Second Stage Labor: Assessing and Preserving Fetal Reserve

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4 Aspects of Normal Second Stage

- Duration
- Spontaneous bearing down efforts
- Open versus closed glottis pushing
- Maternal positioning and movement

Identified Phases of Second Stage

- Latent or Resting Phase ("Lull")
  Period of rest and calm. Bearing down efforts not well established. (Also known as "rest and be thankful.")

- Active or Descent Phase
  Increasing intensity of uterine contractions from the Ferguson's reflex. Strong, rhythmic urge to push.

- Transitional Phase ("Ring of Fire")
  Head visible on perineum. Bearing down efforts are strong and effective.
Ferguson's Reflex

- Hormonal basis of major reflex controlling childbirth.
- Relationship of uterine contractions and the posterior pituitary hormone, oxytocin.
- Stretching of the cervix augments uterine activity by augmenting oxytocin secretion.
- Occurs when presenting part is at 0/+1 station.
- Reflex named for the physician/pharmacologist who discovered it in 1940, Dr. James Ferguson, a Canadian!

The use of directed valsala pushing is so ingrained in the American culture of birth, that it has been difficult to make the change to an approach that requires support of the woman's spontaneous urges.

"We've always done it this way."

- American women have grown to expect specific direction during the second stage of labor.
**“Tribal Lore” versus EBP**

- Ritual is a powerful didactic and socializing tool.
- Preservation of the “status quo” is important to us.
- There is a large gulf between what we KNOW and what we PRACTICE.
- Managing 2nd stage is controversial and bringing about change in long established practice patterns is a challenge.

**Evidence-based Practice**

- Successful implementation of a practice change depends on the nature of evidence being used, the influence of context (i.e. the culture of the providers), and the type of facilitation required for the process.

**Using Evidence.....**

- The evidence is mounting.....the care given during the second stage directly impacts maternal and fetal outcomes.
Cardinal Movements

- Internal Rotation
- Engagement
- Descent
- Flexion
- Internal rotation
- External rotation
- Extension
- Expulsion

There is no more stressful period in labor for the fetus than in the active pushing phase of the second stage of labor.

Nursing Challenges

Assessment of descent progress:
- No strict guidelines for expected descent
- Only guidelines for deviations from “normal.”

Station is an important consideration when assessing the transition from the latent phase of second stage to the active phase.

Promotion of physiologic descent
Nursing Challenges

- Assessment of pain, coping, fatigue. Encourage to rest and follow own urges to push. Continuation of epidural infusion throughout second stage.
- Support woman’s spontaneous pushing efforts.
- Assist with premature urges to bear down with positioning, medication (OP).

Influences on Fetal Response in Second Stage

- Length of active labor
- Significant events
- Insults prior to second stage resulting in FHR changes
- Fetal reserve (look to FHRV and FHR baseline)
- Fetal oxygen status
- Uterine activity (normal?)
- Type of maternal pushing

Recognizing Stress/Hypoxemia

- Allow fetal assessment data to guide maternal pushing efforts.
- Second stage often includes continued coached pushing despite FHR patterns indicative of fetal stress.
- Increased intraamniotic pressures leads to a decrease in uterine blood flow and insufficient blood flow to fetus.
Nursing Responsibilities in 2nd Stage

- Maintain a sufficiently interpretable FHR and UA tracing.
- Be knowledgeable: use standard terminology and recognize FHR characteristics
- Be able to differentiate between maternal and fetal heart rates
  - Adjust Ultrasound
  - Apply PSE
  - Use pulse oximeter

When the time is right for pushing, the best approach based on current evidence is to encourage the woman to do whatever comes naturally.

Types of Pushing

- Closed glottis, involuntary
- Closed glottis, voluntary (Valsalva)
- Directed pushing
- Nondirected pushing (open glottis, spontaneous)
Closed Glottis Pushing

- Do not force legs against the abdomen.
- This causes perineal stretching and increases the risk of laceration.

Closed Glottis Pushing

Approaches to Improve Fetal Oxygenation

- Stop pushing temporarily and let the fetus recover.
- Avoid sustained closed-glottis pushing
- Instruct/assist with 3-4 pushing efforts per contraction lasting 6-8 seconds
- Maternal pushing efforts with alternate contractions
- Limit pushing efforts to every second or even third contraction
- Don’t discourage grunting and vocalizing
Open Glottis Pushing

- Forced exhalation of air or very brief periods of breath holding for 3-5 seconds.
- Spontaneously hold breath with urge to push OR uses a strong, expiratory grunt accompanying the pushing.
- The abdominals are pulled inward allowing them to work more effectively.
- The fall of pO2 and the rise of pCO2 in maternal arterial blood is minimized.

“Natural Music of Birth:” Vocalization

- Groans
- Grunts
- Moans
- High pitched noise uncoordinated with pushing is ineffectual and can be counterproductive.

Important FHR Aspects

- A baseline FHR should be able to be identified between contractions. (That means a minimum of 2 minutes between contractions is needed.)
- Recurrent variable and prolonged decelerations are associated with respiratory acidemia at birth.
- Some fetuses develop metabolic acidemia if this pattern continues for a long time.
- This is especially true if the decelerations occur with every contraction and pushing effort.
- The FHR should be used as an indicator of how well the fetus is tolerating the second stage and thus guide care and interventions.
◆ Minimize the normal physiologic stress to the fetus in the second stage by shortening the active pushing phase.
◆ Coached pushing starting when the mother is complete does not result in a clinically significant decrease in the length of the second stage.
◆ Passive fetal descent until the urge to push results in about the same length of second stage for women with epidurals as does coached pushing immediately upon complete dilation without the urge to push.

◆ On going assessment of effective efforts of pushing and fetal descent.
◆ If no descent, use assessment of fetal position for effective and optimal position changes.
◆ Facilitate and support spontaneous pushing.
◆ Maintain good body alignment.
◆ Maintain an empty bladder to facilitate descent and avoid bladder trauma.

◆ Maternal positioning has an effect on the relationship between the fetus and the maternal pelvis.
◆ Upright positions open the pelvis 30% more.
Positions for Pushing

1. Sitting up
2. Standing
3. Squatting
4. Lying on side
5. Lying on back

More Positions for Pushing

- Found in the Labor Progress Handbook by Penny Simkin, PT and Ruth Archeta, RN.

"Except for being hanged by the feet, the supine position is the worst conceivable position for labor and delivery.

Caldeyro-Barcia 1979
Avoid supine/lithotomy because….

- Focuses most of body weight on the tailbone and narrows the pelvic inlet.
- Compresses major blood vessels decreasing blood pressure, circulation, and oxygenation (to mom and fetus).
- Contractions are weaker, less frequent.
- Pushing is harder.
- Increased likelihood of episiotomy or lacerations from perineal tension

Impact of Epidurals on 2nd Stage

- Limits pushing endeavors by the woman.
  * Critical to change positions frequently
- Adequate support for good body mechanics a must!
- Frequent assessments for movement ability/disability in lower limbs and support for extremities from flexed hips and legs to avoid postpartum lower extremity nerve injury. This could lead to femoral nerve paralysis.
  * More common in large babies, CPD, posterior presentation, thin abdominal walls, platypelloid pelvis

Fear—Tension—Pain

- The psyche of a laboring woman is a critical component of a successful birth—her emotional response to the return of painful contractions should not be minimized.
- The fear and anxiety can have a negative impact on labor outcomes including causing indeterminant and abnormal FHR patterns due to catecholamine release.
Femoral Nerve Palsy

- Caused by interpelvic hematomas, tumors, abscesses, trauma, diabetic neuropathy
- Most common compression during pelvic surgery due to positioning of retractors
- Vaginal deliveries (under reported)

**Etiology:** fetal head compression of lumbosacral trunk as it descents through the posterior brim of the pelvis. Compression of femoral nerve against inguinal ligament by flexion of thighs on abdomen and outward rotation of the hips.

Symptoms to Observe For

- Decreased sensation over thigh/medial calf
- Weakness of the quadriceps
- Weakness of the psoas (from hip extension)
- Depressed or absent knee jerk
- Difficulty rising from chair/bed
- Knees “buckle” when climbing stairs (25% bilateral)

**Prognosis?**
- Conservative evaluation by anesthesia
- Improvement in 2-6 weeks, recovery by 6 months
- “Tincture of time”

Delayed Pushing: Laboring Down

**BENEFITS**

- Fetal
  - Fewer decelerations
  - Increased cerebral oxygen
  - Increased blood volume

- Mother
  - Decreased active pushing time
  - Increased efficiency
  - Increased contractility
  - Decreased perineal tearing
  - Decreased operative delivery

**POTENTIAL RISKS**

- Fetal
  - Prolonged second stage
  - Shoulder dystocia

- Mother
  - Obstructed labor
  - Increased PPH
Considerations for “Green Light”

- Moderate FHRV
- Accelerations (every 30-40 minutes)
- Variables that abruptly return to baseline with stable baseline rate and moderate FHRV
- No prolonged decelerations
- Stable baseline rate (not increasing)
- Occasional late decelerations accompanied by moderate FHRV and stable baseline and they respond to interventions

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How Long Can the 2nd Stage Be?

- **ACOG**
  - Without epidural: Nullip 2 hours/Multip 1 hour
  - With epidural: Nullip 3 hours/Multip 2 hours

- **Problem:** Studies show little association between length and outcome.

- **Who made these rules anyway?**

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How Long Can the 2nd Stage Be?

- **Zhang (NIH):** Descent of 3 cm may take up to 3 hours. (His work is incredible!)

- **Critical?** Length of *bearing down*.

- **So what really is important to focus on is how long has she been pushing not how long has she been complete.**
Be familiar with standards and provide timely updates regarding progress (or lack of progress), efforts, position changes, FHR pattern and interventions required.

Fetal Acidemia and FHR Patterns
(Please consider below information)

- Moderate FHRV
- Minimal or absent FHRV in the presence of late or variable decelerations
- Depth of decelerations
- Time course of development of acidemia following normal tracing.

Fetal Acidemia and FHR Patterns
Is there an association?

Minimal or absent FHRV + Late or Variable Decelerations

23% acidemic
(base deficit > 12mEq/L or a pH < 7.20 or newborn depressed (5 minute apgar < 7)))
Development of Acidemia

When initially normal tracing develops abnormal FHR patterns in the absence of a catastrophic event, significant Acidemia develops (develops in > 60 minutes).

Identify cause of change, intervene, decide to deliver?

Best Practice: Second Stage

- Watch the FHR carefully.
- Place internal scalp electrode judiciously.
- Watch fetal head descent over time.
- Uncoached/delayed pushing.
- Prevent tachysystole.
- Decrease/stop pitocin and see what happens.
- Know about risk factors and watch for shoulder dystocia.
- Prepared team readiness is vital.
Tracings to Evaluate

- Can you identify the baseline?
- Can you assess FHRV?
- Can you say this fetus is oxygenated and perfused?
- Is this a normal second stage FHR pattern?

Words of Advice

- Apply principles of physiological goals to "preserve the reserve" and provide fetal intrauterine resuscitation when indicated.
- Avoid tachysystole! Pitocin is either the uterus’ best friend or the worst enemy.
- Use the position(s) that promote perfusion and oxygenation to the fetus.

Take Aways and Conclusions

- Second stage has been reconceptualized to support the physiologic approach to improve maternal and fetal outcomes.
- It is imperative for nurses to recognize the value of spontaneous bearing down efforts and their power to result in progress.
- Be at the bedside and watch for clues that the woman is ready to push.
- Re-evaluate directed pushing based on science.
References

- Hanson, Lisa (2009) Second-Stage Labor Care: Challenges in Spontaneous Bearing Down. JPNN Jan/March


Thank you for inviting me to share.