

# A GUIDE TO THE USE OF PREBIOTICS AND PROBIOTICS

## Quality of Evidence for Probiotic Use for the Treatment of Diseases in Infants and Children<sup>1</sup>

### Level I,\* Clear efficacy

- Acute diarrhea, mild-to-moderate: mainly lactobacilli, 10 billion/dose; shortens illness by 1 day
- Allergy and atopic dermatitis: prevention
- Antibiotic-associated diarrhea: mainly *Saccharomyces boulardii* and LGG†
- Clostridium difficile diarrhea: *S. boulardii* and LGG, mainly in severe recurrent disease
- Pouchitis: adult studies; VSL#3‡

### Level I, Efficacy suggested or efficacy possible

- Acute diarrhea, mild-to-moderate: Prevention, modest effect with some conflicting reports
- Hepatic encephalopathy: small studies favor efficacy in adults; large/pediatric studies needed
- Irritable bowel syndrome
- Necrotizing enterocolitis
- Ulcerative colitis: equivalent to aminosalicylic acid preparations

### Common Probiotics

*Bifidobacterium (bifidum, breve, infantis, longum)*; *Streptococcus thermophilus*; *Lactobacillus (acidophilus, casei, GG, plantarum, reuteri, rhamnosus)*; *Lactococcus (lactis, cremoris)*; *Escherichia coli (Nissle 1917)*; *Saccharomyces (boulardii, cerevisiae)*; combination therapies

\* Evidence obtained from at least one properly designed randomized controlled study

† LGG = *Lactobacillus GG*

‡ VSL#3 = Probiotic mixture of lactobacilli (4 strains), bifidobacteria (3 strains), and *S. thermophilus*

## Prebiotics and Common Sources

- Inulin and fructooligosaccharides (FOS)<sup>2</sup>: human breast milk; foods: asparagus, bananas, leeks, onions, garlic, wheat, chicory, tomatoes, and Jerusalem artichoke<sup>3</sup>
- (*trans*-) galactooligosaccharides (TOS or GOS)<sup>2</sup>: supplemented infant formula
- Prebiotic candidates with preliminary/promising data<sup>2</sup>: gluco-, isomalto-, xylo-, and soybean oligosaccharides; lactosucrose; polydextrose

## Benefits of Prebiotics for Infants

- Increase stool softness and frequency, similar to that of breast-fed infants<sup>4,5</sup>
- Promote development of the immune system, increase fecal secretory IgA in infants<sup>6</sup>
- Reduce infection rates including URIs and infections requiring antibiotics<sup>7</sup>
- Stimulate the growth of health-promoting bifidobacteria that aid in immune system development<sup>3</sup>
  - Bifidobacteria colonization similar to that found within gut of breast-fed infants
  - Inhibit the growth of harmful bacteria (by increasing beneficial bacteria population)
- May help increase iron absorption<sup>8</sup>

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