



# Nourishing Pediatric Health

The benefits of prebiotics & probiotics for the child's developing microbiome

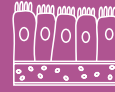
## Functions of the Gut Microbiome:<sup>1</sup>



Immune Development & Function



Brain-Gut Communication



Epithelial Barrier Integrity



GI Motility & Constipation

### Dys·bi·o·sis /, disbī'ōsəs/ noun

<sup>1</sup> Disruption to the composition of resident commensal communities relative to the community found in healthy individuals.

### Dysbiosis is associated with acute & chronic conditions:



#### ACUTE<sup>1-4</sup>

Constipation & Diarrhea  
Infant Colic  
Necrotizing Enterocolitis



#### CHRONIC<sup>1,3-5</sup>

Inflammatory Bowel Disease  
Diabetes  
Atopic Dermatitis

### Prebiotic fibers maintain a healthy microbiome by:<sup>1,4-6</sup>

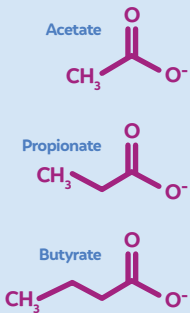


Serving as fuel for resident microorganisms and probiotics such as lactobacilli and bifidobacteria



Reducing the proliferation of pathogenic bacteria by lowering intestinal pH and stimulating mucin secretion

#### Gut fermentation and production of **short chain fatty acids (SCFAs)**



- Mediate intestinal mucus and water secretion<sup>1</sup>
- Increase fluid and electrolyte absorption<sup>1</sup>
- Modulate diarrhea, slow GI transit, and improve stool formation (liquid to formed) often within 24 hours of consumption<sup>10</sup>
- Enhance weaning of parenteral nutrition and improve tolerance to enteral feeds<sup>5,10</sup>
- Reduce susceptibility to opportunistic pathogens and inflammation by strengthening intestinal epithelium<sup>1</sup>

Common examples of prebiotics are wheat dextrin, inulin, pectin, and guar gum



**95%** of American children do not meet adequate intakes (AIs) of total fiber set forth by the Institute of Medicine.<sup>7</sup>

### Pediatric Total Fiber Recommendations<sup>\*8</sup>

Age	Minimum (Age + 5 g/d)	Maximum (Age + 10 g/d)
1-3	6-8 g	11-13 g
4-8	9-13 g	14-18 g
9-13	14-18 g	19-23 g
14-18	19-23 g	24-28 g

American Health Foundation<sup>31</sup>  
<sup>\*</sup>Total fiber = dietary + functional fiber intake. Fiber recommendations are not appropriate for children under 1 year of age. A food-first approach is recommended; however, a pediatric supplement, such as Culturelle® Kids Probiotic + Fiber, can help bridge the fiber gap.

"The impact of both short-term and long-term dietary patterns on the gut microbiome cannot be overstated."<sup>11</sup>

### Pediatricians play a key role in providing nutrition education to parents.<sup>9</sup>



**Optimize nutrition<sup>9</sup>**  
with fiber-rich whole grains & plant foods



**Minimize diarrhea<sup>10,11</sup>**  
with foods high in pectin



**Mitigate constipation<sup>8,12</sup>**  
with dietary sources of fluid, fiber, & motility-promoting bioactive components

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## Pediatrician Consult<sup>13</sup>

A pediatrician consult is advised before offering functional fiber supplements to children. Clinical judgement may dictate a referral to a pediatric gastroenterologist. When discussing fiber with families, clinicians must be judicious and considerate of caregiver health literacy.

Fiber recommendations are estimated based on a child's age and weight, but not appropriate for all medical conditions. For example, readily fermentable fibers may be contraindicated in patients with irritable bowel syndrome, specifically those following a FODMAP diet. A board certified pediatric dietitian can provide individualized medical nutrition therapy for children with specialized diets.

Increase intake of fiber slowly in children with special attention to signs of abdominal distention, bloating, and pain. This is particularly important in **young children who may not clearly articulate their medical symptoms.**



## Probiotic Benefits

The health benefits of a probiotic are strain and dose specific.

Only a minority of probiotics have demonstrated efficacy in high-quality clinical trials. With over **1000 scientific studies** and over **200 human clinical trials**, *Lactobacillus rhamnosus* GG ATCC 53103 has been **more extensively studied than any other probiotic strain** since its identification more than thirty years ago by Professors Goldin and Gorbach at Tufts University.



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