Proceedings of the First Baby Initiative Meeting  
July 29, 2011  
Embassy Suites  
Charleston, West Virginia  

**Welcome, Introductions, and Background of the Project -- Ann Stottlemyer, presiding**

Presentation: First Baby Initiative

- Phase I Accomplishments
- Phase II – First Baby Initiative
- Project methodology
- Monthly feedback
- Password-protected web access

Cesarean Section Overview -- David Lagrew, MD, Saddleback Memorial Center, Laguna Hills, California  
Bishop Scores and Labor Inductions -- Luis Bracero, MD, MFM, Women and Children’s Hospital, CAMC, Charleston  

Strategies for Reducing Unnecessary Cesarean Sections--Presentation -- David Lagrew, MD  
Strategies for Reducing Unnecessary Cesarean Sections--Handout -- David Lagrew, MD

**World Café -- Walk and Talk: What will work for West Virginia**

Facilitators:

- Luis Bracero, MD, MFM, Champion  
- David Jude, MD, OB/Gyn, Champion  
- William Holls, MD, MFM, Champion  
- Brenda Dawley, MD, OB/Gyn  
- Kim Farry, MD, OB/Gyn  
- Joseph DeRose, DO, OB/Gyn

Recorders:

- Peggy Thorne-Church, RN, BSN, MBA  
- Marlene Merkle, RN  
- Mary Beth Stewart, RN  
- Phyllis Bradley, RN, BSN  
- June Jett, RN  
- Maureen Schmitt, RN

Participants discussed strategies for reducing C-Sections in first-time mothers, barriers that will be faced, and possible solutions as they rotated through discussion groups under three headings: General, Pre-Labor, and Labor. See notes from the discussion groups.
Phase 1

WV Quality Collaborative
For Eliminating Non-Medically Indicated Elective Preterm Deliveries Prior to 39 Weeks Gestation

WV Health Care Authority, in Collaboration with:
- West Virginia Perinatal Partnership
- West Virginia Health Improvement Institute
- March of Dimes – WV Chapter
Phase 1

• 14 hospitals representing more than 70% of WV deliveries participated

• Monthly meetings to discuss successes and failures

• Access to website and listserv to share information
Phase 1

Primary Goal:

Eliminate deliveries when gestational age is less than 39 weeks and no medical indications are documented.
Phase 1

- Data gathered from WV birth certificate data by WV Office of Health Statistics monthly
- 2008 data baseline
Non-Medically Indicated Elective Births Prior to 39 Weeks Gestation by Month
West Virginia, January 2008 – December 2010*

*Preliminary 2010 data.
Data Source: Birth Certificate Data, West Virginia Health Statistics Center.
Phase 1

LESSONS LEARNED

• Education of patients, providers and staff necessary
• Better recording of birth certificate data required
• Revisions needed to birth certificate format (in process)
Phase II
First Baby Initiative

A Partnership Project of the
West Virginia Perinatal Partnership,
the West Virginia Health Care Authority,
the March of Dimes, West Virginia Chapter
and the West Virginia Birthing Hospitals
Phase II
First Baby Initiative

CHAMPIONS
Dr. Luis Bracero
Dr. William Holls
Dr. David C. Jude

STAFF
Nancy Tolliver
Ann Stottlemyer
Joyce Daniels
Amy Wenmoth
Phase II
First Baby Initiative

• 25 participating hospitals as of 7/28/11
• Each hospital has team
• Initial educational meeting
• Monthly conference calls to identify and share information
Phase II
First Baby Initiative

PROJECT GOALS FOR FIRST TIME MOTHERS

• Reduce c-section rate
• Reduce early admissions rate
• Reduce labor induction rate
• Improve birth outcomes
Phase II
First Baby Initiative

SPECIAL RISKS FOR FIRST TIME MOTHERS

- 37% had labor induced, 41.2% (2009)
- Of labor inductions, 50.9% had no documented MRF
- More than 30% of those induced ended in c-section
SPECIAL RISKS FOR FIRST TIME MOTHERS
(Cont’d.)

• 7% experienced two or more complications of L & D (data source: WV birth certificate 2001 - 2005)

• Other studies show:
  – Twice the rate of epidural
  – Almost twice the babies admitted to NICU
Average Facility Labor and Birth Charge By Site and Method of Birth, United States, 2007-2009

- **2007**
  - Birth center vaginal: $1,872
  - Hospital vaginal no complications: $8,316
  - Hospital vaginal complications: $9,617
  - Hospital cesarean no complications: $11,408
  - Hospital cesarean complications: $14,894

- **2008**
  - Birth center vaginal: $8,919
  - Hospital vaginal no complications: $10,690
  - Hospital vaginal complications: $12,532
  - Hospital cesarean no complications: $14,843
  - Hospital cesarean complications: $20,074

- **2009**
  - Birth center vaginal: 
  - Hospital vaginal no complications: $15,799
  - Hospital vaginal complications: 
  - Hospital cesarean no complications: 
  - Hospital cesarean complications: $21,495

Site and Method of Birth: birth center vaginal, hospital vaginal no complications, hospital vaginal complications, hospital cesarean no complications, hospital cesarean complications.
Phase II
First Baby Initiative

MONTHLY TELECONFERENCES

• Second Wednesday of every month (dates in packet)
• Share change concepts implemented
• Share barriers faced
• Share solutions applied
• Review data reports and progress
West Virginia First Baby Initiative

The West Virginia Perinatal Partnership is pleased to be collaborating with the West Virginia Health Care Authority, March of Dimes-WV Chapter, and West Virginia hospitals in a project to improve health outcomes of mothers and their babies. The “West Virginia First Baby Initiative” is a quality improvement initiative that seeks to reduce cesarean sections in first-time mothers.

An introductory meeting will be held on July 29, 2011, beginning at 9:00 AM at the Embassy Suites in Charleston. In addition to presentations on the latest research related to improving first-time mother and infant outcomes, the meeting will feature a presentation on a model project in pre-term birth prevention by Dr. David Logrew of Saddleback Memorial Center, Laguna Hills, California.

Under the leadership of Maternal Fetal Medicine specialists Dr. Luis Bracero and Dr. William Hollis, and Obstetrician/Gynecologist Dr. David C. Jude, hospitals will be encouraged to examine practices and focus on reducing cesarean section rates among low-risk nulliparous women. Each WV hospital participating in the First Baby Initiative will identify a team of the people to be responsible for planning, implementing, and measuring progress on the project within their facility.

The project will also include a process to identify and share information about change concepts being employed by the participating maternity providers. From September 2011 through May 2012, teams will participate in monthly teleconferences to share tools and lessons learned and to generate ideas to address barriers and identify resources.

Medical research has long studied the effects of elective labor induction and of cesarean delivery on mother and baby. West Virginia, like most of the US and Canada, has seen a rise in the rate of elective primary cesarean delivery and in elective labor induction, in part due to the widespread perception that these procedures are of little or no risk to healthy women. West Virginia has experienced some of the highest rates of labor induction and c-sections in the
**Mission**

We are a statewide partnership of health care professionals and public and private organizations working to improve perinatal health in West Virginia.

- We want health care providers to be able to best care for pregnant women and their babies.
- We encourage new laws that promote better health for pregnant women and their babies.
- We create opportunities for perinatal professionals to share their expertise with each other.
- We spread the latest knowledge about perinatal health through educational programs.
- We work to reduce tobacco and drug use among pregnant women and foster oral health care in pregnant women and infants.
- We study research and trends in mother/child health and work to distribute that information.

GET INVOLVED

READ MORE ABOUT US AND OUR ACCOMPLISHMENTS SO FAR

READ OUR 2010 WORKPLAN (PDF)

GOTO THE 2010 PERINATAL SUMMITS PROCEEDINGS PAGE

**First Baby Initiative Announced**

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West Virginia First Baby Initiative

The West Virginia Perinatal Partnership is pleased to be collaborating with the healthy kids and families coalition and West Virginia community to improve the outcomes of birth and their first baby postnatal care. An introduction to the initiative will be held at the Embry Conference Center on November 19th at 9:00 AM. The meeting will focus on the latest research and the key areas of intervention, with a focus on early intervention for pregnant women and the California born baby prevention by Dr. David Lagrew of Saddleback Memorial Center, Laguna Hills, California.

Under the leadership of Maternal Fetal Medicine specialists Dr. Luis Bracero and Dr. William Hols, and Obstetrician/Gynecologist Dr. David C. Jude, hospitals will be encouraged to examine practices and focus on reducing cesarean section rates among low-risk nulliparous women. Each WV hospital participating in the First Baby Initiative will identify a team of the people to be responsible for planning, implementing, and measuring progress on the project within their facility.

The project will also include a process to develop and share information about the concepts being employed by the participating maternity providers. From the $20 million and $24 million reduction in postpartum hospital costs, more than $40 million in costs are being identified by the participating hospitals.
West Virginia First Baby Initiative

Confidential Data

**NOTICE:** Data accessible through this page is preliminary and is subject to refinement and correction throughout the First Baby Initiative project time period and beyond. Because the data is preliminary, the data is intended only for the internal use of participating hospitals to address the goals and objectives of the West Virginia First Baby Initiative.

Reports

Aggregated data for West Virginia hospitals will be update and posted here before the second Tuesday of the month during the term of the project.

Selected Statistics for West Virginia Resident First-Time Mothers 2001-2005.
### Hospital Data - Phase 1 Update and Phase 2 Baseline Data

Data Source: Birth Certificate Data, West Virginia Health Statistics Center

July 29, 2011

### Hospital: NAME

**Phase 1: Non-Medically Indicated Births <39 Weeks Gestation**

Participant in Phase 1: NO

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2008</th>
<th>2009</th>
<th>2010**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total Births</td>
<td>#</td>
<td>% of Births</td>
</tr>
<tr>
<td>1. Elective Inductions &lt;39 Weeks</td>
<td>Hospital</td>
<td>21,443</td>
<td>1,991</td>
</tr>
<tr>
<td>2. Elective C-sections &lt;39 Weeks</td>
<td>Hospital</td>
<td>21,443</td>
<td>935</td>
</tr>
<tr>
<td>3. Total Elective Births &lt;39 Weeks</td>
<td>Hospital</td>
<td>21,443</td>
<td>2,929</td>
</tr>
</tbody>
</table>

* WV Total = Births occurring in all West Virginia hospitals

** Preliminary 2010 data
### Indicator 1: Primary C-sections - Preliminary 2010 Data

<table>
<thead>
<tr>
<th>Hospital</th>
<th>WV Total*</th>
<th># Births</th>
<th>Primary C-sections</th>
<th>% of Births</th>
<th># Births</th>
<th>Primary C-sections</th>
<th>% of Births</th>
<th># Births</th>
<th>Primary C-sections</th>
<th>% of Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Singleton Births</td>
<td>Hospital</td>
<td>8,729</td>
<td>2,996</td>
<td>34.3</td>
<td>11,439</td>
<td>955</td>
<td>8.3</td>
<td>20,168</td>
<td>3,951</td>
<td>19.6</td>
</tr>
<tr>
<td>WV Total*</td>
<td>Hospital</td>
<td>8,388</td>
<td>2,678</td>
<td>31.9</td>
<td>11,123</td>
<td>738</td>
<td>6.6</td>
<td>19,511</td>
<td>3,416</td>
<td>17.5</td>
</tr>
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</table>

**Interpretation Example:** In 2010, 34.3% of nulliparous singleton births that occurred in WV were delivered by c-section.

### Indicator 2: Inductions - Preliminary 2010 Data

<table>
<thead>
<tr>
<th>Hospital</th>
<th>WV Total*</th>
<th># Births</th>
<th>Inductions with No MRF or Congenital Anomalies</th>
<th># &lt;39 Weeks</th>
<th>% of Births</th>
<th># &lt;41 Weeks</th>
<th>% of Births</th>
<th># Births</th>
<th>Inductions with No MRF or Congenital Anomalies</th>
<th># &lt;39 Weeks</th>
<th>% of Births</th>
<th># &lt;41 Weeks</th>
<th>% of Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Singleton Births</td>
<td>Hospital</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>WV Total*</td>
<td>Hospital</td>
<td>8,729</td>
<td>249</td>
<td>2.9</td>
<td>1,583</td>
<td>18.1</td>
<td></td>
<td>11,439</td>
<td>300</td>
<td>2.6</td>
<td>1,583</td>
<td>13.8</td>
<td></td>
</tr>
</tbody>
</table>

**Interpretation Example:** In 2010, 18.1% of nulliparous singleton births that occurred in WV were induced prior to 41 weeks gestation with no documentation of a medical risk factor or congenital anomaly.

### Indicator 3: Primary C-sections after Induction vs. Spontaneous Labor** - Preliminary 2010 Data

<table>
<thead>
<tr>
<th>Hospital</th>
<th>WV Total*</th>
<th># Births</th>
<th>Primary C-sections</th>
<th>% of Births</th>
<th># Births</th>
<th>Primary C-sections</th>
<th>% of Births</th>
<th># Births</th>
<th>Primary C-sections</th>
<th>% of Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>Induced</td>
<td>Hospital</td>
<td>3,654</td>
<td>1,228</td>
<td>33.6</td>
<td>3,350</td>
<td>234</td>
<td>7.0</td>
<td>7,004</td>
<td>1,462</td>
<td>20.9</td>
</tr>
<tr>
<td>WV Total*</td>
<td>Hospital</td>
<td>3,878</td>
<td>936</td>
<td>24.1</td>
<td>4,521</td>
<td>366</td>
<td>8.1</td>
<td>8,399</td>
<td>1,302</td>
<td>15.5</td>
</tr>
</tbody>
</table>

**Interpretation Example:** In 2010, 33.6% of WV nulliparous singleton births that were induced resulted in a c-section, compared to 24.1% of nulliparous singleton births that experienced spontaneous labor.
Cesarean Section

Overview

David C. Lagrew, Jr., M.D.
MemorialCare Health System
Univ. of California, Irvine
Outline

- Overview
- Why would we want to lower the CSR?
- Risks and Benefits
- Rate Calculations
  - Risk stratification
  - Using various rates
Factors in Rising CSR

• Maternal age
• Increasing Obesity Rate
• Abandonment of VBAC
• Malpractice concerns continue
• Provider patterns
• “Okay to have elective cesarean section”
Physician Factor in CSR

- 11 obstetricians in community hospital
- Overall rate 26.2% but varied 19.1 to 42.1%
- Primary rate 17.2% but varied 9.6 to 31.8%
- Only gravidity was more important than the identity of the physician in determining CS chances

CSR by Indication

Compounding Effect of Maternal Age

Fig. 4. Primary cesarean delivery rates among parous women with singleton pregnancies by maternal age: 1990 and 2003.

Figure 1. Birth rates by age of mother: United States, 1990–2003

NOTE: Rates are plotted on a log scale.
Obesity Rate

2007-2009 Combined Data
What is the argument to lower the CSR?

Maternal and Neonatal Safety?
Cesarean Section and PNMR

Modified from: O’Driscoll and Foley, Obstet Gynecol 61:1,83
Maternal Mortality Rate, California, 1970-2007

Possible Reasons

• Increasing maternal age
• Increasing obesity
• Increasing multiple gestations
• Increasing rate of induced deliveries
• Increasing rate of cesarean section and patients with prior cesarean section
CS Related Maternal Mortality

- Higher with CS (22.3 per 100,000) than vaginal (10.8 per 100,000)
- CS procedure mortality (5.7 per 100,000)
- Major risks: infection, anesthesia, hemorrhage, pulmonary embolism
- Literature review relative risks 0 to 25.7
- Morbidity: Major-1.1-3.8%, minor 11.5-40.3%

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>% of All Deaths</th>
<th>% Preventable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiomyopathy</td>
<td>21%</td>
<td>22%</td>
</tr>
<tr>
<td>Hemorrhage</td>
<td>14</td>
<td>93</td>
</tr>
<tr>
<td>PIH</td>
<td>10</td>
<td>60</td>
</tr>
<tr>
<td>CVA</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>Chronic condition</td>
<td>9</td>
<td>89</td>
</tr>
<tr>
<td>AFE</td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Infection</td>
<td>7</td>
<td>43</td>
</tr>
<tr>
<td>Pulmonary embolism</td>
<td>6</td>
<td>17</td>
</tr>
</tbody>
</table>

UK: Peripartum Hysterectomy

- The incidence of peripartum hysterectomy was 0.41 cases per 1,000 births
- Maternal mortality was 0.6% (95% CI 0-1.5%)
- Risk Factors:
  - Previous cesarean delivery (odds ratio [OR] 3.52, 95% CI 2.35-5.26)
  - Maternal age over 35 years (OR 2.42, 95% CI 1.66-3.58)
  - Parity of three or greater (OR 2.30, 95% CI 1.26-4.18)
  - Previous manual placental removal (OR 12.5, 95% CI 1.17-133.0)
  - Previous myomectomy (OR 14.0, 95% CI 1.31-149.3)
  - Twin pregnancy (OR 6.30, 95% CI 1.73-23.0)

Peripartum Hysterectomy: Indications for Hysterectomy

31/87 patients with abnormal pathology

Glaze et al. Trends in Peripartum Hysterectomy
Obstet Gynecol 2008;111:732–8
Risks following CS

- 2.4 percent of cesareans followed by serious complications
- Uterine rupture, placenta previa or accreta, maternal death, fetal death
- Somewhat buffered by decreasing numbers of subsequent pregnancy

Previous CS Risks
Previa/Accreta

## 100% Elective Cesareans

<table>
<thead>
<tr>
<th>Deliveries per Year</th>
<th>Previas per Year</th>
<th>Accretas per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000</td>
<td>131</td>
<td>51</td>
</tr>
<tr>
<td>2500</td>
<td>66</td>
<td>25</td>
</tr>
<tr>
<td>1000</td>
<td>26</td>
<td>10</td>
</tr>
</tbody>
</table>

Assume all patients had cesarean sections
Figures based on 1998-2002 MemorialCare data based on Clark et al risks
## Previous CS vs. No prior CS

<table>
<thead>
<tr>
<th>Outcome</th>
<th>RR</th>
<th>Absolute Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine Rupture</td>
<td>42.18</td>
<td>1/316 vs. 1/13,318</td>
</tr>
<tr>
<td>PP with bleeding</td>
<td>2.06</td>
<td>1/227 vs. 1/468</td>
</tr>
<tr>
<td>Abruptio Placenta</td>
<td>1.87</td>
<td>1/171 vs. 1/255</td>
</tr>
<tr>
<td>Thromboembolism</td>
<td>2.81</td>
<td>1/330 vs. 1/928</td>
</tr>
<tr>
<td>Cord pH &lt; 7.00</td>
<td>2.49</td>
<td>1222 vs. 1/552</td>
</tr>
<tr>
<td>Perinatal Death</td>
<td>1.33</td>
<td>1/246 vs. 1/328</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>6.07</td>
<td>1/359 vs. 1/2,177</td>
</tr>
</tbody>
</table>

## Previous C Section vs. Vaginal Delivery

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RR</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aminoglycoside†</td>
<td>1.14</td>
<td>(0.89,1.46)</td>
</tr>
<tr>
<td>Blood Tx *</td>
<td>2.66</td>
<td>(1.81,3.80)</td>
</tr>
<tr>
<td>ICU/CCU *</td>
<td>3.85</td>
<td>(2.47,6.01)</td>
</tr>
<tr>
<td>DVT</td>
<td>2.96</td>
<td>(0.19,47.4)</td>
</tr>
<tr>
<td>Readmission *</td>
<td>1.51</td>
<td>(1.01,2.26)</td>
</tr>
</tbody>
</table>


* *p < 0.05
† Statistically significant by trial of labor
FINHYST, a prospective study of 5279 hysterectomies

- Surgical adhesiolysis [odds ratio (OR) 2.41, 95% confidence interval (CI) 1.38-4.21] was the strongest single risk factor for major complications as a whole.

- Bladder injury was associated with a history of caesarean section (OR 4.01, 95% CI 2.06-7.83) and with a large uterus ≥500 g (OR 2.88, 95% CI 1.05-7.90), while bowel injury was associated with adhesiolysis (OR 29.07, 95% CI 7.17-117.88).

Effects of delivery by caesarean section on lung mechanics and lung volume in the human neonate

- The babies born by cesarean section had a mean thoracic gas volume of only 19.7 ml/kg body weight compared to 32.7 ml/kg for the babies born vaginally.

Milner AD et al Arch Dis Child 1978 Jul;53(7):545-8
Indeed, large baby NICU admissions are high!
Repeat CS Neonatal Morbidity
MFMU Network CS Registry, 99-02

<table>
<thead>
<tr>
<th></th>
<th>RCS</th>
<th>VBAC</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>15,212</td>
<td>8,336</td>
<td></td>
</tr>
<tr>
<td>RDS</td>
<td>318 (2.1%)</td>
<td>119 (1.4%)</td>
<td>.0003</td>
</tr>
<tr>
<td>TTN</td>
<td>630 (4.1%)</td>
<td>156 (1.9%)</td>
<td>.0001</td>
</tr>
<tr>
<td>NICU Admission</td>
<td>1682 (11.1%)</td>
<td>626 (7.5%)</td>
<td>.0001</td>
</tr>
<tr>
<td>Oxygen</td>
<td>673 (4.4%)</td>
<td>212 (2.5%)</td>
<td>.0001</td>
</tr>
<tr>
<td>Ventilator</td>
<td>192 (1.3%)</td>
<td>63 (0.8%)</td>
<td>.0003</td>
</tr>
</tbody>
</table>

Jain, L Sem Perinatol 2006
ECS deliveries contribute to Severe HRF and ECMO!

Jain, L Sem Perinatol 2006
Risk of pediatric Crohn's disease

• Some 1536 patients diagnosed with pediatric CD and 15,439 controls matched by delivery unit, week of birth, sex, and born between 1973 and 2006 were identified through Swedish registers.

• Birth by cesarean section is associated with a modestly increased risk for pediatric CD among boys (odds ratio [OR] = 1.25, 95% confidence interval [CI] 1.01-1.54) but not girls, (OR = 0.99, 95% CI 0.76-1.29) and elective cesarean section is associated with a modest increased risk for the entire population (OR = 1.36, 95% CI 1.02-1.80).

Inflamm Bowel Dis 2011
Exclusive caesarean section delivery and subsequent urinary and fecal incontinence

- 12 year follow up
- Data on all births over a 12-month period were obtained from units and women were followed 3 months, 6 years and 12 years after the birth
- Unless women are resolved to have all their deliveries by the abdominal route (and their medical advisors agree), caesarean section does not protect from subsequent UI.
- Even among those who do deliver exclusively by caesarean section, 40% still report UI; and this strategy confers no benefit for subsequent FI.

MacArthur C, Glazener C BJOG 2011;118:1001-1007
Urinary Incontinence

- Vaginal delivery is a risk factors for UI at 3 months
- Strong association between antepartum UI and postpartum incontinence
- Cesarean has an incomplete protective effect
- Women having more than 3 cesareans had similar prevalence of UI as women delivered vaginally

Wilson et al, BJOG 1996;103:154-61
Prevalence of urinary incontinence and associated risk factors in a cohort of nuns.

- 149 nulliparous nuns, mean age of 68
- The prevalence of incontinence in nulliparous, predominantly postmenopausal nuns is similar to rates reported in parous, postmenopausal women
- Even in the absence of pelvic floor trauma from childbirth, urine loss is associated with symptoms of stress incontinence more often than with symptoms of urge incontinence

Urinary incontinence in nuns

Studying the Rates

Major Strategies
Important Cesarean Rates

- Total Cesarean Section Rate
- Primary Cesarean Section Rate
- Repeat Cesarean Section Rate
- VBAC Rate
  - Trial VBAC Rate
  - Success VBAC Rate
- Risk Adjusted
  - Normal Term Vertex Singleton
  - With age adjusted
  - With BMI adjusted?
Flamm's Rule

• Achieve 15% by the following formula.

• Breakdown:
  • 5% rate of dystocia.
  • 5% rate of repeat CS.
  • 5% rate of other.
    • Fetal distress, TTB, herpes, breech, etc.
### 2006 MC Hospital CSR Data

<table>
<thead>
<tr>
<th>Measure</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCSR</td>
<td>26.6</td>
<td>32.8</td>
<td>31.3</td>
<td>29.6</td>
</tr>
<tr>
<td>PCSR</td>
<td>15.2</td>
<td>21.0</td>
<td>19.9</td>
<td>19.4</td>
</tr>
<tr>
<td>NTSV CSR</td>
<td>19.2</td>
<td>26.5</td>
<td>27.3</td>
<td>25.0</td>
</tr>
<tr>
<td>% Low 5 Apgar</td>
<td>1.1</td>
<td>2.5</td>
<td>1.0</td>
<td>0.8</td>
</tr>
<tr>
<td>%&lt;19 yo</td>
<td>5.3</td>
<td>6.5</td>
<td>2.6</td>
<td>0.7</td>
</tr>
<tr>
<td>%&gt;35 yo</td>
<td>16.6</td>
<td>18.9</td>
<td>24.2</td>
<td>32.4</td>
</tr>
<tr>
<td>% Nullip</td>
<td>35.9</td>
<td>37.9</td>
<td>40.0</td>
<td>40.5</td>
</tr>
</tbody>
</table>
Adjustment Factors

• Divided into nulliparous, multiparous with no history of cesarean, multiparous with prior cesarean
• Subgroups of above: multiple pregnancy, breech/transverse presentation, prematurity, no trial allowed, less than 36 weeks with medical risk factors, more than 36 weeks with medical risk factors
• Created 18 subgroups

## Risk Adjustment Example

<table>
<thead>
<tr>
<th>Provider</th>
<th>Low</th>
<th>Risk</th>
<th>High</th>
<th>Risk</th>
<th>Total CSR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CSR</td>
<td>%Pts(n)</td>
<td>CSR</td>
<td>%Pts(n)</td>
<td>Total CSR</td>
</tr>
<tr>
<td>A</td>
<td>10%</td>
<td>90% (9)</td>
<td>50%</td>
<td>10% (5)</td>
<td>14%</td>
</tr>
<tr>
<td>B</td>
<td>10%</td>
<td>50% (5)</td>
<td>30%</td>
<td>50% (15)</td>
<td>20%</td>
</tr>
<tr>
<td>B*</td>
<td>10%</td>
<td>90% (9)</td>
<td>30%</td>
<td>10% (3)</td>
<td>12%</td>
</tr>
</tbody>
</table>
NTSV CSR Rates

- There was large variation noted in the NTSV CB rate among the 20 hospitals, with unadjusted rates ranging from 10.5% to 30.2%. Strong correlations were found between CB rates and labor induction rates ($r = 0.57$, $P < .0001$) and with early labor admission rates ($r = 0.62$, $P < .0001$).

- The strongest correlation was found between NTSV CB rates and a combined measure of induction and early labor admission ($r = 0.73$, $P < .0001$). Rates of term 5-minute Apgar score below 7 were not correlated with the NTSV CB rate.

- Hospital nulliparous maternal age distribution varied markedly and direct standardization led to significant changes in the NTSV CB rate.

- NTSV CB rate is strongly influenced by elective obstetric practices.

Raw versus Adjusted Rates

![Graph showing raw versus adjusted rates for different hospitals. The x-axis represents different hospitals, and the y-axis represents the NTSV OB Rate. Each hospital is labeled and ordered by mean maternal age, with the highest hospitals on the left. The adjusted rates are indicated by black bars, and the crude rates by white bars. Significant differences are marked with asterisks. The legend notes that an asterisk indicates a significant difference between adjusted and crude rates, with P < 0.01.]
Rate versus Induction Rate

The diagram shows a scatter plot with circular markers of varying sizes. The x-axis represents the NTSV Induction Rate, ranging from 0% to 40%. The y-axis represents the NTSV CB Rate, ranging from 10% to 30%. The correlation coefficient $r$ is 0.57, and the coefficient of determination $r^2$ is 0.32.
Rate versus Early Admission

![Graph showing the relationship between NTSV CS Rate and NTSV Early Labor Admission Rate]

- The correlation coefficient ($r = 0.62$)
- Coefficient of determination ($r^2 = 0.38$)
Rate versus Early Admit/Induction

The scatter plot shows the relationship between NTSV induction rate and early labor admission rate. The correlation coefficient is $r = 0.73$ with $r^2 = 0.53$. The graph indicates a positive correlation between the two rates.
Versus Low 5 minute Apgar

Increased Variation at Lower NTSV CB Rates?
Maternal Age and NTSV CSR

Sutter Health Data:
2001-2003: 41,416 NTSV births

For ages 17 - 42 yrs,
$r^2 = 0.961 (P<.001)$
Raw versus Adjusted Rates

![Bar chart comparing raw and adjusted rates across different hospitals.](chart.png)

*Adj. v. Crude, P<.01*
Why NTSV?

<table>
<thead>
<tr>
<th>First Delivery Route</th>
<th>Risk of Subsequent for Cesarean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal</td>
<td>10%</td>
</tr>
<tr>
<td>Cesarean</td>
<td>90%</td>
</tr>
</tbody>
</table>
Key clinical changes to lower NTSV Cesareans

- Reducing unnecessary inductions
- Admit after 3 cms

Successful

CSR Reduction
Decreasing the cesarean section rate in a private hospital

• A retrospective analysis from a prospectively collected delivery database of all patients delivered between May 15, 1988, and June 30, 1994

• The overall cesarean section rate fell from 31.1% to 15.4%. Similar reductions were noted in the primary (17.9% to 9.8%) and repeat cesarean section rates (13.2% to 5.7%).

• The primary cesarean section rate fall was accompanied by a drop in abdominal delivery for cephalopelvic disproportion and fetal distress.

• The repeat cesarean section rate is explained by a significant increase in trial and successful vaginal birth after cesarean delivery.

• No increase in maternal, fetal, or neonatal morbidity or mortality was observed.

Lowering CS with Feedback

• The Perinatal Data Center, regarding cesarean birth rates and a variety of obstetric outcomes was provided to the medical and nursing staff at one hospital. The other center served as a control. After the first observation period, the outcomes system was introduced to the second hospital.

• Finally, "open label" feedback, intradepartmental release of everyone's key statistics with names attached, was performed. Active management of labor was not practiced at either hospital.

Results.

• Cesarean birth rates were stable in the baseline period from 1980 through 1988 at 24% to 25%. Introduction of the Perinatal Data Center outcomes system was associated with a reduction to 21% at the first hospital with no change in the control hospital.

• Subsequent introduction of the system 3 years later in the control hospital resulted in a decline from 25% to 20.5%. After merger of the two obstetric units and the institution of "open label" feedback, an additional decline to 18.5% was observed.

Main EK Pediatrics. 1999 Jan;103
Successful Reduction

- Mount Sinai, New York
- During the first two years of the program, the cesarean-section rate fell from 17.5 percent of 1697 deliveries in 1985 to 11.5 percent of 2301 deliveries in 1987 (P less than 0.05).
- Decline in the rate of primary cesarean sections, from 12 to 6.8 percent
- The proportion of infants with five-minute Apgar scores lower than 7 increased from 3 percent in 1985 to 4.9 percent in 1987 (P less than 0.05), but neither the fetal mortality rate (11.9 per 1000) nor the neonatal mortality rate (11.2 per 1000) in 1987 differed significantly from the rates in 1985.

Key changes to lowering CSR

• Culture of cesarean being a “good thing to avoid”
• Provider feedback
• Labor support
• Clinical practices
Questions

Major Strategies
Bishop Scores and Labor Inductions

Women and Children’s Hospital
Charleston, WV

Luis A. Bracero, MD
Labor induction

• Labor is induced when the benefits to either the woman or the fetus outweigh those of continuing the pregnancy
Elective Labor Induction

• Induction of labor for the convenience of the practitioner or the patient in the absence of obstetrical or medical indications

• Major Risks:
  – Increased incidence of C/S rate in nulliparous women
  – Increase risk of iatrogenic prematurity
  – Increased risk of chorioamnionitis

• Increased total hospital costs compared to spontaneous labor
Evaluation Before Labor Induction

• Maternal Parameters
  – Confirm indication for induction
  – Review contraindications to labor or vaginal birth
  – Assign Bishop score
Evaluation Before Labor Induction

• Fetal Parameters
  – Confirm gestational age
  – Confirm fetal well-being
  – Estimate fetal weight
  – Determine fetal presentation
  – Assess need to document fetal lung maturity status
Indications for Assessing Fetal Maturity

• To prevent iatrogenic prematurity, fetal pulmonary maturity should be confirmed before scheduled delivery at less than 39 weeks of gestation unless fetal maturity can be inferred from any of the following historic criteria:
  – Ultrasound measurement at less than 20 weeks of gestation supports gestational age of 39 weeks or greater.
  – Fetal heart tones have been documented as present for 30 weeks by Doppler ultrasonography.
  – It has been 36 weeks since a positive serum or urine human chorionic gonadotropin pregnancy test result.
Induction of Labor

- ACOG Practice Bulletin No. 170, August 2009
  - “A mature fetal lung test result before 39 weeks of gestation in the absence of appropriate clinical circumstances, is not an indication for delivery”
Purpose of Labor Induction Review

• To determine if ACOG Guidelines for Elective Inductions are being adhered.
  – Not perform elective inductions before 39 weeks
Purpose of Labor Induction Review

• To determine:
  – incidence
  – indications
  – gestational age of inductions
    > 39 weeks
    < 39 weeks
  – success of inductions
  – neonatal outcomes
In September 2008, the OB/GYN Dept. initiated a Quality Improvement Initiative on Scheduled Labor Inductions.
- Developed a data collection form to obtain data on labor induction
- Labor and Delivery nursing staff were in-serviced on completion of form for all scheduled inductions
- Physician Education

First 6 months of data collection were analyzed to establish practice trends

The OB/GYN Dept. voted on 2/3/09 to accept the ACOG guidelines for elective labor inductions - “39 week rule”

At the OB/GYN departmental meeting on 3/3/09, it was voted that all elective inductions prior to 39 weeks would be reviewed by the Peer Review Committee

Labor Induction data continues to be collected for post-intervention comparison
### Cervical Ripening and Induction of Labor Analysis

**Patient Name:**

**Induction Date:**

**EDC:**

**Gestational age at induction:**

- **AM:** 
- **PM:**

**Please mark 1 primary reason (P) and all other applicable reasons as secondary (S).**

**A. INDICATIONS BASED ON GESTATION**

- □ + 07 - + 07 wks
- □ ≥ 42 wks

**B. INDICATIONS BASED ON FETAL CONDITION**

- □ Fetal anomaly (BMI)
- □ Severe IUGR (Hypoxic Ischemic Encephalopathy)
- □ Fetal Death
- □ Cerebral Palsy
- □ Other (specify): [ ]

**C. INDICATIONS BASED ON ANTE. FETAL TESTING**

- □ Non reactive NST
- □ Spontaneous variable/prolonged decelerations
- □ Biochemical profile score of [ ]
- □ Decreased variability
- □ Other (specify): [ ]

**D. INDICATIONS BASED ON MEMBRANES/AMNIOTIC FLUID STATUS**

- □ Ruptured membranes for [ ] hours
- □ Polyhydramnios
- □ Oligohydramnios

**E. INDICATIONS BASED ON MATERNAL CONDITION**

- □ Chronic hypertension
- □ Gestational HTN (BP)
- □ DM
- □ Other: [ ]

**F. INDICATIONS BASED ON ELECTIVE/LOGISTIC/OTHER FACTORS**

- □ Elective
- □ Macrosomia (Body wt) □ EFW □ US □ Clinically
- □ History of rapid labor
- □ Distance from hospital
- □ Cervical dilation > 4 cm
- □ Unstable fetal lie
- □ Other: [ ]

**FETAL MATURITY CRITERIA**

- □ Crow’s rump length at 6-12 wks supports EGA ≥ 35 wks.
- □ US scan at 13-20 wks confirms EGA ≥ 35 wks (h/p and physical exam).
- □ Amniocentesis done Date: [ ]

**Cervical Ripening Agent:**

- □ None
- □ Oxytocin
- □ Cervidil

**BISHOP SCORE:**

<table>
<thead>
<tr>
<th>Factor</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dilatation Effacement</td>
<td>Closed</td>
<td>0-2</td>
<td>3-5</td>
<td>6-7</td>
</tr>
<tr>
<td>Station Consistency</td>
<td>-3</td>
<td>0-2</td>
<td>≥-1</td>
<td>≥+1</td>
</tr>
<tr>
<td>Cervical Position</td>
<td>Firm</td>
<td>Soft</td>
<td>Medium</td>
<td>Amnion</td>
</tr>
</tbody>
</table>

**Time of Bishop Score**

- [ ]

**Ment”s ID Label**

- Allergy:
  - GBS: [ ]
  - Pos: [ ]
  - Neg: [ ]
  - Unknown: [ ]

**Physician’s Name:**

**Date:**

**Ranking:**

**Bumped:**

**Chart:**

[ ]

**Phone No:**

**All No:**

**DOB:**

**VIE:**

**All No:**

**Date:**

**Rank:**

**Bumped:**

[ ]

[ ]

[ ]
Data Analysis

• Compared data 6 months prior and 6 months after the OB/GYN Dept accepted the ACOG Guidelines for Labor Induction

• Pregnancy outcomes determined using Women and Children’s Delivery Database
# Induced Labor in West Virginia

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Births</th>
<th>Labor-Induced</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>21,137</td>
<td>6,973</td>
<td>33.0%</td>
</tr>
<tr>
<td>2007</td>
<td>21,917</td>
<td>7,938</td>
<td>36.2%</td>
</tr>
<tr>
<td>2008</td>
<td>21,443</td>
<td>7,690</td>
<td>35.9%</td>
</tr>
<tr>
<td>2009</td>
<td>21,298</td>
<td>7,173</td>
<td>33.7%</td>
</tr>
<tr>
<td>2010</td>
<td>20,755</td>
<td>7,056</td>
<td>34.0%</td>
</tr>
<tr>
<td>Total (2006-2010)</td>
<td>106,550</td>
<td>36,830</td>
<td>34.6%</td>
</tr>
</tbody>
</table>

WV Bureau For Public Health, Health Statistic Center, 2011
Incidence of Scheduled Inductions

• Time period of analysis: 9/1/08-8/30/09
• 761 scheduled inductions
• 3052 births
• Incidence of Induction = 24.9%

*US induction average in 2006 was 22% (ACOG; July 21, 2009)
Incidence of Scheduled Inductions

- **Pre-Intervention (9/1/08-2/28/09)**
  - Births: 1501
  - Inductions: 397
  - Incidence: 26.4%*

- **Post-Intervention (3/1/09-8/30/09)**
  - Births: 1551
  - Inductions: 364
  - Incidence: 23.5%*

*US induction average in 2006 was 22% (ACOG, July 21 2009)
# Primary Reasons for Induction

<table>
<thead>
<tr>
<th>Indication</th>
<th>Pre-Intervention n=397</th>
<th>Post-Intervention n=364</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td><strong>Percent</strong></td>
<td><strong>Number</strong></td>
</tr>
<tr>
<td>Gestational Age $&gt; 41$</td>
<td>14 3.5%</td>
<td>23 6.3%</td>
</tr>
<tr>
<td>Fetal Condition</td>
<td>29 7.3%</td>
<td>17 4.7%</td>
</tr>
<tr>
<td>Antenatal Fetal Testing</td>
<td>8 2.0%</td>
<td>12 3.3%</td>
</tr>
<tr>
<td>Membranes/Amniotic Fluid Status</td>
<td>20 5.0%</td>
<td>7 1.9%</td>
</tr>
<tr>
<td>Maternal Condition</td>
<td>67 16.9%</td>
<td>67 18.4%</td>
</tr>
<tr>
<td>Logistic/Other Factors (Elective)</td>
<td>259 65.2%</td>
<td>238 65.4%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>397 100%</td>
<td>364 100%</td>
</tr>
</tbody>
</table>
## Patient Demographics of Scheduled Inductions

<table>
<thead>
<tr>
<th></th>
<th>Pre-Interv All n=397</th>
<th>Post-Interv All n=364</th>
<th>Pre-Interv Elective n=259</th>
<th>Post-Interv Elective n=238</th>
<th>Pre-Interv Elective &lt;39 weeks n=46</th>
<th>Post-Interv Elective &lt;39 weeks n=27</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maternal Age</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤19</td>
<td>49 (12.3%)</td>
<td>60 (16.5%)</td>
<td>33 (12.7%)</td>
<td>40 (16.8%)</td>
<td>2 (4.3%)</td>
<td>7 (25.9%)</td>
</tr>
<tr>
<td>20-24</td>
<td>101 (25.4%)</td>
<td>90 (24.7%)</td>
<td>66 (25.5%)</td>
<td>61 (25.6%)</td>
<td>13 (28.3%)</td>
<td>6 (22.2%)</td>
</tr>
<tr>
<td>25-29</td>
<td>134 (33.8%)</td>
<td>105 (28.8%)</td>
<td>83 (32.0%)</td>
<td>65 (27.3%)</td>
<td>14 (30.4%)</td>
<td>3 (11.1%)</td>
</tr>
<tr>
<td>30-34</td>
<td>72 (18.1%)</td>
<td>83 (22.8%)</td>
<td>49 (18.9%)</td>
<td>53 (22.2%)</td>
<td>13 (28.3%)</td>
<td>8 (29.6%)</td>
</tr>
<tr>
<td>≥35</td>
<td>41 (10.3%)</td>
<td>26 (7.1%)</td>
<td>28 (10.8%)</td>
<td>19 (8.0%)</td>
<td>4 (8.7%)</td>
<td>3 (11.1%)</td>
</tr>
<tr>
<td><strong>Parity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>190 (47.9%)</td>
<td>198 (54.4%)</td>
<td>115 (44.4%)</td>
<td>125 (52.5%)</td>
<td>9 (19.6%)</td>
<td>13 (48.1%)</td>
</tr>
<tr>
<td>Provider Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Service</td>
<td>55 (13.9%)</td>
<td>51 (14.0%)</td>
<td>42 (16.2%)</td>
<td>28 (11.8%)</td>
<td>0 (0.0%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Private</td>
<td>342 (86.1%)</td>
<td>313 (86.0%)</td>
<td>217 (83.8%)</td>
<td>210 (88.2%)</td>
<td>46 (100.0%)</td>
<td>27 (100.0%)</td>
</tr>
<tr>
<td></td>
<td><strong>p=.081</strong></td>
<td><strong>p=.081</strong></td>
<td><strong>p=.07</strong></td>
<td><strong>p=0.16</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Not enough variability to test*
### Incidence of Scheduled Elective Inductions

**Pre-Intervention (9/1/08-2/28/09)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Inductions</th>
<th>% Inductions</th>
<th>Births</th>
<th>% Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>Births</td>
<td>1501</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductions</td>
<td>397</td>
<td>(26.4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>259</td>
<td>(65.2%)</td>
<td></td>
<td>(17.3%)</td>
</tr>
<tr>
<td>Elective &lt;39 wks</td>
<td>46</td>
<td>(17.8%)</td>
<td></td>
<td>(3.1%)</td>
</tr>
</tbody>
</table>

**Post-Intervention (3/1/09-8/30/09)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Inductions</th>
<th>% Inductions</th>
<th>Births</th>
<th>% Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>Births</td>
<td>1551</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductions</td>
<td>364</td>
<td>(23.5%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>238</td>
<td>(65.4%)</td>
<td></td>
<td>(15.3%)</td>
</tr>
<tr>
<td>Elective &lt;39 wks</td>
<td>27</td>
<td>(11.3%)</td>
<td></td>
<td>(1.7%)</td>
</tr>
</tbody>
</table>
Rate of Scheduled Elective Inductions <39 wks
Scheduled Elective Inductions <39 weeks

Pre Int.  | Post Int.
--------|--------
18%     | 11%    
46      | 27     

*p = 0.035 (Fisher’s Exact Test)*
**Gestational Age of Scheduled Elective Inductions**

<table>
<thead>
<tr>
<th></th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRE (n=259)</strong></td>
<td>37</td>
<td>40</td>
<td>39.07</td>
<td>.762</td>
</tr>
<tr>
<td><strong>POST (n=238)</strong></td>
<td>37</td>
<td>40</td>
<td>39.18</td>
<td>.658</td>
</tr>
</tbody>
</table>
Scheduled Elective Inductions and Gestational Age

Weeks Gestation

- **Pre:** 4 2
- **Post:** 55 28
- **39 weeks:** 120 134
- **40 weeks:** 80 74

Pre vs Post Inductions
## Bishop Scoring System

<table>
<thead>
<tr>
<th>Score</th>
<th>Dilation (cm)</th>
<th>Effacement (%)</th>
<th>Station</th>
<th>Cervical Consistency</th>
<th>Cervical Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Closed</td>
<td>0-30</td>
<td>-3</td>
<td>Firm</td>
<td>Posterior</td>
</tr>
<tr>
<td>1</td>
<td>1-2</td>
<td>40-50</td>
<td>-2</td>
<td>Medium</td>
<td>Mid</td>
</tr>
<tr>
<td>2</td>
<td>3-4</td>
<td>60-70</td>
<td>-1</td>
<td>Soft</td>
<td>Anterior</td>
</tr>
<tr>
<td>3</td>
<td>≥ 5</td>
<td>≥ 80</td>
<td>+1, +2</td>
<td>----</td>
<td>---</td>
</tr>
</tbody>
</table>

Induction to active labor successful with a score of 7 or greater, less successful with lower scores.
C-Sections and Scheduled Elective Inductions

<table>
<thead>
<tr>
<th></th>
<th>Pre Int.</th>
<th>Post Int.</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;39 weeks</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>&gt;=39 weeks</td>
<td>44</td>
<td>45</td>
</tr>
<tr>
<td>Overall</td>
<td>52</td>
<td>49</td>
</tr>
</tbody>
</table>

*p= 0.735 (Fisher’s Exact Test)
Low Bishop Score (<7) and Scheduled Elective Inductions

Pre Int. | Post Int.
---|---
<39 wks | 46% | 63%
>=39 wks | 58% | 55%
Overall | 61% | 63%

*p= 0.089 (Fisher’s Exact Test)
Bishop Score and C/S rate in Scheduled Elective Inductions

*82/282 (29%) for <7 BS
19/215 (9%) for >=7 BS

*p<0.001 (Fisher’s Exact Test)
C/S Rate by Bishop Score and Parity in Scheduled Elective Inductions

- <7 BS
  - Nuliparous: 9%
  - Multiparous: 4%
  - All: 9%
  - Pearson Chi-Square: p<0.001

- >=7 BS
  - Nuliparous: 16%
  - Multiparous: 4%
  - All: 9%
  - Pearson Chi-Square: p=0.005

Note: p-values indicate statistical significance.
Nulliparity and Bishop Score for Scheduled Elective Inductions

• Out of the 497 Elective Inductions:
  • 240 (48.3%) performed on nulliparous patients
    – 160 (67%) had unfavorable cervix (<7 BS)
    – 70 (44%) with unfavorable cervix had C/S
    – 80 (33%) had a favorable cervix (≥7 BS)
    – 13 (16%) with favorable cervix had C/S
  • Of all electively induced nulliparous patients, 83 (35%) had C/S
# 1 Year Follow-Up

## Post-Intervention – (3/1/09-8/30/09)

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Induction %</th>
<th>Births %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Births</td>
<td>1551</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductions</td>
<td>364</td>
<td>(23.5%)</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>238</td>
<td>(65.4%)</td>
<td>(15.3%)</td>
</tr>
<tr>
<td>Elective &lt;39 wks</td>
<td>27</td>
<td>(11.3%)</td>
<td>(1.7%)</td>
</tr>
</tbody>
</table>

## 1 Year Follow-up (9/1/09-8/30/10)

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
<th>Induction %</th>
<th>Births %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Births</td>
<td>3249</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inductions</td>
<td>707</td>
<td>(21.8%)</td>
<td></td>
</tr>
<tr>
<td>Elective</td>
<td>490</td>
<td>(69.3%)</td>
<td>(15.1%)</td>
</tr>
<tr>
<td>Elective &lt;39 wks</td>
<td>22</td>
<td>(4.5%)</td>
<td>(0.7%)</td>
</tr>
</tbody>
</table>
Does Labor Induction Increase the Risk of Amniotic Fluid Embolism?

- AFE incidence rate in USA: 1/20,000 to 1/30,000 live births
- Retrospective population based study in Canada (3M hospital births - 12 years) to assess the association between AFE and Induction of Labor
- AFE singleton rate: 6/100,000 deliveries (fatal: 0.8/100,000)
- AFE total rate OR = 2 (1.5-2.8); fatal rate OR = 3.5 (1.5-8.4) after labor induction
- AFE adjusted (other risk factors) rate OR = 1.8 (1.3-2.7)

Does Labor Induction Increase the Risk of Cerebral Palsy?

- Registry based cohort of all children born in Norway 1996-1998
- 176,591 children surviving neonatal period
- 373 children had CP; 241 had detailed data available
- Prevalence Rate: 2 per 1,000 live births
- Labor induction: 24.1% CP children vs. 13.4% no CP children (p<0.001)

Strategies for Preventing Unnecessary CS
Key changes to lowering CSR

• Culture of cesarean being a “good thing to avoid”
• Provider feedback
• Labor support
• Clinical practices
Flamm’s Rule

• Achieve 15% by the following formula.
• Breakdown:
  • 5% rate of dystocia.
  • 5% rate of repeat CS.
  • 5% rate of other.
    • Fetal distress, TTB, herpes, breech, etc.

Bruce Flamm M.D., Kaiser Permanente
Lessons from a "breakthrough series" collaborative

• Of 28 participating organizations, 15 percent achieved cesarean delivery rate reductions of 30 percent or more during the 12-month period of active collaborative work.

• An additional 50 percent achieved reductions between 10 and 30 percent.

• CONCLUSIONS: The Healthy People 2000 goal of a cesarean delivery rate below 15 percent by the year 2000 is attainable.

IHI “Top 10” Changes

- Admission criteria/triage
- Activity in labor
- Walking epidurals
- Epidurals after 4 cm
- Labor support
- Intermittent auscultation
- VBAC guidelines
- VBAC education
- Therapeutic rest
- Data and feedback
General Strategies

• Education to staff
• Physician leadership/ownership: local champion
• Provider feedback
• Peer review/2\textsuperscript{nd} opinion
• CBE: induction risks, labor support, VBAC class
• Hospitalist/laborist
• Doulas and specialized support staff
• Call schedule changes
Opinion Leaders Vs. Audit/feedback

• 76 physicians in 16 community hospitals
• Looked at trial of labor
• After 24 months no difference between control and groups in audit and feedback group
• Opinion leader groups were 85% higher than controls and 46% higher than audit groups
• No adverse outcome differences

Lomas et al, JAMA 1991;265:2202
Using Clinical Data for Lowering the Cesarean Section Rate

Collect detailed and accurate data

Monthly hospital and q 6 mo Individual reports analyzed information

Caregivers improve practice pattern

Self analysis and comparison

Hawthorn Effect
Provider Feedback

• Computerized delivery database based on delivery summary report of each delivery
• Accurate and up-to-date data provided
• Routinely analyzed for completeness and accuracy
• Provided two major sources of feedback
  • Monthly hospital wide statistics of mothers and infants
    • Total CSR, primary CSR, repeat CSR, indications, trial VBAC rates, etc.
  • Biannual individual physician reports
Individual Physician Reports

- Confidential report generated every 6 months
- Detailed information
  - Various CSRs given
  - Breakdown of indication CSR (CPD, FD, etc.)
  - Trial VBAC and VBAC success rates given
  - Patient demographics for risk factors
- Hospital-wide and group means given for comparison
- "Tips" given in accompanying letter
<table>
<thead>
<tr>
<th>DELIVERY TYPES</th>
<th>Tot</th>
<th>% Tot</th>
<th>EPISIOTOMIES</th>
<th>Tot</th>
<th>% Tot</th>
<th>BREAKDOWN BY LACERATIONS</th>
<th>Tot</th>
<th>% Tot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Vaginal Deliveries:</td>
<td>71</td>
<td>91.0%</td>
<td>None:</td>
<td>59</td>
<td>83.1%</td>
<td>Vaginal:</td>
<td>4</td>
<td>5.6%</td>
</tr>
<tr>
<td>Total C-Sections:</td>
<td>7</td>
<td>9.0%</td>
<td>Midline:</td>
<td>12</td>
<td>16.9%</td>
<td>Cervical:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mediolateral:</td>
<td>0</td>
<td>0.0%</td>
<td>Periurethral:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sulcus:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1° Perineal:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2° Perineal:</td>
<td>44</td>
<td>62.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3° Perineal:</td>
<td>2</td>
<td>2.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4° Perineal:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total Deliveries:</strong></td>
<td>78</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**Primary CS rate calculated on Total Deliveries - Previous CS**

<table>
<thead>
<tr>
<th>PREVIOUS C-SECTIONS MANAGEMENT</th>
<th>Total Repeat C/S</th>
<th>% Repeat C/S</th>
<th>VBAC - Spontaneous:</th>
<th>Total VBAC</th>
<th>% VBAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repeat C/S - Labor:</td>
<td>1</td>
<td>10.0%</td>
<td>VBAC - Spontaneous:</td>
<td>5</td>
<td>50.0%</td>
</tr>
<tr>
<td>Repeat C/S - No Labor:</td>
<td>1</td>
<td>10.0%</td>
<td>VBAC - Forceps:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Repeat C/S - Failed VBAC:</td>
<td>0</td>
<td>0.0%</td>
<td>VBAC - Vacuum:</td>
<td>3</td>
<td>30.0%</td>
</tr>
<tr>
<td><strong>Repeat C/S - Total:</strong></td>
<td>2</td>
<td>20.0%</td>
<td><strong>VBAC - Total:</strong></td>
<td>8</td>
<td>80.0%</td>
</tr>
</tbody>
</table>

Total Patients with Previous C/S: 10 (12.8% of all deliveries)

Trial VBAC Rate: 80.0%
VBAC Success Rate: 100.0%

<table>
<thead>
<tr>
<th>BREAKDOWN BY LOW BIRTH WEIGHTS</th>
<th>Total</th>
<th>Rate</th>
<th>BY STATUS</th>
<th>Total</th>
<th>Rate</th>
<th>BY ADD'L PROC</th>
<th>Total</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Birth Weight (under 2500 gms):</td>
<td>0</td>
<td>0.0/1000</td>
<td>Livebirths:</td>
<td>79</td>
<td></td>
<td>Hysterectomy:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Very Low Birth Weight (under 1500 gms):</td>
<td>0</td>
<td>0.0/1000</td>
<td>Stillbirths:</td>
<td>0</td>
<td>0.0/1000</td>
<td>Tubal Lig:</td>
<td>4</td>
<td>5.1%</td>
</tr>
<tr>
<td>Very Low Birth Weight (under 1000 gms):</td>
<td>0</td>
<td>0.0/1000</td>
<td>TAB/SABs:</td>
<td>0</td>
<td></td>
<td>ppD&amp;C:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>(excludes TAB/SAB)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Emergent CS:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vacuum Assisted C/S:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>B-Lynch Suture:</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Tamponade Balloon:</td>
<td>0</td>
<td>0.0%</td>
</tr>
</tbody>
</table>
Feedback Principles

• *Prompt*
• *Accurate*
• *Detailed*
• *Does it seem right?*
Individual Physician Reports

- Confidential report generated every 6 months
- Detailed information
  - Various CSRs given
  - Breakdown of indication CSR (CPD, FD, etc.)
  - Trial VBAC and VBAC success rates given
  - Patient demographics for risk factors
- Hospital-wide and group means given for comparison
- "Tips" given in accompanying letter
Dissemination of CSR Statistics

- Many authors have recommended publication of CSR in effort to decrease individual variation.
- Difficult in the private setting because 1) detailed appropriate statistics are confusing to the public, 2) provider opposition, 3) legal restrictions.
- Analysis of raw CSRs without analyzing by risk factors may cause the public to make inappropriate and unwise selections.
- Our confidential system appeared to accomplish a similar goal with minimal interference to staff and physicians.
- Mandated sharing of statistics with health care purchasing agents is beginning- detailed analysis will provide protection.
Pre-Labor Strategies

• Reducing unnecessary inductions: ≥ 39 weeks and ACOG indications

• Macrosomia management changes

• Management of “oligohydramnios”

• No admission prior to 3 cm and other labor evaluation techniques

• Breech: detection and version
Meta Analysis Induction/CSR

- Our searches identified 3,722 potentially relevant articles, of which 76 articles met inclusion criteria. Nine RCTs compared expectant management with elective induction of labor. We found that overall, expectant management of pregnancy was associated with an approximately 22 percent higher odds of cesarean delivery than elective induction of labor (OR 1.22, 95 percent CI 1.07-1.39; absolute risk difference 1.9, 95 percent CI: 0.2-3.7 percent). The majority of these studies were in women at or beyond 41 weeks of gestation (OR 1.21, 95 percent CI 1.01-1.46).

- Despite the evidence from the prospective, RCTs reported above, there are concerns about the translation of such findings into actual practice, thus, there is a great need for studying the translation of such research into settings where the majority of obstetric care is provided.

Intermountain Healthcare’s Experience

• Intermountain Healthcare is a vertically integrated healthcare system that operates 21 hospitals in Utah and southeast Idaho and delivers approximately 30,000 babies annually.
• Computerized L&D system.
• MFM s hired by system, but OBs are independent.
• January 2001: 9 urban facilities participated in a process improvement program for elective deliveries.
• 28% of elective deliveries were occurring before 39 completed weeks of gestation.

% Non-medically Indicated Deliveries <39 Weeks, January 1999 – December 2005

## Stillbirths Before and After Implementation of Guidelines at Intermountain Healthcare

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Stillbirths</td>
<td>Deliveries</td>
</tr>
<tr>
<td>37</td>
<td>17</td>
<td>4,117</td>
</tr>
<tr>
<td>38</td>
<td>19</td>
<td>9,954</td>
</tr>
<tr>
<td>39</td>
<td>10</td>
<td>13,752</td>
</tr>
<tr>
<td>40</td>
<td>10</td>
<td>7,925</td>
</tr>
<tr>
<td>41</td>
<td>2</td>
<td>1,938</td>
</tr>
<tr>
<td>All</td>
<td>58</td>
<td>37,686</td>
</tr>
</tbody>
</table>

“Tips” for Labor/induction

• Careful to have good indication for induction
• Avoid macrosomia and oligohydramnios inductions
• Induce only with a ripe cervix
• Avoid serial inductions
Follow by Gestational Age

Percent of AFIs Still < 5 cm in 3-4 days

P < 0.01

Suspected Fetal Macrosomia (Non-Diabetic Population)

- Does not reduce risk of shoulder dystocia
- Doubles risk of cesarean delivery
- 262 pregnancies EFW >90%
- Elective group:
  - 57% cesarean delivery rate
  - 5.3% shoulder dystocia
- Spontaneous labor group:
  - 31% cesarean delivery rate
  - 2.5% shoulder dystocia

Combs et al. Obstet Gynecol 1993; 81:492-496
EBM- Non-Clinical CSR Reduction

- Implementation of guidelines with mandatory second opinion can lead to a small reduction in caesarean section rates, predominately in intrapartum sections.
- Peer review, including pre-caesarean consultation, mandatory secondary opinion and post cesarean surveillance can lead to a reduction in repeat caesarean section rates.
- Guidelines disseminated with endorsement and support from local opinion leaders may increase the proportion of women with previous caesarean sections being offered a trial of labor in certain settings.
- Nurse-led relaxation classes and birth preparation classes may reduce caesarean section rates in low-risk pregnancies.

Meta Analysis Induction/CSR

• Our searches identified 3,722 potentially relevant articles, of which 76 articles met inclusion criteria. Nine RCTs compared expectant management with elective induction of labor. We found that overall, expectant management of pregnancy was associated with an approximately 22 percent higher odds of cesarean delivery than elective induction of labor (OR 1.22, 95 percent CI 1.07-1.39; absolute risk difference 1.9, 95 percent CI: 0.2-3.7 percent). The majority of these studies were in women at or beyond 41 weeks of gestation (OR 1.21, 95 percent CI 1.01-1.46).

• Despite the evidence from the prospective, RCTs reported above, there are concerns about the translation of such findings into actual practice, thus, there is a great need for studying the translation of such research into settings where the majority of obstetric care is provided.

Labor Strategies

- RN labor support and technique changes (ambulation, telemetry, 2\textsuperscript{nd} stage)
- Anesthesia/Comfort Measures: aroma therapy, acupuncture, walking epidural
- Oxytocin protocols
- Active Management
- FHR interpretation training
- VBAC trials
Changing Labor Techniques

- More aggressive dosing and interval techniques for oxytocin administration
- Cervical ripening with prostaglandin gel
  - Outpatient procedure, multiple doses if required
- Collaborative practice
  - Care manager met with induction and CS patients
  - Detailed hourly care-mapping for inductions
    - More timely beginning and advancements
  - Staff education on laboring techniques, oxytocin administration and active management
- Encouragement of ambulation and upright laboring positioning
CSR by Dilation at Placement

Thorp et al, AJOG 169:853,1993
“Tips” for Epidurals

• Placement at only 4 cm or greater
• Less local more narcotic
• Maintain upright position changes
• Describe technique and philosophy in childbirth classes
• No pushing until descent and rotation
• An epidural is better than a c-section
A Clinical Trial of Active Management of Labor

- 1934 nulliparous women at low risk of complications assigned before 30 weeks
- No difference in CSR (10.5% vs. 11.5%)
- Shortened median labor 2.7 hrs (6.2 vs. 8.9 hrs)
- Percent of women in labor longer than 12 hours was 3 times higher with usual management (9% vs. 26%)
- Lower incidence of fever in labor (7% vs. 11%)

EBM: Active Management

• CS rates in the active management group were statistically significantly lower than in the routine care group (RR 0.77 95% CI 0.63 to 0.94).

• More women in the active management group had labors lasting less than twelve hours, but there was wide variation in length of labor within and between trials.

• There were no differences between groups in use of analgesia, rates of assisted vaginal deliveries or maternal or neonatal complications.

• It is possible that some components of the active management package are more effective than others.

Cochrane Database Syst Rev. 2008 Oct 8;(4)
Increasing the VBAC Rate

- Individual physician feedback
- "Opinion leader" role
- VBAC class
  - Pros/cons of trial labor
  - Refresher course on labor
  - 90% trial of labor from participants
IHI Changes leading to VBAC

- VBAC Class
- Hospital rates distributed
- Individual and group rates distributed
- Education office staff
- Consent forms
- Patient testimonials
- In-house anesthesia and OB-Gyn
- Care map after 1st C-Section, info on VBAC

- Mail brochure at 2 weeks
- “What if it was your wife?”
- “Do what’s easiest for the patient”
- Explain pain control
- Posters in M.D. office
- Previa-previous c-section
- Dr. Flamm’s book
- Follow-up patients to inquire about counselling
Other Strategies

• General
  • More analysis between providers with "IDEAL" target rate for provider by risk analysis
  • Changing of call patterns and delivering attendants (midwives)
  • External benchmarking with other institutions

• Breech
  • Analysis of success of breech version, enhanced detection (third trimester office standard practices), better counseling

• Fetal distress
  • Better interpretation and categorization
Version Success

- The total success rate was 62%, and after a successful ECV 84% of the fetuses were delivered vaginally.
- No severe complications were registered during the ECVs and all babies had normal Apgar Scores at delivery.
- Attempting ECV at least once or even twice, seems to be appropriate since a successful ECV can decrease the rate of cesarean section in this group of patients and by so doing also may decrease the risk of cesarean section in future pregnancies.

EBM- Non-Clinical CSR Reduction

- Implementation of guidelines with mandatory second opinion can lead to a small reduction in **caesarean section rates**, predominately in intrapartum sections.
- Peer review, including pre-caesarean consultation, mandatory secondary opinion and post cesarean surveillance can lead to a reduction in repeat **caesarean section rates**.
- Guidelines disseminated with endorsement and support from local opinion leaders may increase the proportion of women with previous caesarean sections being offered a trial of labor in certain settings.
- Nurse-led relaxation classes and birth preparation classes may reduce **caesarean section rates** in low-risk pregnancies.

Everyone has a role...

- Patients
  - VBAC class, labor class - epidural placement, ambulation
- RN staff
  - Care map development, new techniques like labor management changes, amnioinfusion, encouraging ambulation; Education
- Physicians
  - Jointly developing care maps; Encouraging patients, analyzing their practice to the best practice guidelines
- Hospital
  - Funding for educational programs; Dedicated staff for quality improvement; Developing systems for care map development and adoption; Funding for data acquisition
Tort Reform?

- Malpractice premiums were positively associated with rates of cesarean section (beta = 0.15, P = 0.02) and primary cesarean section (beta = 0.16, P = 0.009), and negatively associated with VBAC rates (beta = -0.35, P = 0.01).
- These estimates imply that a $10,000 decrease in premiums for obstetrician-gynecologists would be associated with an increase of 0.35 percentage points (1.45%) in the VBAC rate and decreases of 0.15 and 0.16 percentage points (0.7% and 1.18%) in the rates of cesarean section and primary cesarean section, respectively; this would correspond to approximately 1600 more VBACs, 6000 fewer cesarean sections, and 3600 fewer primary cesarean sections nationwide in 2003.
- Two types of tort reform-caps on noneconomic damages and pretrial screening panels-were associated with lower rates of cesarean section and higher rates of VBAC.

STRATEGIES FOR REDUCING UNNECESSARY CESAREAN SECTION

GENERAL

- **Education to staff**
  - An important component to any cesarean reduction program is that all of the professionals be educated about the reason your organization has chosen to reduce unnecessary abdominal deliveries. This includes the education of physicians, nurses and other support personnel. It is important to obtain buy in from all of these parties to be successful.

- **Physician leadership/ownership: local champion**
  - Similar to other quality improvement efforts choosing a position leader and can be the local champion is critical to success. This person must strongly support the changes and present a vision to your institution. In collaboratives, this has been shown to be a critical element to success.

- **Provider feedback**
  - Provider feedback is a critical component to most successful programs. Detailed data regarding cesarean section rates and risk factor rates should be given in a timely and regular fashion. These reports must be accurate and the providers must have confidence in the information presented. Many programs have chosen to distribute such reports with accompanying recommendations of changes which can lead to further improvement. Most reports have comparative data for both their group and institutional results. The reports can be given in a confidential fashion and typically the results of all providers are shared, but in a confidential fashion.

- **Peer review/2nd opinion**
  - Many institutions have required a second opinion for non-of urgent cesarean deliveries, particularly in the case of elective primary cesarean. Another strategy is to review all cesarean sections a case review committee's to make sure the reason for the abdominal delivery is well documented in the surgeon used good clinical judgment.

- **CBE: induction risks, labor support, VBAC class**
  - This strategy involves utilizing childbirth education classes to educa te patients on their role and choices involving cesarean delivery. Many providers report significant pressure from patient’s, particularly near term, to proceed with unnecessary inductions and cesarean delivery. These classes can also described choose addresses the institution’s labor support techniques that they can expect during their labor. To specifically addresses the special concerns of vaginal birth after cesarean, institutions utilize a detailed education on the risk and benefits of both a trial of labor and scheduled elective repeat cesarean section. These sessions are typically combined with labor refresh her courses. In addition, the institution’s consent form for prior cesarean can be reviewed.
• **Hospitalist/Laborist**
  o The presence of hospitalist and obstetrical units is thought to be a good strategy for reducing cesarean sections by relieving some of the pressures of the community obstetrician attempting to cover a busy office, difficult call schedule and other pressures a moderate practice. Hospital was also provided a readily available assistant should the need for cesarean arise.

• **Midwives, Doulas and specialized support staff**
  o Labor support specialists can provide coaching and other labor techniques which support the mother in labor. Midwives and doulas have extensive training in labor support. Most are strong advocates for vaginal delivery and encourage the patient to continue difficult labors. For most institutions, they will need to adopt careful guidelines outlining the scope to which patients can use these individuals since often risk management issues may arise. Since they are typically independent contractor's there has to be agreed upon protocols.

• **Call schedule changes**
  o This change involves the formation of the larger call groups so there is less pressure for individual physicians to proceed with cesarean sections. This is obviously a clinical an economical challenge in many cases. Nonetheless, there is evidence that this can improve care.

LABOR

• **RN labor support and technique changes**
  o This involves labor support training for nurses which includes alternative positioning, ambulation, introduction of telemetry and techniques for second stage pushing techniques. The added benefit is this often allows nurses to be more involved with their patients and increases patient satisfaction.

• **Anesthesia/Comfort Measures**
  o Many techniques for various none medical analgesia such as aromatherapy, acupuncture and hypnosis. There is not strong literature to support their effectiveness but many report an improvement in patient satisfaction. In addition to these techniques there are changes in her regional anesthesia such as" walking epidurals" which have been utilized.

• **Oxytocin protocols**
  o Oxytocin protocols which had been implemented in an effort to standardize usage and make safer labors have also been described as lowering cesarean section rates. For this reason, these are often implemented and can also be described as a patient safety measure.

• **Active Management**
  o The Irish for the first to describe Active Management protocols for labor and described success in lowering cesarean section rates. The classic technique involves frequent cervical examinations, aggressive oxytocin utilization and tight admission criteria.
- **FHR interpretation training**
  - In some institutions there are significant numbers of cesarean sections performed for fetal intervention based upon heart rate interpretations. Improvement in heart rate evaluation can often lead to a reduction in the overall cesarean rates and more appropriate interventions for those fetuses who are being compromised.

- **Vaginal birth after cesarean**
  - Most recent studies have confirmed the safety of this technique in the institutions which have appropriate response available. Since the measures to respond to a possible uterine rupture should probably be given to all laboring patients, many institutions are implementing such changes and offering trials of labor to patients with a prior cesarean section. Trial rates can be augmented by a VBAC education program which incorporates the risk and benefits.

**PRE-LABOR**

- **Reducing unnecessary inductions**
  - Recent realization that neonates have improved outcome if elective deliveries are postponed to or greater than 39 weeks have led to a number of institutions implementing induction criteria. These typically involved strict dating criteria and the necessity for having a specific indication at the time of scheduling. The added benefit to the institution is that this often reduces the demands on the labor staff and allows him to focus and give more attention to laboring patients. In addition, indicated inductions are easier to schedule. The literature is conflicted on the degree at which this reduces the overall cesarean rate but nearly all studies show a shortening of laboring times.

- **Macrosomia management changes**
  - Randomized control trials have failed to demonstrate benefit for an attempted labor based upon the ultrasound diagnosis of macrosomia in the nondiabetic patient. Therefore protocols which require careful assessment of the specific weight, quality of the ultrasound estimate and patient counseling can be used to reduce unnecessary interventions. The protocol can also include specific criteria for the diabetic patient.

- **Management of “oligohydramnios”**
  - No literature supports induction of labor for "pending oligohydramnios". Studies have shown that there can be resolution of the decreased fluid, particularly if it is a borderline amniotic fluid index. Therefore careful protocols regarding the management of these patients, including independent assessment of the ultrasound measurement, can be helpful in reducing unnecessary interventions.

- **No admission prior to 3 cm and other labor evaluation techniques**
  - This is thought to be a critical element to active management of labor. This involves retraining of staff and protocols which give alternatives to the admission low risk patients presenting in labor who have not documented significant cervical change.
- **Breech detection and version**
  - Breach version has shown to be successful and approximately 2/3 of attempts and is particularly more successful in patients who are parous. Approximately 85% of successfully turned fetuses will go on to deliver vaginally. Therefore programs where this technique is encouraged and offered to patients have demonstrated lower rates of cesarean section for breech presentation. Offering her version can be combined with an aggressive program to detect all breech fetuses at term including specific protocols on the examination during prenatal visits and liberal utilization of ultrasound to detect all such fetuses.
Meeting participants discussed strategies for reducing C-Sections in first-time mothers, barriers that will be faced, and possible solutions as they rotated through discussion groups under three headings: General, Pre-Labor, and Labor. The following are transcribed flip-chart notes from each of the discussion groups. No attempt has been made to interpret the notes here. They are reproduced for the use of project participants in recalling the substance of the discussions.

General (Group 1)

- Education – induction and c-section risk
- Reimbursement Changes
- Alignment with Liability coverage
- Physician Education
- Peer Review
- Individual Physician Report

General (Group 2)

- Education of docs to conform with quality indicators
- Insurance Co and JACHO
- Billboard/Poster March of Dimes
- Interim reports – report cards (quarterly) email and paper
- Champion will be section chief
- Peds consult prior to induction
- Peer review for (lying)
- Educational Texting – text4baby.com
- Health Stream

Pre-Labor (Group 1)

- Keep out of hospital if NOT in labor
- Stork trail
- Better education (s/s labor)
  - Posters in triage room
  - Website/youtube for labor info
  - Facebook
  - Texting
- Induction – when it is appropriate – medically indicated
- Bishop score
- Family education
- OB Patient Educator
- Residents to attend classes (birthing, breastfeeding)
- AWHONN review (nursing)
- Education –
  - Breech version
  - VBAC
  - Induction
- Better phone triage and instructions to patients
- Physicians
  - Don’t induce for convenience or to “deliver your patients”

Pre-Labor (Group 2)

- Therapeutic rest (if space allows) morphine or dilaudid
- Go to mall and walk, find friend or family that lives closer to hospital to stay with
- Patient education at onset of prenatal care: Include family in this education
  - “We will not intervene to get you delivered until 41 weeks unless medically indicated.”
- Educate the providers
- Repetition, consistency
- Advertise the campaign to patients
  - Hospital level
  - Practice Level
- Reassurance regarding litigation (to providers)
**Labor (Group 1)**

- Spontaneous labor – the best way
- Nursing labor support training
  - Balls
  - Showers
- AWHONN nursing ratio recommendations
- Lack of education funding
- Int. vs. Continuous Fetal monitoring/telemetry
- Walking epidurals/Epidural PCA
- Fetal position training for nursing (OP)
- Pitocin Guidelines
- 3cm/active before admission
- Triage guidelines/lack of space
- Patient education prior to admission – participation in CB classes
- Labor support person

**Labor (Group 2)**

- Nurse support – Yes
- No – Walking & telemetry – not usually prevents C/S
  - Most in bed
  - Majority epidurals
  - Use of Pit without (?) telemetry not available
- ?? Walking epidurals – anesthetists not trained
- Pit Protocol
  - Physician driven vs. standard
  - Difficult to get doctor to agree
- Active Management
  - Once Section, always Section
  - 3 CM – problems:
    - Sell to patient
    - Can’t manage early labor at home
  - Classes – don’t attend
  - Part of Prenatal visit
  - Staffing

- FHR Training
  - Interpretation of strips
  - New Terminology
  - Education (RN’s get, Docs need)
- VBAC – concerns re: outcomes
- C/S rates – Report by Nurse and MD
- Telemetry
  - Room vs. walking
  - Range of telemetry
  - May be difficult to use
  - Bring in sales reps for telemetry model
- Pushing 2nd stage: Labor down
- Epidural rate – most want
- Education:
  - Childbirth classes
  - Can’t get them here
  - Offer money, lunch, cigarettes
  - Make mandatory
- Pitocin
  - Standardize
  - High Usage
  - High Risk
- VBAC
  - Anesthesia not available during labor
  - Not there for emergency
  - CRNA’s stay during labor
  - Insurance
- Childbirth Classes
  - Poor attendance
  - Epidural class
- Induction
  - Creative documentation
  - Consult pediatrician before inducing