

# Closing the Theory–Practice Gap: Intrapartum Midwifery Management of Planned Homebirths

Saraswathi Vedam, CNM, MSN, Meredith Goff, CNM, MS,  
and Vicki Nolan Marnin, CNM, MSN

In the United States, access to qualified homebirth providers varies by state, city, and community, and consistent, evidence-based guidelines for intrapartum management at home are not available. This article examines the similarities and differences in midwifery management of the intrapartum, postpartum, and neonatal course between planned homebirths and planned hospital births. Characteristics of qualified attendants, essential medical supplies and equipment, methods for maternal and fetal surveillance, and common intrapartum indications for transfer are discussed. Unique features of management of the healthy woman and baby in the home are described, as well as the process of consultation and/or referral for collaborative or medical management. Current evidence for the management of fetal intolerance of labor, meconium stained amniotic fluid, prolonged labor, postpartum hemorrhage, and the unstable newborn is discussed in the context of homebirth practice. Aspects of homebirth care that require cultural competency and affect the informed consent process are included. Homebirth practice may provide opportunities to increase the congruence between espoused midwifery philosophy and actual practice. *J Midwifery Womens Health* 2007;52:291–300 © 2007 by the American College of Nurse-Midwives.

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## INTRODUCTION

The phrase “planned homebirth” describes births that occur when “the woman intends to deliver at home; she meets defined medical and environmental criteria for an optimal perinatal course; and she has qualified birth attendants who work within a health care system that provides access to equipment, specialized personnel, and/or hospitalization when necessary.”<sup>1</sup> In the last decade, controlled trials and observational studies have described excellent perinatal outcomes for planned homebirths.<sup>2–8</sup> Women praise the increased control of the environment and process of care when delivering at home.<sup>3,9,10</sup> Rates of intrapartum intervention differ according to birth setting. In developed nations, out-of-hospital births have been associated with the appropriate use of technology and reductions in health care expenses.<sup>6,11,12</sup> Several national and international advisory panels have supported informed choice for place of birth and increased access to appropriate out-of-hospital maternity services.<sup>7,13–15</sup>

In the United States, less than 4% of members of the American College of Nurse-Midwives (ACNM) attend planned homebirths.<sup>16</sup> Physicians in most communities do not provide home care, and 95% of certified nurse-midwives (CNMs) or certified midwives (CMs) provide intrapartum care only in the hospital.<sup>17</sup> The low rates of homebirth in the United States (1%)<sup>18</sup> may be a result of

reduced access to qualified homebirth attendants. Attendant choice of intrapartum practice site and style of management may be influenced by a lack of exposure to effective care in out-of-hospital settings. This article discusses effective intrapartum care across birth settings.

## The Theory–Practice Gap in Contemporary Midwifery Care

Recently, Lange and Kennedy<sup>19</sup> described a theory–practice gap between espoused midwifery philosophy and professional behavior as reported by 245 newly CNMs. When asked to reflect on their final clinical rotation as students (87% hospital placements), study participants described a “lack of congruity between ideal and actual midwifery practices that support normal birth” in the practice(s) of the CNM preceptors they worked with just before graduation. This work suggests that there are unique competencies in perinatal management that characterize, promote, and preserve the midwifery model of care. While respondents noted very little theory–practice gap in the behavior of preceptors in the “dimension of caring,” they observed large differences between ideal and actual midwifery practice in “using low technology approaches when possible” and “intervening only if necessary and appropriate.” Maintenance of a supportive presence in labor was found to be less congruent between professed theory and actual practice. Students in birth center settings (10%) observed the greatest congruence for “respecting the normal processes of birth” ( $P < .01$ ). Respondents also reported a gap between their perception of ideal practice and actual practice in “vigilance and attention to details” in homebirth practices. Authors concluded that this perception may be a function of an incongruence between “how watchfulness is done

Address correspondence to Saraswathi Vedam, CNM, MSN, Division of Midwifery, University of British Columbia, B54-2194 Health Sciences Mall, Vancouver, BC V6T 1Z3. E-mail: saraswathi.vedam@midwifery.ubc.ca

in a hospital setting compared with how a midwife conducts that same activity at home,” further confounded by the students’ very limited exposure to homebirth midwifery practice (2.9% of student placements).

Educational programs for CNMs and CMs in the United States rarely offer out-of-hospital clinical experiences as a core part of the curriculum. Hence, while many of the ACNM core competencies<sup>20</sup> are applicable to any practice setting, the translation of these competencies to an out-of-hospital setting may not be obvious. In addition, there are some screening concepts, management priorities, and therapeutic measures that assume greater significance or are different according to birth site. Increasing confidence among CNMs/CMs in the application of these concepts and methods may reduce the theory–practice gap in the promotion of normal birth. If they become familiar with the realities of care at home, they may consider homebirth practice, and therefore increase access to out-of-hospital maternity services. These low technology core competencies become even more critical in an era when management of health care access and delivery outside the hospital during pandemics, natural disasters, or national crises is a palpable priority.

Antepartum factors that affect birth site selection have been described in detail (Table 1).<sup>21</sup> This article provides a review of the aspects of intrapartum, postpartum, and neonatal midwifery management that can be provided similarly across birth sites, as well as those assessment, management, and therapeutic measures that need to be modified according to birth site.

### CORE COMPETENCIES ACROSS BIRTH SITES

Most women will have two providers present for a planned homebirth, primarily because after the birth, both mother and baby will require attention and surveillance. Midwives may collaborate with other midwives, nurses, or trained birth assistants. Qualified homebirth attendants have the ability to monitor maternal and fetal condition and assess and treat common obstetric conditions with low technology methods. The identification of complications that would be best addressed by equipment or personnel available in the hospital and the ability to initiate a referral are essential components of professional homebirth care. When delivery is imminent or the stage or nature of the condition prohibits safe transfer,

Saraswathi Vedom, CNM, MSN, is the Director of the Division of Midwifery at University of British Columbia and serves as chair of the ACNM Division of Standards and Practice Homebirth Section.

Meredith Goff, CNM, MS, is on the midwifery faculty at Yale School of Nursing and provides intrapartum midwifery care in the Yale Midwifery Faculty Practice.

Vicki Nolan Marnin, CNM, MSN, is clinical preceptor for Yale School of Nursing and practices in a homebirth midwifery private practice as well as a tertiary care intrapartum setting.

**Table 1.** Antepartum Assessment Criteria for Birth Site Selection

#### General Criteria

- Woman physically and mentally healthy and well-nourished
- Adequate social supports before and during birth
- Primary participants mature and able to accept responsibility for self-care
- Commitment to maintaining a positive emotional environment for mother throughout process
- Arrangements made for emergency transport
- Childbirth, homebirth, and breastfeeding education secured (books/classes)
- Preparation of persons planning to be present at the birth
- Complete records from previous provider for current and/or past pregnancies
- Pediatric care arranged before 36 weeks of pregnancy
- Obstetric consultant identified by 36 weeks
- Help available in home 24 hours a day for at least 1 week after the birth
- Commitment to birth without pharmacologic analgesia or anesthesia
- Understanding of and agreement to the screening criteria
- Open and clear communication with the midwife

#### Recommended Indications for Consultation, Collaboration, and/or Referral of Care

- Anemia refractory to treatment
- Chronic hypertension and/or pre-eclampsia requiring management with medication
- Current mental illness that the midwife deems would have a harmful effect on the perinatal course
- Thromboembolic disease (event) requiring heparin
- Insulin-dependent diabetes
- Placenta previa at term
- Rh isoimmunization or positive antibody screen during current pregnancy
- Active preterm labor that cannot be stopped
- Evidence of chorioamnionitis
- Multiple gestation diagnosed before labor
- Substance abuse
- Non-reassuring fetal surveillance results

Adapted with permission from Jackson et al., eds., 2004.<sup>21</sup>

the homebirth midwife may need to manage the complication independently. Hence, preparation for skills, procedures, and management during common urgent care situations is important.

In reality, the competencies required for managing complications during the perinatal period are common to many midwifery practice settings. The management of immediate postpartum hemorrhage (PPH) or unexpected breech delivery, and neonatal resuscitation of the term infant are topics within core curriculum in midwifery educational programs, and prerequisite knowledge for basic certification and practice in any setting. In addition to screening for potential complications and impediments to normal birth, homebirth midwives avoid interventions that may adversely affect maternal or fetal status and precipitate a need for transfer. For example, medications for pain management can affect neonatal respiratory status, thermoregulation, glucose metabolism, and behavioral status,<sup>22</sup> as well as progress of labor.<sup>22,23</sup> In the hospital setting, the availability of naloxone (Narcan;

Endo Pharmaceuticals, Chadds Ford, PA) and immediate access to neonatal providers can mitigate the adverse effects of maternal administration of medications during labor. Even common procedures, such as amniotomy and vaginal exams, have potential adverse consequences if used indiscriminately.<sup>24,25</sup> Inviting the possibility of cord compression, chorioamnionitis, or a reduced dilution of meconium may increase the necessity of therapy only available in the hospital.

Conversely, homebirth midwives and families employ a variety of intrapartum and postpartum measures to prevent complications and promote maternal and fetal well-being in an effort to avoid a change in the setting for care. The best available evidence supports continuous labor support, active hydration and nutrition, and methods to conserve energy and rest in the latent phase. Optimal maternal and fetal positioning, the use of upright positions, heat, and nonpharmacologic methods of pain management are effective, safe, and satisfying supportive and preventative measures that can be employed at home.<sup>26</sup>

### Essential Birth Supplies and Equipment

The “sterile tray” is nearly identical for planned homebirth and planned, term hospital birth (Table 2).<sup>27</sup> The equipment and supplies are best organized in a limited number of carrying cases, which can be easily transported in the midwife’s vehicle and carried quickly from the curb into the home. Materials that are sensitive to heat (medications) can be carried in a Thermos or package with cold packs. Hard or padded cases for oxygen tanks will protect them from damage and inadvertent release in the midwife’s vehicle.

The physical environment of the home may be unfamiliar to the midwife and may not provide the convenience of ergonomic examination and treatment features (adjustable beds, lighting, wall suction, neonatal warming exam tables, etc.). With a little imagination and ingenuity, all of these items can be created simply. Pillows, chair backs, stools, and human supports can be used to position both mother and midwife comfortably. Flashlights and adjustable desk lamps can be propped up with rolled washcloths to direct a beam of light. A city phone book wrapped in a folded towel and underpad makes a firm but comfortable surface to stabilize and visualize the perineum during repairs. A baking sheet or cutting board layered with soft flannel receiving blankets and an electric heating pad serves as a firm, flat, warm, portable surface for neonatal exam or resuscitation.

The family supplies sources of heat, light, and water, nourishing fluids and foods for labor, and a transport vehicle for non-urgent transfer. The plan for emergency transfer is assisted with a posted written listing of emergency numbers, including transport, obstetric, and pediatric personnel, and directions to and from the

**Table 2.** Basic Equipment for Homebirth Bag

<b>Sterile Supplies</b>	
Delivery instruments	Amniotomy device
Suturing instruments	Syringes, needles
Gloves	Intravenous infusion fluids and supplies
Cord clamps	Sterile gauze, sterile saline
Sterile speculum	Suctioning devices (e.g., DeLee mucus traps with filters, RescuVac hand powered mechanical suction)
Suturing supplies	Blood and specimen collection supplies
Urinary catheters	
<b>Equipment for Maternal and Fetal Assessment</b>	
Doppler and/or fetoscope	Scales
Sphygmomanometer	Urine dipsticks to measure protein, glucose (Uristix)
Pediatric stethoscope	Adult stethoscope
<b>Pharmaceuticals</b>	
Medications to control hemorrhage (oxytocin [Pitocin], ergotamine [Methergine], misoprostol [Cytotec])	Prophylactic agents: (e.g. AquaMEPHYTON, antibiotics for GBS prophylaxis, neonatal ophthalmic ointment)
Anesthesia for perineal repair (lidocaine)	
<b>Resuscitation Equipment</b>	
Portable oxygen tank	Self-inflating resuscitation bag
Masks in varying sizes	Infant feeding tube
<b>Nonsterile Supplies</b>	
Gloves	Bendable straws
Instrument and hand cleaning solutions	Examination lubricants
Nitrazine and slides for assessment of PROM	Newborn examination tools (e.g., tape measure, penlight, thermometer)
Medical record forms	Transport blankets and clothing
Flashlight	Enema supplies
Mirror	Smelling salts
Disposable receptacles for contaminated sharp supplies	Sterilization equipment
Herbs, homeopathy as appropriate for care provider experience and education	Apparatus for nonpharmaceutical pain relief (e.g., heating pads, massage balls, oils, cold packs)

GBS = Group B streptococcus; PROM = premature rupture of membranes.

The DeLee mucus trap is manufactured by Sherwood Medical (Saint Louis, MO). The RescueVac is manufactured by Rescue Vac Systems, Inc. (Naperville, IL). Uristix are manufactured by Bayer Diagnostics (Chicago, IL). AquaMEPHYTON is manufactured by Merck & Co., Inc. (Whitehouse Station, NJ).

Adapted with permission from Jackson et al., eds.<sup>27</sup>

nearest hospital. Organization of and access to the birth supplies, clear passageways, and clear, firm surfaces will facilitate efficient care and prompt transfer when necessary.

### Modifications Related to Cultural Competence

Homebirth midwives often are witness to cultural and religious traditions, specific to labor and birth, that may not be practical or permissible in a hospital setting.<sup>28,29</sup>

As invited guests in the home, it is incumbent upon midwives to be both respectful and knowledgeable about

the details of these practices. The inclusion of song, prayer, or specific support persons are components that can be easily integrated into usual practice. The desire for specific environmental modifications (altar, candles, lighting, birthing room location, etc.) sometimes has to be balanced with the practicalities of access to birthing equipment, visualization, and ease of transport. Prohibitions on the use of motor vehicles (Orthodox Jewish or Amish families) may require special arrangements or exceptions when transport is necessary. Specific food and food preparation requirements (Kosher or Brahmin rules) may have an impact on the midwife's ability to prepare or serve food and fluids to the woman. Generally, the midwife can engage the client in an anticipatory discussion about how to best serve her within the context of how she interprets the aspects of her culture that interact with birth.<sup>28,30</sup>

### **Anticipatory Guidance, Support, and Maternal Surveillance**

Once labor is established, the initial and ongoing assessment and management priorities are common to all midwifery practice regardless of anticipated birth site. Whether in home or hospital, the midwife performs a physical exam and checks the signs and symptoms of labor progress and coping abilities at regular intervals. Evidence-based measures to provide comfort and promote progress include continuous loving support, hydrotherapy, acupressure, sterile water papules, massage, maternal positioning, and heat.<sup>26</sup>

The impact of emotional and environmental factors on the progress of labor is well documented in the literature.<sup>31,32</sup> Maternal anxiety engendered by the planned place of birth (either at home or in the hospital) may emerge as a reason to transfer or to initiate preventative strategies earlier. The client's psychological preparedness is a critical variable that may affect the ability to deliver in the home setting without analgesia or labor augmentation. Management of the environment at a planned homebirth has some unique challenges. The midwife's status as a guest may increase the need to balance advocacy for her patient with negotiating family dynamics and cultural expectations. For example, when the primary decision-makers are the elders in the family, they may feel more empowered to assert or insert their presence, opinions, and fears in the home than in the hospital.

### **Fetal Surveillance**

In all intrapartum settings, midwifery evaluation of fetal well-being is indirectly monitored via periodic assessment of fetal heart rate pattern. In the home, intermittent auscultation is the method of fetal heart rate evaluation. Guidelines have been established outlining the frequency and interpretation of intermittent auscultation for low-risk mothers.<sup>33–35</sup>

### **Postpartum Follow-up At Home**

Follow-up postpartum care in the home involves the standard maternal postpartum evaluation of involution, bleeding, vital signs, breasts, perineum, and emotional status during each of the scheduled postpartum visits. Homebirth midwives commonly provide in-home assessments two to four times in the first week, and offer office visits subsequently. Homebirth families frequently require reminders of normal postpartum recovery needs for rest because they do not benefit from limited "visiting hours" and 24-hour access to nutritional and physical support in the hospital. At home, the expectations for return to normal roles and self-care activities may precede physical and emotional readiness. Many homebirth midwives encourage the mother to arrange for 24-hour in-home help during the first week. The importance of adequate postpartum rest and psychosocial support to prevent postpartum depression has been well documented.<sup>36,37</sup> If the midwife is willing to assume a directive role by providing written instructions and messages to the extended family, adherence may improve.

### **Care of the Normal Neonate in the Home**

Unlike the hospital-based midwife, the homebirth midwife is the sole provider responsible for initial examination and care of the newborn at birth and at the early postpartum visits. In the immediate postpartum period, the midwife examines the newborn for signs of normal cardiac and respiratory transition. The newborn's vital signs, output, gross anatomy, alertness, responsiveness, and feeding/attachment behaviors inform ongoing care. Like many hospital-based midwives, the homebirth midwife also makes it her priority to assist with initial lactation. However, because there is usually no other experienced nurse or lactation consultant on site after the midwife leaves the home, many homebirth midwives will not leave until latch and adequate suck/swallow is established. Some homebirth midwives require clients to breastfeed in the initial postpartum period, as the ability to breastfeed is a marker of neonatal health, and breastfeeding improves maternal immunity, reduces stress and anxiety, and promotes uterine involution.<sup>38–40</sup> Immediate newborn care may include the administration of prophylactic therapies and medications (vitamin K or eye prophylaxis).

To ensure that the family has ample opportunity to recuperate and to concentrate on establishing good parenting and breastfeeding habits, homebirth midwives often provide in-home newborn care and assessment until the child is 2 weeks of age. In addition to the physical examination, midwives can evaluate feeding behaviors, monitor family adjustment, and collect state-mandated newborn screening samples.

Ideally, the family will establish a relationship with a pediatric provider who is willing to be available for



**Table 3.** Reasons for Transfer From Planned Homebirth to Hospital Birth

Reasons for IP Transfer
Failure to progress (55%–75%)
Prolonged rupture of membranes
Meconium staining
Nonvertex presentation
Fetal distress
Desire for pharmaceutical pain relief
Bleeding
Hypertension
Reasons for PP Transfer
Maternal
Retained placenta
Postpartum hemorrhage
Laceration repair
Reasons for Neonatal Transfer
Inability to establish normal respirations
Congenital anomalies
Low birth weight
Low Apgar score
Birth trauma
Sepsis

Data taken from Ackermann-Liebrich et al.<sup>2</sup>; Wiegers et al.<sup>4</sup>; Davies et al.<sup>3</sup>; Janssen et al.<sup>6</sup>; Murphy and Fullerton<sup>5</sup>; and Johnson and Daviss.<sup>8</sup>

consultation and referral before the birth. Some pediatric providers are unaware that midwifery core competencies include newborn examination skills and may expect the family to bring the baby to their office in the first 24 hours. The midwife may inform the pediatric providers of their intention to provide care in the immediate newborn period with a letter of introduction detailing rationale for providing in-home care, and the reassurance that the midwife will provide them with copies of the records of the birth, newborn exams, postpartum course, and newborn screening results. In any situation that deviates from the normal newborn course, the midwife will contact the pediatric provider directly as well as referring the family to him/her. Frequently, care and follow-up in such cases results in collaborative care.<sup>41,42</sup>

## TRANSFER FROM HOME TO HOSPITAL

Several prospective analyses of the outcomes of planned homebirths have described reasons for transfers from home to hospital before and after onset of labor at term.<sup>2–6,8</sup> In these studies, the rate of antepartum referrals for obstetric reasons (e.g., fetal growth restriction, previa, pregnancy-induced hypertension, twins, or preterm) for women who intended a planned homebirth ranges from 10% to 20%. Of those women who reached term without medical complications, 5% to 10% required intrapartum referrals, 1% postpartum maternal referrals, and 1% neonatal referrals. The large majority of these transfers occurred for nonemergent conditions (Table 3).

The most common reason for transfer from home to hospital once labor has started is failure to progress. Johnson and Daviss<sup>8</sup> evaluated the outcomes of 5418 women who planned homebirths with certified professional midwives in North America. Twelve percent (n = 655) were transferred to a hospital in the intrapartum or postpartum period. Of those women transferred during labor, 51.2% (n = 323) were transferred for failure to progress in the first or second stage of labor. Murphy and Fullerton<sup>5</sup> conducted a prospective observational study describing outcomes of intended homebirths (N = 1221) attended by CNMs. Of those beginning labor at home, 102 (8.3%) were transferred to the hospital in labor, more than half (n = 63) for prolonged labor or rupture of membranes. Ten women (0.8%) were transferred postpartum and 14 (1.1%) infants were transferred. Intrapartum problems were positively associated with transfer to hospital-based care, and overall outcomes were consistent with expected outcomes for low-risk birth.

When possible, the homebirth midwife encourages a birth site that is within 30 minutes of a hospital that provides obstetric and neonatal services. Once the woman enters the intrapartum period at home, the midwife may recommend a change in planned site of birth regardless of need for consultation or referral. The midwife must consider time required for and method of transfer, in light of whether safe and effective management would be adversely affected if maternal/fetal status changes while en route. The continuing role of the midwife will vary according to her status as a credentialed provider or a referring provider. If the woman is transferred for pain management or augmentation of labor, the midwife who is also on staff at the admitting hospital may remain as primary provider. If the same woman subsequently requires surgical intervention, the midwife will then consult and transfer care. She might provide solely supportive care or assist in the surgery recovery care. Ideally, the physician consultants are available to provide offsite consultation and assume collaborative or primary care role as necessary while still being willing to preserve as much of the birth plan as possible in the hospital setting. Joint reviews of transfers from home to hospital can inform ongoing collaboration and promote mutual respect. Families requiring an emergency transfer or prompt care for maternal or pediatric concerns will need extra support in the immediate postpartum period. Assistance with transport, physical support (rest, hydration, and food), emotional support, and guidance regarding unexpected hospital tests, routines, and treatments is invaluable. The perceived losses of normalcy and control and the loss of a low intervention birth experience can contribute to dissatisfaction and depression, especially if women are not allowed to participate in decision making.<sup>43</sup>

**Table 4.** Common Intrapartum Indications for CNM/MD Consultation, Collaboration, and/or Referral During A Planned Homebirth in the United States

#### **Intrapartum and Immediate Postpartum Factors**

- Evidence of fetal intolerance of labor
- Thick or particulate meconium-stained amniotic fluid with non-reassuring FHTS and/or lack of progress
- Breech or transverse fetus during labor
- Pharmaceutical induction or augmentation of labor
- Abnormal intrapartum bleeding
- Prolonged labor with no evidence of progress and/or evidence of maternal exhaustion
- Cord prolapse
- Maternal desire for pharmaceutical pain management
- Elevated maternal temperature with ruptured membranes
- Severe or persistent postpartum hemorrhage
- Retained placenta
- Congenital anomalies
- Newborn health status unstable
- Discretion of the midwife

Intrapartum guidelines assume adequate time to initiate consultation. Emergent situations are stabilized and, if necessary, hospital transport is arranged. Exceptions to this list may be made taking religious exemptions into consideration.

Adapted with permission from Jackson et al., eds.<sup>27</sup>

### **MANAGEMENT OF INTRAPARTUM AND POSTPARTUM COMPLICATIONS**

Common intrapartum factors that require specialized midwifery management or consultation, collaborative care, or transfer are described in Table 4. While the reasons for most are self-explanatory, management recommendations for some conditions are affected by the evolving state of the evidence and the chosen birth place.

#### **Evidence of Fetal Intolerance of Labor**

Midwives in the home and in the hospital address significant fetal heart rate decelerations, tachycardia, and unexpected persistent bradycardias identically. If a non-reassuring fetal heart rate characteristic is heard, increasing the frequency and duration of auscultation is continued for several contractions to confirm if it is transitory or persistent. Simultaneously, interventions to improve uterine blood flow and fetal oxygenation are instituted, such as maternal position changes and hydration. Fetal scalp or acoustic stimulation may be performed to elicit a reassuring acceleration of the fetal heart.<sup>44</sup> Abdominal and/or vaginal exams may be indicated to diagnosis abruption, cord prolapse, precipitous descent, or malpresentation. If the fetal heart remains nonreassuring, the feasibility of timely transfer to a facility with continuous electronic fetal monitoring is evaluated.

Consideration of stage of labor and imminence of delivery will influence the chosen course. If a persistent variant fetal heart rate pattern is identified in first-stage labor, transfer to hospital-based care may be the prudent plan. However, if delivery is imminent, preparing for

possible neonatal resuscitation and encouraging delivery may be a better use of time and resources. An efficient resuscitation is best accomplished in a stable setting, not in a moving vehicle. The equipment and skill set that a homebirth midwife can provide for a term infant with a terminal bradycardia is identical to those available in most hospitals.

#### **Meconium**

Evidence-based management of the woman with meconium-stained amniotic fluid has evolved in the last decade. Level 1 evidence from prospective multicenter trials addressing the incidence of meconium aspiration syndrome in infants born through meconium-stained amniotic fluid suggests no benefit from amnioinfusion, endotracheal intubation, or intratracheal suctioning, especially in otherwise vigorous infants.<sup>45,46</sup> Potential harm associated with suctioning includes apnea, increased hypoxia, delay in resuscitation, damage of the upper airway, and cardiac arrhythmias. Community standards for care, however, may not yet acknowledge a change in recommendations. Application of the best available evidence (avoidance of suctioning) is possible and may be advisable in the home setting, but if transfer is subsequently affected, differing protocols in the receiving institution may lead to conflict.

The development of meconium aspiration syndrome appears to be associated with intrauterine fetal hypoxia. In the context of thick or particulate meconium-stained amniotic fluid with nonreassuring fetal heart tones and/or lack of progress, the homebirth midwife initiates transfer unless birth is imminent. If delivery is imminent, the homebirth midwife prepares for potential resuscitation and ongoing vigilance for signs and symptoms of meconium aspiration syndrome. Typically, the infant with meconium aspiration syndrome will display symptoms of respiratory distress (e.g., nasal flaring, retractions, poor color, and an unwillingness to breastfeed), though in an otherwise vigorous term baby, these symptoms may develop over several hours.<sup>47</sup> Initiation of surfactant and/or nitrous oxide therapy within 12 hours of delivery may reduce hospital stays.<sup>48</sup> This information can guide the timing of transfer decisions when symptoms of meconium aspiration syndrome develop.

#### **Prolonged Labor**

Management of a long labor is another example of the gap between evidence and practice. Practice and hospital protocols frequently expect adherence to an expected partogram. The need to progress 1 cm/hour or deliver in 8 hours via active management of labor, or to deliver when staffing is available, has made time an outcome measure in itself. In the last 50 years, Friedman's definitions for normal length of labor have been widely adopted. However, Friedman's methodology has recently

come under scrutiny. His conclusions were based on plotting 500 individual labor curves and synthesizing them into one curve.<sup>49</sup> Zhang et al.<sup>50</sup> applied a statistical analysis to compare dilatation at various points during labor (repeated measures analysis) in nulliparous parturients who started labor spontaneously at term with singleton fetuses in a vertex presentation (N = 1992). Women who had cesarean sections were excluded.<sup>50</sup> Labor patterns for the study subjects differed markedly from the Friedman curve, both in increased length and lack of manifestation of a deceleration phase.

Several other investigators have reported that the normal lengths for each stage of labor are likely to be longer than Friedman described, without evidence of maternal or fetal compromise.<sup>51,52</sup> Janni<sup>52</sup> also noted that because the increased maternal morbidity in patients who have a prolonged second stage is partially a result of operative interventions, providers should not base active management solely on elapsed time.

The evidence on maternal preference for active versus expectant management is conflicting,<sup>26,53</sup> but it is clear that patient involvement in decision making is associated with higher levels of satisfaction.<sup>43</sup> Some women experiencing a prolonged labor at home may wish to try all of the nonpharmacologic methods of augmentation before considering transfer to the hospital. Emerging evidence suggests that hydration and rest, followed by nipple stimulation, maternal position changes, acupuncture, and/or water immersion may be effective.<sup>26,54,55</sup> Albers<sup>56</sup> reviewed the conflicting data on the effects of ambulation and cited problems in methodology and confounders in many studies (e.g., randomized women switching groups, definition of ambulation, rules for bedrest, style of electronic fetal monitoring, and amniotomy). As prolonged labor is a nonurgent indication for transfer, some variation in choice can be supported.

### Immediate Postpartum Hemorrhage

With advanced planning, immediate PPH is a complication that can usually be well managed in the home. Factors such as prolonged labor, grand multiparity, or rapid labor with a large infant may increase the risk of PPH. The homebirth midwife will have heightened sensitivity to such factors, may consider prophylactic transfer, and will have pharmaceuticals, syringes, intravenous supplies, and a urinary catheter immediately available. Evaluation and management of bleeding in the home is identical to hospital practice (e.g., digital compression and/or repair of lacerations, vaginal exploration, and assessment and treatment of atony). If there is inadequate response to therapy, emergency medical service is contacted for transport for hospital care.

Transport in the case of moderate PPH is not always required. Sometimes, the midwife will summon emergency personnel but the hemorrhage will have responded

to therapy before their arrival. In this case, the midwife and family will determine advisability of transport dependent on the current maternal status and prognosis. If the uterus is well contracted, the sources of bleeding have been addressed, the infant is nursing well, the vital signs are stable, and the mother is able to engage in self-care without syncope, she may remain on bed rest at home. To assure stability, the midwife usually remains in the home for several hours more than usual. Prophylactic infusion of one or two liters of intravenous fluid and/or a prescription for a postpartum oral oxytocic agent may be provided, especially in the context of homebirth and the absence of continuous nursing care.

### Unstable Newborn

Assessment of respiratory and cardiac status of the newborn begins immediately after the birth in all settings. Both hospital and homebirth providers evaluate and treat infants with poor or absent respiratory effort according to American Academy of Pediatrics/Neonatal Resuscitation Program standards. Recent evidence indicates initiation of bag and mask ventilation with room air may be more effective than with 100% oxygen.<sup>57</sup> Regardless, the oxygen tank can be attached to the tubing and tested for flow before the birth. The reservoir bag can be detached and placed next to the tank with the stethoscope, so that should the addition of oxygen or cardiac assessment be necessary, they are easily accessible. Warmth can be provided continuously with the use of space heaters, the tray prepared with heating pad and receiving blankets, or with foil transport bunting. Emergency services are called for any infant who does not rapidly respond to resuscitation efforts.

Signs of the inability to maintain respiratory health, thermoregulation, hypoglycemia, birth injury, or inability to suckle are all indicators for additional vigilance, supportive therapy, and pediatric consultation if unresolved. Some conditions will resolve spontaneously in the first 24 hours with supportive therapy. For example, transient tachypnea of the newborn is usually self-limiting, but may require the presence of and monitoring by the midwife for an extended period of time. In these cases, the choice of the site of care is made collaboratively between the family, the midwife, and the pediatric provider.

### Congenital Anomalies

Some clients seeking homebirth services decline prenatal testing, such as ultrasound, first trimester screening, and/or amniocentesis. This requires the midwife to be prepared for a wide range of uncommon anomalies, which may not be immediately life-threatening but require prompt transport and evaluation. For an infant who has established adequate oxygenation and perfusion, there is usually a brief visual assessment as the infant

begins to nurse. Infants with cardiac problems often have difficulty simultaneously nursing and breathing. These infants need immediate hospital care. The goal for managing newborns with anatomical anomalies, including gastroschisis, omphalocele, exstrophy of the bladder, or open spinal cord defects is to keep exposed areas moist with sterile saline and gauze, and covered with plastic wrap to maintain moisture, heat, and decrease contamination. The infant should be positioned to support the defect (e.g., prone for Pierre–Robins syndrome) while transport is completed.<sup>42</sup>

Any infant presenting significant findings outside the normal range requires a consult with the pediatric caregiver. Stable infants presenting with orthopedic anomalies or chromosomal disorders (e.g., a cleft lip/palate, Down’s syndrome, or a club foot) may not need immediate pediatric evaluation but may need extra midwifery support and care during the first 24 hours. The infant’s condition, the physical exam, and type of indicated therapy will help determine the timing, setting, and appropriate caregiver for care and/or consultation.

### **INFORMED CHOICE**

Informed decision-making is an essential characteristic of midwifery care. CNMs/CMs who practice in the home setting need to have a clear understanding of the legal and ethical basis of informed decision making. The goal is to provide the laboring woman with the information necessary for her to make an informed choice.

The core elements of informed consent include a discussion of the indications for the intervention, a description of the probable benefits and probable risks associated with the recommended intervention, a discussion of alternative interventions, and a description of the consequences of declining the recommended intervention. In the context of homebirth, the consequences may include conflict with community providers who prefer adherence to an established protocol.

Truly informed choice also requires that a patient be informed when there is little or no evidence to support a particular intervention, or when there is a gap between evidence and standard community practice. This may become particularly relevant when discussing when and if to transfer to the hospital, and what can be expected.<sup>58</sup> Many homebirth clients will have had both the time and inclination to research all options for care, and will be aware of community standards that do not follow the best available evidence.

The courts have repeatedly upheld a patient’s right to refuse treatment, even if not treating may result in serious morbidity or mortality, based on the belief that only the patient can understand her own priorities. Acknowledging this, the American College of Obstetricians and Gynecologists issued a committee opinion in 2004 on informed refusal, stating that once risks, benefits, and

alternatives have been explained, a woman has the right to exercise full autonomy in making an informed decision, which includes informed refusal.<sup>59</sup> An individual’s assessment of risk is based on both fact and emotion. Risk is most effectively communicated when the informant is perceived as being both competent and caring, supportive, and empathetic, all of which engenders trust.<sup>60</sup> For the homebirth midwife, the development of mutual trust and a collaborative relationship with the family is an essential goal, developed over the course of pregnancy through prenatal visits that allow ample time for discussion of medical, psychosocial, and family issues. The joint plan for the intrapartum care of the woman and baby at home acknowledges the family and the midwife as the core health care team, and accounts for individual and cultural differences in priorities for management. Antepartum discussions about variations from normal, transfer protocols, and birth site selection can minimize the possibility of conflict when essential decisions need to be made during the intrapartum period.

### **LESSONS IN PROMOTING NORMAL BIRTH ACROSS SETTINGS**

When midwives assume the primary management role, they are required to utilize the full scope of the ACNM core competencies.<sup>20</sup> Midwives in many hospitals are independently responsible for assessment, diagnosis, and initiation of therapy, even as they arrange for staff assistance, physician consultation, or collaborative care. Their competencies and judgment are deemed adequate to promote optimal outcomes. However, variations among hospitals in CNM/CM credentialing for specific procedures (e.g., repair of lacerations, manual removal of the placenta) may restrict a CNM’s/CM’s ability to independently manage these patients, even though such management is within her scope of practice. Within hospital settings, the ability to receive instant technologic assistance is the “safety net” that provides reassurance to the provider. The presence of pediatric staff at birth, required by some hospitals, may decrease the midwife’s role in newborn care, resulting in a lack of confidence in applying neonatal skills. Although trained in resuscitation, without practice, a midwife may experience apprehension when required to use the skill. Regardless, instant access to technology and specialized staff has not eliminated perinatal mortality and morbidity, even for the lowest-risk women managed in the hospital. Skilled providers must use technology correctly and judiciously to improve obstetric outcomes in any setting.

Familiarity with changes in midwifery practice, based upon emerging evidence that supports the reduced use of an intervention, may be difficult to acquire within an institution that has not updated its protocols. Midwives practicing in homes and midwife-managed birth centers can implement evidence-based management and new procedures more rapidly. The philosophic tenets of the



hallmarks of midwifery<sup>20</sup> include the advocacy of non-intervention in the absence of complications, the incorporation of scientific evidence into clinical practice, and advocacy for informed choice, shared decision-making, and the right to self-determination. Continuity of care and continuous labor presence is inherent in homebirth midwifery practice. Exposure to process and protocols within autonomous practices in out-of-hospital settings may provide opportunities for midwives to reduce the theory–practice gap.

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