Safe Prevention of the First Cesarean Delivery:
Or, the Top 10 Things You Can Do To Help Your Patient Have a Normal Vaginal Delivery

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Objectives

• Describe short and long term morbidity associated with Cesarean delivery (CD)

• Utilize antepartum and intrapartum techniques to maximize the likelihood of uncomplicated vaginal delivery
Disclosures

None
Cesarean Deliveries are Common in the United States

NOTE: Low risk is defined as nulliparous, term, singleton births in a vertex (head first) presentation.
Deliveries at Community Health Centers, 2015

N=1305

- NSVD (73%)
- Operative vaginal delivery (3%)
- VBAC (5%)
- Primary CD (7%)
- Repeat CD (12%)
# Morbidity Associated With Cesarean Delivery

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Vaginal</th>
<th>Cesarean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major maternal morbidity</td>
<td>0.9%</td>
<td>2.7%</td>
</tr>
<tr>
<td>Maternal mortality</td>
<td>3.6 per 100,000</td>
<td>13.3 per 100,000</td>
</tr>
<tr>
<td>Urinary incontinence</td>
<td>No difference at 2 years</td>
<td></td>
</tr>
<tr>
<td>Postpartum depression</td>
<td>No significant difference</td>
<td></td>
</tr>
<tr>
<td>Shoulder dystocia</td>
<td>1-2%</td>
<td>NA</td>
</tr>
<tr>
<td>Neonatal respiratory morbidity</td>
<td>&lt;1%</td>
<td>1-4%</td>
</tr>
<tr>
<td>Neonatal laceration</td>
<td>NA</td>
<td>1-2%</td>
</tr>
</tbody>
</table>

Increasing CDs Are Associated with Accreta and Hysterectomy

<table>
<thead>
<tr>
<th>Number of cesareans</th>
<th>OR for accreta</th>
<th>OR for hysterectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Two</td>
<td>1.3</td>
<td>0.7</td>
</tr>
<tr>
<td>Three</td>
<td>2.4</td>
<td>1.4</td>
</tr>
<tr>
<td>Four</td>
<td>9.0</td>
<td>3.8</td>
</tr>
<tr>
<td>Five</td>
<td>9.8</td>
<td>5.6</td>
</tr>
<tr>
<td>Six</td>
<td>29.8</td>
<td>15.2</td>
</tr>
</tbody>
</table>

Indications for Primary CD

- Maternal-fetal (5%)
- Obstetric (1%)
- Elective (8%)
- Macrosomia (10%)
- Preeclampsia (10%)
- Multiple gestation (16%)
- Nonreassuring fetal heart tracing (32%)
- Arrest of labor (18%)

Obstet Gynecol (2011) 118:29
10. Encourage optimal maternal weight and gestational weight gain

Obstet Gynecol 104: 671.
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<table>
<thead>
<tr>
<th>BMI</th>
<th>Recommended weight gain (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;18.5</td>
<td>28-40</td>
</tr>
<tr>
<td>18.6-24.9</td>
<td>25-35</td>
</tr>
<tr>
<td>25-29.9</td>
<td>15-25</td>
</tr>
<tr>
<td>&gt;30</td>
<td>11-20</td>
</tr>
</tbody>
</table>
10. Encourage optimal maternal weight and gestational weight gain

• Diet and exercise interventions associated with ~20% decreased risk of excess gestational weight gain
• Based on Cochrane review of 49 RCTs with heterogeneous interventions

Cochrane Database Syst Rev. 2015 Jun 15;6
9. Perform external cephalic version for fetuses in breech presentation

• 4% of fetuses are breech >37 weeks
• >85% of women with fetus in breech presentation at time of delivery undergo Cesarean delivery
• Attempting external cephalic version reduces risk of Cesarean by 40%

9. Perform external cephalic version for fetuses in breech presentation
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- ECV at 34-36 weeks is associated with lower rate of noncephalic presentation at delivery (RR 0.81) than ECV at >37 weeks
- Tocolysis (RR 1.68) and regional anesthesia (RR 1.58) are associated with increased likelihood of success

Interventions for helping to turn term breech babies to head first presentation when using external cephalic version. Cochrane Database Syst Reviews Feb 2015.
8. Do not routinely perform Cesarean delivery for suspected fetal macrosomia

- ACOG recommends considering CD if EFW >5 kg, or 4.5 kg in women with diabetes

- However, NNT to prevent one permanent brachial plexus injury is 443

7. Do encourage continuous labor support

• Meta-analysis of 22 trials including 15,288 women found:
  – Reduced risk of Cesarean delivery (RR 0.78, 95% CI 0.67-0.91)
  – Reduced risk of low 5 minute Apgar score (RR 0.69, 95% CI 0.50-0.95)

• Most effective if support is neither hospital staff nor part of woman’s social circle

6. Do induce labour at 41+ weeks

Induction of labor at 41 weeks associated with decreased risk of Cesarean delivery
(24.5% vs. 21.2%, p=0.03)

Induction of labor at 42 weeks associated with decreased risk of perinatal death
(RR 0.31, 95% CI 0.12-0.88)

Induction of labour for improving birth outcomes for women at or beyond term.
Cochrane Database Syst Reviews, June 2012.

6. Do induce labor at 41+ weeks

ACOG recommends that:

“Inductions of labor at 41 weeks and beyond should be performed to reduce the risk of Cesarean delivery and the risk of perinatal morbidity and mortality”

(Grade 1A recommendation)

5. Don’t perform Cesarean delivery for prolonged latent phase of labor
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Cervical dilation of 6 cm should be considered the threshold for the active phase of labor in most women.

Before 6 cm of dilation, standards of active progress should not be applied.
5. Don’t perform Cesarean delivery for prolonged latent phase of labor

95%ile for time between 4 cm and 6 cm:

• 9.6 hrs (primiparous)
• 10.7 hrs (multiparous)
Latent labor in patients with obesity is **lengthy**

![Graph showing time from 4 to 6 cm dilation for different BMI categories (BMI 30-35, BMI 35-40, BMI 40+) with median and 95th percentile values for primiparous and multiparous patients.](image)

AJOG (2011) 205: 244
5. Don’t perform Cesarean delivery for prolonged latent phase of labor

Management of latent labor:
- Therapeutic rest
- Oxytocin
- Amniotomy
- Patient education

5. Don’t perform Cesarean delivery for prolonged latent phase of labor

- Allow “up to 24 hours or longer” of latent labor during induction
- At least 12-18 hours of oxytocin following amniotomy

4. Do wait 4-6 hours without cervical change in active labor prior to performing Cesarean

Historically 2 hours of “adequate” contractions without cervical change defined active phase arrest

4. Do wait 4-6 hours without cervical change in active labor prior to performing Cesarean

Among 542 term gravidas with labor arrest at 4+ cm, delaying Cesarean until 4-6 hours of pitocin resulted in 92% vaginal delivery rate

Including 56-88% among women withOUT labor progress at 4 hours

4. Do wait 4-6 hours without cervical change in active labor prior to performing Cesarean

Labor arrest now defined as:
• 6 cm or more of cervical dilation, and
• Rupture of membranes, and
• No cervical change for 4 hours (adequate MVUs), or
• 6 hours (inadequate MVUs)

Long Inductions Usually Result in Vaginal Delivery

![Graph showing the percentage of delivery via cesarean section (CD) for primiparous and multiparous women at different lengths of first stage of labor (hours).]

AJOG (2009) 201: 477
## Long Inductions are Modestly Associated with Adverse Outcomes

<table>
<thead>
<tr>
<th></th>
<th>12-18 hrs</th>
<th>18-24 hours</th>
<th>Over 24 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPH</td>
<td>0.95</td>
<td>1.19</td>
<td>3.16</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>1.99</td>
<td>3.75</td>
<td>2.83</td>
</tr>
<tr>
<td>3rd or 4th degree laceration</td>
<td>0.89</td>
<td>1.08</td>
<td>0.66</td>
</tr>
<tr>
<td>5 minute Apgar &lt;7</td>
<td>1.32</td>
<td>1.69</td>
<td>1.35</td>
</tr>
<tr>
<td>Birth trauma</td>
<td>2.3</td>
<td>3.05</td>
<td>0.88</td>
</tr>
<tr>
<td>NBICU admission</td>
<td>1.08</td>
<td>1.76</td>
<td>2.03</td>
</tr>
</tbody>
</table>

AJOG (2009) 201: 477
3. Do perform amnioinfusion for repetitive variable decelerations

- Associated with decreased risk of Cesarean delivery (RR 0.62, 95% CI 0.46-0.83)
- Among 1493 women in 13 trials
- Useful only in setting of “suspected umbilical cord compression”
3. Do perform amnioinfusion for repetitive variable decelerations

What about....?

Scalp or vibroacoustic stimulation
Fetal ST segment analysis
Fetal scalp pH sampling
2. Do perform manual rotation for fetus in persistent OP presentation

- OP presentation at delivery associated with 12-fold increase of Cesarean delivery and 3-fold increase for operative vaginal delivery
- Manual rotation associated with decreased risk of operative delivery (RR 0.45)

Obstet Gynecol (2013) 122: 634
2. Do perform manual rotation for fetus in persistent OP presentation
2. Do perform manual rotation for fetus in persistent OP presentation

Detection of OP fetus by physical examination can be difficult

Agreement between physical exam and sonographic assessment is only 27-80%

Birth (2010) 37: 61
1. Do allow *at least* 2-3 hours of pushing before diagnosing second stage arrest

The second stage of labor can be lengthy 95th percentile for women who ultimately have uncomplicated NSVD:

<table>
<thead>
<tr>
<th></th>
<th>No epidural</th>
<th>Epidural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primiparous</td>
<td>3.3 hrs</td>
<td>5.6 hrs</td>
</tr>
<tr>
<td>Multiparous</td>
<td>1.4 hrs</td>
<td>4.3 hrs</td>
</tr>
</tbody>
</table>

Obstet Gynecol (2014) 123: 527
1. Do allow \textit{at least} 2-3 hours of pushing before diagnosing second stage arrest

“Thus, a specific absolute maximum length of time spent in the second stage of labor beyond which all women should undergo operatively delivery has not been identified”

1. Do allow *at least 2-3 hours of pushing* before diagnosing second stage arrest

If progress is made, allow at least:

- 2 hours of pushing in multiparous women, or
- 3 hours of pushing in primiparous women

Longer durations may be appropriate on an individualized basis.

1. Do allow *at least* 2-3 hours of pushing before diagnosing second stage arrest

- Prolonged second stage associated with increased neonatal morbidity (9-11% vs. 7-9%)
- Perinatal mortality rare but increased with prolonged second stage (0.14% vs. 0.04%)
- Maternal morbidity higher (8.4% vs. 6.1%) among primiparous patients

1. Do allow *at least* 2-3 hours of pushing before diagnosing second stage arrest

Intracranial injury is more likely among infants delivered operatively (OR 2.5-3.4) but not significantly different among route of operative delivery

NEJM (1999) 341: 1709
Conspicuously Absent:

- Treatment of GDM
- Management of NRFHTs
- Multiple gestation
- TOLAC
- Choice between vacuum and forceps