

## Human Milk Fortification

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### Expanded Commentary from the Faculty

While human milk remains the ideal nutrition for infants, there can be a great deal of variability in its nutrient content. In addition, the fast-growing preterm infant requires extra energy, protein, fat, minerals, and vitamins beyond what a mother's milk can provide. Fortification is essential in these instances to help babies grow optimally and prevent long-term adverse consequences. This is a timely topic because new technologies are emerging that will allow us to measure exactly what is in a mother's milk, identify what is lacking, and custom-fortify the milk to a preterm infant's needs.

There is good research to support the idea that human milk alone does not provide enough nutrition for preterm babies and that when fortifying powders or liquids are added, babies grow better and are stronger and healthier. It is also essential that preterm infants get fortified human milk instead of preterm formula, as they will benefit from reduced rates of necrotizing enterocolitis, sepsis, and urinary tract infections, as well as better visual and neurocognitive development.

There are both short- and long-term benefits to be gained from fortifying human milk for preterm infants. Preterm babies who receive better nutrition early in life grow faster, and have better compositional growth, so their long-term health is improved with regard to neurodevelopmental outcomes.

Almost all NICUs fortify milk, but the question is how do they fortify it? What is their strategy—is it an aggressive fortification strategy, is it individualized to babies' needs, are they using human milk or formula? The biggest hurdle for customizing fortification is implementing the new analytical technology in the unit, gaining expertise around that technology and the new types of measures required to utilize it appropriately, as well as developing and implementing protocols that everyone will follow.

There is also a need for more research with respect to new high-end, customized fortification approaches, because there is a lack of data to say one approach is better than another. Another issue is figuring out what to do when milk is found to be deficient and then determining what to add to it and how to improve it.

In terms of socioeconomic issues, the benefits of fortifying human milk are likely to have a major impact. Preterm babies consume considerable resources, so making changes that impact their short- and long-term development can significantly affect the long-term cost to society.

There are a couple of important steps clinicians and hospitals can take to begin implementing human milk fortification in their units. First, if this is not already being done, start using human milk and not formula in the NICU. Second, develop a good algorithm or a systematic strategy that addresses what to do with preterm babies who are not growing well. What has been successful at our institution, UC San Diego Medical Center, has been to gather a multidisciplinary team—pediatricians, nurses, dietitians,

occupational therapists, social workers, and administrators—to figure out how to initiate and optimize fortification of human milk. We have developed a program called Supporting Premature Infant Nutrition (SPIN) to tackle this task, and recently published a paper in the August 30, 2013 issue of *Early Human Development* discussing the challenges we faced (see “Suggested Readings” below).

## Group Discussion Items

1. What is our hospital strategy for fortifying milk?
2. Discuss our general practices or strategy for managing preterm infants who are not growing well.
3. Might the systematic strategy used at UCSD and described by Dr. Kim above have any application at our hospital?
4. What other approaches might be used?
5. Discuss the barriers to change in our institution.
6. Are there other problems we haven't talked about?

## Suggested Readings and Resources

1. Kim JH, Chan CS, Vaucher YE, Stellwagen LM. **Challenges in the practice of human milk nutrition in the neonatal intensive care unit.** *Early Hum Dev.*2013; August 30.
2. Alan S, Atasay B, Cakir U, et al. **An intention to achieve better postnatal in-hospital-growth for preterm infants: Adjustable protein fortification of human milk.** *Early Hum Dev.* 2013; September 12.