NO CONFLICTS OF INTEREST TO DISCLOSE
Preventing the First Cesarean Delivery

Summary of a Joint Eunice Kennedy Shriver National Institute of Child Health and Human Development, Society for Maternal-Fetal Medicine, and American College of Obstetricians and Gynecologists Workshop

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With more than one third of pregnancies in the United States being delivered by cesarean and the growing knowledge of morbidities associated with repeat cesarean deliveries, the Eunice Kennedy Shriver National Institute of Child Health and Human Development, the Society for Maternal-Fetal Medicine, and the American College of Obstetricians and Gynecologists convened a workshop to address the concept of preventing the first cesarean delivery. The available information on maternal and fetal factors, labor management and induction, and nonmedical factors leading to the first cesarean delivery was reviewed as well as the implications of the first cesarean delivery on future reproductive health. 

Cesarean delivery is the most commonly performed major surgery in the United States. Approximately one in three pregnancies is delivered by cesarean, accounting for more than 1 million surgeries each year. In 2007, 26.5% of low-risk women giving birth for the first time had a cesarean delivery. The Healthy People target for 2020 is a cesarean delivery rate of 23.5% in low-risk full-term women with a singleton, vertex presentation. This is much higher than the never achieved target cesarean delivery rate of 19% for Healthy People 2010. The appropriate rate of
SAFE PREVENTION OF THE PRIMARY CESAREAN DELIVERY

ACOG OBSTETRIC CARE CONSENSUS
MARCH 2014
based on

NICHD, SMFM, and ACOG Workshop
Obstet Gynecol 2012;120:1181–93
OBJECTIVES

- NICHD/SMFM/ACOG Workshop paper–November 2012
- ACOG Obstetric Care Consensus–March 2014
- General recommendations for care
DON’T SHOOT THE MESSENGER
Determine the scope of the problem
Identify opportunities to reduce unnecessary first cesarean deliveries
Synthesize available information about factors leading to the first cesarean delivery including:

- Obstetric indications
- Maternal indications
- Fetal indications
- Labor management/induction practices
- Non-medical factors
Review implications on future reproduction

Considered recommendations for practice

Find opportunities for patient/community education
2007–26.5% of low risk women giving birth for the first time had CD

TARGET–Healthy People 2020 23.9%

2010 TARGET 15%

Appropriate rate “not easily determined”
>90% will have a repeat CD so this is the group that would have the most impact on lowering overall
COMPLICATIONS OF CD

- **INCREASED RISK—INDEX PREGNANCY**
  - Maternal complications

- **INCREASED RISK—FUTURE PREGNANCIES**
  - Adhesions—Bowel, Bladder, Uterus
  - Abnormal placentation—Previa, Accreta, Increta, Percreta
  - Uterine Rupture—Maternal and Fetal Risks
## MAJOR INDICATIONS FOR PRIMARY CESAREAN DELIVERY

<table>
<thead>
<tr>
<th>STAGE</th>
<th>INDICATION</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRELABOR</td>
<td>MALPRESENTATION</td>
<td>10–15*</td>
</tr>
<tr>
<td></td>
<td>MULTIPLE GESTATION</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>HYPERTENSION DISORD</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MACROSOMIA</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>MATERNAL REQUEST</td>
<td>2–8</td>
</tr>
<tr>
<td>IN LABOR</td>
<td>FIRST-STAGE ARREST</td>
<td>15–30*</td>
</tr>
<tr>
<td></td>
<td>SECOND-STAGE ARR</td>
<td>10–25</td>
</tr>
<tr>
<td></td>
<td>FAILED INDUCTION</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>NONREASS FHR</td>
<td>10</td>
</tr>
</tbody>
</table>

Some indications occur both pre–labor and labor
*Percentage of all C/S with this as primary indication
# Potentially Modifiable OB Indications for First CD

<table>
<thead>
<tr>
<th>Indication</th>
<th>Diagnosis Accuracy</th>
<th>Effect on Prev</th>
<th>Prevent Strat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed induction</td>
<td>Limited</td>
<td>Large</td>
<td>See definitions</td>
</tr>
<tr>
<td>Arrest of labor</td>
<td>Limited</td>
<td>Large</td>
<td>See definitions</td>
</tr>
<tr>
<td>Multiple gest</td>
<td>High</td>
<td>Small</td>
<td>IVF, ECV/br ext</td>
</tr>
<tr>
<td>Preeclampsia</td>
<td>High</td>
<td>Small</td>
<td>Education</td>
</tr>
<tr>
<td>Prior SD</td>
<td>Limited</td>
<td>Small</td>
<td>Education</td>
</tr>
<tr>
<td>Prior myomect</td>
<td>Limited</td>
<td>Small</td>
<td>Imp document</td>
</tr>
<tr>
<td>Prior 3&amp;4 lac</td>
<td>High</td>
<td>Small</td>
<td>Education</td>
</tr>
<tr>
<td>Marginal/LL plac</td>
<td>High</td>
<td>Small</td>
<td>Plac ≥1cm to os</td>
</tr>
<tr>
<td>INDICATION</td>
<td>DIAG ACCURACY</td>
<td>EFFECT ON PREV</td>
<td>PREVENT STRAT</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>---------------</td>
<td>----------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>Malpresentation</td>
<td>High</td>
<td>Large</td>
<td>Version</td>
</tr>
<tr>
<td>Nonreassuring ante- or intrapartum surveillance</td>
<td>Moderate</td>
<td>Large</td>
<td>Education Confirmatory tests Resuscitation</td>
</tr>
<tr>
<td>Macrosomia</td>
<td>Limited</td>
<td>Small</td>
<td>RX diabetes, limit weight gain</td>
</tr>
<tr>
<td>Malformations</td>
<td>Moderate</td>
<td>Small</td>
<td>Education for patients and subspecialists</td>
</tr>
</tbody>
</table>
## POTENTIALLY MODIFIABLE MATERNAL INDICATIONS FOR FIRST CD

<table>
<thead>
<tr>
<th>INDICATION</th>
<th>DIAG ACCURACY</th>
<th>EFFECT ON PREV</th>
<th>PREVENT STRAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obesity (BMI ≥ 30)</td>
<td>High</td>
<td>Small</td>
<td>Preconcept wt loss, limited wt gain</td>
</tr>
<tr>
<td>Infection (HSV, HCV, HIV)</td>
<td>High</td>
<td>Small</td>
<td>HIV RX minimize viral load</td>
</tr>
<tr>
<td>Inadequate pelvis</td>
<td>Limited</td>
<td>Small</td>
<td>Education—not generally c/s indication</td>
</tr>
<tr>
<td>Cardiovascular disease</td>
<td>High</td>
<td>Small</td>
<td>Education—not indication for c/s</td>
</tr>
<tr>
<td>Request (no maternal, OB, fetal</td>
<td>N/A</td>
<td>Small</td>
<td>Education patient &amp; provider</td>
</tr>
<tr>
<td>indication)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SAFE LABOR CONSORTIUM–2010

- Analyzed labor duration in 62,415 women with term singleton and normal outcome

- From this data, they developed “contemporary” partograms for this group (singleton, normal outcome)

- They found that labor took longer than suggested by the Friedman curves
DEFINITIONS OF FAILED INDUCTION AND ARREST DISORDERS

- Failed induction of labor
  - Failure to generate regular (Q3min) contractions and cervical change after at least 24 hours of oxytocin admin, with AROM if feasible

- First-stage arrest
  - ≥ 6cm dilation w/ROM and no change for
    - ≥ 4 hours adequate contractions (>200 MVU)
    - ≥6 hours if contractions inadequate
DEFINITIONS: SECOND-STAGE ARREST—NICHD/SMFM/ACOG

- No progress (descent or rotation) for
  - \( \geq 4 \) hours nulliparas with epidural
  - \( \geq 3 \) hours nulliparas without epidural
  - \( \geq 3 \) hours multiparas with epidural
  - \( \geq 2 \) hours multiparas without epidural
Before diagnosing arrest, if maternal and fetal conditions permit, allow for the following:

- At least 2 hours of pushing in multiparous women
- At least 3 hours of pushing in nulliparous women

Longer durations may be appropriate on an individualized basis (eg with the use of epidural analgesia or fetal malposition as long as progress is being documented)
Manual rotation of the fetal occiput in the setting of fetal malposition in the second stage is a reasonable intervention before moving to operative vaginal delivery or cesarean section.
OP and OT positions are associated with higher rates of cesarean section and neonatal complications.

Proper assessment of fetal position must be made.

Ultrasonography may be used when the position is difficult to determine clinically.
ALGORITHM FOR SPONTANEOUS LABOR

Spontaneous labor

3–5.9 cm

- No cervical change: Supportive care
- Cervical change: Continue labor

At least 6 cm

- No cervical change
  - No cervical change despite adequate contractions for at least 4 hours: Consider cesarean delivery
  - Inadequate contractions; no cervical change for at least 6 hours: Continue labor
- Cervical change: Continue labor
NONREASSURING FHR TRACING

Category II tracings are indeterminate, majority of intrapartum FHR tracings
  ◦ Evaluation
  ◦ Continued surveillance
  ◦ Initiation of corrective measures
  ◦ Re-evaluation

Scalp stimulation resulting in FHR acceleration is correlated with a normal umbilical cord pH (>7.20)

Amnioinfusion for FHR decelerations can reduce CD for non-reassuring FHR
About “resting”

“There is much debate as to how long induction should be allowed to continue and whether it is appropriate to ‘rest’ the patient who does not progress after 12 or more hours of induction but who does not otherwise have a maternal or fetal reason for immediate delivery. In cases in which induction is undertaken for specific maternal or fetal indications that can worsen with time, stopping the induction is not an appropriate option.”
“Resting”

“Examples of such cases include preeclampsia, fetal growth restriction, diabetes, and ruptured membranes.”
## Duration of each cm change

### Nulliparas—Spontaneous Labor

<table>
<thead>
<tr>
<th>CERVICAL CHANGE (CM)</th>
<th>MEDIAN (HOURS)</th>
<th>95TH PERCENTILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–4</td>
<td>1.8</td>
<td>8.1</td>
</tr>
<tr>
<td>4–5</td>
<td>1.3</td>
<td>6.4</td>
</tr>
<tr>
<td>5–6</td>
<td>0.8</td>
<td>3.2</td>
</tr>
<tr>
<td>6–7</td>
<td>0.6</td>
<td>2.2</td>
</tr>
<tr>
<td>7–8</td>
<td>0.5</td>
<td>1.6</td>
</tr>
<tr>
<td>8–9</td>
<td>0.5</td>
<td>1.4</td>
</tr>
<tr>
<td>9–10</td>
<td>0.5</td>
<td>1.8</td>
</tr>
</tbody>
</table>
QUALITY MEASURES TO TRACK AND PROVIDE FEEDBACK FOR EACH OB/GYN PHYSICIAN*

- Rate of non-medically indicated CD
- Rate of non-medically indicated induction
- Rate of labor arrest or failed induction diagnosed without meeting accepted criteria
- Rate of CD for non-reassuring FHR by NICHD category

*For singleton gestation, vertex presentation, at 37–41 6/7 weeks of gestation
Use “non–indicated CD” and avoid “elective CD”

Labor induction should be done only for medical indication; if done for non–medical indication, GA ≥ 39 wks and cervix favorable (BS > 8), especially in nulliparas

Failed induction diagnosis only after adequate attempt

Adequate time for normal latent and active phases and 2nd stage should be allowed unless expedited delivery medically indicated
KEY POINTS

- With reassuring maternal and fetal status, use definitions in this article (from Safe Labor Consortium) for arrest disorders.
- Intermittent auscultation, done appropriately, is acceptable in low-risk patients without FHR abnormalities.
- Medically indicated operative vaginal delivery is acceptable—training and experience are encouraged.
KEY TEACHING POINT

With moderate variability, other findings have little association with neurologic damage or acidosis
KEY POINTS

- Doctors who are salaried with no incentive to limit time spent managing labor have lower CD rates
- When counseling about a first cesarean, discuss risks in subsequent pregnancies (uterine rupture, placental implantation abnormalities)
ACOG OBSTETRIC CARE CONSENSUS

MARCH 2014
US DELIVERY RATES 1999–2011

# Maternal/Neonatal Risks by Delivery Mode

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maternal</strong></td>
<td></td>
</tr>
<tr>
<td>Overall severe morbidity and mortality*†</td>
<td><strong>Vaginal Delivery</strong></td>
</tr>
<tr>
<td></td>
<td>8.6%</td>
</tr>
<tr>
<td></td>
<td>0.9%</td>
</tr>
<tr>
<td>Maternal mortality†</td>
<td>3.6:100,000</td>
</tr>
<tr>
<td>Amniotic fluid embolism§</td>
<td>3.3–7.7:100,000</td>
</tr>
<tr>
<td>Third-degree or fourth-degree perineal laceration</td>
<td></td>
</tr>
<tr>
<td>Placental abnormalities¶</td>
<td>Increased with prior cesarean delivery versus vaginal delivery, and risk continues to increase with each subsequent cesarean delivery.</td>
</tr>
<tr>
<td>Urinary incontinence#</td>
<td>No difference between cesarean delivery and vaginal delivery at 2 years.</td>
</tr>
<tr>
<td>Postpartum depression</td>
<td></td>
</tr>
</tbody>
</table>

| **Neonatal**                                      |                               |
| Laceration**                                      | **Vaginal Delivery**          | **Cesarean Delivery**        |
|                                                   | NA                            | 1.0–2.0%                     |
| Respiratory morbidity**                           | < 1.0%                        | 1.0–4.0% (without labor)     |
| Shoulder dystocia                                 | 1.0–2.0%                      | 0%                            |

Abbreviations: CI, confidence interval; NA, not available; NICU, neonatal intensive care unit; OR, odds ratio; RR, relative risk.
LOW 23% (AK) AND HIGH OF 39.7% (KY)
OR LISTED AS 29.4%, WA 29.5%
HOSPITAL RATES VARY FROM 7.1% TO 69.9%
INDICATIONS FOR PRIMARY CESAREAN DELIVERY

Fig. 3. Indications for primary cesarean delivery. (Data from Barber EL, Lundsberg LS, Belanger K, Pettker CM, Funai EF, Illuzzi JL. Indications contributing to the increasing cesarean delivery rate. Obstet Gynecol 2011;118:29–38.)
How to define abnormal first stage?
- Table of contemporary partogram (also includes multipara data)

How should abnormally progressing 1st stage be managed?
- Extensive table format of recommendations and scientific evidence grading for each item

How to define abnormal 2nd stage?

How should abnormally progressing 2nd stage be managed?
- Operative vaginal delivery and manual rotation
ACOG Q&A

- Which FHR tracings deserve intervention and what are these interventions?
  - This is a full–day or more lecture–but requires attention/training efforts

- What is the effect of induction of labor on cesarean delivery?
  - You may not expect this answer
INDUCTION IS NOT A 4-LETTER WORD

- Induction rate has increased at same time as CS rate
  - 9.5% in 1990 → 23.1% in 2009

- FAULTY LOGIC—correct comparison group for induced labor is EXPECTANT management not spontaneous labor
THE MATH OF LABOR INDUCTION

CD rate induced patients > CD rate in spontaneous labor patients

≠

Induction → CD
Studies that compare labor induction with expectant management have found the same or **LOWER** CD rates

- True even with unfavorable cervix
- Cervical ripening agents should be used for induction with unfavorable cervix

- **<41 weeks**–Maternal or fetal indications only
- **≥ 41 weeks**–ALL COMERS to reduce risk of CD and perinatal morbidity and mortality
WHEN HAS THE INDUCTION “FAILED”?

- Experts propose allowing longer duration of latent phase (up to 24 hours or longer)
- Oxytocin + ruptured membranes at least 12–18 hours
- If maternal & fetal status allows—requires clinician judgment
HOW CAN THIS BE ACCOMPLISHED?

- Continuous L&D support—doulas
- Set the agenda with practices, hospitals, health care systems, and patients
- Changing culture and attitudes will be challenging
- Audit & feedback to clinicians WITH second opinions and culture change worked better than audit alone
- Tort reform
- More research in this area could provide data to support safe lowering of CD rate
CONCLUSIONS

- Important goal since it will reduce maternal/neonatal M&M in index and future pregnancies
- Challenge since new data is difficult to communicate and operationalize
- Culture change needed—never easy
- Med-legal concerns haven’t changed
- Requires entire team to be invested in the practice change—RN/CNM/MD
- Requires ongoing monitoring and feedback after initial education
Kaiser’s Story

Patrice Chatterton, RNC, CPHQ