

## MYOCARDIAL INFARCTION

*A 55-year-old man with no serious health conditions has a moderately severe myocardial infarction.*

When Mr. Santos feels chest pain, he goes right over to the local Family Health Strategy (FHS) health post and is seen by a physician immediately. He is placed in the observation room, where he is given oxygen and a painkiller. The health post lacks electrocardiography (ECG) equipment, so the physician calls an ambulance, which, since the health post is 5 km from town, takes 20 minutes to arrive.

At the hospital, Mr. Santos is taken first to the secondary care clinic, where his myocardial infarction is confirmed on ECG. If appropriate, he is then given thrombolytic agents. However, because of the severity of the infarction, he is transferred to the university hospital intensive care unit to undergo angioplasty. He remains in the hospital for 6 days.

The day he returns home, Mr. Santos is visited by his community health agent, who lives nearby and who helps him understand the purposes of his new medications and work out an administration schedule. She also talks to him about recommended dietary changes and offers lifestyle advice on such topics as smoking cessation, weight loss, and physical activity. Then she arranges for the physician who first saw Mr. Santos at the FHS post to visit him at home. Unfortunately, the patient was not given a discharge summary, so the physician has no way of knowing what treatment he received in the hospital, except for the aspects that Mr. Santos was told about and understood. Planned technology implementation should eventually allow information transfer from the hospital to the health posts.

The physician arranges for Mr. Santos to receive home visits from a *Núcleos de Apoio à Saúde da Família* — a team that includes a physiotherapist and a psychologist, among others. All these services are paid for by Mr. Santos's municipality and the Brazilian government.

ing a robust primary care system is more than a bureaucratic exercise; in Brazil, it has required long-term social movements and professional commitments.

The future of Brazil's FHS, its

sustained expansion to the remaining urban centers and the middle classes, and its effective integration into secondary and tertiary care will require continued engagement by health care

providers and the public and continued financial, technical, and intellectual investments — all of which ultimately depend on sustained political support.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

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DOI: 10.1056/NEJMp1501140

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## A NICE Delivery — The Cross-Atlantic Divide over Treatment Intensity in Childbirth

Neel Shah, M.D., M.P.P.

For generations, both British and American mothers have assumed that the safest way to give birth is to spend many hours, if not days, in a hospital bed under the supervision of an obstetrician. Now, new guidelines are challenging these deeply held beliefs.

After completing an evidence-based review, the United Kingdom's National Institute for Health and Care Excellence (NICE) concluded that healthy women with straightforward pregnancies are safer giving birth at home or in a midwife-led unit than in a hospi-

tal under the supervision of an obstetrician.<sup>1</sup> Across the pond, eyebrows went up. The *New York Times* editorial board (and others) wondered, "Are midwives safer than doctors?"<sup>2</sup> How can homes be safer than hospitals? And what implications will the British

guidelines have for the United States?

Currently, 9 out of 10 babies born in the United Kingdom are delivered in physician-led hospital maternity units (in the United States, the rate is closer to 99 out of 100).<sup>1,3</sup> NICE does not dictate a clinician type or birth setting and makes it clear that women should have freedom to make choices consistent with their needs and preferences. Yet Britain's National Health Service believes that when the new guidelines are implemented, these preferences may change. Thousands more British women per year are expected to avoid hospitals willingly — at least in part out of concern for their own safety and with the expectation that their babies will be no worse off.

The safety argument against physician-led hospital birth is simple and compelling: obstetricians, who are trained to use scalpels and are surrounded by operating rooms, are much more likely than midwives to pick up those scalpels and use them (see table).<sup>4</sup> For women giving birth, the many interventions that have become commonplace during childbirth are unpleasant and may lead to complications, including hospital-acquired infections. For babies, the interventions rarely appear to be helpful. Among multiparous women in a large cohort study, babies born with “serious medical problems” — which included diagnoses ranging from encephalopathy to stillbirth — were equally rare (0.2 to 0.3%) in high- and low-intervention settings.<sup>1</sup>

Of course, there are caveats. The NICE guidelines apply to low-risk pregnancies only. The pregnancies of a majority of women fall into this category, but pregnancies in women who are obese or have diabetes, for example, are

excluded. In addition — and perhaps most important for a woman with a low-risk pregnancy — labor may become complicated without warning. Determining the appropriate time to intervene is a judgment call based more on art than science.

Like most evidence-based guidelines, childbirth recommendations are based on measures of central tendency. But what is true for the average woman is not true for everyone. As it turns out, not one of my patients believes she is average, and I suspect that many of them are correct. That's why I personally never perform cesarean sections that are unnecessary: if the baby initially has low Apgar scores, I'm convinced I did the cesarean just in time; if the baby initially has great Apgar scores, I still did the cesarean just in time. Without a counterfactual, and with limited data to guide me (generally speaking, pregnant women are not excited about becoming experimental subjects), I can believe that my decision making is always accurate.

Or is it? We know that even mothers who appear healthy — those who might be considered statistically “average” — can start hemorrhaging or have umbilical cord prolapse or another unanticipated emergency. In these uncommon cases, surgical obstetrical care saves lives. On both sides of the Atlantic, tolerance for the possibility of catastrophe at a moment that's expected to be profoundly joyful is understandably low.

What differs between Britain and the United States is the way this possibility is presented and managed. NICE and the American College of Obstetricians and Gynecologists (ACOG) both recognize that babies born at home face risks that might be avoided

in a hospital setting. For first-time mothers in particular, the risk of delivering a baby with serious medical problems is two to three times as high at home as it is in a hospital.<sup>1,3</sup> As a result, 45% of British first-time mothers who intend to give birth at home ultimately get transferred to a hospital obstetrical unit during the course of labor.<sup>1</sup> Still, NICE presents home birth as a reasonable, preference-sensitive option and emphasizes the risks of over-intervention in hospitals.<sup>1</sup> By contrast, ACOG strongly emphasizes the risks of underintervention and states unequivocally that “hospitals and birthing centers are the safest setting for birth.”<sup>3</sup>

At its core, this debate is not about the superiority of midwives over doctors or hospitals over homes. It is about treatment intensity and when enough is enough. Nearly all Americans are currently born in settings that are essentially intensive care units (ICUs): labor floors have multipaneled telemetry monitors, medications that require minute-by-minute titration, and some of the highest staffing ratios in the hospital. Most labor floors are actually more intensive than other ICUs in that they contain their own operating rooms.

Surely every birth does not require an ICU. At present, 5 of the 10 most common medical interventions performed in the United States are related to childbirth, and cesarean sections are the most commonly performed major surgery worldwide. The risks that concern the British are real. Major complications such as hemorrhage, severe infection, and organ injury are three times as likely to occur with cesarean deliveries as they are with vaginal deliveries (2.7% vs. 0.9%).<sup>5</sup>

One reason the risks associat-

Rates of Spontaneous Vertex Birth, Transfer to Obstetrical Care, and Obstetrical Interventions for Each Planned Place of Birth among Multiparous Women with a Low-Risk Pregnancy.*				
Event or Intervention	Hospital Obstetrical Unit	Home	Freestanding Midwifery Unit	Hospital Midwifery Unit
	percentage of multiparous women			
Transfer during labor or immediately after birth	0.4	12.0	9.4	12.5
Primary outcome	0.3	0.2	0.3	0.2
Neonatal unit admission	1.7	1.2	1.1	1.3
Spontaneous vertex birth	90.6	98.3	98.0	96.6
Ventouse delivery	3.4	0.5	0.4	1.3
Forceps delivery	1.9	0.4	0.7	1.1
Intrapartum cesarean section	4.0	0.5	0.6	0.9
Blood transfusion	0.6	0.4	0.3	0.6
Epidural or spinal analgesia	14.8	2.8	3.4	5.7
Episiotomy	7.4	1.5	2.2	3.6

\* The primary outcome was a composite of intrapartum stillbirth, early neonatal death, neonatal encephalopathy, meconium aspiration syndrome, brachial plexus injury, fractured humerus, and fractured clavicle. The data are weighted to reflect each unit's duration of participation and the sampling of obstetric units and to take into account the clustered nature of the data. Data on all other interventions except transfer were weighted and restricted to women included in the adjusted analysis. Data are from Hollowell et al.<sup>4</sup>

ed with physician-led hospital birth appear starker in Britain is that underintervention is less likely there than it is in the United States. Access to care is a given. British women who give birth outside the hospital receive focused, one-on-one attention from a qualified midwife. When more intense care is needed, there are clear protocols and mechanisms to facilitate transfer to a hospital. The fact that nearly half of first-time mothers who initially intend to have a home birth are transferred to hospitals may be a sign of a working system rather than a failing one. In this context, particularly for multiparous women, who have lower transfer rates, giving birth in the comfort and privacy of home not only seems reasonable — it seems preferable.

 An audio interview with Dr. Shah is available at NEJM.org

In the United States, access to obstetrical care that is coordinated among homes, birthing centers, and hospitals is both unreliable and uncommon. Nearly half of all

U.S. counties have no practicing obstetricians or midwives, so women are often forced to drive to distant facilities offering needlessly complex care.<sup>2</sup> Lower-level care facilities that could potentially fill this gap — such as midwifery-led birthing units — are few and far between. As a first step, ACOG and the Society for Maternal–Fetal Medicine released a consensus statement in February 2015 providing definitions for facility-based levels of maternal care. Unlike our British counterparts, however, U.S. obstetricians lack clear protocols for determining when and how to transfer patients to risk-appropriate facilities. Moreover, U.S. facilities often lack formal referral relationships and may face financial disincentives to transfer patients.

As a U.S.-trained obstetrician, I have little doubt that the United States offers outstanding care for medically complicated pregnancies. But there are lessons to be learned from the British system. The majority of women with

straightforward pregnancies may truly be better off in the United Kingdom.

Disclosure forms provided by the author are available with the full text of this article at NEJM.org.

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DOI: 10.1056/NEJMp1501461

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