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A Reconsideration of Home Birth in the United States

Howard Minkoff and Jeffrey Ecker

ABSTRACT

Home births continue to constitute only a small percentage of all deliveries in the United States, in part because of concerns about their safety. While the literature is decidedly mixed in regard to the degree of risk, there are several studies that report that home birth may at times entail a small absolute increase in perinatal risks in circumstances that cannot always be anticipated prior to the onset of labor. While the definition of "small" will vary between individuals, and publications vary in the level of risk they ascribe to birth at home, studies with the least methodological flaws and with adequate power often cite an excess death rate in the range of one per thousand.

Home birth is, in that regard, but one example of patients' choices and plans that sometimes carry increased risk or include alternatives that individual physicians feel uncomfortable supporting or recommending. Our intention in this opinion piece is not to advocate for or against home birth. Rather, we recognize that home birth is but one example of a patient choice that might differ from what a provider feels is in a woman's best interests.

In this article we will discuss ethical considerations in such circumstances using home birth as an example. We consider in this article how the ethical principles of respect for autonomy and non-maleficence can be balanced using, among other examples, the choice by some for a home birth. We discuss how absolute rather than relative risk should guide individuals' evaluation of patient choices. We also consider how in some circumstances, the value and safety added by a physician's participation may outweigh a potentially small increment in absolute risk that might result from a patient's decision to deliver at home because of a perceived physician endorsement.

We recognize, however, that doctors and midwives participating in choices they have not recommended, or may even believe will lead to or increase risk for adverse outcomes, presents dilemmas and raises important questions. When does respect for patient choice and autonomy become support for poor decision making? When is participation not respectful but enabling? Finally we discuss the role and responsibility of organized medicine in making all births as safe as possible.

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INTRODUCTION

Several years ago the only hospital in New York City that provided backup services for midwives who performed home births closed.[1] While home birth advocates lamented the closure, obstetrics' organizations were less troubled. As recently as 2008 the American College of Obstetricians and Gynecologists (ACOG) had reiterated its long-standing opposition stating, "While childbirth is a normal physiologic process that most women experience without problems, monitoring of both the woman and the fetus during labor and delivery in a hospital or accredited birthing center is essential because complications can arise with little or no warning. . . ."[2] Those complications, whether a cord prolapse or a

placental abruption, can be accompanied by rapid drops in pH[3] and increases in base excess[4] that in turn are potentially perilous when they occur at some remove from a hospital, anesthesiologists, appropriate pharmaceuticals, equipment, and an operating room. A meta-analysis published in 2011 reinforced concerns about home birth, reporting that neonatal deaths were tripled in that setting.[5] A separate analysis by Evers and colleagues[6] of births in Utrecht in the Netherlands found that delivery-related perinatal deaths were more frequent among low-risk midwife-supervised deliveries than obstetrician-supervised secondary care. Given that many low-risk deliveries in the Netherlands are planned for home birth, these results were highly suggestive that site of birth could be linked to perinatal risk.

Given the risks these studies suggest, what would justify physicians' reconsidering home birth in the U.S.? First, as we have previously noted, some women desire home birth.[7] In the U.S., where home birth is actively discouraged, only approximately one in 200 births occur at home. However the rate may be rising. The National Center for Health statistics reported that "After a gradual decline from 1990 to 2004, the percentage of home births increased by 5 percent to 0.59 percent in 2005 and remained steady in 2006."[8] Additionally, the number of women who actually deliver at home may represent only a percentage of those who would, were that option more readily available. For example, in England it has been estimated that 8 to 10 percent of women desire home birth,[9] but because of a shortage of trained providers, only 2 percent actually deliver at home.[10]

Those facts alone should lead to some consideration about what drives people, if not *to* home birth, then at least *away* from hospitals. The ACOG seems to have recognized this dynamic when it modified its statement on home birth in 2011, noting that, although it believes hospitals are safer, it respects the right of women to make informed decisions about the site of birth.[11] ACOG was cautious in its statement, emphasizing the need to counsel women about the risks and benefits of their choice, limiting that choice to appropriate candidates, and highlighting the need for well-trained certified midwives to be part of the delivery team and to have provision made for timely transport to a hospital if needed. Still, its 2011 statement represented, at minimum, a dramatic change in tone and emphasis from statements promulgated as recently as 2008, when ACOG restated its opposition to home birth. "The American College of Obstetricians and Gynecologists (ACOG) reiterates its long-standing opposition to home births," adding, as noted above, that "While childbirth is a normal physiologic process that most women experience without problems, monitoring of both the woman and the fetus during labor and delivery in a hospital or accredited birthing center is essential because complications can arise with little or no warning even among women with low-risk pregnancies."[12]

A second reason for reconsideration of home birth is that the evidence upon which the ACOG based its original objection has serious limitations, as ACOG acknowledged in its more recent statement. Third, other organizations (for example, the Society of Obstetricians and Gynecologists of Canada—SOGC,[13] the Royal College of Obstetricians and Gynecologists—RCOG,[14] and the American Public Health Association—APHA[15]) that share ACOG's philosophy regarding many other issues, do not share ACOG's conclusions regarding home birth. The RCOG, for example, has stated they "support home birth for women with uncomplicated pregnancies. . . . There is ample evidence showing that labouring at home increases a woman's likelihood of a birth that is both satisfying and safe." Finally, even if it was determined that home birth in the best of circumstances (that is, with well-trained midwives, well-screened populations, and birth plans that included contingencies for emergency transit to hospitals) were associated with increased risk, women would retain autonomy and could chose to accept risk. This reality leaves open a key question: should obstetricians be involved in "harm reduction," that is, developing collaborative protocols and otherwise working to make home birth as safe as possible? This article will focus on these issues and conclude with a series of recommendations intended to make the choice of home birth a safer alternative, regardless of the frequency with which it is exercised.

WHY CHOOSE HOME BIRTH? WHY WORRY ABOUT SUCH A CHOICE?

Several reasons have been cited for women's interest in home birth, including the:

> . . . support and empowerment attained through their relationship with the midwife, perceptions of relaxation in their own home, being informed and included in the planning of their care, and the amount of time the midwife spent with their family . . . the confidence arising from their intense preparation and partnership with their midwives permitted them to choreograph their birth experience to a degree that would not be possible in a formal setting.[16]

A Swedish study reported that a wish to have the baby's siblings and a female friend present at the birth, not wanting pharmacological pain relief during labor and birth, and dissatisfaction with medical aspects of intrapartum care also played a role.[17] The U.S. Center for Health Statistics suggests women may choose home birth for reasons that include "a desire for a low-intervention birth in a familiar environment surrounded by family and friends and cultural or religious concerns."[18] Some Amish women, for example, feel that their beliefs are more likely to be respected at home,[19] and women from countries where home birth is the norm may be more likely to opt out of hospital birth. There is some evidence that the expectations of women choosing home birth are realized, at least in so far as several studies have reported higher satisfaction scores for women delivering at home.[20]

Satisfaction, however, must be balanced by considerations of safety. Unfortunately, while a large number of studies of home birth have been published, the literature is compromised by a lack of randomized trials and by biases in available retrospective population data. Such biases include inherent differences in the populations choosing different birth settings (as noted above) and difficulties in data ascertainment and reporting. Ideally, for example, studies of home birth should not include unscheduled home birth, since women who have an unplanned home birth represent a uniquely at-risk group (for example, potentially more limited resources, planning, and prenatal care).[21] Studies should also assign to the home birth cohort those women who required transfer to hospital after beginning with a plan to labor and deliver at home, for such a transfer may potentially harbor worse outcomes. If not appropriately addressed, the first issue inflates the risk of home birth, while the second inappropriately underestimates such risk.

Wax and colleagues, in a recent meta-analysis, addressed both issues and found that "Although planned home and hospital births exhibited similar perinatal mortality rates, planned home births were associated with significantly elevated neonatal mortality rates."[22] However, that finding is tempered by additional considerations. First, although the difference in the relative risk of neonatal death was significant in this study, the absolute increase was not large: approximately one additional death per thousand. Second, there was no standard for quality applied to home birth attendants, or exclusions if there were no clear systems to link homes to hospitals; thus it is possible that the results included outcomes from both suboptimally as well as appropriately prepared home settings. To this end, in sensitivity analysis, when studies that included births not attended by certified midwives were excluded, there were no longer significant differences in neonatal mortality. Also, a study by de Jonge and colleagues, the largest study in the meta-analysis[23] (more than 300,000 births, compared with approximately 20,000 among all of the other studies combined) was not included in the neonatal mortality assessment because it looked at early but not late neonatal deaths. It should be noted that the de Jonge study found no excess deaths in the home birth group, whether it included neonatal deaths within 24 hours of birth or within a week, and actually reported fewer neonatal intensive care admissions. Additionally, in the Wax meta-analysis, there were countervailing benefits reported among home births. Infants born at home were less likely to be premature, have low birth weight, and need assisted ventilation. There were fewer maternal interventions, including episiotomy and operative delivery. Women were less likely to experience lacerations, hemorrhage, and infections.

While the Wax meta-analysis has engendered much debate, subsequently published studies support its conclusion that home birth is associated with a small absolute risk of adverse neonatal outcomes, including mortality. For example, the Birthplace in England study, a large prospective cohort analysis of outcome by place of intended birth, concluded that, for nulliparous women (women who have not yet had a baby), the odds of a composite adverse outcome (stillbirth after start of care in labor, early neonatal death, neonatal encephalopathy, meconium aspiration syndrome, brachial plexus injury, fractured humerus, or fractured clavicle) were higher for planned home births (adjusted odds ratio 1.75, 95 percent confidence interval 1.07 to 2.86).[24]

Ultimately, although the Wax study concluded that risks from home birth was greater than those from hospital birth, it stated, "a reasonable estimate of the excess neonatal mortality realized by planned home births . . . would be one death per 1,333 births."[25] That level of risk is not dramatically different from other risks that are associated with a variety of delivery options, such as trial of labor after cesarean section (TOLAC) that are now open to women, and that are supported, or even encouraged, by professional obstetrical organizations. In addition, it is worth noting that in analyzing much of the same literature as Wax, the United Kingdom's RCOG concluded, "home birth is a safe option for many women."[26] In part, the RCOG's alternate interpretation of the same data may have been the result of an alternate frame and perspective that it used

for its analysis, since it set out "not to define safety in its narrow interpretation as physical safety only but also to acknowledge and encompass issues surrounding emotional and psychological well-being. Birth for a woman is a rite of passage and a family life event, as well as being the start of a lifelong relationship with her baby." For the RCOG and others, including patients, home birth may be about more than just morbidities and mortalities as traditionally defined by U.S. obstetricians.

The ACOG position, both the older version and the newer Committee Opinion, has focused on the risks of home birth, such as those highlighted by Wax, more than on the benefits enumerated by the RCOG. Differences in the weighting of values such as safety, patient satisfaction, and family choice explain only a part of the difference between the U.S. and England in attitudes toward home birth. Differences in the systems available to support home birth may also contribute to differences in perspectives across continents between ACOG and RCOG. de Jonge and colleagues, whose data contributed the bulk of the patients to the Wax meta-analysis, found, for example, that home birth was safe, "provided the maternity care system facilitates this choice through the availability of well-trained midwives and through a good transportation and referral system."[27] Similarly, the RCOG opinion regarding home birth explicitly stipulates, "Both the RCM [Royal College of Midwives] and the RCOG believe that to achieve best practice within home birth services it is necessary that organizations' systems and structures are built to fully support this service."[28] The U.S. currently lacks that framework, and ACOG has recognized the potential importance of that deficiency: "Another factor influencing the safety of planned home birth is the availability of safe and timely intrapartum transfer of laboring patients. The relatively low perinatal and newborn mortality rates reported for planned home births reported from Ontario, British Columbia and the Netherlands were from highly integrated health care systems."[29]

This absence of an organized system for home birth underpins, at least in part, the reticence of some ethicists to embrace the somewhat more liberal ACOG statement in 2011. For example, Chervenak and colleagues felt that this statement did not adequately address obstetricians' obligations to discuss and highlight risks with women interested in home birth.[30] In particular they noted that "transport systems in most locales are not as well developed as in the Netherlands," and went on to state, "the clinical and ethical significance of the transport issue cannot be overemphasized."

However, Chervenak and McCullough had a more elemental argument that turned on their particular view of physicians' obligations to mothers and their fetus, specifically the manner in which physicians should approach a pregnant woman's choice in the setting of home birth. Patient choice and respect for patient autonomy are increasingly valued in medical decision making, and deference to patient wishes has been proposed as an appropriate solution to resolving ethical and other conflicts that arise as patients and providers choose among alternate paths of management.[31] Indeed, some suggest the principle of respect for autonomy is "first among equals."[32] However, respect for autonomy may present challenges when patient choices do not match the choices preferred or, in some cases, permitted by individual providers, facilities, or healthcare organizations. Chervenak and McCullough, in their article on home birth, espoused the standard principle-based approach to medical ethics, of which respect for autonomy is an important part, but they assigned equal weight to fetal beneficence-based obligations and maternal autonomy-based obligations.[33] They further argued that if an intervention is reasonably expected to result in "unacceptable clinical risk" for either the mother or fetus, the clinician should recommend against it. They believed that home birth is such an unacceptable risk.

We would raise two issues in that regard: how to weigh risks, and, more importantly, the nature of physicians' obligations if the mother's weighting is different than the physician's. In regard to the first issue—the need to recommend against unacceptable risks—the devil is, of course, in the definition of "unacceptable." In the first instance, as we will argue later, using relative risk as a determining metric can lead to misleading advice. One could use the fact that the risks from making a left turn in a car are substantially higher than from making a right turn as an argument for counseling women with children in their car against ever making a left turn. Yet we accept that the inconvenience of making extra turns just to arrive at the same spot is sufficiently important to outweigh the risks to the child-passenger of a car that makes left turns. "Higher" is not enough when risks are to be judged. Before any potential higher risk from home birth drives decisions and/or policy, we believe that, given the absolute risks (approximately one per thousand), maternal concerns about the medicalization of birth must be afforded due consideration. At the very least, efforts to make hospital birth more attractive and less "medical," when appropriate, should be considered, since such efforts offer the possibility of pleasing both sides in

this debate. We agree that when discussing options with a patient who expresses an interest in home birth it is appropriate to raise the issue of the mother's beneficence-based obligations to her fetus. Since she may be balancing the importance of a family-centered experience against risks to her child, obstetricians should offer reliable counsel about the consequences of her decision. The goal in such conversation is to educate, not to make women feel guilty about what some may perceive to be a riskier choice. Regret is possible regardless of choice: a woman who has an uncomplicated low-risk hospital birth may, in retrospect, wish she had chosen a home delivery, while another who had a complication at home may wish she had opted for hospital birth. Obstetricians may need to couple that with efforts to make whatever choice a woman makes as a safe as possible, since her weighting of benefits and burdens may not mirror the obstetrician's.

The legitimate concerns about daunting logistical hurdles in the U.S. (how to organize an efficient system for hospital transport from home birth, especially in rural areas?) should not be seen as a fixed barrier to home birth. Rather, such concerns raise the question of whether, as obstetrical care in the U.S. undergoes other transitions (for example, the increasing rarity of solo practice, the use of laborists —obstetricians whose sole responsibility is covering a labor and delivery unit, more hospital-owned practices), we should develop an infrastructure that would more safely accommodate birth alternatives. There can be no argument that there are regions in the U.S. where designing a system for safe transport from home to hospital when intrapartum complications arise will be challenging, if not impossible. In some rural settings, homes may be hours from hospitals. In some urban areas, four- or five-story walkups make movement of women in labor exceedingly difficult and dangerous. However, a strategic approach to designing an integrated setting would recognize instances in which the risks of home birth would be prohibitive, and guidelines could reflect that reality. In some countries where home birth is common, for example, such a birth is only allowed on the first floors of a dwelling. Similarly, home birth would be discouraged by public and professional health organizations in areas where prompt hospital transfer could not be effected.

An integrated system that tethers home birth to backup centers lies, at best, somewhere in the future. In regard to physicians' obligations within the current system, we would suggest that there are three: first, to consider how their participation can potentially benefit or harm women; second, to open a dialogue with other stakeholders, including patients and home birth providers, in order to consider the future of home birth; and, third, to minimize risks to women who choose home birth, even if/when physicians do not agree with that choice. All of this may involve a shift to what some may recognize as a deliberative, rather than an informative, paradigm for patient engagement and counseling.[34]

In regard to these obligations, we acknowledge that provider participation in choices they have not recommended presents a dilemma. Central to the answers to the questions posed earlier (When does respect for patient choice and autonomy become support for poor decision making? When is participation not respectful but enabling?) is a balancing of the principles of beneficence (doing good) and non-maleficence (not doing harm). Arguably many, if not most, medical choices will be made safer by a physician's participation. Physicians and midwives possess knowledge and skills not held by most patients, assets that permit them to manage medical problems and emergencies in a manner that will lead toward optimal outcomes. If nothing else, physicians' training may allow them to recognize when a chosen plan encounters complications—anticipated or not—that require modifying or abandoning the original approach in favor of alternate strategies.

Yet, what if making a bad option safer makes that option appealing in ways that it would not otherwise be? Perhaps, absent physician involvement in a risky plan, a patient would have chosen the usual recommended course. In such cases, by respecting patient choice and actively participating in a plan they would not recommend, providers may seem to violate their obligation to do no harm. Participation and collaboration may not be the lesser of two evils when a third path—recommended clinical management—is the alternative, albeit an alternative that would seem to limit patient choice and autonomy. In considering limits on patient choice, it is important to recognize that while a patient's right to refuse almost anything (even when pregnant) has few limits, her right to demand any/every intervention is more limited. Using our current construct, let us assume a woman is a poor candidate for a home birth (for example, a breech with three prior cesarean sections and a placenta previa). One alternative would be having a physician in the home who would try his or her best to perform surgery with a kitchen knife and a sewing needle. A second approach would be to look away and forgo any involvement, and the third (recommended clinical management) would be to convince the patient to come to the hospital for a scheduled cesarean section.

Dilemmas of this sort are not uncommon in medicine. To what degree should physicians support those seeking a trial of labor after cesarean delivery at a site without immediately available resources for cesarean delivery, for example? As a matter of policy, the debate surrounding "harm reduction"—for example, needle exchange for those using intravenous drugs—presents similar issues. Home birth is another illustration of the complexities raised by these sorts of issues.

In regard to the second obligation that we suggest above (to open a dialogue with other stakeholders), medical and midwifery organizations have labored on equal footing in countries where home birth has been most successful. That relationship facilitates the final obligation noted above (making such deliveries as safe as possible for those who choose to have them, even after being informed of possible risks). Credible medical and midwifery organizations recognize that home birth must be subject to guidelines and standards. Therefore, judgments about home birth should be based on an assessment of what would transpire if an integrated healthcare system were in place that required credentialed home birth attendants, and that facilitated referral and transportation. If home birth would be an acceptable option under those circumstances, then obstetricians should be partners in efforts to create those conditions. While those efforts might be Herculean, the antecedent step would be simpler: to have a conversation with midwifery organizations to objectively consider all aspects of home birth, such as factors that make it more risky (for example, previous cesarean sections, long distances from a hospital) or less risky (qualified personnel in attendance, plans for transfer if necessary).

Regardless of whether those efforts are undertaken, obstetricians already have a critical third obligation: to play a role in assuring that women who have a home birth are as safe as possible, even if such a birth is opposed precisely because of the perceived danger that it entails. The debate about the appropriateness of home birth won't end merely because some studies suggest that neonatal death rates will rise by one per thousand, even if it were conceded that that number was accurate. That level of obstetric risk has been reported to result in different clinical choices by different populations.[35] Therefore, rather than ostracizing women who arrive at a hospital after a failed attempt at home birth, obstetricians should work with home birth advocates not only to make sure that women are informed of the risks of home birth and dissuaded as appropriate, but also to engage in a dialogue that would make the process as safe as possible for those who chose home birth in the face of fair and objective warnings. Accordingly, when women who start labor at home need to come to the hospital, obstetricians must assure that there is no delay in transport, that all women are readily accepted into the hospital, and that there is no delay in their care once they arrive. To some extent, these responsibilities speak to the issues raised in relation to the first obligation, that is, that obstetricians can help make home birth safer, but only if they participate.

Despite the contentiousness of this issue, and some apparently intractable differences between opposing sides of the debate, a few conclusions seem warranted. First, as suggested above, for many deliveries the birthing experience in the hospital can be made more accommodating without compromising safety. In fact, many of the priorities of women who desire out-of-hospital birth are now receiving greater emphasis in hospitals. For example, episiotomies are no longer advocated as a routine procedure. In some facilities, guidelines are less stringent in regard to the number of family members who can be present and/or these institutions offer alternatives to the previously "standard" practice of continuous electronic fetal monitoring. Additionally, many authorities are advocating the use of patient safety "bundles" (a small set of evidence-based practices—perhaps three to five—that, when performed together and reliably, have been shown to improve patient outcomes to reduce the rate of induction and of late preterm birth).[36] Other issues remain to be addressed, such as the high and rising cesarean section rate. Second, a hierarchy of risk should be articulated for patients when considering the appropriateness of an out-of-hospital birth. While no parturient, whether delivered at home or in a hospital, would fall into a "no risk" category," women with uterine scars, placenta previa, or transverse lies, or with no means of transport to a hospital, to cite but a few examples, face a risk that would, in the estimation of many, make birth outside of a hospital, staffed with an immediately available provider, inappropriate. The RCOG has stated, "The discussion with women regarding their potential transfer in labour should include consideration of the distance between birth settings and of other local circumstances which may introduce delay in transfer."[37] Third, we should all agree that appropriately trained and credentialed individuals should attend all births, regardless of where they occur (although what constitutes appropriate training is beyond the intended scope of this essay). Fourth, there is a need for a joint commitment from obstetricians and midwives

to bring the best of both disciplines to bear on the subject, as is evident in the RCOG policy which has, as noted above, the Royal College of Midwives as a cosignatory. At this juncture, more could be accomplished with full and frank discussions by all responsible stakeholders regarding the place of home birth in the U.S., than with an out-of-hand dismissal of the subject. As long as obstetricians absent themselves from any dialogue about home birth, the ability of ACOG or any other organization to set standards will be weakened.

We recognize that moving toward an environment in which home birth is as safe as it appears to be in other countries will require addressing major challenges such as the incremental costs of doing so, professional liability issues, and the vast rural and mountainous areas that make emergency transports difficult. Accordingly, while there is reason to imagine that physician participation (for example, developing transfer standards and agreements, accepting responsibility for patients sent to the hospital) will make home birth safer, informed consent conversations can also be used to make clear that a physician's participation does not signify that the obstetrician believes that the choice is without risk. With regard to the balance of respect for patient autonomy and the principles of beneficence and nonmaleficence, for some women an absence of physicians' participation will not drive them from home birth, and for these patients, the choice is home birth with or home birth without physician collaboration. For others, the choice is home birth with physician collaboration or hospital birth. Those whose choice depends on physician collaboration will likely be those most open to discussion and counseling.

As a matter of public health, many physicians recognize the importance of dialogue and risk reduction. We offer and support options that may make certain behaviors less risky, even if not risk free or recommended. Programs for needle exchange are not designed to eliminate intravenous drug abuse (indeed, some argue it does the opposite), but they are designed to reduce infection associated with such behavior and to provide a relationship/interaction for engaging those involved in such practices. Although a matter of sometimes contentious public debate, ACOG supports contraceptive counseling for teens, arguing that safer sex practices and pregnancy prevention are important resultant benefits, even if some critics contend that counseling encourages sexual activity. The potential benefits of physician participation in all of these activities, including home birth, argue that discussion and dialogue around such issues should be encouraged rather than dismissed out of hand, because of concerns about the behaviors that are the foundations of these conversations. Participation, discussion, and dialogue may, for example, allow physicians to guide and influence the nature of the care provided, including, as discussed in ACOG's recent home birth document, appropriate training for those who attend home births.

Finally, harm reduction should trump any other consideration. Respect for autonomy argues for accepting an informed woman's right to make a choice, even if a physician considers her choice foolish. While a physician might argue a right of conscientious refusal, in this instance the physician is not being asked to participate in home birth, but rather to deal with any untoward consequences, should a woman be brought from home to hospital with a peripartum complication. In that circumstance, the physician's right to conscientious refusal would be tightly circumscribed by her or his duty to rescue. "Harm reduction" is, in part, assuring that women who develop complications warranting transfer to a hospital receive care expeditiously and nonjudgmentally. Physicians are obliged to use their skills to ameliorate the risk of subsequent complications in all women, including those who chose a plan for home birth, even those who may have been aware of general recommendations or advice to reject such plans. Moreover, if the latter condition is not met, a midwife's subsequent reticence to return to the facility might lead to dangerous delays in future. Despite possible disagreements with a woman's choice, physicians should hold to their duty to exercise their fiduciary obligation to women by using their skills to minimize risks, even women who have shunned advice to have a baby in the hospital.

NOTES

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3. Fetal pH (measure of acidity or basicity) is measured during labor via fetal scalp blood testing to determine whether a fetus's level of oxygen is sufficient. T.Y. Leung et al., "Urgent cesarean delivery for fetal bradycardia," *Obstetrics & Gynecology* 114 (2009); 1023-8.

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7. J. Ecker and H. Minkoff, "Home birth: what are physicians' ethical obligations when patient choices may carry increased risk?" *Obstetrics & Gynecology* 117, no. 5 (May 2011): 1179-82.

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12. "ACOG Statement on Home Birth," see note 2 above.

13. Society of Obstetricians and Gynecologists of Canada, "Policy Statement on Midwifery," *Journal of Obstetrics and Gynecology Canada* 31, no. 7 (July 2009): 662.

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17. I. Hildingsson, U. Waldenström, and I. Rådestad, "Swedish women's interest in home birth and in-hospital birth center care," *Birth* 30, no. 1 (2003): 11-22.

18. MacDorman, Menacker, and Declercq, see note 8 above.

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