Preventing the First Cesarean

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Family Medicine Resident School
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Disclosures

• None
Objectives

• Discuss optimal cesarean delivery rate and effect of first cesarean on reproductive history
• Understand role of labor dystocia as primary etiology for cesarean delivery
• Understand recommendations of 2012 SMFM/NICHD/ACOG Workshop
• Discuss other evidence approaches to reduce the primary cesarean rate
Role of first cesarean in determining reproductive history

• Only 8% of women in the United States with a prior cesarean have a VBAC
• Decrease in VBAC rate primarily due to fewer women choosing TOLAC or having access to TOLAC as success rate of TOALC is stable at 75%
• Most VBAC talks end with the “solution “ to VBAC dilemma being the prevention of first cesarean
The graph illustrates the trends in cesarean section rates over a period spanning from 1989 to 2011. It differentiates between total cesarean sections (purple line), primary (first-time) cesarean sections (blue line), and vaginal birth after cesarean section (VBAC, grey line). The y-axis represents the rate per 100 deliveries, while the x-axis denotes the years from 1989 to 2011. The visual data shows a significant increase in cesarean section rates, particularly for total cesarean sections and primary cesarean sections, with a peak around 2004 before stabilizing. The VBAC rate increases gradually from a low in 1989 to a higher rate by 2011.
What is optimal cesarean rate?

- Target of Health People 2010 was 15% for low risk full term women - NOT MET
- Target of Healthy People 2020 is 23.9% for same population
- 2007 rate for this population was 26.5% so goal is about a 10% reduction
- WHO
Association of low cesarean rate with maternal mortality

Cesarean rates compared to Maternal Mortality Ratio

Extremely low cesarean rates in least developed nations

• 49 countries described as lowest resource by United Nations- 34 of these are in Africa

• Average cesarean rate is 2% in these countries
Correlation of international cesarean rates with presence of skilled birth attendant

What does WHO say?

• 1985 statement that rates higher than 10-15% not justified in any country
• 2009 WHO handbook: “Both very low and very high rates of caesarean section can be dangerous, but the optimum rate is unknown. Pending further research, users of this handbook might want to continue to use a range of 5-15% or set their own standards.”
• “Earlier editions of this handbook set a minimum (5%) and a maximum (15%) acceptable level for caesarean section. Although WHO has recommended since 1985 that the rate not exceed 10-15%, there is no empirical evidence for an optimum percentage or range of percentages, despite a growing body of research that shows a negative effect of high rates.”

What does ACOG say?

2000 ACOG Task force on cesarean rates

Nulliparous women at 37 weeks of gestation or greater with singleton fetuses with vertex presentations: The national 1996 cesarean delivery rate for this group was 17.9%; the expert working group goal at the 25th percentile for this group is 15.5%.
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>Hypertensive disorders</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 arrest</td>
<td>10–25</td>
</tr>
<tr>
<td></td>
<td>Failed induction</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Nonreassuring fetal heart rate</td>
<td>10</td>
</tr>
</tbody>
</table>

Some indications may occur both prelabor and in labor.

* Percentage of all cesarean deliveries that have this as a primary indication.

## Cesarean Practice Variation

### Examples of Cesarean Rate Range

<table>
<thead>
<tr>
<th></th>
<th>High</th>
<th>Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>States, 2005</td>
<td>LA: 37%</td>
<td>UT: 22%</td>
</tr>
<tr>
<td>Alabama hospitals, 2006</td>
<td>50%</td>
<td>15%</td>
</tr>
<tr>
<td>Florida hospitals, 2004</td>
<td>57%</td>
<td>19%</td>
</tr>
<tr>
<td>Massachusetts hospitals, 2005</td>
<td>39%</td>
<td>22%</td>
</tr>
<tr>
<td>New Jersey hospitals, 2006</td>
<td>64%</td>
<td>14%</td>
</tr>
<tr>
<td>NJ hospitals, standard* nulliparas/no TOL, 2006</td>
<td>20%</td>
<td>2%</td>
</tr>
<tr>
<td>NJ hospitals, standard* nulliparas/TOL, 2006</td>
<td>40%</td>
<td>8%</td>
</tr>
<tr>
<td>NJ hospitals, multiple gestations/no TOL, 2006</td>
<td>95%</td>
<td>33%</td>
</tr>
<tr>
<td>New York City hospitals, 2005</td>
<td>45%</td>
<td>17%</td>
</tr>
</tbody>
</table>

* standard = singleton term vertex (Healthy People low-risk woman) (classification of Robson 2001)
Benchmark Cesarean Rates in USA

Healthy Low-Risk Women

National Birth Center Study II (Stapleton: J Midwifery Womens Health Feb 2013)

• 15,574 women planning and eligible for a birth center birth at the onset of labor, 93% experienced a spontaneous vaginal birth regardless of where they ultimately gave birth, whereas 6% had a cesarean birth.

• There were no maternal deaths. The intrapartum fetal mortality rate for women who were admitted to the birth center in labor was 0.47/1000, and the neonatal mortality rate was 0.40/1000 excluding anomalies.
Benchmark Cesarean Rates in USA

Mixed Risk Women

Zuni-Ramah Hospital, northwestern New Mexico (Leeman et al. 2003)
1,132 women of 20+ weeks gestation, 1992-1996: 7.3% cesarean rate
vs. 1996 cesarean rates: national 20.7%, New Mexico Native American
women 12%

In comparison with national 1996 childbearing population
• Higher rates of pre-eclampsia, diabetes, chronic hypertension
• Lower rates of advanced maternal age, previous cesarean, multiple
gestation

Differences do not seem to be explained by demographics or maternity risk
factors.
Differences attributed to maternity practices, cultural attitudes and genetics.
Importance of Preventing the First Cesarean

• 90% of women who have cesarean with first birth have repeat cesarean delivery
• Vicious cycle of rising cesarean rate
<table>
<thead>
<tr>
<th>Indication</th>
<th>Diagnostic Accuracy*</th>
<th>Effect on Prevention of First Cesarean Delivery†</th>
<th>Preventive Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed induction</td>
<td>Limited</td>
<td>Large</td>
<td>See Table 5 and Figure 1</td>
</tr>
<tr>
<td>Arrest of labor</td>
<td>Limited</td>
<td>Large</td>
<td>See Table 5 and Figure 3</td>
</tr>
<tr>
<td>Multiple gestation</td>
<td>High</td>
<td>Small</td>
<td>Prevent multiple gestations: encourage single embryo transfer</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Safe trial of labor: training for vaginal twin delivery, simulation for cephalic version, or breech extraction of second twin</td>
</tr>
<tr>
<td>Preeclampsia</td>
<td>High</td>
<td>Small</td>
<td>Education: preeclampsia is not an indication for cesarean delivery</td>
</tr>
<tr>
<td>Prior shoulder dystocia</td>
<td>Limited</td>
<td>Small</td>
<td>Improved documentation as to prior shoulder dystocia</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Education regarding risk of recurrence based on estimated fetal weight</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Prior shoulder dystocia is not an absolute indication for cesarean delivery</td>
</tr>
<tr>
<td>Prior myomectomy</td>
<td>Limited</td>
<td>Small</td>
<td>Improved documentation of prior myomectomy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Education regarding impact of myomectomy on delivery</td>
</tr>
<tr>
<td>Prior third-degree or fourth-degree laceration, prior breakdown of repair, fistula</td>
<td>High</td>
<td>Small</td>
<td>Education: not an absolute indication for cesarean delivery</td>
</tr>
<tr>
<td>Marginal and low-lying placentation</td>
<td>High</td>
<td>Small</td>
<td>Education: limited ability to predict recurrence</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Education: attempt at vaginal delivery; acceptable as long as placenta is 1 cm or more from internal os³⁶</td>
</tr>
</tbody>
</table>

* Diagnostic criteria accuracy: how readily and accurately cases can be diagnosed. For example, the ability to diagnose multiple gestations is high, whereas the ability to identify all cases of shoulder dystocia is limited as a result of subjectivity of the definition.

† Effect on prevention of first cesarean delivery: large means that modification of indication (eg, arrest of labor) could lead to a large decrease in cesarean deliveries. Small means that modification of indication (eg, prior shoulder dystocia) could lead to a small decrease in cesarean deliveries.
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<tr>
<th>Indication</th>
<th>Diagnostic Accuracy*</th>
<th>Effect on Prevention of First Cesarean Delivery†</th>
<th>Preventive Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malpresentation</td>
<td>High</td>
<td>Large</td>
<td>External cephalic version</td>
</tr>
<tr>
<td>Nonreassuring antepartum or intrapartum fetal surveillance</td>
<td>Moderate</td>
<td>Large</td>
<td>Education regarding correct interpretation and management (Fig. 2)</td>
</tr>
<tr>
<td>Macrosomia</td>
<td>Limited</td>
<td>Small</td>
<td>Confirmatory tests (eg, scalp stimulation)</td>
</tr>
<tr>
<td>Malformations, eg, NTD, SCT, EXIT procedure, hydrops</td>
<td>Moderate</td>
<td>Small</td>
<td>Intrauterine resuscitative measures (eg, IVF, position change, oxygen, etc)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Screen for and treat diabetes; limit weight gain in pregnancy</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Anecdotal for indication</td>
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<td></td>
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<td></td>
<td>Education: cesarean delivery not indicated for abdominal wall defects</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Multidisciplinary education of subspecialists and counseling of patients</td>
</tr>
</tbody>
</table>

*Diagnostic criteria accuracy: how readily and accurately cases can be diagnosed. For example, the ability to diagnose malpresentation is high, whereas the ability to identify macrosomia is limited. Moderate accuracy is between high and limited.

†Effect on prevention of first cesarean delivery: large means that modification of indication (eg, malpresentation) could lead to a large decrease in cesarean deliveries. Small means that modification of indication (eg, malformations) could lead to a small decrease in cesarean deliveries.
Some of first cesarean are without medical indication

- Maternal Choice
- Macrosomia
- Vtx/vtx twins
Preventing the Breech Cesarean (10-15% of all c/s)

- 10-15% primary cesarean for malpresentation
- Workshop felt “prevention” could have large effect
- Preventive strategy was increased use of external cephalic version
- All international obstetric groups recommend ECV but vastly underutilized
- Failure to diagnose on Leopold’s rampant
Breech /transverse in prenatal care

• Know if vtx by 35-36 weeks: Vaginal exam or office ultrasound if unsure
• Encourage version as safest choice
• Offer to have done at 37 weeks
• Identified supportive physician for version
• If unsuccessful or appears likely difficult consider regional anesthesia or perhaps for all primips
External cephalic version with spinal analgesia

Table 2. Outcome and Findings at Time of External Cephalic Version Procedure

<table>
<thead>
<tr>
<th></th>
<th>Spinal Analgesia Group (n=36)</th>
<th>Control Group (n=34)</th>
<th>P</th>
<th>95% CI of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Successful conversion to vertex position</td>
<td>24/36 (66.7)</td>
<td>11/34 (32.4)</td>
<td>.004**‡‡</td>
<td>0.0954 to 0.5513</td>
</tr>
<tr>
<td>Uterine tone relaxed</td>
<td>32/34 (94.1)</td>
<td>25/30 (83.3)</td>
<td>.168‡</td>
<td>-0.0748 to 0.3046</td>
</tr>
<tr>
<td>Easy palpation of fetal head</td>
<td>31/35 (88.6)</td>
<td>24/28 (85.7)</td>
<td>.735‡</td>
<td>-0.1807 to 0.2198</td>
</tr>
<tr>
<td>Further analgesia offered for ECV due to pain</td>
<td>0/36 (0%)</td>
<td>15/34 (44.1)</td>
<td>&lt;.001***</td>
<td>0.2361 to 0.6180</td>
</tr>
<tr>
<td>VAS pain score (0–10)</td>
<td>1.76±2.74</td>
<td>6.84±3.08</td>
<td>&lt;.001**‡</td>
<td>-6.5 to -3.7</td>
</tr>
</tbody>
</table>

CI, confidence interval; ECV, external cephalic version; VAS, visual analog scale. Data are presented as n (%. 95% CI of the mean) or mean±standard deviation.
Spinal analgesia for version

- Consider if offering to all or using selectively
- Increases time on L & D
- Talk to anesthesia; T6 level goal
- Hypotension not a problem in study but can occur
- Allow maximal BP response before initiating attempt at ECV
Any role for planned vaginal breech in 2013?

- Premoda trial demonstrated equivalent safety with strict hospital based protocols
- Long term outcomes of Term Breech trial reassuring
- SOGC Canada has initiative to increase availability of vaginal breech
- Limited swing of pendulum in USA- OHSU and Anchorage IHS offering
- Experience/training is major limitations
Multiple gestation

- Workshop felt this will have relatively small effect on preventing first cesarean
- Recommend encouraging single embryo transfer to prevent multiple gestation
- Training for vaginal twin delivery with simulation for cephalic version or breech extraction of second twin recommended as “secondary” prevention
Isn’t it safer just to section all twins?

- Twin Birth Study
- 2804 women from 26 countries
- 32-38 weeks. A is 1500-4000 grams and vertex
- Delivery 37 5/7 to 38 6/7
- Primary outcome death or serious morbidity same in CS vs. vaginal delivery groups
- 60.5% in planned vaginal group delivered twin A vaginally and only 4% section rate for twin B
Cesarean for NRFHTs (10% of all C/s)

- 10% of Primary CS and workshop felt reduction could have major effect
- Prevention is education about interpretation and management, use of ancillary tests (scalp stim) and intrauterine resuscitation
- No benefit of continuous monitoring in low risk and increases cesarean rate
- RR of continuous CTG for cesarean 1.66, 95% CI 1.30-2.13
- Intermittent auscultation requires 1:1 ratio, training, guidelines and may not be appropriate for higher risk patients
Assessment of intrapartum fetal heart rate monitoring. *Given the wide variation of fetal heart rate (FHR) tracings in Category II, this algorithm is not meant to represent assessment and management of all potential FHR tracings but provide an action template for common clinical situations. †Intrauterine resuscitative measures may include oxygen supplementation, position change, intravenous fluids, stopping oxytocin, tocolysis, and amnioinfusion. ‡Timing and mode of delivery based on feasibility and maternal-fetal status. Modified from Management of intrapartum fetal heart rate tracings. Practice Bulletin No. 116. American College of Obstetricians and Gynecologists. Obstet Gynecol 2010;116:1232–40. Fig. 2. Spong. Preventing the First Cesarean Delivery. Obstet Gynecol 2012.
Workshop recommendations

• Intermittent auscultation, done appropriately, is an acceptable method for labor management in low-risk patients without heart rate abnormalities.

• In the patient with moderate fetal heart rate variability, other findings have little association with neurologic damage or acidosis
Issue is category two fetal monitoring

- Presence of moderate variability confirms nonacidotic fetus despite presence of decelerations
- Difficult to reassure physicians with medical legal background
- Lack of direct line between complications in subsequent pregnancies and initial decision to perform CS for NRFHTs
Solutions to fetal monitoring quandary

• Increased physician education in interpretation management
• ? Benefit to introduction of electrocardiographic ST-segment analysis, computerized fetal heart rate pattern interpretation
• Revision of 3 tier system- UCSF has developed and Portland area hospital use five tier system
Box 1. Quality Measures to Track and Provide Feedback for Each Obstetrician–Gynecologist Physician*

- Rate of nonmedically indicated cesarean delivery
- Rate of nonmedically indicated induction
- Rate of labor arrest or failed induction diagnosed without meeting accepted criteria
- Rate of cesarean deliveries for nonreassuring fetal heart rate by *Eunice Kennedy Shriver* National Institute of Child Health and Human Development category

*For singleton gestation, vertex presentation, at 37 0/7 to 41 6/7 weeks of gestation.*
Role for terbutaline

• Concerning Level 2 or any Level 3 monitoring in setting of tachysystole

• Other fetal monitoring that will lead to rapid cesarean if does not resolve (e.g. bradycardia)

• Milder concerns may try other interventions before terbutaline: position changes, decrease pitocin, normalize BP, IV hydration

• Do not use terbutaline for tachysystole if fetal monitoring is not concerning
Failed induction: 10% of all c/s

- NICHD: Labor induction should be performed only for medical indication; if done for nonmedical indications, the gestational age should be 39 weeks or more, and the cervix should be favorable (Bishop score more than 8), especially in the nulliparous patient.
- 40% are still in latent labor after 6 hrs of oxytocin induction and almost 20% at 12 hours
Failed induction study

- 13467 Nullips $\geq$ 36 weeks induction with unripe cervix ($\leq$ 2cm and not completely effaced)
- 69.7% out of latent labor by 6 hrs of oxytocin and ROM
- Only 5% still in latent labor at 12 hrs oxytocin and ROM

*Obstet Gynecol* 2011;117:267–72
Failed induction: 10% of all c/s

• Failed induction is defined as failure to generate regular (e.g. every 3 minutes) contractions and cervical change after at least 24 hours of oxytocin administration with artificial membrane rupture if feasible.

• Try not to diagnose without AROM

• Consider whether stopping induction overnight of for a few days is reasonable (e.g. not for IUGR or preeclampsia but could for GDMA2 at 38 weeks or postdates at 41 1/7
Algorithm for induced labor: Preventing the First Cesarean Delivery.

1. Induction
   - Oxytocin with regular frequent contractions

2. Cervical change from baseline
   - At least 6 cm
     - Contraction at least every 3 minutes for at least 6 hours, but no further cervical change
       - Rupture of membranes not safe or not feasible
         - Consider cesarean delivery
       - Rupture of membranes safe and feasible
         - Consider cesarean delivery
   - Less than 6 cm
     - Rupture of membranes not safe or not feasible
       - Administer oxytocin at least 24 hours
         - Rupture of membranes not safe or not feasible
           - Consider double setup for attempted rupture of membranes
             - Consider cesarean delivery
   - No cervical change from baseline

3. Rupture of membranes safe and feasible
   - Administer oxytocin at least 24 hours
     - Rupture of membranes not safe or not feasible
       - Consider double setup for attempted rupture of membranes
         - Consider cesarean delivery
   - Rupture of membranes not safe or not feasible
     - Consider cesarean delivery

4. Cervical change
   - Continue labor
   - No cervical change despite adequate contractions for at least 4 hours
     - Rupture of membranes not feasible
       - Consider cesarean delivery
   - Inadequate contractions; no cervical change for at least 6 hours
     - Rupture of membranes not feasible
       - Consider cesarean delivery

5. Options:
   - Mechanical cervical ripening
   - Pharmacologic cervical ripening with alternate agent
   - Consider resting patient overnight

6. Less than 3 cm; fetal heart tracing reassuring; patient stable
   - At least 3 cm
     - Rupture of membranes not safe or not feasible
       - Administer oxytocin at least 24 hours
         - Rupture of membranes not safe or not feasible
           - Consider double setup for attempted rupture of membranes
             - Consider cesarean delivery
   - Rupture of membranes safe and feasible
     - Administer oxytocin at least 24 hours
       - Rupture of membranes not safe or not feasible
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   - Rupture of membranes not safe or not feasible
     - Administer oxytocin at least 24 hours
       - Rupture of membranes not safe or not feasible
         - Consider double setup for attempted rupture of membranes
           - Consider cesarean delivery
First Stage Arrest of Labor: 15-30% of CS

• Active stage labor may not begin until 6cm
• Common to move slowly from 3->4->5->6
• Slower in inductions till 6 cm then same as spontaneous
• Using cervical ripening agents will shorten labor but may not change CS rate
How to use oxytocin

- New UNM protocols Fast vs. slow, q15 vs. q 30
- New **standard** will be start at 2 mu and increase by 2 q 30 minutes until 12 mu then increase q2-4 mu q 30 as needed until 7 contractions in 15 min, MVU> 200 or max 36 mu
- Failure to increase oxytocin leads to more chorioamnionitis and failed induction cesareans. Fast pit with short intervals leads to more tachysystole but not operative delivery for NRFHTs
Duration of Each Centimeter Change in Cervical Dilatation for Nulliparous Women With Spontaneous Onset of Labor*

<table>
<thead>
<tr>
<th>Cervical Change (cm)</th>
<th>Median (h)</th>
<th>95th Percentile (h)</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>

Definitions if Failed Induction and Arrest Disorders

Failed induction of labor
Failure to generate regular (eg, every 3 min) contractions and cervical change after at least 24 h of oxytocin administration, with artificial membrane rupture if feasible

First-stage arrest
6 cm or greater dilation* with membrane rupture and no cervical change for
4 h or more of adequate contractions (eg, >200 Montevideo units) or
6 h or more if contractions inadequate

Second-stage arrest
No progress (descent or rotation) for
4 h or more in nulliparous women with an epidural
3 h or more in nulliparous women without an epidural
3 h or more in multiparous women with an epidural
2 h or more in multiparous women without an epidural

* Since women may still be in latent labor, additional time and interventions may be needed in order to diagnose an arrest of active labor before 6 cm dilatation (see Figure 1 for suggested management).
Algorithm for spontaneous labor.

*Consider outpatient management of uncomplicated labor until at least 3 cm dilated or fetal membrane rupture occurs. †Continued observation in latent phase, with augmentation as indicated. Discharge may be appropriate if labor subsides, membranes remain intact, and maternal and fetal status remain stable. Fig. 3. Spong. Preventing the First Cesarean Delivery. Obstet Gynecol 2012.
2nd stage arrest of labor: 10-25% of all C/S

- Inverse rate of operative vaginal and cesarean deliveries
- Consider oxytocin
- NICHD: Medically indicated operative vaginal delivery is an acceptable birth method. Given the current rates, it is critical that training and experience in operative vaginal delivery are augmented and encouraged.
Summary

• Treat induction different than spontaneous labor until active/6 cm
• Active labor starts later than we thought
• Fetal monitoring increases CS without evidence of benefit in low risk
• Moderate variability is a key finding
• Find the breech, offer version
Are there time limits for labor beyond which risks of continuing exceed the benefit of potential vaginal delivery?
Risks of prolonged induction/labor without progress/descent

• Vaginal delivery becomes less likely as labor becomes more prolonged
• Increased PPH due to atony with less response to oxytocin and other medicines
• Complicated cesareans when at 8-10 cm for prolonged period
Induction tips: Cervical Ripening

• What If contractions continue 4 hrs after vaginal miso and unripe cervix?
• Sequential use of miso followed by Cook or Foley
• Combined use of Miso with Foley/Cook
• 2-3 doses of miso followed by Cook
Misoprostol Guideline

- **Dosage Regimen:**
  - 25 micrograms placed in the posterior vaginal fornix every 4 hours
    - If no significant uterine activity (i.e. at least 3 contractions in a 10 minute period and/or cervical change) after 2 doses, the dose may be increased to 50 mcg every 4-6 hours
  - 50 micrograms PO every 4 hours (NOT buccal or sublingual)
    - Consider re-dosing after 4 hours if contractions are ≥ 4 minutes apart, and fetal status is reassuring
  - Once a patient has received total dosing of 200 mcg, continued use should be discussed with attending versus converting to another method of induction
  - Maximum dose is 300 mcg regardless of route of administration
  - OB provider should evaluate patient prior to re-dosing
Induction tips: pitocin maxed and not in active labor

- Decide if induction needs to be continued
- Unripe cervix consider return to miso of mechanical ripening
- Consider amniotomy
- Short two hour “pitocin holiday” for 2 hours
Second Stage Labor Tips

• Assess position (OA vs. OP) when complete if not sooner
• Use ultrasound as needed for position
• Laboring down usually no >90 minutes unless
• Don’t labor down or encourage active pushing unless contractions at least q2-3 minutes
• Offer rotation if OP
Consultation of operative obstetrical backup (FP OB fellowship faculty or Ob/Gyn) for prolonged labor or failed induction

- Labor induction with oxytocin has occurred for 24 hours and the patient is not in active labor
- Arrest of active labor ($\geq 6$ cm) for four hours of adequate contractions without cervical change
- Arrest of active labor ($\geq 6$ cm) for six hours without adequate contractions
- Second stage labor greater than four hours with an epidural or three hours without an epidural when delivery does not appear imminent.
Labor induction with oxytocin has occurred for 24 hours and the patient is not in active labor.

The 24 hours does not include any time period of cervical ripening. In this situation amniotomy will have been performed if technically feasible – e.g. not at high station and/or unengaged vertex.
Active Phase Arrest

- Arrest of active labor (> 6cm) for four hours of adequate contractions without cervical change

- Arrest of active labor (> 6cm) for six hours without adequate contractions

In these setting amniotomy and IUPC placement has usually occurred
Second stage labor greater than four hours with an epidural or three hours without an epidural when delivery does not appear imminent.

- A maximum of 60-90 minutes of laboring down is encouraged with an epidural before initiating active maternal efforts if vertex is above plus two station and no spontaneous urge to push is present.
- Oxytocin should usually be used to increase the contraction frequency to q 2-3 minutes during the period of passive descent.
- After two hours of second stage labor a note should be placed by the primary MCH attending physician assessing the clinical situation including EFW, progress of descent, position (e.g. OP), adequacy of contractions, and fetal monitoring.
Does manual rotation work?

- 796 attempts at manual rotation with 90.3% success rate
- Success rotation 3.8% cesarean rate
- Unsuccessful rotation 58.8% cesarean rate

Le Ray et al Obstetrics & Gynecology 2007;110:873-879
Assessing for Occiput Posterior

- Feel for anterior and posterior fontanelles
- With OP large anterior diamond shaped fontanel with 4 sutures easily felt
- Posterior fontanel smaller and meeting of three suture lines
- With epidural may be able to enter and feel ear, neck or brow
When to assess for OP

- Any vaginal examination when 6 cm or more dilated
- Slow progress and post anterior lip increase suspicion
- Back labor
Laboring Down

- Appropriate for 60-90 minutes.
- May decrease operative vaginal deliveries and maternal exhaustion
- Often need to initiate oxytocin to bring contractions to q2-3 minutes
- Assess hourly for progress
- Not appropriate if NRFHTs and if chorioamnionitis then shortening labor is best
Vacuum Assisted Vaginal Delivery

• Core skill for family medicine maternity care
• 5% of deliveries
• 8 % of primip deliveries
• Appropriate to consider if Vtx at plus 2 or lower and prolonged second stage
• Not indicated based on set time limits
Normal Birth Mechanism
Vacuum Delivery
Axis Animation
Final Traction
Final Traction
Team approach to labor dystocia management and consultation

- Long labors and inductions are often stressful for the patient, her family and maternity care providers including physicians and nurses.
- When these situations arise a maternity care team huddle to discuss labor management is encouraged and may address issues such as oxytocin management, family dynamics, or consideration of OP position.
- It is strongly encouraged that when an MCH or Ob/Gyn consultation occurs that they initially meet with the MCH team and nurse to understand the clinical scenario and psychosocial dynamics.
MCH Labor management

- Start using Preventing the First Cesarean criteria
- MCH induction guidelines in development
- Initiate structured approach to second stage
- Implement new consultation guidelines