Organizational Principles to Guide and Define the Child Health Care System and/or Improve the Health of all Children

Providing Care for Infants Born at Home

Kristi Watterberg, MD, FAAP, COMMITTEE ON FETUS AND NEWBORN

The American Academy of Pediatrics (AAP) believes that current data show that hospitals and accredited birth centers are the safest settings for birth in the United States. The AAP does not recommend planned home birth, which has been reported to be associated with a twofold to threefold increase in infant mortality in the United States. The AAP recognizes that women may choose to plan a home birth. This statement is intended to help pediatricians provide constructive, informed counsel to women considering home birth while retaining their role as child advocates and to summarize appropriate care for newborn infants born at home that is consistent with care provided for infants born in a medical care facility. Regardless of the circumstances of his or her birth, including location, every newborn infant deserves health care consistent with that highlighted in this statement, which is more completely described in other publications from the AAP, including Guidelines for Perinatal Care and the Textbook of Neonatal Resuscitation. All health care clinicians and institutions should promote communications and understanding on the basis of professional interaction and mutual respect.

INTRODUCTION

Women and their families may desire a home birth for a variety of reasons, including cultural or religious beliefs and traditions, hopes for a more family-friendly setting, increased control of the process, and decreased obstetric intervention.\(^1\) The incidence of home birth has increased over the past decade, with the largest increase occurring in white, non-Hispanic women; more than 2% of births to these women now occur at home, with wide variation in incidence among states.\(^2\) However, a woman’s choice to plan a home birth is not well supported in the United States. Problems with home birth include wide variation in state laws and regulations, lack of appropriately trained and willing providers, and lack of supporting systems to ensure the availability of specialty consultation and timely transport to a hospital. Geography also may adversely affect the safety of planned home birth because travel times longer than 15 to 20 minutes to a medical facility have been associated with increased risk for adverse

abstract

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neonatal outcomes, including mortality.3,4

Planned home birth in the United States has previously been reported to be associated with a twofold to threefold increase in perinatal (fetal or newborn) death or an absolute risk increase of approximately 1 to 2 deaths per 1000 live births.5–7 These findings were recently confirmed in a population-based study by using birth certificates with information on intended place of birth as well as actual place of birth, permitting analysis of birth outcomes after intrapartum transfer to the hospital.8

This study also confirmed previous findings that infants born at home in the United States have an increased incidence of low Apgar scores and of neonatal seizures.5,6 There may be an irreducible minimum increase in adverse outcomes with planned home births, even in a well-integrated health care system such as that in England. For example, the English National Institute for Health and Care Excellence recommends that practitioners “advise low-risk nulliparous women that planning to give birth in a midwifery-led unit (freestanding or alongside) is particularly suitable for them because the rate of interventions is lower and the outcome for the baby is no different compared with an obstetric unit. Explain that if they plan birth at home there is a small increase in the risk of an adverse outcome for the baby.”9

This advice is based on the Birthplace in England study, which revealed an increase in composite adverse outcomes of intrapartum stillbirths and early neonatal deaths, neonatal encephalopathy, meconium aspiration syndrome, brachial plexus injury, and fractured humerus or clavicle.10

In a recent position statement, the Committee on Obstetric Practice of the American College of Obstetricians and Gynecologists stated, “Although the College believes that hospitals and accredited birth centers are the safest settings for birth, each woman has the right to make a medically informed decision about delivery.”11 In addition, “Women inquiring about planned home birth should be informed of its risks and benefits based on recent evidence.”11 In the statement, the authors reviewed appropriate candidates for home birth and health care system components “critical to reducing perinatal mortality rates and achieving favorable home birth outcomes” (Table 1).

If requested, pediatric health care providers in the United States should be prepared to provide constructive, informed counsel to women considering home birth while retaining their role as child advocates in assessing whether the situation is appropriate to support a planned home birth (Table 1). In addition to apprising the expectant mother of the increase in neonatal mortality and other neonatal complications with planned home birth (Table 1), the health care provider counseling a pregnant woman about planned home birth should make her aware that some women who plan to deliver at home will need transfer to a hospital before birth because of unanticipated complications. This percentage varies widely among reports, from approximately 10% to 40%, with a higher transfer rate for primiparous women.10,13 The mother should be encouraged to see transfer to a hospital not as a failure of the home birth but rather as a success of the system to provide a healthy outcome for both mother and infant.

Care of the newborn infant born at home is a particularly important topic because infants born at home are cared for outside the safeguards of the systems-based protocols required of hospitals and birthing centers, placing a larger burden on health care providers attending home births to remember and perform all components of assessment and care of the newborn infant. To assist providers, this policy statement addresses the following specific areas: resuscitation and evaluation of the newborn infant immediately after birth and essential elements of care and follow-up for the healthy term newborn infant.

### TABLE 1 Planned Home Birth Considerations

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<th>Potential candidate for home birth</th>
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<tr>
<td>• Absence of preexisting maternal disease</td>
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<td>• Absence of significant disease arising during the pregnancy</td>
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<tr>
<td>• A gestation of 37 + 0/7 to 41 + 6/7 weeks</td>
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<td>• A singleton fetus estimated to be appropriate for gestational age</td>
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<tr>
<td>• A cephalic presentation</td>
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<td>• Labor that is spontaneous or induced as an outpatient</td>
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<tr>
<th>Reported risks to the newborn associated with planned home birth in the United States</th>
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<tr>
<td>• Increased fetal and/or neonatal mortality5–8</td>
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<tr>
<td>• Increased incidence of neonatal seizures5,6,8</td>
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<tr>
<td>• Higher incidence of an Apgar score &lt;4 at 5 min5,6,8</td>
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<th>Systems needed to support planned home birth</th>
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<td>• The availability of a physician or a midwife certified by the American Midwifery Certification Board (or its predecessor organizations) or whose education and licensure meet the International Confederation of Midwives Global Standards for Midwifery Education practicing within an integrated and regulated health system</td>
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<tr>
<td>• Attendance by at least 2 care providers, one of whom is an appropriately trained individual (see text) whose primary responsibility is the care of the newborn infant</td>
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<tr>
<td>• Availability of appropriate equipment for neonatal resuscitation12</td>
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<tr>
<td>• Ready access to medical consultation</td>
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<tr>
<td>• Access to safe and timely transport to a nearby hospital with a preexisting arrangement</td>
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As stated in Guidelines for Perinatal Care, fetal malpresentation, multiple gestation, and previous cesarean delivery are considered absolute contraindications to planned home birth.
ASSESSMENT, RESUSCITATION, AND CARE OF THE NEWBORN INFANT IMMEDIATELY AFTER BIRTH

As recommended by the American Academy of Pediatrics (AAP) and the American Heart Association, there should be 2 care providers present at every birth, at least 1 of whom has the primary responsibility to care for the newborn infant. Situations in which both the mother and the newborn infant simultaneously require urgent attention are infrequent but will, nonetheless, occur. Thus, of the 2 care providers who should attend each birth, at least 1 should have the appropriate training, skills, and equipment to perform a full resuscitation of the infant in accordance with the principles of the Neonatal Resuscitation Program. To facilitate obtaining emergency assistance when needed, the operational integrity of the telephone or other communication system should be tested before the delivery (as should every other piece of medical equipment), and the weather should be monitored. In addition, access to safe and timely transport to a medical facility should be available, and a previous arrangement with that facility should be in place. Examples of guidelines and forms for maternal and infant transport, developed by the Home Birth Summit organization, can be found at http://www.homebirthsummit.org.

Care of the newborn infant immediately after delivery should adhere to practices described in Guidelines for Perinatal Care and should include provision of warmth, initiation of appropriate resuscitation measures, and assignment of Apgar scores. Although skin-to-skin contact with the mother is the most effective way to provide warmth, portable warming pads should be available in case a newborn infant requires resuscitation and cannot be placed on the mother’s chest. The infant should be monitored closely in the transitional period. Temperature, heart rate, skin color, peripheral circulation, respiration, level of consciousness, tone, and activity should be monitored and recorded at least once every 30 minutes until the infant’s condition has remained stable for 2 hours. Infants who receive extensive resuscitation (eg, positive-pressure ventilation for more than 30 to 60 seconds) should be transferred to a medical facility for close monitoring and evaluation. Additionally, any infant who has respiratory distress, continued cyanosis, or other signs of illness should be immediately transferred to a medical facility.

CARE OF THE NEWBORN INFANT

Subsequent newborn care should adhere to that described in Guidelines for Perinatal Care as well as the AAP statement regarding care of the well newborn infant. Although a comprehensive review of these guidelines would be far too lengthy to include in this statement, a few practice points are worthy of specific mention.

- Transitional care (first 4–8 hours): The infant should be kept warm and should undergo a detailed physical examination that includes an assessment of gestational age and intrauterine growth status as well as a comprehensive risk assessment for neonatal conditions that require additional monitoring or intervention. Temperature, heart and respiratory rates, skin color, peripheral circulation, respiration, level of consciousness, tone, and activity should be monitored and recorded at least once every 30 minutes until the infant’s condition is considered normal and has remained stable for 2 hours. A newborn infant who is determined to be <37 weeks’ gestational age by physical assessment should be transferred to a medical facility for continuing observation for conditions associated with prematurity, including respiratory distress, poor feeding, hypoglycemia, and hyperbilirubinemia.

- Monitoring for early-onset sepsis: As recommended by the Centers for Disease Control and Prevention and the AAP, all pregnant women should be screened for group B Streptococcus colonization at 35 to 37 weeks’ gestation. Women who are colonized should be given an intrapartum antibiotic (penicillin, ampicillin, or cefazolin) at least 4 hours before delivery. If the mother has received this intrapartum treatment and both she and her newborn infant remain asymptomatic, they can remain at home if the infant can be observed frequently by an experienced and knowledgeable health care provider. If the mother shows signs of intraamniotic infection (chorioamnionitis) but the infant appears completely well, the infant also can remain at home as long as he or she is observed frequently by an experienced and knowledgeable health care provider: A quantitative estimate of the risk of newborn infection (as can be obtained from use of the sepsis risk calculator at https://neonatalsepsiscalculator.kaiserpermanente.org) may help guide the decision to transfer the infant to a medical facility. If the infant does not appear completely well, the infant should be transferred rapidly to a medical facility for further evaluation and monitoring in accordance with AAP guidelines.

- Glucose screening: Infants who have intrauterine growth restriction or whose mothers have diabetes should be delivered in a hospital or birthing center because of the increased risk of hypoglycemia and other neonatal
complications. If, after birth, an infant is discovered to be small or large for gestational age or an infant has required resuscitation, he or she should be screened for hypoglycemia, as outlined in the AAP statement. If hypoglycemia (glucose level <45 mg/dL) is identified and persists after feeding, the infant should be transferred promptly to a medical facility for continuing evaluation and treatment.

- **Eye prophylaxis**: every newborn infant should receive prophylaxis against gonococcal ophthalmia neonatorum, as directed by local laws and regulations.
- **Vitamin K**: Every newborn infant should receive a single parenteral dose of vitamin K1 oxide (phytonadione [0.5–1 mg]) to prevent vitamin K-dependent hemorrhagic disease of the newborn. Oral administration of vitamin K has not been shown to be as efficacious as parenteral administration for the prevention of late hemorrhagic disease.
- **Hepatitis B vaccination**: For all medically stable infants weighing >2000 g at birth who are born to hepatitis B surface antigen (HBsAg)-negative mothers, the first dose of vaccine should be administered within 24 hours of birth. Only single-antigen hepatitis B vaccine should be used for the birth dose, following proper storage and handling requirements for immunizations. Infants born to mothers who are HBsAg-positive or whose HBsAg status is unknown should also receive hepatitis B immune globulin, as guided by current recommendations.
- **Assessment of feeding**: A trained caregiver should evaluate at least 1 session of breastfeeding, including observation of position, latch, and milk transfer. The mother should be encouraged to record the time and duration of each feeding, as well as urine and stool output, during the early days of breastfeeding. Nomograms providing hour-specific expected weight loss in the first postnatal week can be found at https://www.newbornweight.org/.
- **Screening for hyperbilirubinemia**: Infants whose mothers are Rh-negative should have cord blood sent for a Coombs direct antibody test; if the mother's blood type is O and she is Rh-positive, the cord blood may be tested for the infant's blood type and sent for a direct antibody test, but it is not required, provided that there is appropriate surveillance, risk assessment, and follow-up. All newborn infants should be assessed for risk of hyperbilirubinemia and undergo bilirubin screening between 24 and 48 hours after birth. The bilirubin value should be plotted on the hour-specific nomogram to determine the risk of severe hyperbilirubinemia and the need for repeat determinations.
- **Universal newborn screening**: Every newborn infant should undergo universal newborn screening in accordance with individual state mandates. A list of conditions for which screening is performed in each state is maintained online by the National Newborn Screening and Genetic Resource Center (available at http://genes-r-us.uthscsa.edu/resources/consumer/statemap.htm).
- **Hearing screening**: the newborn infant's initial caregiver should document arrangements for screening the infant's hearing.
- **Pulse oximetry screening**: Screening for congenital heart disease should be performed by using oxygen saturation testing, ideally between 24 and 48 hours' postnatal age. Earlier screening can be performed, although the incidence of false-positive screen results may be increased. Helpful information for oximetry screening for planned home births can be found at https://wisconsinshine.org/home-births/.
- ** Provision of follow-up care**: Documentation of prenatal care, delivery, and immediate postnatal course, in addition to prompt, comprehensive communication with the follow-up care provider, is essential. Completion of forms such as those found on the AAP Bright Futures Web site (https://brightfutures.aap.org) can help provide such communication. A knowledgeable and experienced health care professional should examine all infants within 24 hours of birth and subsequently within 48 hours of that first evaluation. The initial follow-up visit should include infant weight and physical examination, especially for jaundice and hydration. If the mother is breastfeeding, the visit should include evaluation of any maternal history of breast problems (eg, pain or engorgement), infant elimination patterns, and a formal observed evaluation of breastfeeding, including position, latch, and milk transfer. Results of maternal and neonatal laboratory tests should be reviewed; clinically indicated tests, such as serum bilirubin, should be performed; and screening tests should be completed in accordance with state regulations. The documentation provided by the health care professional attending the birth should include whether tests and vaccinations usually performed as part of hospital protocols have been completed or scheduled.

**CONCLUSIONS**

The AAP does not recommend planned home birth. However, the AAP recognizes that women may choose to plan a home birth. The AAP concurs with the American College of Obstetricians and Gynecologists statement that “for quality and safety reasons, the College specifically supports the provision of care by...
midwives who are certified by the American Midwifery Certification Board (or its predecessor organizations) or whose education and licensure meet the International Confederation of Midwives Global Standards for Midwifery Education. The College does not support provision of care by midwives who do not meet these standards.\(^{11}\)

In the case of a home birth, as advocates for children, the AAP recommends that provisions for the potential resuscitation of a depressed newborn infant and immediate neonatal care be optimized in the home setting. Thus, each delivery should be attended by 2 care providers, at least 1 of whom has the primary responsibility for the newborn and has the appropriate training, skills, and equipment to perform a full resuscitation of the infant in accordance with the principles of the Neonatal Resuscitation Program.\(^{12,14}\)

Regardless of the circumstances of his or her birth, including location, every newborn infant deserves health care that adheres to the guidelines highlighted in this statement and more completely described in other AAP publications.\(^{15-17}\) Continuing efforts by all health care clinicians and institutions should promote communications and understanding on the basis of professional interaction and mutual respect.

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**ABBREVIATIONS**
AAP: American Academy of Pediatrics
HBsAg: hepatitis B surface antigen

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