

## Protect the Microbiome

Robert J. Karp, MD  
Professor of Pediatrics  
SUNY Downstate Medical Center  
Brooklyn, New York

### Expanded Commentary from the Faculty

Breastfeeding rates in the United States remain below the goal established by the Centers for Disease Control and Prevention. A majority of mothers start out breastfeeding, but rates fall to 43% within 6 months, with only 13% of babies being exclusively breastfed. There are a number of reasons why women do not start to breastfeed, and if they do start, why they do not continue. One reason that should be of concern to clinicians is that health care providers frequently fail to emphasize the benefits of breastfeeding to their patients. A lack of knowledge about infant nutrition on the part of many clinicians undoubtedly contributes to this situation. The family physician and his/her staff, as well as hospital practices, can have a major impact on the initiation and maintenance of breastfeeding, and consequently on the health and well-being of mothers and their children.

This clinical pearl discusses the influence of breastfeeding on the short- and long-term health of infants. Although it is hidden from clinical view, the “microbiome,” or totality of flora in the gut, has an impact on the nutritional status and health of infants. Prebiotics and probiotics can help to protect this environment, increasing positive flora components such as bifidobacteria and lactobacilli. Human milk contains a complex mixture of prebiotic oligosaccharides; in addition, it may contain some probiotics. Infant formula may also be enriched with prebiotics and probiotics.

Although more research is needed on prebiotics and probiotics in the pediatric population, studies suggest that there are both short- and long-term benefits as a result of protecting the microbiome. There is some evidence to suggest that probiotics can reduce the risk of necrotizing enterocolitis in preterm babies. Other studies suggest prebiotics may prevent infections and atopic dermatitis in infants. Proof is less certain for other benefits of probiotics and prebiotics in infants, but it appears that there is a consistent positive association between pre- and probiotics and gut health.

Based on this research, clinicians should encourage breastfeeding as the best way to provide pre- and probiotics to all infants. Hospitals should reinforce the importance of breastfeeding, educating women about the benefits both to the infant and the mother. When breastfeeding is not possible, clinicians should encourage parents to use fortified formula for babies that are weaned at less than 1 year of age, since that practice will also supply prebiotics and probiotics. For babies that are weaned after 1 year of age, parents should be advised to include yogurt in the diet, since that is the easiest and most available form of probiotics in food.

Reducing the incidence of necrotizing enterocolitis and improving the gut health of infants by increasing breastfeeding rates will provide significant current and future health benefits, while also reducing health care costs.

### Group Discussion Items

1. When we educate mothers about breastfeeding, has anyone also conveyed the benefits of prebiotics and probiotics, or discussed gut flora?
  - If so, ask the person(s) describe the encounter(s)
2. Which of our current practices help protect the microbiome?
3. What are some things that might put a patient's microbiome at risk?
4. What would be an easy change for us to make?
5. Discuss other approaches that could be used.
6. Identify internal barriers we might expect to see.
7. Are there related problems we haven't talked about?

### Suggested Readings and Resources

1. Feld LG, Hyams JS, eds. Optimizing Infant Nutrition: The How, When and Why of Breastfeeding, Complementary Foods, and Fortifiers. Available at: [www.PediatricNutritionCE.org](http://www.PediatricNutritionCE.org).
2. Thomas DW, Greer FR, American Academy of Pediatrics Committee on Nutrition. **Probiotics and prebiotics in pediatrics.** *Pediatrics*. 2010;126:1217-1231.
3. Parracho H, McCartney AL, Gibson GR. **Probiotics and prebiotics in infant nutrition.** *Proc Nutr Soc*. 2007;66:405-411.
4. Sherman PM, Cabana M, Gibson GR, et al. **Potential roles and clinical utility of prebiotics in newborns, infants, and children: Proceedings from a global prebiotic summit meeting, New York City, June 27-28, 2008.** *J Pediatr*. 2009;155:S61-S70.