



Second Stage Labor

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ACOG/SMFM CONSENSUS

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ACOG/SMFM OBSTETRIC CARE CONSENSUS Safe prevention of the primary cesarean delivery



Society for Maternal-Fetal Medicine

This document was developed jointly by the American College of Obstetricians and Gynecologists (the College) and the Society for Maternal-Fetal Medicine with the assistance of Aaron B. Caughey, MD, PhD, Allison G. Cahill, MD, MSc, Jeanne-Marie Guise, MD, MPH, and Dwight I. Rowe, MD, MSPH

The information reflects emerging clinical and scientific advances on the date issued. It is subject to change, and should not be construed as dictating an exclusive course of treatment or procedure. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to the institution or type of practice.



Background
In 2011, 1 in 3 women who gave birth in the United States did so by cesarean delivery.¹ Even though the rates of primary and total cesarean delivery have plateaued recently, there was a rapid increase in cesarean rates from 1996 through 2011 (Figure 1). Although cesarean delivery can be lifesaving for the fetus, the mother, or both in certain cases, the rapid increase in the rate of cesarean births without evidence of concomitant decreases in maternal or neonatal morbidity or mortality raises significant concerns that cesarean delivery is overused. Variation in the rates of nulliparous, term, singleton, vertex cesarean births also indicates that clinical practice patterns affect the number of cesarean births performed. The most common indications for primary cesarean delivery include, in order of frequency, labor dystocia, abnormal or indeterminate (breech), nonreassuring fetal heart rate tracing, fetal malpresentation, multiple gestation, and suspected fetal macrosomia. Safe reduction of the rate of primary cesarean deliveries will require different approaches for each of these, as well as other, indications. For example, it may be necessary to avoid the initiation of labor dystocia because recent data show that contemporary labor progression at a rate substantially slower than what was historically taught. Additionally, improved and standardized fetal heart rate interpretation and management may have an effect. Increasing women's access to nonmedical interventions during labor, such as continuous labor and delivery support, also has been shown to reduce cesarean birth rates. External cephalic version for breech presentation and a trial of labor for women with twin gestations when the first twin is in cephalic presentation are other of several examples of interventions that can contribute to the safe lowering of the primary cesarean delivery rate.

In 2011, 1 in 3 women who gave birth in the United States did so by cesarean delivery. Cesarean birth can be lifesaving for the fetus, the mother, or both in certain cases. However, the rapid increase in cesarean birth rates from 1996 through 2011 without clear evidence of concomitant decreases in maternal or neonatal morbidity or mortality raises significant concerns that cesarean delivery is overused. Variation in the rates of nulliparous, term, singleton, vertex cesarean births also indicates that clinical practice patterns affect the number of cesarean births performed. The most common indications for primary cesarean delivery include, in order of frequency, labor dystocia, abnormal or indeterminate (breech), nonreassuring fetal heart rate tracing, fetal malpresentation, multiple gestation, and suspected fetal macrosomia. Safe reduction of the rate of primary cesarean deliveries will require different approaches for each of these, as well as other, indications. For example, it may be necessary to avoid the initiation of labor dystocia because recent data show that contemporary labor progression at a rate substantially slower than what was historically taught. Additionally, improved and standardized fetal heart rate interpretation and management may have an effect. Increasing women's access to nonmedical interventions during labor, such as continuous labor and delivery support, also has been shown to reduce cesarean birth rates. External cephalic version for breech presentation and a trial of labor for women with twin gestations when the first twin is in cephalic presentation are other of several examples of interventions that can contribute to the safe lowering of the primary cesarean delivery rate.

Balancing risks and benefits
Childbirth by the very nature carries potential risks for the woman and her baby, regardless of the route of delivery. The National Institutes of Health has

conditions—such as placenta previa or uterine rupture—cesarean delivery is both treatment and a 3-month follow-up, women were more likely to have urinary, but not fecal, in-

ACOG PRACTICE BULLETIN

CLINICAL MANAGEMENT GUIDELINES FOR OBSTETRICIANS-GYNECOLOGISTS
NUMBER 17, JUNE 2000
Obstetrics Technical Bulletin Number 176, August 1990

Operative Vaginal Delivery

This Practice Bulletin was developed by the ACOG Committee on Practice Bulletins—Obstetrics, with the assistance of Michael DeLoraine, MD. The consensus is designed to aid practitioners in making decisions about appropriate obstetrical management. This guideline should not be construed as mandating a particular course of treatment or procedure. Variations in practice may be warranted based on the needs of the individual patient, resources, and limitations unique to the institution or type of practice.

Background

Clinical studies performed before the 1970s suggested that the risk of fetal morbidity was actually less higher when the infant is born vaginally than when it is born by cesarean, with operative vaginal delivery providing the ability to deliver the fetus in a position that may be most favorable for the infant. The most recent data suggest that the risk of fetal morbidity is similar for both modes of delivery, but that the risk of maternal morbidity is lower for vaginal delivery. The risk of maternal morbidity is also lower for vaginal delivery than for cesarean delivery. The risk of maternal morbidity is also lower for vaginal delivery than for cesarean delivery. The risk of maternal morbidity is also lower for vaginal delivery than for cesarean delivery.

Operative vaginal delivery is an important part of obstetrical management. It is a procedure that is performed with either the vacuum extractor or forceps on the fetal scalp. The technique for operative vaginal delivery is described in this bulletin. The technique for operative vaginal delivery is described in this bulletin. The technique for operative vaginal delivery is described in this bulletin.

ACOG PRACTICE BULLETIN

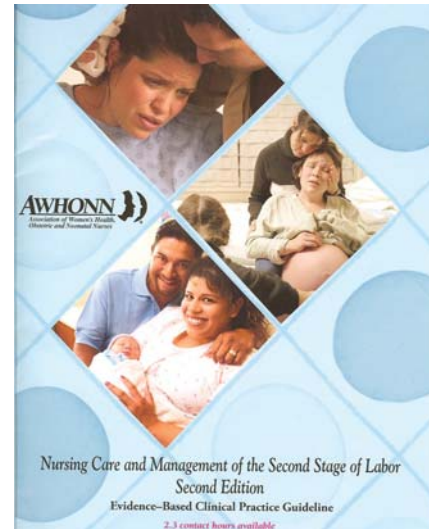
CLINICAL MANAGEMENT GUIDELINES FOR OBSTETRICIANS-GYNECOLOGISTS
NUMBER 43, DECEMBER 2003
Obstetrics Technical Bulletin Number 274, December 1999

Dystocia and Augmentation of Labor

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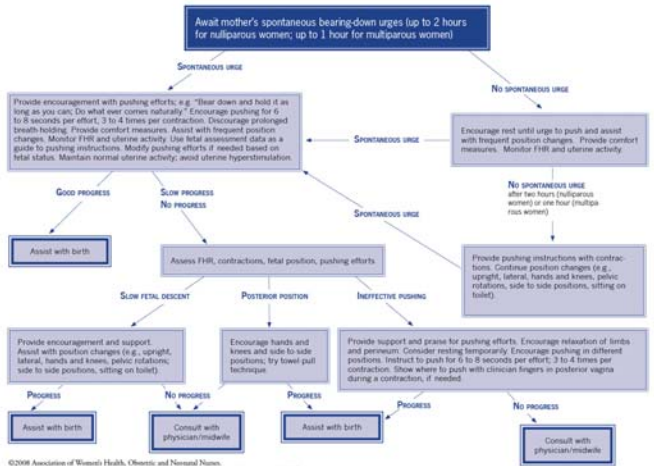
Background

The objective of labor is the passage of a viable fetus and placenta into the birth canal. The process of labor is a complex one, involving a series of physiological changes in the fetus, the placenta, and the mother. The process of labor is a complex one, involving a series of physiological changes in the fetus, the placenta, and the mother. The process of labor is a complex one, involving a series of physiological changes in the fetus, the placenta, and the mother.



Nursing Care and Management of the Second Stage of Labor
Second Edition
Evidence-Based Clinical Practice Guideline
2-3 contact hours available

Suggested Algorithm for Second Stage of Labor Management



Second Stage Labor

- Keep the fetus safe
- Avoid perineal trauma
- Promote a vaginal birth

Second Stage Labor

- Keep the fetus safe
 - Careful surveillance
 - Avoid tachysystole
 - Maternal versus fetal heart rate
 - Intrauterine resuscitation as needed

Second Stage Labor

- Keep the fetus safe
 - Passive fetal descent
 - Minimize active pushing phase
 - Know when to choose cesarean

Second Stage Labor

- Avoid perineal trauma
 - Passive fetal descent
 - Avoid perineal stretching / massage
 - Proper maternal positioning

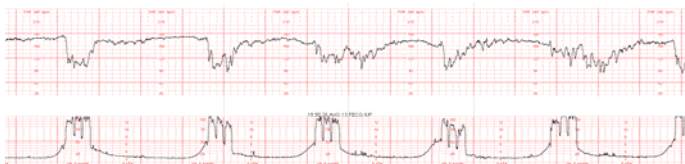
Second Stage Labor

- Promote a vaginal birth
 - Passive fetal descent
 - Minimize active pushing phase
 - Proper maternal positioning
 - Apply recent evidence for second stage time frames WNL

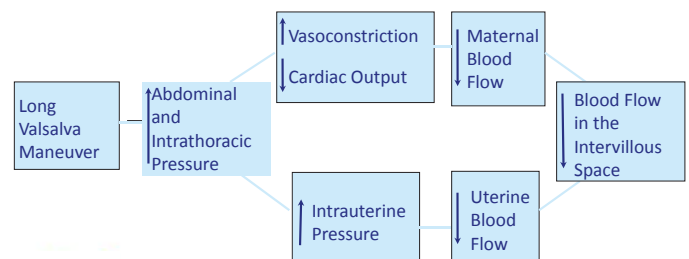
Active Pushing Phase



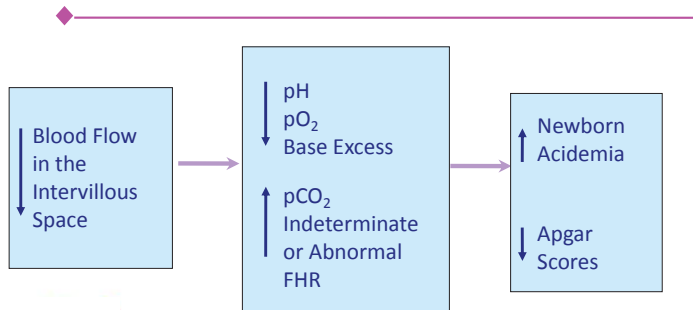
- Most physiologically stressful part of labor for the fetus



Physiology of Second Stage



Physiology of Second Stage



Passive Fetal Descent

Delayed Pushing; Laboring Down

- For women with epidural analgesia/ anesthesia coached, closed glottis pushing immediately at 10 cm will not result in a clinically significant decrease in length of second stage or decrease in risk of cesarean

Coached Pushing at 10 cm

- Increases risk of:
 - FHR decelerations
 - Fetal hypoxemia
 - Abnormal fetal acid-base status
 - Operative vaginal birth
 - Perineal lacerations
 - Bladder dysfunction
 - Maternal fatigue

Delayed Pushing

- Less fetal heart rate decelerations
- Less effect on fetal acid-base status (umbilical cord gases & fetal lactate)
- Less effect on fetal oxygen status

(Caldeyro-Barcia et al., 1981; Fraser et al., 2000; Hansen et al. 2002; Nordstrom et al. 2001; Piquard et al. 1989; Simpson & James, 2005; Thomson, 1993)

Second Stage Labor

- "Take a deep breath and hold it" four times with each contraction is physiologically inappropriate based on current evidence
- Counting to 10 with each push promotes prolonged breath-holding, maternal apnea and fetal compromise



Open-glottis pushing is best for mother and baby

Physiologic Pushing



- Discourage prolonged breath holding (no more than 6 - 8 sec, no more than 3 efforts per contraction)
- Instead, instruct the woman to bear down and allow her to choose whether or not to hold her breath while pushing (e.g., bear down and hold it as long as you can)
- Avoid Valsava maneuver: Increased intrathoracic pressure causes decrease in CO, BP, and placental perfusion, can lead to fetal hypoxemia

(Caldeyro-Barcia, 1979; 1981)

When to Push

- Delay pushing until urge to push
- Up to 2 hrs for nulliparous women
- Up to 1 hr for multiparous women

(Hanson, Clark & Foster, 2001; AWHONN 2008)

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

Spong et al. (2012)

How Long?

- Before diagnosing arrest of labor in second stage, if maternal and fetal conditions permit, allow for following:
 - At least 3 h of pushing in nulliparous women
 - At least 2 h of pushing in multiparous women
- Longer durations may be appropriate on individualized basis (e.g., with use of epidural analgesia or with fetal malposition) as long as progress is being documented

ACOG & SMFM (2014)

How Long?

- A specific absolute maximum length of time spent in second stage of labor beyond which all women should undergo operative birth has not been identified

ACOG & SMFM (2014)

Operative Vaginal Birth

- Operative vaginal birth in second stage of labor by experienced and well-trained physicians should be considered safe, acceptable alternative to cesarean birth
- Training in, and ongoing maintenance of, practical skills related to operative vaginal birth should be encouraged

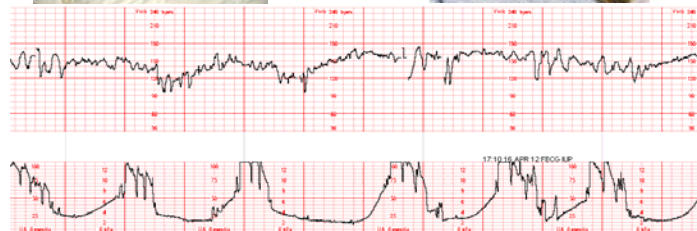
ACOG & SMFM (2014)

Manual Rotation

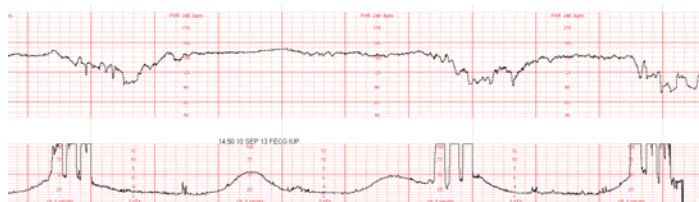
- Manual rotation of fetal occiput when there is fetal malposition in second stage labor is a reasonable intervention to consider before moving to operative vaginal birth or cesarean birth
- To safely prevent cesarean birth when there is fetal malposition, it is important to assess fetal position in second stage labor, particularly if there is evidence of abnormal fetal descent

ACOG & SMFM (2014)

Modification of Pushing Efforts If Recurrent Decelerations Occur



Modification of Pushing Efforts If Recurrent Decelerations Occur



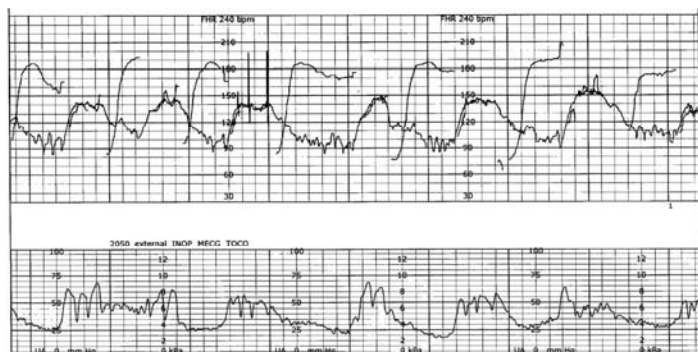
Modification of Pushing Efforts

FHR indeterminate or abnormal

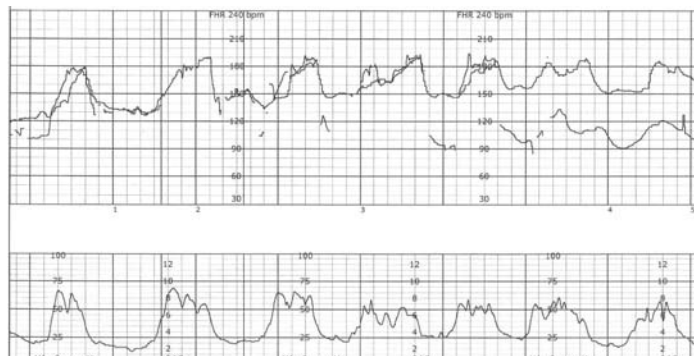
- Push with every other contraction
- Maintain stable baseline rate
- Discontinue or decrease oxytocin based on FHR pattern
 - Recurrent late decelerations
 - Recurrent variable decelerations
 - Moderate vs minimal variability
 - Baseline rate elevated



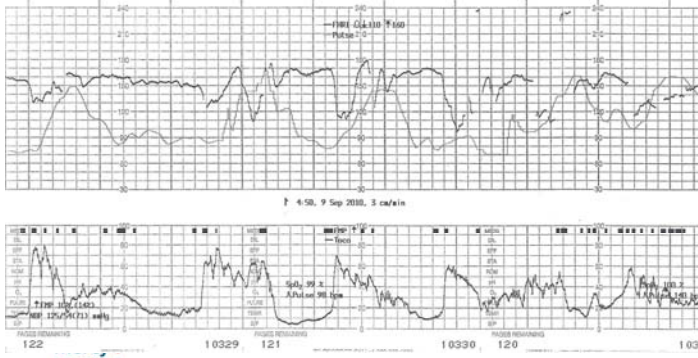
Second Stage Labor: MHR and FHR



Second Stage Labor: MHR and FHR

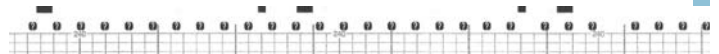


Second Stage Labor: MHR and FHR

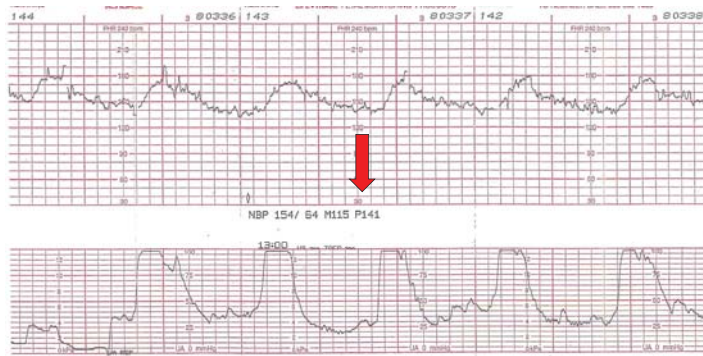


Confirm Maternal HR and FHR as Distinctly Different Tracings

- Coincidence alerts ??? may indicate maternal rather than fetal HR is being recorded



- FSE can record maternal HR if the fetus is dead



Clinical Implications

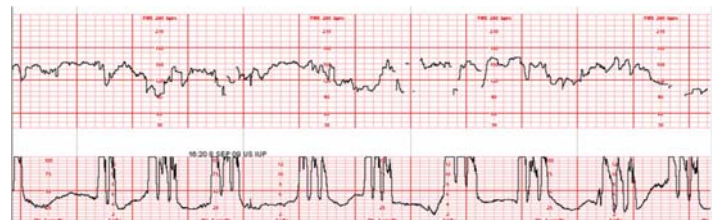
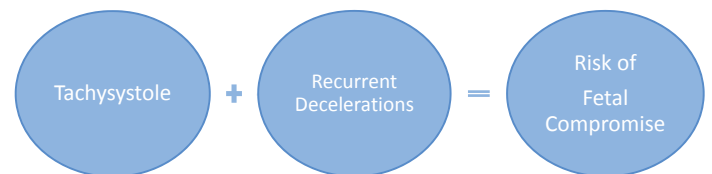
- Confirm fetal heart rate in presence of maternal tachycardia
- Tachycardia, minimal variability unlikely to spontaneously resolve to normal baseline rate and moderate variability
- Maternal HR increases during pushing efforts
- Accelerations during pushing are often maternal heart rate tracing

Tachysystole

- Adverse fetal outcomes following tachysystole are a significant source of professional liability
- 43% of claims involving neurologically impaired baby are related to oxytocin management (tachysystole)

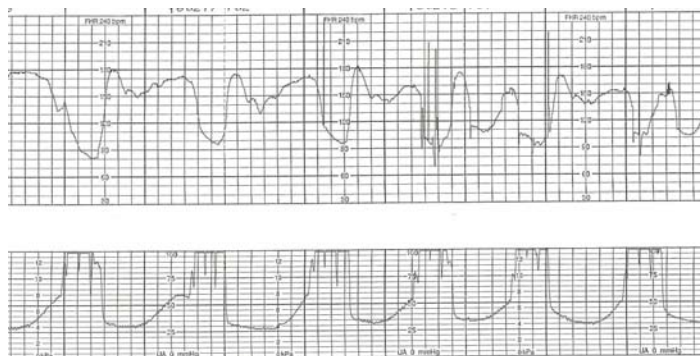
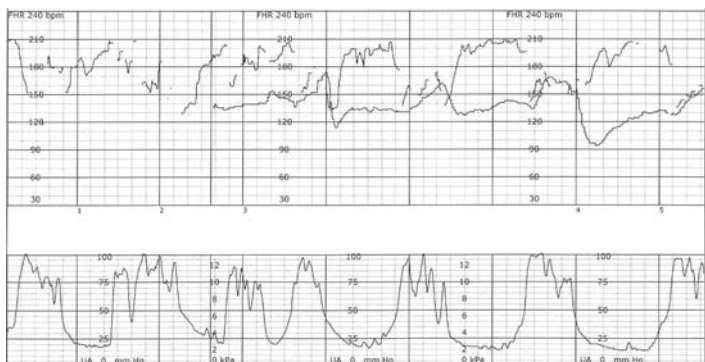
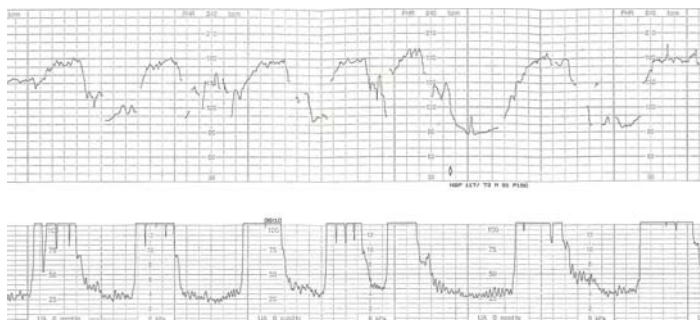
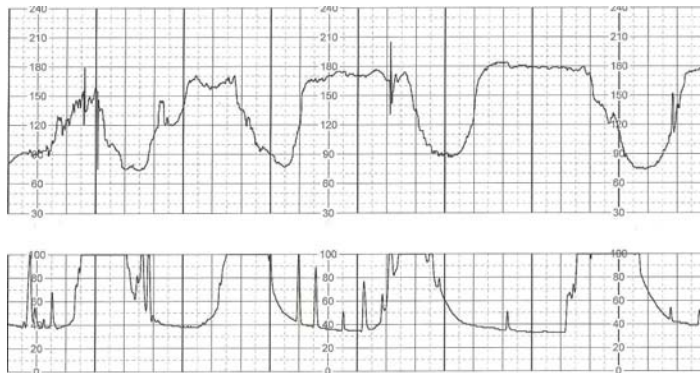
(ACOG, 2004)

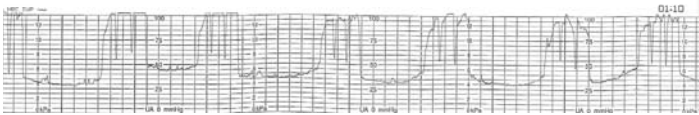
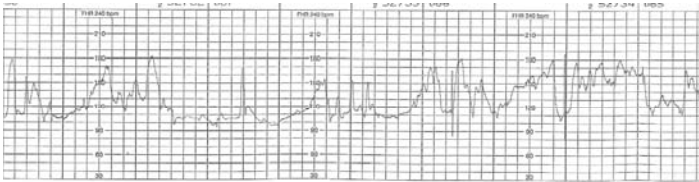
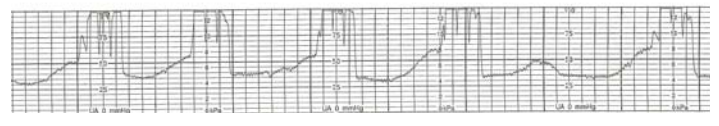
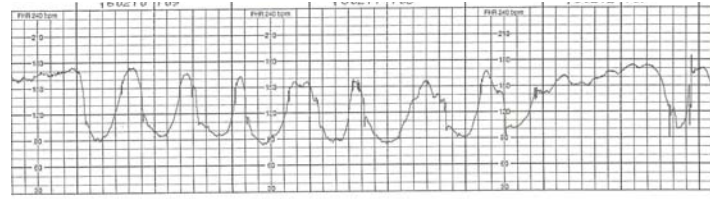
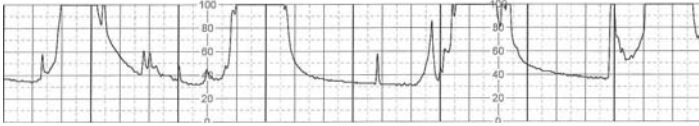
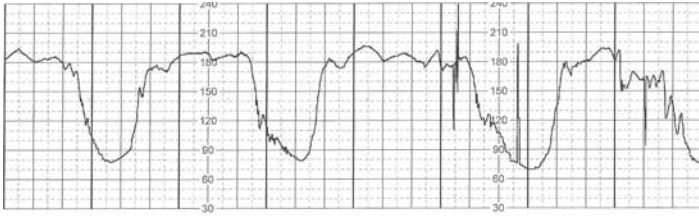
During Second Stage Labor



Second Stage Labor

- 129 closed claims involving vaginal birth of a neurologically damaged baby
- 82% included at least 1 hour of inappropriate second stage care
 - Continued coached pushing despite indeterminate / abnormal FHR pattern (recurrent decelerations, minimal variability, tachycardia)
 - Tachysystole

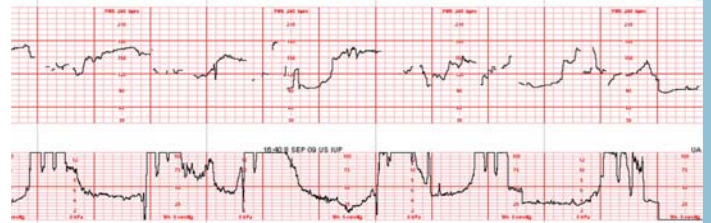




Keeping the Fetus Safe



- 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



Upright Positioning

- Less pain
- Less parental pain medication
- Less perineal trauma
- Less oxytocin
- Shorter labor
- Fewer episiotomies
- Fewer operative assisted births
- Fewer FHR abnormalities



Same Pelvic Relationship

Avoiding Negative Maternal Hemodynamic Consequences



Effects of Maternal Position

Lumbosacral Spine and Lower Extremity Nerve Injuries

- Hyperflexion of knees (<math><90^{\circ}</math> angle)
- Prolonged pushing
- Lithotomy position
- Use of stirrups during pushing
- Provider assisting pushing legs back
- Compression of peroneal, lateral femoral cutaneous, and femoral nerves
- Transient to permanent nerve damage

(Tubridy & Redmond, 1996; Wong et al., 2003)

Effects of Maternal Position

Lumbosacral Spine and Lower Extremity Nerve Injuries

- Harm can occur by several mechanisms including transection, stretch, compression and/or vascular injury
- Compression and stretch may result in decreased perineural blood flow and ischemia
- Focal demyelination and conduction block or axon loss with nerve conduction failure
- Average time for resolution is 2 months, with a range of 72 hours to 1 year

(Wong et al., 2003)

Forcing Legs Back Against the Abdomen

- The lithotomy position, particularly with the thighs flexed at an angle less than 90° , increases the risk of lumbosacral spine and lower extremity nerve injuries and should be avoided during pushing

(Wong et al., 2003)



Forcing Legs Back Against the Abdomen

- Pulling the legs back and open results in stretching of the perineum and risk of perineal tearing and lacerations; should be avoided during pushing

(de Jong et al., 1997; Gardosi et al., 1989; Golay et al., 1993; Sampselle & Hines, 1999; Simpson & James, 2005)



Perineal Massage



- *Antepartum* perineal massage *may* be beneficial for nulliparous women
- During labor perineal massage may be harmful
- Use of warm compresses, oils and lubricants for perineal massage are associated with an increased incidence of perineal irritation, genital tract trauma, and a non-intact perineum at birth

(Aikens-Murphy & Feinlan, 1998; Albers et al., 1996; Albers et al., 2005; Stamp et al., 2001)

Perineal Massage



- No evidence that perineal massage during labor, especially second stage labor is beneficial
- Some women find the technique uncomfortable
- Absent data to support benefits, perineal massage during labor should be avoided

(Aikens-Murphy & Feinlan, 1998; Albers et al., 1996; Albers et al., 2005; Stamp et al., 2001)

Epidural Anesthesia

- Turning down the rate or turning off the infusion significantly increases pain, risk of fetal malposition and operative vaginal birth; does not shorten the duration of second stage

(Phillips & Thomas, 1983; Torvaldsen et al., 2004)



Epidural Anesthesia

- Advocate for an appropriate level of block with which pain is relieved but the woman can still move her legs, assist with positioning and feel the urge to push when conditions are favorable for pushing

(Phillips & Thomas, 1983; Torvaldsen et al., 2004; Abenheim & Fraser, 2008)



Safe Second Stage Care

Appropriate

- Timing
- Pushing techniques
- Support / Encouragement / (If needed, coaching)
- Positioning
- Contraction frequency
- Coordination of pushing efforts with fetal response
- Patience

