Second Stage Labor Care

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Assessments

- Time since complete and duration of effective pushing
- Fetal well-being (FHR tracing)
- Progress in fetal rotation and descent—hourly
- Adequacy of contractions
- Parity
- Maternal pushing effort
- Anesthesia effects
- Patient’s desires re: vaginal vs. operative delivery
- Pain, exhaustion, anxiety, fears, coping
- Environment in the room

What is “Physiologic Second Stage”?

- Based on the principle that the second stage is a normal physiologic event
- Respects the latent phase (or lull) of early 2nd stage when contractions may space out, pain subsides, and typically no pushing urge is present
- Supports a woman to push spontaneously and deliver with a minimum of intervention
- Encouraging women to push in a variety of non-supine positions that encourage fetal descent and rotation and allow for maternal comfort and control

Spontaneous Urge to Push

- Known as the *Ferguson reflex*, or fetal ejection reflex
- Occurs when vertex begins to stretch the pelvic floor muscles
- Usually accompanied by a surge of endogenous oxytocin

“Many doctors and midwives still seem to consider it their function to aid and abet and even coerce the mother into forcing the foetus as fast as she can through her birth canal”

Open Glottis Pushing

Roberts et al (1987) studied the spontaneous, non-directed pushing efforts of nulliparous women with no formal childbirth education and found:
- Women exhaled with grunts or cries (open glottis) while pushing
- Made 3 to 5 brief (4-6 second) pushes per contraction
- Those who held their breath did so no longer than 6 seconds
- Number, duration, and amplitude of pushes increased at the intrapartum pressure of the contractions increased
- Labor progress was adequate

Lengthy, Sustained, Valsalva Pushing Found to Cause:
- Increases intra-thoracic pressure, reducing utero-placental blood flow
- Decelerations in FHR
- Reduced FHR variability
- Hypoxemia
- Fetal academia

Aldrich et al., 1995; Blackburn, 2007, pp. 143-4; Knauth & Halseburdo, 1986; Roberts & Hanson, 2007; Thomson, 1993; Peterson & Besuner, 1997

Spontaneous Pushing

RCTs comparing directed/coached to spontaneous pushing have found significantly:
- Fewer, less severe perineal lacerations
- Improved bladder function postpartum
- Less pelvic floor prolapse postpartum
- Improved neonatal Apgar scores
- Little or no difference in length of second stage

Schaffer et al, 2005

- RCT of 128 women, unmedicated randomized to coached vs. uncoached pushing
- 3 months postpartum, conducted standardized pelvic floor evaluation and urodynamic testing (examiners blinded)
- Women who were coached women had:
  - Decreased first urge to void
  - Decreased levator ani tone
  - Decreased bladder capacity
  - Pelvic Organ Prolapse Quantification (POQ) showed significantly more descent

Coached Pushing

“Given that several RCTs have not identified maternal or fetal benefits to this practice, and coupled with evidence that urogynecologic indices may be negatively impacted, it seems prudent to recommend that coached pushing be limited to specific indications such as prolonged second stage or non-reassuring fetal heart rate.”

-Laboring Down

Schaffer, Bloom, Casey, McIntow, Ninia, & Leveno, (2005)
Delayed vs. Immediate Pushing

Several RCTs, most involving nulliparous women with epidurals, compared delayed vs. immediate pushing found:

• Increase rate of spontaneous vaginal deliveries
• Decreased perineal trauma
• Less time spent pushing, but longer 2nd stage
• Less maternal exhaustion
• Fewer FHR decelerations, less severe FHR decelerations
• No significant differences in fetal outcomes
• Less maternal fatigue

Brennato et al., 2008; Hansen, Clark, & Foster, 2002; Fitzpatrick et al., 2002; Fraser et al., 2000; Hansen, Clark, & Foster, 2002; Mayberry et al, 1999; Plunkett, 2001; Simpson & Dotti, 2005.

Being Supportive Without Giving Orders

• “You’re doing so good—just push that baby down when you’re ready.”
• “Listen to your body”
• “Nice work!”
• “Excellent! You got it!”
• “That’s great—if you still feel the urge again, then try again.”
• Gentle directions: “Let’s try this…” or “Do you want to try…”
• “Keep it coming.”
• “That’s it, push when you feel the urge”
• “Don’t push unless you have a contraction, but go ahead if you feel it”

Phrases of supportive direction and praise by labor nurses (from Roberts, Gonzales, & Sampselle, 2007)

Positions for Laboring Down

Drawings by Ruth Ancheta from The Labor Progress Book, 2nd Ed by Penny Simkin and Ruth Ancheta. Used by permission.

Laboring Down: Are We Just Doing Nothing?

• Determine fetal position (ask provider)
• Suggest positions that facilitate rotation and descent
• Assess:
  – Position and station Q 30 minutes (and reposition if indicated)
  – Contraction pattern—adequate?
  – FHR, bladder, pain, comfort and coping
  – Atmosphere in the room, maternal coping, exhaustion
• Time limit generally accepted (studies varied)
  – 1 hour if parous
  – 2 hours if nulliparous

Laboring Down: When To Begin to Push?

• Strong urge/spontaneous pushing present
• Fetal head at ≥2+ station and position is OA, LOA, or ROA
• Fetal head visible with spread of labia
• Expedited delivery is indicated by maternal or fetal status
• Sufficient time elapsed after complete (1-2 hours)

Interventions for FHR Decelerations in 2nd stage?

• Position change (lateral, hands-knees)
• Oxygen (10L/min non-rebreather mask)
• IV fluid bolus
• Rest through a contraction or two (not pushing) Does the FHR recover?
• If so, push every other contraction
• Amnioinfusion
**Epidural & Length of Second Stage**

- Strong association with longer 2nd stage
- Multiparous as well as nulliparous women
  
  (Paterson, Saunders, & Wadsworth, 1992)
- Schiessl et al (2005): observational study, n=1,456:
  - mean length 44 minutes vs. 124 minutes
  - 48% had prolonged (>2hrs) 2nd stage vs. 9% without epidural

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**Epidural and OP**

- Prospective cohort study of fetal positions in labor using ultrasound
- Most OP fetuses rotated OA close to delivery
- Women requesting epidurals no more likely to have posterior fetus prior to epidural
- OP position close to delivery more likely after epidural (13% vs. 3%, OR 4.0)
  
  (Lieberman, Davidson, Lee-Parritz, and Shearer, 2005)

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**Low Dose Epidural & CSE**

- Newer Low Dose Epidural and Combined Spinal Epidurals are not your mother’s epidural!
- 0.1% or 0.06 (1/16ths)% bupivacaine solution combined with opioid (vs. 0.25%) provides effective pain relief with minimal motor block
- One-time spinal injection of opioid provides rapid onset of analgesia without motor impairment
- COMET study: RCT compared low dose epidural and CSE with 0.25% bupivacaine. Found fewer assisted deliveries and greater motor strength, including ability to stand and ambulate with no difference in pain relief
  
  (Comparative Obstetric Mobile Epidural Trial Study Group UK, 2001, Nageotte, Larson, Rumney, Sidhu, & Hellenbach, 2009)

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**UPRIGHT POSITIONS**

- Throughout most of human history, and around the world, women birthed standing, squatting, or sitting up (DeLonge, Teunissen, & Lagro-Janssen, 2004; Roberts, 1980)
- Lithotomy (supine with legs up) position believed to have started with the advent of forcep-assisted delivery (Shermer & Raines, 1997)

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**Historical Perspectives**
Benefits of Upright Positioning

- Reduced time spent pushing
- Less frequent FHR decels and reduced fetal acidosis compared to supine
- Fewer assisted delivery
- Fewer episiotomies
- Fewer and less severe perineal lacerations
- Less pain, easier pushing, and greater patient satisfaction
- Stronger and more frequent contractions

Bhandwaj, Kukade, Patil, & Bhandwaj, 1995; Desonge, Teunissen, & Lagro-Janssen, 2004; Golay, Vedam, & Sogol, 1993; Gupta, Hofmeier, Smith, 2000; Terry et al., 2006; Gordon, Hutton, and Lynch, 1989; Naist, Konojo, Noorani, 2007; Roberts, 1980; Roberts, Alpert, Cameron, & Torvaldsen S, 2005

Supine Position

- Mother must push baby uphill through the curve of Carus
- No evidence that it helps the fetus “get around the pubic bone!”
- Can cause maternal hypotension via vena cava suppression (Golay, Vedam, & Sogol, 1993; Gupta, Hofmeier, Smith, 2000)
- Reduces uterine blood flow (Roberts, 1980)
- Better view for provider

Positions for Pushing: Sitting

Birth Chair/Stool

Birth Cushion

Positions for Pushing: Squatting

Drawings by Ruth Ancheta from The Labor Progress Book, 2nd Ed by Penny Simkin and Ruth Ancheta. Used by permission.
More Non-supine Positions for Pushing: Kneeling, Hands-Knees, Standing, and Side-Lying

The Dangle

Occiput Posterior

- Epidural may ↑ risk of persistent OP
- Fetuses change position often in labor
- 80% of OP babies turned anterior by delivery (Lieberman, Davidson, Lee-Parritz, & Shearer, 2005)
- No association with back pain
- Ultrasound more reliable than hands (Simkin, 2009)

A few words about OCCIPUT POSTERIOR

Occiput Posterior

- Hands-knees: n=100. 75% rotated vs. 0% sitting for 10 minutes (Andrews & Andrews, 1983; Stremler et al, 2005)
- Manual rotation can prevent assisted vaginal and Cesarean delivery (Simkin, 2010)
- Laboring down can prevent assisted vaginal and Cesarean delivery

DURATION OF SECOND STAGE
Zhang et al, 2010

Table 2. Duration of Labor in Hours by Parity in Spontaneous Onset of Labor

<table>
<thead>
<tr>
<th>Cervical Dilation (cm)</th>
<th>Parity 0 (n=25,624)</th>
<th>Parity 1 (n=16,755)</th>
<th>Parity 2+ (n=16,219)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–4</td>
<td>1.8 (8.1)</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>4–5</td>
<td>1.3 (6.4)</td>
<td>1.4 (7.3)</td>
<td>1.4 (7.0)</td>
</tr>
<tr>
<td>5–6</td>
<td>0.8 (3.2)</td>
<td>0.8 (3.4)</td>
<td>0.8 (3.4)</td>
</tr>
<tr>
<td>6–7</td>
<td>0.6 (2.2)</td>
<td>0.5 (1.9)</td>
<td>0.5 (1.8)</td>
</tr>
<tr>
<td>7–8</td>
<td>0.5 (1.6)</td>
<td>0.4 (1.3)</td>
<td>0.4 (1.2)</td>
</tr>
<tr>
<td>8–9</td>
<td>0.5 (1.4)</td>
<td>0.3 (1.0)</td>
<td>0.3 (0.9)</td>
</tr>
<tr>
<td>9–10</td>
<td>0.5 (1.8)</td>
<td>0.3 (0.9)</td>
<td>0.3 (0.8)</td>
</tr>
</tbody>
</table>

Data are median (95th percentile).

When is Second Stage Prolonged?

ACOG: consider diagnosis of prolonged 2nd stage when lack of continuing progress for:

- 3 hrs with epidural, 2 hrs unmedicated for nulliparous women
- 2 hrs with epidural, 1 hr unmedicated for parous women
- “Length of the second stage is not in itself an absolute or even strong indication for operative termination of labor”


Prolonged Second Stage

Associated with:
- Epidural use
- Nulliparity
- Advanced maternal age
- ↑ risk of operative or assisted delivery, with risk increasing the longer the hours of 2nd stage (about 20% vaginal ≥4 hours)
- Morbidity strongly correlated with method of delivery

Risk Factors for Prolonged Second Stage

- Longer first stage of labor
- Epidurals
- Nulliparity
- BMI > 30
- Maternal age > 35 years
- Macrosomia
- OP or OT fetal position


Outcomes Associated with Prolonged Second Stage

Maternal morbidty (strongly assoc w/ mode of delivery)
- Operative delivery
- 3rd, 4th degree lacerations
- Chorioamnionitis
- Uterine atony and increased blood loss

Neonatal morbidity
- 5 min. Apgar score <7
- Neonatal trauma
- NICU admissions

• Retrospective studies (no RCTs)


Outcomes Associated with Prolonged Second Stage

• Morbidity strongly correlated with method of delivery
• Myles & Santolaya (2003): n=7,818. Of women complete >2hrs, 65% delivered vaginally with no ↑ neonatal morbidity (20% vaginal ≥4 hours)
• Rouse et al (2009): n=4,126. After controlling for mode of delivery, association with chorioamnionitis and transfusion dropped out
• Caughhey (2009): maternal morbidity may be due to obstetrical interventions or co-morbid causes of dystotic labor
2014 ACOG & SMFM Consensus Statement

- A specific absolute maximum length of time spent in second stage of labor beyond which all women should undergo operative delivery has not been identified.
- Before diagnosing arrest of labor in second stage, if maternal and fetal conditions permit, allow for following:
  - At least 2 h of pushing in multiparous women
  - At least 3 h of pushing in nulliparous women
- Longer durations may be appropriate on individualized basis (eg, with use of epidural analgesia or with fetal malposition) as long as progress is being documented
- Operative vaginal delivery in second stage of labor by experienced and well-trained physicians should be considered safe, acceptable alternative to cesarean delivery. Training in, and ongoing maintenance of, practical skills related to operative vaginal delivery should be encouraged.
- Manual rotation of fetal occiput in setting of fetal malposition in second stage of labor is reasonable intervention to consider before moving to operative vaginal delivery or cesarean delivery.
- To safely prevent cesarean deliveries in setting of malposition, it is important to assess fetal position in second stage of labor, particularly in setting of abnormal fetal descent.

<table>
<thead>
<tr>
<th>Organizations</th>
<th>Indicated/Recommended</th>
<th>Limit for Multiparous women</th>
<th>Limit for Nulliparous women</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACOG, Society for Maternal &amp; Fetal Medicine et al., 2011</td>
<td>Operate to deliver maximum length of time spent in the second stage of labor beyond which all women should undergo operative delivery (180 minutes)</td>
<td>180 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>ACOG, 2000</td>
<td>Operate if diagnosing arrest of labor in the second stage of labor is not imminent and fetal condition permits</td>
<td>6 hours</td>
<td>3 hours</td>
</tr>
<tr>
<td>ACOG, 2003</td>
<td>Operate if failure to progress is documented and delivery is not imminent</td>
<td>180 minutes</td>
<td>60 minutes</td>
</tr>
<tr>
<td>ACOE’s 2007</td>
<td>Operate if vaginal delivery is not imminent and the second stage of labor is not progressing</td>
<td>60 minutes</td>
<td>30 minutes</td>
</tr>
</tbody>
</table>

**ASSISTED VAGINAL DELIVERY**

<table>
<thead>
<tr>
<th>Complete Delivery</th>
<th>1 hour</th>
<th>2 hours</th>
<th>3 hours</th>
<th>4 hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multiparous</td>
<td>No epidural</td>
<td>Epidural</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nulliparous</td>
<td>No epidural</td>
<td>Epidural</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Vacuum Safety Guidelines**

- ≥36 Weeks GA (d/t ↑ risk for intraventricular hemorrhage if <36 weeks)
- Steady traction in the line of the birth canal; rocking or torque not recommended
- Not appropriate for rotation
- Progress in descent should accompany each pull
- Pressure should not >500-600mm Hg
- Should not last more than 20-30 minutes
- Time of maximum force should not exceed 10 minutes
- No more than 3 pop-offs (none is ideal!)

**Risks Associated with Forceps**

**Maternal complications:**
- Pain
- Vaginal and/or cervical laceration
- Extensions of episiotomy
- Perineal wound infection
- Bladder trauma
- Increased blood loss
- Fracture of coccyx

**Neonatal complications:**
- Cephalohematoma: 2%
- Skin marks or lacerations
- Bruising
- Nerve injury
- Skull fracture
- Ocular trauma
Safety Guidelines for Forceps

• Cervix must be fully dilated and retracted
• Head must be engaged and position known
• Pelvimetry performed
• Adequate anesthesia
• Bladder must be emptied
• Some practices use a provider check list

Safety Guidelines for Forceps

• Potential concerns to note (Red Flags):
  – Short maternal stature
  – Large estimated fetal weight
  – Slow labor progress over time
  – Hx of second stage FTP

ACOG Criteria for Forceps

• Outlet forceps:
  – The scalp is visible at the introitus, without separating the labia
  – The fetal skull has reached the pelvic floor
  – The sagittal suture is in anteroposterior diameter, right or left occiput anterior or posterior position (i.e., the fetal head is at or on the perineum and rotation does not exceed 45º).
• Low forceps:
  – The leading point of the fetal skull is at a station greater than or equal to +2 cm and is not on the pelvic floor
  – any degree of rotation may be present.
• Mid forceps:
  – The station is above +2 cm, but the head is engaged.

SHOULDER DYSTOCIA

Shoulder Dystocia

• Unpredictable
• Highly Litigated
• Requires Rapid, Coordinated Team Effort
• Drill, Drill, Drill.

Shoulder Dystocia

• Incidence:
  – 1.29 per 1000 births
  – Risk of recurrence 10-15%
    • Related to birth weight and vacuum assistance in index pregnancy
• Risk factors:
  – Fetal weight >4000 grams
  – Diabetes
  – Prolonged Second Stage or Rapid Descent
  – Operative/Assisted Vaginal Delivery
  – Labor Induction
Fetal Injury
• Brachial Plexus Injury
• Fractures
• Asphyxia
• Hypoxic Ischemic Encephalopathy
• Death

Maternal Injury
• Uterine Rupture
• Hemorrhage
• Cervical and Vaginal and Perineal Lacerations
• Bladder Injury
• Post traumatic stress disorder

HELPERR
• Help
  — Get help and prepare for resuscitation.
  — Remain calm. Note the time head is delivered
• Evaluate for Episiotomy (LIP)
• Legs (McRoberts)
  — Assist woman to bring legs straight back-Touch ears with knees
• Pressure, Suprapubic
  — Direct toward Fetal face
• Entry Maneuvers Woods Screw (LIP)
• Remove the posterior Arm (LIP)
• Roll the patient (Gaskin Maneuver)
  — Assist patient to hands and knees

McRobert’s Maneuver

Suprapubic Pressure
Shoulder to Nose

Gaskin Maneuver (All 4’s)
Manual Extraction of Posterior Arm

Wood Screw

Zavannelli Maneuver and C/Section

Documentation

- the time of delivery of the head
- direction the head is facing after restitution
- Maneuvers performed, their timing and sequence
- the time of delivery of the body
- Staff in attendance and the time they arrived
- condition of the baby (Apgar score)
- umbilical cord blood acid-base measurements.
- position of the fetal head at delivery for identification of the anterior and posterior shoulders during the delivery.