Ultrasound-Based Fetal Tracking Technology During Labor: Is It the Next Best Thing?

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ABSTRACT

In this column, the author reprises a recent selection from the Lamaze International research blog, *Science & Sensibility*. With the introduction of a new technology intended to acutely track fetal station and position during labor through birth, questions are being raised about the necessity—and possible danger—of this technology and its potential impact on normal birth.

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Lamaze International's research blog, *Science & Sensibility*, is intended to help childbirth educators and other birth professionals gain the skills necessary to deconstruct the evidence related to current birth practices. Visit the Science & Sensibility Web site (www.scienceandsensibility.org) to stay up to date and comment on the latest evidence that supports natural, safe, and healthy birth practices.

The woes of electronic fetal monitoring (EFM) have been discussed in the lay media and books, as well as scholarly journals, for decades (Banta & Thacker, 2002; Chen & Wang, 2006; Goer, 1999; Luthy et al., 1987). Despite the collective wisdom that routine EFM does not deliver on the promised protection against undetected fetal hypoxia, brain damage, and related long-term disability and death, the technology has become ubiquitous in most hospital-based childbirth settings since its introduction in 1968.

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the actual harm that can come from continuous monitoring (Alfirevic, Devane, & Gyte, 2006).

NEW TECHNOLOGY, NEW PROBLEM¹

The Trig Medical company has a seemingly altruistic goal in mind: to reduce the risks involved with childbirth while improving the outcome of pregnancy and lowering the overall cost of obstetrical care. Their newest product promises nothing short of this. The LaborPro is an ultrasound-based device created to accurately track fetal station and position upon entering the mother's pelvis. Using GPS-like position tracking technology, the LaborPro promises to "improve the labor and delivery experience and outcomes of childbirth" by removing the "blind interpretation" of cervical dilation and

¹Reprint of September 22, 2011, *Science & Sensibility* blog post by Kimmelin Hull at <http://www.scienceandsensibility.org/?p=3460>

fetal positioning by maternity care providers (Trig Medical, 2010, LaborPro video clip). In layman's terms, Trig Medical believes maternity care providers are so inept at their clinical skills of measuring cervical dilation and fetal position and station that they believe (another) technical device is warranted in the labor and birth setting. Ultimately, the LaborPro is positioned as a tool that can reduce unnecessary cesarean surgery and improve rates of fetal and maternal morbidity and mortality (and record progress of labor minute-by-minute in case these data become useful in a postbirth lawsuit).

Sounds compelling, right?

Two studies published in the *American Journal of Obstetrics and Gynecology* provide data to support the use of the LaborPro in the labor and birth setting (Nizard et al., 2009a, 2009b). The studies were conducted by Dr. Jacky Nizard and colleagues in multiple centers including sites in France, Israel, and Brooklyn, New York. Interestingly, one of the other researchers, Dr. Yoav Paltieli, is not only employed by Trig Medical, but the developer of the device. The studies were small ($N = 166$ women, fetal position/head station study; $N = 188$ women, cervical dilation study), and clinical examinations for study data were conducted by midwives and physicians. The ultrasound scans were performed by midwives and midwifery students in the final stages of their training. The condensed results of the studies are as follows:

- A mean absolute difference of $5.5 \text{ mm} \pm 6.1 \text{ mm}$ was evident between vaginal exam for fetal station versus LaborPro assessment of fetal station.
- Vaginal examination head-position evaluation, within a 45-degree interval, complied with the LaborPro system in 35 of 87 cases (40.2%).
- Mean error was $10.2 \text{ mm} \pm 8.4 \text{ mm}$ and ranged from $7.5 \text{ mm} \pm 7.3 \text{ mm}$, when cervical dilation was $> 8 \text{ cm}$, to $12.5 \text{ mm} \pm 8.7 \text{ mm}$ when cervical dilation was between 6.1 cm and 8 cm.

Indisputably, there were differences between the LaborPro and clinician measurements of dilation, station, and position; however, I cannot help but to ask how clinically significant were those differences? For example, the study article by Nizard et al. (2009a) provides the mean difference in measurement of fetal head station between the clinician's own estimation and that of the LaborPro. Out of (only) 59 measurements, clinician measurements were $-0.8 \text{ mm} \pm 0.89 \text{ mm}$ different compared to LaborPro data. The measurement 0.8 mm is equivalent

to 0.08 cm, less than a tenth of a centimeter. Can this difference in estimation of where the fetus lies in the mother's pelvis really make a difference in clinical outcome? Even at its worst deviation ($-0.8 \text{ mm} + 0.89 \text{ mm}$), the difference between a clinician's estimation of fetal station is $+1.69 \text{ mm}$ (little more than one tenth of a centimeter). I have a hard time understanding how the knowledge of the fetus being one tenth of a station farther down (or up and out of) the pelvis would actually alter clinical management of labor and birth. Based solely on the LaborPro's assessment, I can imagine the clinician saying, "Mrs. Jones, according to the LaborPro, your baby is at negative one and nine-tenths station, rather than at zero station, as we thought. We are going to need to do a cesarean section to get this baby out, safely."

On a more personal note, I can also imagine being a maternity care provider—a doctor or midwife—well adept at assessing a woman's process in labor, only to be approached by a company—or hospital administration—and told, "Your clinical assessment skills aren't nearly as good as you think they are . . . you need this machine to better track your patients' progress through labor." Kind of demeaning, right?

And what about the nonmeasurement-based indicators as to where a woman (and her baby) are in labor? As I imagine any midwife and intuitively-gearred maternity care provider will tell you, so much more than the results of a vaginal exam reveal how a woman's labor is progressing: her self-derived body positioning, her vocalization, her behavior, and the physical sensations she reports. Opting for more and more devices to tell us what is going on during labor risks taking the art away from maternity care. Do we really want to continue trending toward a device-driven, artless approach to attending labor and birth?

Furthermore, aside from the above-mentioned issues is the potential intrusion of yet another device to distract care providers from tending to the woman. I remember one sage piece of wisdom I heard again and again during physician assistant school: Treat the patient, not the monitor (test, scan, etc.). Investing in one more machine is tantamount to divesting ourselves of our clinical skills and our attention to the human subject before us and, instead, increasing our concern for recorded data that *might* come in handy *if* things go poorly during a birth—we risk aiming our attentions in all the wrong places.

Maternity care providers, I urge you: Say "No" to the LaborPro.

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A CALL FOR UNIFYING OUR VOICES

The LaborPro is not the only new technology proposed to save women and babies during labor and birth. Since the advent of modern obstetrical practice, numerous devices (Block, 2008) have come and gone and, yes, some have (fortunately or unfortunately) remained. Questioning new technology should be a given; pushing back against the adoption of new machinery should always be an option if the proposed benefits of using that technology do not clearly outweigh the clinical skills and decision-making capabilities of the sentient, compassionate, well-trained provider. The maternity care industry has learned the hard way (and, in many cases, is still apparently learning) that over four decades of EFM use has not delivered on the proposed value of routine continuous EFM. I wonder: Will we follow a similar course with ultrasound-based fetal tracking, or will we learn from the past, quickly and concisely use various communication channels, and join our voices to circumvent the process of reaching a conclusion that many in the normal birth advocacy movement are already coming to?

REFERENCES

- Alfirevic, Z., Devane, D., & Gyte, G. M. (2006). Continuous cardiotocography (CTG) as a form of electronic fetal monitoring (EFM) for fetal assessment during labour. *Cochrane Database of Systematic Reviews*, 3: CD006066. <http://dx.doi.org/10.1002/14651858.CD006066>
- Banta, H. D., & Thacker, S. B. (2002). Electronic fetal monitoring. Lessons from a formative case of health technology assessment. *International Journal of Technology Assessment in Health Care*, 18(4), 762–770.
- Block, J. (2008). *Pushed: The painful truth about childbirth and modern maternity care*. Cambridge, MA: Da Capo Press.
- Chen, C. Y., & Wang, K. G. (2006). Are routine interventions necessary in normal birth? *Taiwanese Journal of Obstetrics & Gynecology*, 45(4) 302–306.
- Goer, H. (1999). *The thinking woman's guide to a better birth*. New York, NY: Perigee Books.
- Luthy, D. A., Shy, K. K., van Belle, G., Larson, E. B., Hughes, J. P., Benedetti, T. J., . . . Stenchever, M. A. (1987). A randomized trial of electronic fetal monitoring in preterm labor. *Obstetrical & Gynecological Survey*, 69(5), 687–695.
- Nizard, J., Haberman, S., Paltieli, Y., Gonen, R., Ohel, G., Le Bourthe, Y., & Ville, Y. (2009a). Determination of fetal head station and position during labor: A new technique that combines ultrasound and a position-tracking system. *American Journal of Obstetrics and Gynecology*, 200(4), 404.e1–404.e5. <http://dx.doi.org/10.1016/j.ajog.2008.10.051>
- Nizard, J., Haberman, S., Paltieli, Y., Gonen, R., Ohel, G., Nicholson, D., & Ville, Y. (2009b). How reliable is the determination of cervical dilation? Comparison of vaginal examination with spatial position-tracking ruler. *American Journal of Obstetrics and Gynecology*, 200(4), 402.e1–402.e4. <http://dx.doi.org/10.1016/j.ajog.2009.01.002>
- Trig Medical. (2010). *LaborPro. Seeing labor progress. Breakthrough in non-invasive labor progress monitoring*. Retrieved from <http://www.trigmed.com/contents/page.asp?contentPageID=62>

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