Review of the Management of the Second Stage of Labor

Charles Hirt, MD
May 6, 2016

Initial Process Improvements
- Broad scope
  - Perinatologists
  - Obstetricians
  - Family Practice
  - Neonatologists
  - Certified Nurse Midwives
  - Advanced Practice Nurses
- Full support of Administration

Areas of Work: Standardization of Practice
- OB Induction Plan
- No Elective inductions prior to 39 weeks
- Induction and Augmentation of Labor orders and policies
- Cervical ripening orders and policies
- Intrapartum admissions orders
- Management of tachysystole algorithm
- Chorioamnionitis management orders
- Diabetes order sets and outpatient guideline developed

Problem Statement: Identified Second Stage of Labor as Critical Area to Address
- Areas of concern:
  - Third and Fourth Degree Laceration Rates
  - Vacuum Assisted Delivery Rate
  - Cesarean Section Rate
  - Adverse Outcome Index
  - All leading to neonatal and maternal morbidity

Problem Statement: Current Practices
- Often women are encouraged to push upon full dilation
- High rate of epidural use (87%)
- Lack of movement due to epidural
- Current evidence suggest better outcomes by delaying pushing in women who have epidurals until the urge to push is present

A Special Thanks to my Colleague....
Who co-developed this presentation, and modified the guideline for her doctoral work ...
Samantha A. Sommerness, DNP, APRN, CNM, Clinical Assistant Professor, University of Minnesota School of Nursing
**Happy to report the results of this study and guideline are under review for publication **
Lack of standardization of management of the length of the second stage of labor.
- Inconsistent use of operative vaginal delivery bundle.
- Fetal heart rate patterns are managed differently in the second stage than in the first stage.
- Failure to rescue in the second stage.
- Lack of documentation in second stage.

There are two phases:
- Phase I: “the lull” or Latent phase: From complete dilatation until the urge to bear down.
- Phase II: Active phase or pushing phase: From the onset of active pushing efforts to crowning of the presenting part.

In many cases, the woman is encouraged to push upon complete dilatation with high fetal station, without the urge to push.

Lack of documentation in second stage.

May 2010 2nd Stage Labor “Deep Dive”

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Pushing Techniques
• AWHONN encourages the use of physiologic bearing down versus sustained breath holding during expulsive efforts.
  – "Physiologic bearing down (several short pushes without breath holding), while resulting in a slightly longer second stage, may result in improved maternal/fetal gas exchange and maternal satisfaction with her birth experience". (vanBijsterveld, 2004)
  – Several studies have confirmed AWHONN’s position

A better approach for maternal breathing efforts during pushing phase of labor
Open-glottis pushing:
• The woman should be told to push simultaneously with a forced expiration for short periods of time, usually over 5-6 seconds
• Often accompanied by a grunt
• The glottis is at least partially opened, abdominal muscles are shortened and contracted against the uterus and intrathoracic pressure does not increase to interfere with venous return

Physiology of pushing efforts on cardiac output and fetal oxygenation
• Sustained breath holding combined with prolonged bearing down may produce fetal hypoxia and acidosis due to mother’s closed glottis and increased thoracic pressure.
• This combination results in a drop in fetal arterial pressure caused by decreased cardiac output due to diminished fetal return to the heart.

Second Stage Labor Practices
• For women with epidural anesthesia who do not feel the urge to push when they are completely dilated, delay pushing until the urge to push is felt (up to 2 hours for multiparous women and up to 1 hour for multiparous women).
• Use upright positioning with the woman’s feet flat on the bed. Change to a lateral position or other positions of comfort as necessary.
• Avoid forcing the woman’s legs back against her abdomen.
• Discourage prolonged breath holding. Instead, instruct the woman to bear down and allow her to choose whether or not to hold her breath while pushing.
• Discourage more than three to four pushing efforts with each contraction and more than 4 to 8 seconds of each pushing effort (avoid counting to 10 with each pushing effort).
• Take steps to minimize a normal fetal heart rate (FHR) pattern while pushing. Push with every other or every third contraction if necessary to avoid recurrent FHR decelerations. Reposition as necessary to treat FHR decelerations. Use the fetal response to pushing as a guide for second stage care.
• Avoid uterine hyperstimulation during the second stage of labor. Make sure that contractions are no closer than every 2 to 3 minutes while pushing. Titrate analgesia accordingly, use an intravenous fluid bolus of lactated Ringer’s solution, and repose to decrease contraction frequency.
• Allow the woman’s perineum to stretch naturally rather than using manual massage or stretching.

Rationale for a Standardized Guideline
• Guidelines incorporating evidence based practice improve outcomes
• Guidelines describe appropriate care based on the best available scientific evidence and broad consensus
• Reduce inappropriate variation in practice
• Establish shared mental models and expectations
General guidelines for the development and management of the second stage of labor
1. Includes primigravida and multigravida women
2. Women are completely dilated with an epidural
3. The guideline criteria specifies who should labor down and who should push
4. Women are repositioned every 30 minutes, both during the first stage of labor and in the guideline
5. Consistent examiner, who is proficient in station and position assessment
6. Normal FHR required for any delayed pushing strategy
7. Provider to be notified every hour and PRN

Guideline algorithm

- The 2nd stage of labor management guideline algorithm establishes two separate pathways
  
  - Immediate Pushing:
    - Head is visible
    - Urge to push is present AND station is + 2 or below AND position is OA, LOA, ROA
    - Provider desires
  
  - Delayed Pushing
    - Those who don’t meet the above criteria (OP)

Obstacles in Implementation

- Physician resistance to guideline usage
- Disbelief in benefits of laboring down

Descriptive Data – Consistent Across All Three Groups

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Maternal Age, Years</td>
<td>30.3 (5.0)</td>
<td>31.2 (4.5)</td>
<td>30.9 (4.9)</td>
<td>0.06</td>
</tr>
<tr>
<td>Gestational Age, Weeks</td>
<td>39.2 (1.2)</td>
<td>39.1 (1.3)</td>
<td>38.6 (1.6)</td>
<td>0.03</td>
</tr>
<tr>
<td>Induced, # Yes (% of group)</td>
<td>167 (41%)</td>
<td>89 (36%)</td>
<td>62 (34%)</td>
<td>0.23</td>
</tr>
<tr>
<td>Pitocin Use, # (% of group)</td>
<td>337 (84%)</td>
<td>213 (87%)</td>
<td>150 (82%)</td>
<td>0.45</td>
</tr>
<tr>
<td>Birthweight, g (SD)</td>
<td>3416.6 (441.8)</td>
<td>3392.6 (455.7)</td>
<td>3392.0 (507.5)</td>
<td>0.76</td>
</tr>
<tr>
<td>Nulliparous, # (% of group)</td>
<td>215 (53%)</td>
<td>77 (55%)</td>
<td>51 (45%)</td>
<td>0.25</td>
</tr>
</tbody>
</table>

*Table 1: One-way ANOVA was used for the comparison of means (SD), Kruskal-Wallis ANOVA was used for the comparison of medians (ranges) and for the comparison of proportions, the square was used.
Maternal and Fetal Outcomes – Reduced Vacuum Use and Pushing Time

Table 2: Maternal and Fetal Outcomes of 832 Charts

<table>
<thead>
<tr>
<th>Variable</th>
<th>Retrospective Group</th>
<th>Guideline Documented</th>
<th>Guideline Not Documented</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>APGAR at 5 minute (mean)</td>
<td>7.9 (1.1)</td>
<td>7.5 (1.2)</td>
<td>7.9 (1.2)</td>
<td>0.14</td>
</tr>
<tr>
<td>Mean Active Pushing, minutes</td>
<td>38 (21.8)</td>
<td>39 (21.9)</td>
<td>39 (21.8)</td>
<td>&lt;0.01</td>
</tr>
<tr>
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<td>38 (21.8)</td>
<td>39 (21.9)</td>
<td>39 (21.8)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Lacerated, 1% (mean, range)</td>
<td>16% (10%)</td>
<td>17% (18%)</td>
<td>12% (12%)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Vacuum Assisted Deliveries, 1% (mean, range)</td>
<td>8% (20.9%)</td>
<td>6% (14.7%)</td>
<td>4% (12.9%)</td>
<td>0.011</td>
</tr>
<tr>
<td>Episiotomy, 9% (mean, range)</td>
<td>100 (20.6%)</td>
<td>89 (29.7%)</td>
<td>94 (20.4%)</td>
<td>0.22</td>
</tr>
<tr>
<td>3rd Degree Lacerations, 1% (mean, range)</td>
<td>27% (30.7%)</td>
<td>24% (15.4%)</td>
<td>26% (31.8%)</td>
<td>0.72</td>
</tr>
<tr>
<td>4th Degree Lacerations, 1% (mean, range)</td>
<td>6% (13%)</td>
<td>5% (13.4%)</td>
<td>7% (10%)</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Table 3: Path Model Showing a Regression Analysis

<table>
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<tr>
<th>Variable</th>
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<th>Episiotomy p-value</th>
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<tr>
<td>Guideline Documented</td>
<td>0.2 (0.30)</td>
<td>0.1 (1.3)</td>
</tr>
<tr>
<td>Guideline Not Documented</td>
<td>0.3 (0.45)</td>
<td>0.3 (0.78)</td>
</tr>
<tr>
<td>Multiparous (mean, range)</td>
<td>0.0 (0.3)</td>
<td>0.0 (0.4)</td>
</tr>
<tr>
<td>Vacuum (mean, range)</td>
<td>0.2 (0.30)</td>
<td>0.2 (0.3)</td>
</tr>
<tr>
<td>Episiotomy (mean, range)</td>
<td>0.1 (0.30)</td>
<td>0.1 (0.3)</td>
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Explanation of the effect of parity on the path model

- Overall, a vacuum was used on 80/334 (24%) of nulliparous births, and 33/314 (11%) of multiparous births
- For the nulliparous:
  - Retrospective group: 56/208 (27%)
  - Guideline used: 13/76 (17%)
  - Guideline not used: 11/50 (22%)
- **Nulliparous guideline group had 17% vacuum assisted births compared to the retrospective group (27%)**

Recap: Benefits to Laboring Down

- Decreased vacuum use
  - And related reduction through the regression analysis
  - 3rd/4th degree lacerations
  - Episiotomies
- Decreased pushing time
- No statistical increase in length of second stage
- Potential for (not measured)
  - Reduced maternal fatigue
  - Increased patient satisfaction
  - Reduced nursing fatigue and injuries

Results: Impact of Vacuum Use on Other Outcomes

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</tr>
<tr>
<td>Guideline Not Documented</td>
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<td>0.0 (0.4)</td>
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<tr>
<td>Vacuum (mean, range)</td>
<td>0.2 (0.30)</td>
<td>0.2 (0.3)</td>
</tr>
<tr>
<td>Episiotomy (mean, range)</td>
<td>0.1 (0.30)</td>
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**For the multiparous:**
- Retrospective group: 27/149 (14%)
- Guideline used: 2/64 (3%)
- Guideline not used: 6/62 (10%)
- Multiparous vacuum assisted births occurred in only 3% of guideline births, compared to 14% in retrospective group
- **Both parity groups have a significant decrease in the guideline group. A drop of 7% for the nulliparous and 8% in the multiparous**