

Evidence-based Recommendation: Probiotics (*Lactobacillus rhamnosus* GG) for Acute Gastroenteritis

You may begin to notice changes in how acute gastroenteritis (AGE) is being managed among inpatients at Cincinnati Children's Hospital Medical Center. In preparation for the release of updated treatment guidelines for AGE, evidence-based recommendations are beginning to be implemented on the inpatient units.

CCHMC Best Evidence Statement	Evidence
<p>“It is recommended to administer <i>Lactobacillus rhamnosus</i> GG (LGG) to children with acute gastroenteritis to reduce the duration of diarrhea, risk of protracted diarrhea, and duration of hospitalization.”¹</p> <p>The entire BEST can be accessed online at: http://tiny.cc/CCHMCLGG.</p>	<p>A 2010 Cochrane meta-analysis² demonstrated that probiotics, and particularly lactobacilli, reduced the duration of an acute diarrheal episode by approximately one day. Additionally, it reports that children on probiotics have a reduced risk of a diarrheal episode lasting three or four days by 40% and 60%, respectively.</p> <p>A 2007 meta-analysis⁴ focusing specifically on the use of LGG in 988 children with AGE found that LGG is associated with significant reductions in duration of diarrhea, risk of diarrhea for >7 days, and duration of hospitalization. (See figure below.)</p>
<h3>Probiotic Activities²</h3> <p>Probiotics act against enteric pathogens by:</p> <ul style="list-style-type: none"> • Competing for nutrients and binding sites • Acidifying the gut contents • Producing a variety of chemicals • Increasing specific and non-specific immune responses 	<p style="text-align: center;">Modified from Szajewska et al. 2007</p>
<h3>Side Effects and Risks</h3> <p>Side effects of probiotics in ambulatory care have rarely been reported in immunocompetent patients. Probiotics should not be administered to pre-term infants or patients with underlying immune-deficiencies or conditions affecting intestinal permeability. The risk for bacteremia and sepsis after LGG ingestion has been reported in some case reports involving infants and children with severe underlying diseases such as short-gut syndrome, prematurity, cerebral palsy, and cardiac surgical diseases³.</p>	<p>A 2002 meta-analysis⁵ reported a positive linear association between <i>Lactobacillus</i> dosage amount and reduction in diarrhea duration (see figure on right) and suggests 10 billion colony-forming units (CFU) to be the minimal effective dose for reducing the duration of diarrhea.</p>
<p>We welcome your questions and comments. Please feel free to contact Josh Schaffzin (joshua.schaffzin@cchmc.org) or Connie Yau (connie.yau@cchmc.org) by email or call the Division of General and Community Pediatrics at 513.636.4506.</p> <p>References</p> <ol style="list-style-type: none"> 1. Use of <i>Lactobacillus</i> GG in children with acute gastroenteritis, Cincinnati Children's Hospital Medical Center, April 15, 2011. http://tiny.cc/CCHMCLGG. 2. Allen SJ, Martinez EG, Gregaño GV, et al. Probiotics for treating acute infectious diarrhea. Cochrane Database of Systematic Reviews 2010, Issue 11. Art. No. CD003048. 3. Boyle R, Robins-Browne R, and Tang M. Probiotic use in clinical practice: what are the risks? <i>Am J Clin Nutr</i> 2006;64:1256-1264. 4. Szajewska H, Skorka A, Ruszczyński M, et al. Meta-analysis: <i>Lactobacillus</i> GG for treating acute diarrhoea in children. <i>Aliment Pharmacol Ther</i> 2007;25:871-881 5. Van Niel, CW, Feudtner C, Garrison MM, et al. <i>Lactobacillus</i> therapy for acute infectious diarrhea in children: a meta-analysis. <i>Pediatrics</i> 2002;109:678-684. 	<h3>Formulation and Dosage</h3> <p>A live formulation of at least 10 billion LGG CFU per day has been proven to be most efficacious in reducing the duration of diarrhea in patients with AGE. LGG treatment should begin as soon as possible, and last for 5 to 7 days^{1,4}.</p> <p>Culturelle® by Amerifit, Inc. is the only product readily available locally in the correct dose and formulation, with 10 billion live LGG CFU per capsule. The capsule contents can be dissolved in water for oral administration. Of note, Culturelle for Kids® contains only 1 billion CFU per capsule. Other available probiotic products containing LGG do not specify a known amount of live LGG.</p>