Research Summaries for Normal Birth

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ABSTRACT

In this column, the author presents summaries of four research studies that further illuminate the physiology and benefits of normal birth. The topics of the studies are home birth, upright positions during the second stage of labor, delayed pushing in women using epidural analgesia, and the effect of exposure to familiar odors on newborns.

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PROSPECTIVE STUDY CONFIRMS SAFETY OF PLANNED HOME BIRTH WITH LOW RATES OF MEDICAL INTERVENTIONS

- Johnson, K. C., & Daviss, B. A. (2005). Outcomes of planned home births with certified professional midwives: Large prospective study in North America. *British Medical Journal*, 330(7505), 1416–1422.

Summary

This is the largest prospective study of the outcomes of planned home birth in North America. All certified professional midwives (CPMs) credentialed by the North American Registry of Midwives were required to participate in the study as a condition of recertification. A total of 409 participating midwives provided data on all of their clients who were due in 2000. Rigorous follow-up procedures with midwives and independent validation of a ran-

dom sample of the data ensured a complete and reliable data set. All deaths were reviewed by cross-reference with autopsies, coroner reports, or peer reviews.

The researchers collected data related to maternal demographic factors, rates of and reasons for hospital transfer, use of medical interventions, maternal and newborn outcomes, and client satisfaction. Medical intervention rates were compared with rates reported among low-risk women by the National Center for Health Statistics, as well as with rates reported in the *Listening to Mothers* survey, which analyzed births during a similar time period (Declercq, Sakala, Corry, Applebaum, & Risher, 2002). Fetal and newborn death rates were compared with outcomes of other large, published studies of low-risk births in North America.

The study focused on 5,418 CPM clients intending a home birth at the start of labor. The rate of intrapartum or postpartum transfer was 12.1%. Failure to progress, request for pain relief, and

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maternal exhaustion were the most commonly reported reasons for intrapartum transfer, while maternal hemorrhage and retained placenta were the most common reasons for postpartum transfer. The newborn transfer rate was 0.7%, most commonly for respiratory problems. Urgent transfer occurred in 3.4% of intended home births.

Rates of medical interventions in intended home births, including attempted induction of labor (9.6%), electronic fetal monitoring (9.6%), episiotomy (2.1%), cesarean section (3.7%), and vaginal instrumental delivery (1.6%), were consistently much lower than averages reported in hospital-based births. Intrapartum and newborn mortality occurred at a rate of 1.7 deaths per 1,000 low-risk intended home births (excluding breeches, twins, and fatal birth defects), a rate consistent with most published studies of low-risk births occurring within or outside of hospitals. No maternal deaths were reported. A random sample of 10% of the mothers were contacted and asked about their satisfaction with their birth experiences. Over 97% were extremely or very satisfied, and over 98% said they would use a CPM for a subsequent birth.

Significance for Normal Birth

This is one of the largest prospective studies of the outcomes of home birth. Furthermore, the compulsory nature of CPM participation and the rigorous study methods render this study relatively free of the methodological flaws that have plagued previous studies of home birth. This study confirms that infrequent use of interventions can be associated with excellent perinatal outcomes and provides strong evidence that planned home birth is no more risky than planned hospital birth for low-risk women and their infants.

An analysis of a national survey of childbearing women in the United States found that women who gave birth at home were far more likely to have achieved all six care practices that support normal birth (Declercq & Corry, 2003). This is because the approach to care is fundamentally different in most out-of-hospital settings, where care practices that support normal birth are the norm except

when compelling medical reasons dictate otherwise. Unfortunately, many people believe that the best outcomes will be achieved with aggressive use of medical interventions. This study adds to the large body of evidence refuting that approach.

UPRIGHT POSITIONS IN SECOND STAGE MAY DECREASE INSTRUMENTAL DELIVERIES IN WOMEN WITH EPIDURAL ANALGESIA

- Roberts, C. L., Algert, C. S., Cameron, C. A., & Torvaldsen, S. (2005). A meta-analysis of upright positions in the second stage to reduce instrumental deliveries in women with epidural analgesia. *Acta Obstetrica et Gynecologica Scandinavica*, 84(8), 794–798.

Summary

This meta-analysis assessed the effectiveness of upright positions during the second stage of labor for lowering the risk of instrumental vaginal delivery in women using epidural analgesia. The researchers conducted a systematic review of the literature using prespecified criteria to identify relevant randomized controlled trials (RCTs). Data from included studies were combined into a new dataset and analyzed using standard statistical methods for meta-analysis.

Only two RCTs, providing data for a total of 281 women (166 upright and 115 recumbent), met study criteria. Both studies limited enrollment to women with uncomplicated, term pregnancies in spontaneous or induced labor with epidural analgesia. However, one study included multiparous women (those with previous vaginal births), while the other restricted enrollment to nulliparous women (those having their first baby).

Differences in outcomes between women using upright positions in the second stage of labor and those assigned to recumbent positions failed to reach statistical significance because of the small size of the studies, variation in study definitions of upright positions, differences in what outcomes were reported, and compliance with randomization. However, statistically nonsignificant differences were found in the rates of instrumental birth, cesarean section, perineal trauma, and length of labor—all favoring the use of upright positions. Differences across the two groups in rates of instrumental and cesarean birth were large. No differences were found in any of the infant outcomes

measured in either study. The authors conclude that “the results of this meta-analysis...are inconclusive, but encouraging enough to justify a full-sized trial that could determine whether the observed effects are real or chance findings” (p. 796).

Significance for Normal Birth

Upright positions in birth have been used throughout history and across cultures because they use gravity to help the baby descend and tend to be less painful than supine positions, where the woman lies on her back. Studies of upright positions report lower rates of obstetric interventions, especially instrumental delivery. Because epidural use is associated with a higher rate of instrumental deliveries in nulliparous women, it is likely that encouraging upright positions may help women choosing epidural analgesia achieve spontaneous vaginal births and avoid the risks associated with instrumental delivery. These include injury to the pelvic floor muscles, a complication strongly associated with bowel and bladder incontinence. While this meta-analysis failed to detect statistically significant differences in the mode of birth between women in upright and supine positions, the results are likely due to methodological flaws and weaknesses of the included studies. A well-designed RCT is needed to further clarify this issue.

DELAYED, “PHYSIOLOGIC” PUSHING IMPROVES FETAL OXYGENATION IN WOMEN USING EPIDURAL ANALGESIA

- Simpson, K. R., & James, D. C. (2005). Effects of immediate versus delayed pushing during second-stage labor on fetal well-being: A randomized clinical trial. *Nursing Research*, 54(3), 149–157.

Summary

This randomized controlled trial compared the effects on fetal well-being of two different approaches to the management of the second stage of labor in nulliparous women with epidural analgesia. Forty-five nulliparous women with uncomplicated pregnancies who were undergoing elective induction of labor at term were randomized to “immediate pushing” ($n = 22$) or “delayed pushing” ($n = 23$). Women in the immediate-pushing group began pushing as soon as they were 10 cm. dilated and were coached by a nurse to hold their breath

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(closed-glottis pushing) and push for 10 seconds three to four times per contraction with every contraction until birth. Women in the delayed-pushing group remained on their left side from the time they reached 10 cm. of dilation until they felt the urge to push or until 2 hours had passed (whichever came first). At that time, they were encouraged to bear down without holding their breath (open-glottis pushing), for no more than 6–8 seconds at a time and no more than three times per contraction, until birth. Fetal well-being was monitored using internal fetal oxygen saturation (FSpO₂) sensors and continuous electronic fetal heart rate monitoring. FSpO₂ values <30% are abnormal and considered clinically significant (i.e., contribute to poor neonatal outcomes) when fetal oxygen saturation remains this low for >2 minutes during labor.

Fetal oxygen desaturation events lasting >2 minutes occurred significantly more frequently in the immediate-pushing group than in the delayed-pushing group (mean of 7.9 events versus 2.7 events, $p = .02$). The mean oxygen saturation decreased significantly over the course of second stage in both groups; however, women in the delayed-pushing group had significantly smaller changes in fetal oxygen saturation during second stage than women in the immediate-pushing group. This difference persisted even when researchers controlled for the length of second stage and the presence of a nuchal cord (umbilical cord wrapped around the neck). Additionally, significant differences occurred between the two groups in the rates of variable and prolonged fetal heart rate decelerations. No differences were found in other measures of fetal well-being or in newborn outcomes such as Apgar scores.

The second stage of labor was significantly longer in the delayed-pushing group (mean 139 minutes versus 101 minutes, $p = .01$). However, the average length of active pushing was significantly longer in the immediate-pushing group (mean = 101 minutes versus 59 minutes, $p = .002$). This is significant because 94% of instances of fetal oxygen desaturation lasting >2 minutes occurred during active pushing, with the remainder occurring during passive descent in the delayed-pushing group. Significantly more women in the immediate-pushing group had perineal lacerations (13 versus

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5, $p = .01$). Other maternal outcomes, including rates of instrumental or cesarean birth and episiotomy, were similar between the two groups.

Significance for Normal Birth

RCTs show that physiologic pushing (that is, bearing down instinctively with the natural urges and without holding one's breath) is easier on the baby and equally effective when compared with directed pushing (that is, bearing down on command while holding one's breath beginning at full dilation). Despite this, closed-glottis pushing is used routinely in many birth settings, even in women using epidural analgesia, which can delay the woman's urge to bear down and prolong the second stage. The attempt to hurry second stage may have arisen because many birth settings impose arbitrary time limits on the length of second stage. This study shows that, despite the increased duration of second-stage labor, delayed physiologic pushing should be used when a nulliparous woman has an epidural in order to optimize fetal well-being and lower the woman's risk of perineal trauma.

EXPOSURE TO SMELL OF MOTHER'S MILK REDUCES DISTRESS DURING PAINFUL NEWBORN PROCEDURES

- Rattaz, C., Goubet, N., & Bullinger, A. (2005). The calming effect of a familiar odor on full-term newborns. *Journal of Developmental & Behavioral Pediatrics*, 26(2), 86–92.

Summary

In this randomized controlled trial, researchers evaluated the effect of exposure to familiar odors on newborns experiencing painful procedures. Forty-four healthy, full-term, exclusively-breastfed newborns underwent routine heel-stick blood sampling at 3 days of age. Eleven were exposed to a sample of their mother's milk during the procedure, 11 were exposed to a vanilla scent to which they had

been familiarized over the previous 24 hours, 11 were exposed to a vanilla scent to which they had not previously been exposed, and a control group of 11 were exposed to no scent during the procedure. Investigators measured the number and duration of instances of crying and grimacing, the number of head movements, and the newborn's behavioral state during two separate intervals during the heel-stick procedure and during the 30 seconds following the procedure for each newborn. All data were obtained from video recordings of the heel-stick procedures, and a random sample was double-checked by a different investigator for reliability. In order to minimize bias, the investigators were blinded regarding the study group to which each newborn belonged.

Babies smelling a familiar odor (either maternal milk or vanilla) cried and grimaced significantly less during the period immediately following the heel-stick procedure than those smelling an unfamiliar odor or no odor at all. Both groups of babies smelling a familiar odor reduced crying between the heel-stick procedure and the recovery period, demonstrating that they settled themselves more easily. Infants smelling their mother's milk displayed fewer head movements (a measure of motor agitation or stress) during the heel-stick. No other significant differences were found between the group smelling maternal milk and the group smelling familiar vanilla or between the groups smelling a familiar odor and the group smelling an unfamiliar odor or no odor at all. No differences were found between the babies smelling an unfamiliar odor and those smelling no odor.

Significance for Normal Birth

Research has shown that it is best for mothers and babies to stay together after birth. Unfortunately, in many hospitals, separation of the mother and her baby takes place routinely, and these separations often occur to accommodate painful or stressful procedures such as blood draws, administration of medications, or circumcision. Previous research has found that close contact and/or breastfeeding during painful procedures provide significant analgesia (pain relief) for the newborn. This study suggests that the newborn's keen inborn sense of smell contributes to the analgesic effect. It provides further evidence that newborns are physiologically designed to feel secure and comforted when they are in close contact with their mothers.

The study suggests that the newborn's keen inborn sense of smell contributes to an analgesic effect during painful procedures.

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CENTERS FOR DISEASE CONTROL AND PREVENTION RECOGNIZE LINK BETWEEN BIRTH PRACTICES AND BREASTFEEDING

In an August 3, 2005, press release, the Coalition for Improving Maternity Services (CIMS) welcomed the inclusion of the "Maternity Care Practices" section in the Centers for Disease Control and Prevention's (CDC's) new *Guide to Breastfeeding Interventions*. This publication follows a strong, new policy statement in support of breastfeeding from the American Academy of Pediatrics last winter, *Breastfeeding and the Use of Human Milk*.

The link between childbirth and breastfeeding is a hallmark of CIMS's own Mother-Friendly Childbirth Initiative (MFCI), in which the tenth item lists the steps of the Baby-Friendly Hospital Initiative. The evidence-based MFCI was adapted as a model for the World Health Organization's *Global Strategy on Infant and Young Child Feeding*.

Research shows that breastfeeding is vital to the short- and long-term health of babies and mothers. Birth practices such as induction, epidural anesthesia, episiotomy, and cesarean section can make breastfeeding more difficult. Furthermore, hospital procedures that separate mothers and babies can interfere with the establishment of breastfeeding. CDC's new *Guide to Breastfeeding Interventions* acknowledges the importance of keeping mother and baby together during the birth and in the hours and days after birth for a successful breastfeeding relationship.

"For the CDC to come out this strongly on the effect of maternity practices on breastfeeding is fabulous. This is the first time a U.S. government policy document has linked birth practices to breastfeeding, and may be one of the first policy documents that addresses some of the MFCI steps clearly," said lactation consultant Linda Smith, IBCLC, and a CIMS board member.

Smith collaborated with the late Mary Kroeger, CNM, on *Impact of Birthing Practices on Breastfeeding*, which examines the research about this important link.

WEB SITE RESOURCES

1. For more information about the *Guide to Breastfeeding Interventions*, go to <http://www.cdc.gov/breastfeeding/>
2. The American Academy of Pediatrics' *Breastfeeding and the Use of Human Milk* can be found at <http://www.aap.org/healthtopics/breastfeeding.cfm>
3. To learn about The Mother-Friendly Childbirth Initiative, visit the CIMS Web site (<http://www.motherfriendly.org>).
4. The WHO's *Global Strategy on Infant and Young Child Feeding* can be found at <http://www.who.int/nut/#inf>