



Your Essential Prenatal Supplement

Momma and Baby Need You

By Guy Schenker, DC

A BABY'S "FIRST MEAL" CONSISTS OF THE MOTHER'S MICROBIOTA, picked up while sliding and slurping through the birth canal. The good bacteria obtained double every 20 minutes, coating the GI tract with slime, and within a day, the slime-slick is selectively permeable.

Since success in this initial and critical exposure upon passage through the vagina depends on the quality of the mother's microbiota, it is essential that Momma supplement with prebiotics and probiotics (a synbiotic supplement) through her entire pregnancy. That maternal colonization (or the lack of it) has far-reaching health effects that will persist throughout her infant's childhood and into adulthood.^{1,2,3,4,5,6}

L. reuteri is an essential probiotic among the bacteria transferred to the newborn via the vaginal transmission, although lactic acid species account for less than 1% of the total microbiota in infants, and Bifidobacteria make up 60% to 90% of their total fecal microbiota. Among other most immune-strengthening species found in healthy postnatal infants are *B. breve* and *B. longum*. *L. reuteri* is transferred to the newborn via vaginal transmission and significantly present in human milk, as are several Bifidobacteria species.^{7,8,9}

That brings us to baby's second meal — colostrum — which contains both prebiotics and probiotics. *L. reuteri* supplementation during late pregnancy reduces the breast milk levels of a baby's immune system stressor TGF-beta2, and low levels of this inflammatory cytokine are associated with less allergic sensitization and less IgE-associated eczema in breast-fed infants. Colostrum also contains significant levels of the anti-inflammatory cytokine IL-10.

One of the most fundamental benefits of a healthy first and second meal is that the neonate achieves Th1/Th2 immune balance. Neonatal Th1 stimulus is essential. During gestation, there is a skewing toward Th2 immune dominance in both mother and fetus. The Th2 dominance suppresses Th1, preventing the mother and fetus from rejecting each other.

At four to five weeks prenatal, the fetal thymus develops, and "self" is developed. "Foreign" is developed in infancy, beginning with the probiotic and prebiotic first two meals, ideally reflecting the mother's healthy microbiome.^{8,10,11,12}



You must direct your focus to probiotics and prebiotics. Colostrum contains prebiotic oligosaccharides, such as inulin-type fructans, which are not digested in baby's small intestine but enter the colon as intact large carbohydrates that are then fermented by the healthy bacteria received from Momma to produce short-chain fatty acids and other health-promoting end-products. The inulin-type prebiotics particularly increase the production of Bifidobacteria and some Lactobacilli (whereas formula-fed infants produce more Enterococci and Enterobacteria).^{13,14}

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The growing immune power promoted by probiotic fermentation is important for the development and sustainment of intestinal barrier function. A healthy microbiota received from the mother stimulates the synthesis of secretory IgA, the antibody that coats and protects mucosal surfaces against harmful bacterial invasion.

Note that the greatest difference between infants who are provided with a healthy first two meals and infants who are not, or infants who are formula-fed, is the ratio of Bifidobacteria to lactic acid

bacteria, which indicates more protective immune system development. *Lactobacillus acidophilus* is a species that needs to be minimized, and it occurs in high quantities in formula-fed infants.

L. paracasei, along with *L. reuteri*, is among the few *Lactobacillus* probiotics supporting immune system development in healthy neonates. *L. paracasei* decreases the risk of developing IgE allergies. *L. acidophilus* colonization is found in only 14% of one-month-old infants and confers no protection against atopic disease.^{15,16,17,18}

Early colonization of the neonatal gut with a healthy mother's microbiota promotes a strong yet balanced immune response that persists throughout lactation and beyond weaning. The central role of mother's microbiota in the development of baby's mucosal immunity is your most important consideration for pregnant patients.

The intestinal mucosa in the baby, just as in the mother, represents the largest surface area in contact with antigens of the external environment. The dense carpet of the gut microbiota overlying the mucosa accounts for the largest portion of the antigens presented to immune cells, and it is this antigen presentation that stimulates the pattern recognition receptors of intestinal epithelial cells.^{19,20,21}

Now that we have considered the fundamental need to ensure transfer of probiotics and prebiotics in the first two meals, let us go back nine months. Synbiotic supplementation is not something your pregnant patients need to consider only in the last month or two of gestation.

The crucial consideration of immune transfer to baby requires attention from the very beginning of pregnancy. Obviously, a more thoroughly established mother's microbiota will be achieved by many months of supplementation.

There is another consideration, though. Bacterial vaginosis in pregnancy is a clinical condition caused by the replacement of adequate hydrogen peroxide-producing probiotic species in the vagina with high concentrations of putrefactive aerobic and anaerobic bacteria. The condition is present in 40% or more of women (both within and outside of pregnancy), and 50% of women with this condition are asymptomatic.

There is a strong correlation between bacterial vaginosis and maternal and fetal morbidity. Studies show that the chances of spontaneous abortion, preterm labor, premature birth, preterm premature rupture of the membranes, amniotic fluid infection, postpartum endometriosis, and post-Cesarean wound infections are increased because of bacterial vaginosis during pregnancy. When there is any significant degree of maternal vaginosis, baby is covered with unhealthy microbiota in the birth canal, so that the earlier in pregnancy a woman addresses her need for healthy microbiota, the better for both her and her baby.^{22,23}

Do you begin to appreciate how fundamental it is to colonize a baby's gut immediately at birth? Probiotics and prebiotics obtained at birth are an absolute prerequisite for baby's immune system maturation. The benefits of supplementing your pregnant patients with a synbiotic extend far beyond this gut-immune axis. Transmission of a healthy microbiota from Momma to baby is merely the first step, driving the development of baby's:

- Gut-brain axis²⁴
- Gut-hypothalamus axis²⁵
- Gut-liver axis²⁶
- Gut-adipose axis²⁷
- Gut-pancreas axis²⁸

- Gut-muscle axis²⁹
- Gut-immune system axis³⁰

Will the infant develop a solid blood-brain barrier via the gut-brain axis?³¹ Is baby destined to become obese during childhood and into adulthood? Obesity in children is largely created by mother's microbiota, driving her infant's gut-liver and gut-adipose axes.³² Are mood disorders programmed into this neonate's future?³³

Do you appreciate the profound influence you will have on pregnant patients with synbiotic supplementation? Both the health of the pregnancy and development of the fetus-neonate-infant depend on probiotics, specifically your selection of *L. reuteri*, *L. paracasei*, *L. rhamnosus*, *B. breve*, and *B. longum*. Just as critical are prebiotics, with an emphasis on inulin. Momma and baby need you.

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