time-to-delivery does not affect morbidity, thus C-section is not indicated for chorioamnionitis alone. This assumes stable maternal and fetal status.
TREATMENT

- IV ampicillin every 6 hours and gentamicin every 8–24 hours until delivery is a typical regimen based on clinical consensus. IV Unasyn is an alternative.

- If cesarean delivery is performed, clindamycin every 8 hours (or metronidazole) adds anaerobic coverage.

- Optimal treatment should include a single postpartum dose of IV antibiotics (<5% failure rate).
SUPPORTIVE THERAPY

- **Antipyretics (acetaminophen)**
  Intrapartum Rx is important since maternal fever plus fetal acidosis has been associated with a marked increase in neonatal encephalopathy incidence

- Treating fever with antipyretics may help resolve fetal tachycardia and possibly avoid C/S for FHR concerns

- External cooling and cold IV fluids may be considered for higher maternal temps

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ASYMPTOMATIC NEONATE MANAGEMENT

Consultation with obstetric providers is important to determine the level of clinical suspicion for chorioamnionitis. Chorioamnionitis is diagnosed clinically and some of the signs are nonspecific.

- Limited evaluation includes blood culture (at birth), and complete blood count with differential and platelets (at birth, 6-12 hours of life, or both).

CDC Guidelines Referenced

7th Edition of Guidelines for Perinatal Care

Neonatal Evaluation in Setting of Chorioamnionitis Diagnosis

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SO HOW DOES THIS RELATE TO THE SAFE DELIVERIES ROADMAP?
WSHA SAFE DELIVERIES ROADMAP

- Admit in labor –
  Cervix ≥4 cms ideally; Pain management options

- First Stage Management Recommendations –
  Avoid C/S prior to 6cms with stable Mom and Baby;
  Do appropriate interventions for prolonged labors

- Second Stage Management -
  ≤3 hrs for Multips & ≤4 hrs for Nullips, max 5 hrs

- Induction Management –
  Avoid term non-medical inductions w/unfavorable cervix

Maternal & Neonatal Balancing Measures to Avoid Harm

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Two of the Safe Deliveries Roadmap strategies may lead to lower risk of chorioamnionitis

**Admit in labor** – Cervix $\geq 4$ cms ideally

Could result in less time in L&D where bedrest is common
Possibly avoid need for other obstetric interventions for long, but normal early labors.

**Induction Management** – Avoid term non-medical inductions with an unfavorable cervix
Avoiding elective cervical ripening usually results in shorter spontaneous labors

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The other two Safe Deliveries Roadmap strategies may decrease, increase or make no difference in chorio rates.

**First Stage** — risk of too much patience, not intervening when protracted labors occur or FHR concerns emerge (AROM, Augment, FSE, Amnioinfusion, use of Partogram)

**Second Stage** — will need to follow recommended max times according to parity (augment for ctx freq with stable FHR, use of FSE, coach intermitt pushing for FHR variables)
Comparative Data on Chorioamnionitis Rates

WSHA Safe Deliveries Roadmap

- Chose to look at Maternal LOS and Neonatal UNC (Unanticipated Neonatal Complications) due to known challenges of accurately identifying “chorioamnionitis”

Swedish Health System

- Has an internal Perinatal Database which can be queried by an OB RN abstractor
- Can also look at chorio diagnoses by coding
- Has bedside neonatal eval & ABX coverage for moms with dx of chorioamnionitis
Swedish Health System Chorioamnionitis Rates  
Currently three Level II and one Level IV Hospitals

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015 Jan - May</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chorio by Coding</td>
<td>486/9015 (5.4%)</td>
<td>475/8577 (5.5%)</td>
<td></td>
</tr>
<tr>
<td>Chorio by Database</td>
<td>538/9015 (6.2%)</td>
<td>534/8577 (6.2%)</td>
<td>253/4155 (6.1%)</td>
</tr>
</tbody>
</table>

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Swedish First Hill NTSV C/S Rates
1/2013 - 05/2015

Safe Deliveries Roadmap Bundle Approach
Decreasing Trend in NTSV C/S Rates
Discussion/Questions
### Upcoming Meetings

#### 2015

- **Roadmap Monthly (webcast) 7:00am – 8:00 am**

<table>
<thead>
<tr>
<th>March 12</th>
<th>August 20</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 30</td>
<td>October 15</td>
</tr>
<tr>
<td>May 21</td>
<td>November 19</td>
</tr>
<tr>
<td>June 18</td>
<td>December 17</td>
</tr>
<tr>
<td>July 16</td>
<td></td>
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</tbody>
</table>

- **Safe Tables (in-person) 9:00am – 2:30 pm**
  - September 8

Canceled
Thank You!

Mara Zabari, Executive Director of Integration
206-216-2529
maraz@wsha.org

Safe Deliveries Roadmap Website
http://www.wsha.org/0513.cfm%20