The risk factors that can result in the death of newborn infants depend greatly on whether they are born into the developed or the developing world. In the developed world, the infants at greatest risk either have complex malformations or inborn metabolic errors or are extremely preterm infants, at less than 24 weeks of gestation (barely half the normal period). They require a highly technological care environment with complex diagnostic and therapeutic measures (1, 2). In the developing world, infants who are not so premature or critically ill die daily because basic maternal and neonatal care is not available. These infants face problems such as mild prematurity, birthing difficulties, and infections already overcome in structured health systems that fail to be implemented in poor or less developed countries or regions (3). The challenge in these areas is to translate what has already been achieved in the developed world in a meaningful and economically viable way. Monitoring of vital signs is essential to support the life of babies who are sick or preterm (or both) as soon as they are born. On page 947 of this issue, the study by Chung et al. (4) on developing a wireless system to monitor babies in a less invasive manner. This technology is part of a frontier in which physics,
create the healthiest possible bonding (5, 6).

In the developed world, a key aspect of this care is continuous electronic monitoring of heart rate and continuous evaluation of oxygen saturation, as these data guide resuscitation decisions after birth. In the longer term, the clinician manages the care of critically ill infants on the basis of additional monitored data, including neonatal and environmental temperature, content of carbon dioxide in expired breath, the respiratory parameters of the ventilator that breathes for the infant, and electric brain waves. All this equipment needs electricity, batteries, or wireless transmit and under the crib bed that is designed to allow RF transmission (see the figure). This wireless, battery-free operation provides time-synchronized continuous data streaming of several vital signs. The soft mechanics and light adhesive interfaces to the skin are also compatible with advanced medical imaging techniques.

This technology may improve the care of very preterm infants in developed-world settings, but also has great potential impact on monitoring practices all over the world and may give many neonates a more equitable opportunity to survive. In general, neonatology needs new inputs of hard sciences and preserve proper development. However, these developments must be considered in the context of millions of infants in the developing world, or in areas of poverty in the developed world, who live for less than 1 month not because of impairment or prematurity, but because of their families’ poor economic and health conditions (3, 8).

Wireless sensing

The system designed by Chung et al. uses soft skin-like sensors that are powered with an antenna, placed under an infant’s bed, that also receives data from the sensors.

Easier on the child

Neonates are more likely to have fewer skin lesions and fewer constraints on movement.

Comparable to wired sensors

Accurate monitoring of heart rate, respiratory rate, oxygen saturation, and skin temperature can be achieved without increasing costs.

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Improving care of critically ill newborns
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