Appendix: Birth Can Safely Take Place at Home and in Birthing Centers

The Coalition for Improving Maternity Services:

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ABSTRACT

Although most women in the United States give birth in hospitals, a substantial body of research suggests that planned home birth or birth in freestanding birth centers have equally good or better outcomes for low-risk women. Out-of-hospital birth often facilitates mother-friendly care. Rationales and systematic reviews of both home birth and freestanding birth center birth are presented.

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The Coalition for Improving Maternity Services (CIMS) *Mother-Friendly Childbirth Initiative* is grounded in the principle that birth can safely take place at home and in birthing centers as well as in hospitals. Although many believe that hospitals are the safest environment for labor and birth, research shows that equally good or better outcomes can be achieved in low-risk women having planned home births or giving birth in freestanding birth centers. Because of its inherently noninterventive and more intimate nature, out-of-hospital birth facilitates mother-friendly care.

For a description and discussion of the methods used to determine the evidence basis of the Ten Steps of Mother-Friendly Care, *see this issue's "Methods" article by Henci Goer on pages 5S–9S.*

HOME BIRTH

For the purposes of this review, home birth has the following characteristics:

- woman is at low risk for complications,
- birth is planned to take place at home, and
- care provider is qualified to provide care in the home setting (this will usually be a professional midwife).

Studies of unplanned home births or home birth with no qualified provider have been excluded.

Care in the home birth setting is consistent with mother-friendly care as defined in this document. The largest prospective study of home births with professional midwives in North America (54,418) found the following (Johnson & Daviss, 2005):

- 92% did not have intravenous fluids during labor (see Step 6 on pp. 32S–64S),
- 90% had fetal heart rate monitoring via intermittent auscultation (Doppler or fetoscope) instead of continuous electronic monitoring (see Step 6),

For more information on the Coalition for Improving Maternity Services (CIMS) and copies of the Mother-Friendly Childbirth Initiative *and accompanying* Ten Steps of Mother-Friendly Care, *log on to the organization's Web site (www.motherfriendly.org) or call CIMS toll-free at 888-282-2467.*

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- 90% achieved spontaneous labor (see Step 6),
- 2% had an episiotomy (see Step 6), and
- 3.7% had a cesarean section (see Step 6).

Home Birth

Rationale for Compliance	Evidence Grade
Compared with a similar population of women having hospital births, planned home births with a qualified attendant resulted in the following maternal outcomes (including mothers who intended to give birth at home at the onset of labor but were transferred to the hospital at some time during or after labor):	
• similar rates of antepartum and/or intrapartum hypertension (PIH, pre-eclampsia) (Ackermann-Liebrich, 1996; Wiegers, 1996).	**Quality:** A **Quantity:** B **Consistency:** A
• fewer or similar rates of induction of labor (Janssen, 2002; Johnson, 2005; Olsen, 1997; Weigers, 1996).	**Quality:** A **Quantity:** A **Consistency:** A
• fewer or similar rates of augmentation of labor (Janssen, 2002; Johnson, 2005; Olsen, 1997; Weigers, 1996).	**Quality:** A **Quantity:** A **Consistency:** A
• lower incidence of active phase arrest of labor in multiparous women (cessation of progress in cervical dilation after 3–4 cm in women with prior births) (Wiegers, 1996).	**Quality:** A **Quantity:** C **Consistency:** NA*
• less use of intravenous fluids in labor (see also Step 6, p. 34S) (Johnson, 2005).	**Quality:** B **Quantity:** A **Consistency:** NA*
• less use of amniotomy in labor (see also Step 6, p. 38S) (Janssen, 2002; Johnson, 2005).	**Quality:** A **Quantity:** A **Consistency:** A
• similar incidence of abnormal fetal heart rate in labor (Wiegers, 1996; Woodcock, 1994).	**Quality:** B **Quantity:** B **Consistency:** A
• less use of continuous electronic fetal monitoring (external and internal) (Janssen, 2002; Johnson, 2005).	**Quality:** A **Quantity:** A **Consistency:** A
• increased choice of movement and birth position in labor (see also Step 4, pp. 24S–26S) (Ackermann-Liebrich, 1996).	**Quality:** A **Quantity:** B **Consistency:** NA*
• less need for analgesia in labor (Ackermann-Liebrich, 1996; Janssen, 2002).	**Quality:** A **Quantity:** A **Consistency:** A
• less need for epidural and/or spinal anesthesia in labor (Janssen, 2002; Johnson, 2005).	**Quality:** A **Quantity:** A **Consistency:** A
• fewer vaginal instrumental deliveries (vacuum extraction and forceps) (Janssen, 2002; Johnson, 2005; Olsen, 1997).	**Quality:** A **Quantity:** A **Consistency:** A
• fewer cesarean sections as follows: ○ fewer or equivalent cesareans (Janssen, 2002; Johnson, 2005; Olsen, 1997; Wiegers, 1996).	**Quality:** A **Quantity:** A **Consistency:** A

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Home Birth

Rationale for Compliance	Evidence Grade
○ fewer cesareans in nulliparous women (Janssen, 2002).	**Quality:** A **Quantity:** B **Consistency:** NA*
○ fewer cesareans in multiparous women (Janssen, 2002).	**Quality:** A **Quantity:** A **Consistency:** NA*
○ fewer cesareans in women who have had a cesarean before (more vaginal births after cesarean) (Janssen, 2002).	**Quality:** A **Quantity:** B **Consistency:** NA*
○ fewer cesareans for labor progress disorders (labor dystocia, failure to progress, cephalopelvic disproportion, arrest of labor) (Janssen, 2002).	**Quality:** A **Quantity:** B **Consistency:** NA*
○ fewer or equivalent cesareans for emergencies in labor, such as fetal distress (Janssen, 2002; Woodcock, 1994).	**Quality:** B **Quantity:** B **Consistency:** A
• fewer perineal injuries as measured by:	
○ more intact perineums (Ackermann-Liebrich, 1996; Janssen, 2002).	**Quality:** B **Quantity:** A **Consistency:** A
○ fewer episiotomies (Janssen, 2002; Johnson, 2005; Olsen, 1997; Wiegers 1996).	**Quality:** A **Quantity:** A **Consistency:** A
○ fewer or similar rates of anal sphincter laceration (Olsen, 1997; Wiegers, 1996).	**Quality:** A **Quantity:** A **Consistency:** A
• reduced need for maternal blood transfusion (Wiegers, 1996).	**Quality:** B **Quantity:** B **Consistency:** NA*
• less or equivalent incidence of maternal infection or need for antibiotics after birth (Janssen, 2002; Wiegers, 1996).	**Quality:** A **Quantity:** A **Consistency:** A
Among women having a home birth after a hospital birth, 85% said they preferred the home birth experience and, of those planning more children, 91% said they would plan a home birth (Davies, 1996).	**Quality:** B **Quantity:** B **Consistency:** NA*
Compared with similar women having hospital births, planned home births with a qualified attendant resulted in the following perinatal outcomes:	
• similar percentages of low-birth-weight infants (Ackermann-Liebrich, 1996; Janssen, 2002; Wiegers, 1996).	**Quality:** A **Quantity:** B **Consistency:** B
• similar rates of infants admitted to intensive care units (Wiegers, 1996).	**Quality:** A **Quantity:** B **Consistency:** NA*
• less or similar rate of birth traumas (Durand, 1992; Wiegers, 1996; Woodcock 1994).	**Quality:** A **Quantity:** A **Consistency:** A
• similar perinatal mortality rates for infants born to low-risk mothers planning homebirths (Gulbransen, 1997; Janssen, 2002; Olsen 1997).	**Quality:** A **Quantity:** A **Consistency:** A

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Home Birth

Rationale for Compliance	Evidence Grade	
• increased incidence of neonatal acidemia in home-born infants compared with hospital-born infants. (Ackermann-Liebrich, 1996). However, evaluation by neutral pediatricians between day 2 and day 6 of life showed no differences between home- and hospital-born infants. Study authors explained that lower blood pH measurements are probably an artifact arising from the common practice of delayed cord clamping at home births and the additional time needed to transport blood samples to the hospital for analysis.	**Quality:** **Quantity:** **Consistency:**	B B NA*

A = good; B = fair; C = weak; NA = not applicable; PIH = pregnancy-induced hypertension
Quality = aggregate of quality ratings for individual studies
Quantity = magnitude of effect, numbers of studies, and sample size or power
Consistency = the extent to which similar findings are reported using similar and different study designs
*only one study

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EXCLUDED STUDIES

Anderson, R. E., & Murphy, P. A. (1995). Outcomes of 11,788 planned home births attended by certified nurse-midwives. A retrospective descriptive study. *Journal of Nurse-Midwifery, 40*(6), 483–492. **Reason:** Had better quality, more recent research; no comparative data included.

Bastian, H., Keirse, M. J., & Lancaster, P. A. (1998). Perinatal death associated with planned home birth in Australia: Population based study. *BMJ, 317*(7155), 384–388. **Reason:** Poor study design. Population includes high-risk mothers (twins, intra-uterine growth retardation, preterm, breech) and outcomes not adjusted for these factors.

Murphy, P. A., & Fullerton, J. (1998). Outcomes of intended home births in nurse-midwifery practice: A prospective descriptive study. *Obstetrics and Gynecology, 92*(3), 461–470. **Reason:** Not applicable. Lacks comparative analysis with hospital outcomes.

Pang, J. W., Heffelfinger, J. D., Huang, G. J., Benedetti, T. J., & Weiss, N. S. (2002). Outcomes of planned home births in Washington state: 1989–1996. *Obstetrics and Gynecology, 100*(2), 253–259. **Reason:** Poorly designed. Quality of study poor enough to invalidate results for the following reasons:

- includes unplanned and possibly unattended home births;
- includes unplanned home births with unqualified attendants;
- includes preterm births;
- although it reports a high perinatal mortality, 10 of the 20 babies who died had congenital heart disease; some home births may have been chosen with the parents knowing the prognosis; and
- selection criteria of home births studied never established.

FREESTANDING BIRTH CENTERS

For the purposes of this document, birth centers are defined as freestanding facilities that provide intrapartum and immediate postpartum care to low-risk women and their newborns. Studies of hospital-based birth centers were excluded for two reasons. The first reason is that freestanding birth centers provide a largely homogenous style of care aligned with the mother-friendly model (Rooks, 1992a, 1992b). For birth centers located within hospitals, the style of care and practice policies can vary greatly from one center to another and from that typical in freestanding birth centers, depending on the hospital's model of care and its influence on the birth center. The second reason is that a freestanding birth center's care involves the need to transfer women and/or babies to the hospital when indicated—an important difference from in-hospital care.

Freestanding Birth Centers

Rationale for Compliance	Evidence Grade	
The National Birth Center Study (Rooks, 1992a, 1992b) evaluated the care and outcomes of 11,814 women admitted in labor at 84 birth centers and found the following practice patterns:	**Quality:** **Quantity:** **Consistency:**	A B NA*
• 41% had nonclear fluids or solid food during labor (see Step 6 on pp. 32S–64S). • 80% did not have intravenous fluids during labor (see Step 6 on pp. 32S–64S). • 90% had fetal heart rate monitoring via intermittent auscultation (Doppler or fetoscope) instead of continuous electronic monitoring (see Step 6 on pp. 32S–64S). • 49% used hydrotherapy (22% tub, 27% shower) (see Step 7 on pp. 65S–73S). • 35% were given massages in labor (see Step 7 on pp. 65S–73S). • 13% chose to use systemic analgesia (see Step 7 on pp. 65S–73S). • 3% chose to have epidural analgesia (see Step 7 on pp. 65S–73S). • 79% gave birth in nonsupine positions (see Step 4 on pp. 25S–27S). • 90% initiated breastfeeding (see Step 10 on pp. 79S–80S).		
Birth center care results in a cesarean section rate (4.4%) significantly lower than national outcomes reported for the same time period (Rooks, 1992b).	**Quality:** **Quantity:** **Consistency:**	B A NA*
Birth center care results in a perinatal mortality rate (1.3 per 1,000 births overall; 0.7 per 1,000 births excluding congenital anomalies) significantly lower than national outcomes reported for the same time period (Rooks, 1992b).	**Quality:** **Quantity:** **Consistency:**	B B N *
When compared with similar populations, care in freestanding birth centers resulted in the following maternal outcomes:		
• similar antepartum hospital admission rates (Jackson, 2003 American Journal of Public Health [AJPH]).	**Quality:** **Quantity:** **Consistency:**	A B NA*
• fewer inductions of labor (see also Step 6, pp. 42S–44S) (Jackson, 2003 AJPH).	**Quality:** **Quantity:** **Consistency:**	A B NA*
• less frequent oxytocin augmentation of labor (Jackson, 2003 AJPH).	**Quality:** **Quantity:** **Consistency:**	A B NA*
• increased intake of food and drink in labor (Jackson, 2003 AJPH).	**Quality:** **Quantity:** **Consistency:**	A B NA*
• increased use of ambulation in labor (see also Step 4, p. 24S) (Jackson, 2003 AJPH).	**Quality:** **Quantity:** **Consistency:**	A B NA*
• less frequent use of intravenous fluids in labor (see also Step 6, p. 34S) (Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:** **Quantity:** **Consistency:**	A A A

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Freestanding Birth Centers

Rationale for Compliance	Evidence Grade	
• less use of amniotomy in labor (see also Step 6, p. 38S) (Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	A
	Consistency:	A
• fewer episodes of abnormal fetal heart rate in labor (Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	A
	Consistency:	A
• less use of continuous electronic fetal monitoring (external and internal) (see also Step 6, p. 39S) (Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	A
	Consistency:	A
• more effective pain management in labor, including:		
○ less frequent use of analgesia in labor (Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	A
	Consistency:	A
○ less frequent use of epidural anesthesia in labor (Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	A
	Consistency:	A
○ more use of nonpharmacological pain relief measures in labor, including hydrotherapy, comfort measures, and other strategies (see also Step 7, pp. 65S–68S) (Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	A
	Consistency:	A
• increased number of spontaneous vaginal births (David, 1999; Jackson, 2003 AJPH; Walsh, 2004).	**Quality:**	A
	Quantity:	A
	Consistency:	A
• fewer vaginal instrumental deliveries (vacuum extraction and forceps) (David, 1999; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	A
	Consistency:	A
• fewer cesarean rates overall (David, 1999; Jackson, 2003 AJPH; Walsh, 2004).	**Quality:**	A
	Quantity:	A
	Consistency:	B
• fewer episiotomies (Fullerton, 1992; Jackson, AJPH 2003; Walsh, 2004).	**Quality:**	A
	Quantity:	A
	Consistency:	A
• similar incidence of maternal infection or need for antibiotics after birth when compared with hospital births (Jackson, 2003 AJPH). No study found an increase in the infection rate with birth center care.	**Quality:**	A
	Quantity:	B
	Consistency:	NA*
When compared with similar populations planning hospital births, care in freestanding birth centers resulted in the following perinatal outcomes:		
• similar rates of preterm births (Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	B
	Consistency:	NA*
• similar rates of low–birth-weight infants (David, 1999; Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	A
	Consistency:	A
• similar incidence of thick meconium in the amniotic fluid (Fullerton, 1992; Jackson, 2003 AJPH).	**Quality:**	A
	Quantity:	B
	Consistency:	NA*
• lower incidence of fetal heart rate abnormalities (Fullerton, 1992; Jackson, 2003).	**Quality:**	A
	Quantity:	A
	Consistency:	A

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Freestanding Birth Centers

Rationale for Compliance	Evidence Grade	
• similar rates of infants being admitted to intensive care units after birth (David, 1999; Jackson, 2003 AJPH).	**Quality:** **Quantity:** **Consistency:**	A B A
• fewer infants requiring evaluation and treatment for infection (Jackson, 2003 AJPH).	**Quality:** **Quantity:** **Consistency:**	A B NA (only 1 study)
• similar incidence of neonatal readmission (Jackson, 2003 AJPH).	**Quality:** **Quantity:** **Consistency:**	A B NA*
Women delivering in birth centers reported that, compared with their prior experiences in hospitals, birth center staff (Coyle, 2000): • treated pregnancy and birth as a natural life event; • treated women as autonomous individuals and provided them with information that enabled them to make informed decisions; • actively encouraged women to listen to their bodies and trust their ability to give birth naturally; • had a noninterventionist approach to care; and • supported the mother's own belief in the normalcy of birth.	**Quality:** **Quantity:** **Consistency:**	B B NA*

A = good; B = fair; NA = not applicable
Quality = aggregate of quality ratings for individual studies
Quantity = magnitude of effect, numbers of studies, and sample size or power
Consistency = the extent to which similar findings are reported using similar and different study designs
*only one study

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Walsh, D., & Downe, S. M. (2004). Outcomes of free-standing, midwife-led birth centers: A structured review. *Birth, 31*(3), 222–229.

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Gottvall, K., Grunewald, C., & Waldenstrom, U. (2004). Safety of birth centre care: perinatal mortality over a 10-year period. *BJOG, 111*(1), 71–78. **Reason:** Not applicable. Birth center located within a hospital.

Schmidt, N., Abelsen, B., & Oian, P. (2002). Deliveries in maternity homes in Norway: Results from a 2-year prospective study. *Acta obstetricia et Gynecologica Scandinavica, 81*(8), 731–737. **Reason:** No data for comparison to similar population. Also, geographical obstacles require 2–3 hours for transport; not generalizable to other locations.

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