Labor Management: Keeping Mother and Baby Safe

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Safe Labor Management

- Promote maternal and fetal wellbeing
- Avoid unnecessary interventions
- Maintain careful assessment
- Communicate often and effectively
- Include mother and support persons
- If cesarean is needed based maternal or fetal condition, perform in a timely manner

ACOG / SMFM Recommendations

- Induction of labor < 41 0/7 weeks generally should be limited to women with maternal/fetal indications
- Induction of labor at ≥ 41 0/7 weeks is recommended to minimize risk of cesarean and perinatal morbidity and mortality
- Cervical ripening should be used for induction with unfavorable cervix

ACOG / SMFM Recommendations

- Active labor is more accurately defined as beginning at 6 cm cervical dilation
- Neither active phase labor protraction nor labor arrest should be diagnosed before 6 cm
- Most women with a prolonged latent phase will eventually begin active phase of labor with expectant management

Presented at Washington State Hospital Association Safe Table, Sept. 4, 2014
6 cm is the new definition of the beginning of active labor

ACOG / SMFM Recommendations

- A prolonged latent phase (e.g., > 20 hours in nullips and > 14 hours in multips) should not be an indication for cesarean birth
- Slow but progressive labor in first stage should not be an indication for cesarean birth

Labor Progress: Nulliparous Women

<table>
<thead>
<tr>
<th>cm</th>
<th>Spontaneous (Hours) 5th / 95th percentiles</th>
<th>Induction (Hours) 5th / 95th percentiles</th>
<th>Augmented (Hours) 5th / 95th percentiles</th>
</tr>
</thead>
<tbody>
<tr>
<td>3-10</td>
<td>4.2 (1.3, 13.1)</td>
<td>6.9 (2.0, 24.9)</td>
<td>6.6 (2.0, 23.6)</td>
</tr>
<tr>
<td>3-4</td>
<td>0.4 (0.1, 2.3)</td>
<td>1.4 (0.2, 8.1)</td>
<td>1.2 (0.2, 6.8)</td>
</tr>
<tr>
<td>4-6</td>
<td>0.5 (0.1, 2.7)</td>
<td>1.3 (0.2, 8.8)</td>
<td>1.4 (0.3, 7.6)</td>
</tr>
<tr>
<td>5-6</td>
<td>0.4 (0.06, 2.7)</td>
<td>0.6 (0.1, 4.3)</td>
<td>0.7 (0.1, 4.9)</td>
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<tr>
<td>6-7</td>
<td>0.3 (0.03, 2.1)</td>
<td>0.4 (0.05, 2.8)</td>
<td>0.5 (0.06, 3.9)</td>
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<tr>
<td>7-8</td>
<td>0.3 (0.04, 1.7)</td>
<td>0.2 (0.03, 1.5)</td>
<td>0.3 (0.05, 2.2)</td>
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Harper et al., 2012 Normal progress of induced labor. Obstetrics and Gynecology 119 (6), 1113–8

ACOG / SMFM Recommendations

- Women with > 6 cm of cervical dilation and ROM who do not progress after 4 hours of adequate uterine activity, or at least 6 hours of oxytocin administration with inadequate uterine activity and no cervical change, may have active phase arrest in first stage labor and may need cesarean
- Intrauterine resuscitation measures may be useful in maintaining fetal wellbeing and thus avoiding cesarean birth for abnormal or indeterminate fetal status

ACOG / SMFM Recommendations

- Ideal length of second stage labor is unknown.
- Diagnosis of arrest of second stage labor should not be made until at least 2 hrs of pushing in multips and at least 3 hrs of pushing in nullips.
- Epidurals may be associated with longer second stage.
- Operative vaginal birth and manual rotation of the fetal occiput in the context of fetal malposition in second stage may be viable alternatives to cesarean birth.

Things Have Changed

Collaborative Perinatal Project (n = 39,491 births 1959-1966)
Consolidation on Safe Labor (n = 98,359 births 2002-2008)

Presented at Washington State Hospital Association Safe Table, Sept. 4, 2014
Conclusions
When compared to women who spontaneously labored 50 years ago (CPP), women in the CSL:
- Older (26.8 vs 24.1 years)
- Heavier (BMI 29.9 vs 26.3 ± 4.2 kg/m²)
- Higher epidural rates (55% vs 4%)
- Higher oxytocin use (31% vs 12%)
- Higher cesarean birth rates (12% vs 3%)

Conclusions
First stage labor now, compared to 50 years ago:
- Longer by 2.6 hours in nulliparous women
- Longer by 2.0 hours in multiparous women
- Even after adjusting for maternal and pregnancy characteristics
- Prolonged labor is mostly due to changes in practice patterns

Average labor curves for nulliparous women with singleton term pregnancies in spontaneous labor with vaginal birth.
Laughon et al., 2012 Changes in labor patterns over 50 years. AJOG.

Average labor curves for multiparous women with singleton term pregnancies in spontaneous labor with vaginal birth.
Laughon et al., 2012 Changes in labor patterns over 50 years. AJOG.

Average labor curves by parity in singleton term pregnancies with spontaneous onset of labor, vaginal birth, and normal neonatal outcomes. P0, nulliparous; P1, women of parity 1; P2, women of parity 2 or higher.
Zhang et al., Contemporary Labor Patterns. Obstetrics & Gynecology, 2010.

Labor Progress Nulliparous Women
<table>
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<tr>
<th>CMs</th>
<th>Spontaneous Mean (5% / 95% percentiles)</th>
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Labor Curves of Nulliparous Women by BMI

Kominiarek et al., (2011). Labor patterns by BMI.

Labor Curve Based on Fetal Gender

Cahill et al. (2012) Impact of fetal gender on the labor curve. AJOG, 206:335.e1-5.

Length of Labor Based on Fetal Size


The Cost of Having a Baby in the United States

Prepared for:
Childbirth Connection
Catalyst for Payment Reform
Center for Healthcare Quality and Payment Reform
January 2013

Hospital Reimbursement

<table>
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<th>Type</th>
<th>Payer</th>
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<tr>
<td>Vaginal</td>
<td>Medicaid</td>
<td>$5,387</td>
</tr>
<tr>
<td>Cesarean</td>
<td>Medicaid</td>
<td>$8,969</td>
</tr>
<tr>
<td>Vaginal</td>
<td>Commercial</td>
<td>$10,814</td>
</tr>
<tr>
<td>Cesarean</td>
<td>Commercial</td>
<td>$18,392</td>
</tr>
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Cost of Having a Baby in the US (2013)
Indeterminate (Category II)

- Wide range of clinical implications associated with various types of FHR patterns within category II
- Imprecise nature of category II as it relates to fetal wellbeing makes it challenging/not always useful for clinical decisions during labor

Promoting Fetal Wellbeing

- Supporting a woman in giving birth vaginally within the upper normal limits of labor duration must be in the context of a well fetus
- Assessment of fetal status should be considered relative to the likelihood and timing of vaginal birth

Promoting Fetal Wellbeing

- Adequate maternal cardiac output, blood pressure, hemoglobin levels, and oxygen saturation
- Adequate blood flow to the uterus and placenta (volume, hemoglobin levels and oxygen saturation)
- Adequate placental function
- Normal uterine activity
- Uninterrupted blood flow to fetus

Uteroplacental Perfusion

Factors that May Decrease

- Maternal conditions
  - (Hypertensive disorders of pregnancy; diabetes)
- Maternal hypotension
- Excessive uterine activity or hypertonus
- Placental changes
  - (decreased surface area, edema, degeneration, calcifications, infarcts, infection)
- Vasoconstriction

Excessive Uterine Activity

- Tachysystole
- Decreased Uteroplacental Perfusion
- Decreased Fetal Oxygenation

Deteriorating Fetal Status

Normal Oxygenation

Hypoxia

Acidosis

Tissue Damage / Death

Moderate Variability

- Highly predictive of baby that is
  - Vigorous
  - Well oxygenated
  - Normal pH

(Parer et al., 2006)
Evolving Deterioration

- Moderate variability
  - 98% Apgar >7 at 5 min and pH >7.15
- Absent or minimal
  - 23% fetal acidemia
- Fetal acidemia with decreasing variability in combination with decelerations develops over a period of time approximating 1 hr
  (Parer et al., 2006)

Maternal-Fetal Assessment

- Maternal Vital Signs based on condition
- Fetal heart rate
  - Baseline rate
  - Variability
  - Presence or absence of accelerations
  - Presence or absence of decelerations
  - Evolution over time
- Uterine Activity
  - Contraction frequency
  - Contraction duration
  - Contraction intensity
  - Uterine resting tone

Team Communication

- Concise
- Clear
- What's going on / situation
- Context or background
- Appraisal / assessment
- Request / recommendation
- Further discussion
- Decision
- Mobilize team response if needed

Team Communication

Indeterminate (Cat II)/ Abnormal (Cat III) FHR Patterns

- Baseline rate, variability, presence or absence of accelerations and decelerations
- Clinical context of FHR pattern (oxytocin, misoprostol, tachysystole, bleeding, IV pain meds, hypotension, cord prolapse, second stage)
- FHR pattern evolution (how long has this been developing)
- Intrauterine resuscitation techniques / fetal response
- Urgency (now, as soon as you can; within 30 min)
- Standard FHR terminology

Intrauterine Resuscitation

- Repositioning (side to side)
- IV fluid bolus of at least 500 mL lactated Ringer’s solution
- Oxygen at 10 L/min via nonrebreather facemask (usually no more than 15-30 min per event)
- Discontinuation of oxytocin/removal of Cervidil
- Amnioinfusion (first stage)
- Modification of pushing efforts (second stage)
- Medications (SQ Terbutaline / IVP Ephedrine)
**When? Repositioning**

FHR pattern suggests:
- Decreased oxygenation
- Umbilical cord compression

Maternal status suggests:
- Hypotension
- Uterine activity is excessive

**When? IV Fluid Bolus**

FHR pattern suggests:
- Decreased oxygenation

Maternal status suggests:
- Hypotension
- Dehydration
- Uterine activity is excessive

**When? Oxygen**

Usual intrauterine resuscitation techniques haven’t resolved indeterminate / abnormal FHR pattern:
- Lateral positioning
- Discontinuation of oxytocin
- IV fluid bolus of at least 500 mL L/R
- Correction of maternal hypotension
- Amnioinfusion
- Modification of pushing efforts

**When? Amnioinfusion**

- Recurrent variable decelerations during first stage labor that have not resolved with position change
- Not for late decelerations
- Not for active pushing phase of labor

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*Presented at Washington State Hospital Association Safe Table, Sept. 4, 2014*
Second Stage Labor

Active pushing is most physiologically stressful part of labor for the fetus

- FHR indeterminate or abnormal
  - Push with every other contraction
  - Maintain stable baseline rate
  - Discontinue or decrease oxytocin based on FHR pattern
    - Recurrent late decelerations
    - Recurrent variable decelerations
    - Moderate vs minimal variability
    - Baseline rate elevated

Second Stage Labor

- Avoid tachysystole
- Consider discontinuing pushing temporarily if FHR does not recover between pushes / contractions

Physiologic Reserve

Fetus less likely to tolerate continued pushing with recurrent decelerations if

- Minimal variability
- Rising FHR baseline into abnormal range
- First stage decelerations
- Infectious process

During Second Stage Labor

Tachysystole + Recurrent Decelerations = Risk of Fetal Compromise

Promoting Fetal Wellbeing

- Birth of the fetus, when possible, prior to the development of damaging degrees of hypoxia/acidemia

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Summary

- Patience and support
- Labor within the context of normal limits
- Know the evidence / share with colleagues
- Careful assessment to promote maternal and fetal wellbeing
- Timely and accurate communication among members of the team