

## Probiotics for GI Health in 2012: Issues and Updates

**Table 1.** World Gastroenterology Organization (WGO)<sup>1</sup> and Yale Probiotic Working Group<sup>2</sup> Recommendations Regarding Probiotics Marketed in the United States: Uses for GI Conditions. Probiotic use is not recommended for seriously ill patients.

INDICATION	GENUS/SPECIES/STRAIN	PATIENT POPULATION: STRENGTH OF EVIDENCE <sup>A</sup> /EFFECTIVENESS <sup>B</sup> (Evidence-based dose)	COMMERCIAL PRODUCT/ PROPRIETARY MICROBE NAME/ MANUFACTURER'S RECOMMENDED DOSE	MANUFACTURER'S WEBSITE	COST/QUANTITY <sup>C</sup>
Prevention of Acute Infectious Diarrhea	<i>Lactobacillus rhamnosus</i> (GG)	<b>Pediatrics: B</b>	<b>Culturelle</b> 10x10 <sup>9</sup> CFU/ day To support digestive health and immune function 10x10 <sup>9</sup> CFU twice per day for digestive upset	<a href="http://www.culturelle.com/">http://www.culturelle.com/</a>	\$18.52/30 capsules (1 x 10 <sup>10</sup> CFU/capsule); \$15.82/30 powder packets (1.5 x10 <sup>9</sup> CFU/packet)
	<i>Saccharomyces cerevisiae</i> var. boulardii	<b>Pediatrics: B</b>	<b>Florastor</b> Saccharomyces boulardii (lyophilized [lyo]) 250 mg <i>Contraindicated with central venous catheter</i>	<a href="http://florastor.com/">http://florastor.com/</a>	\$35.50/50 capsules (250 mg/capsule); \$19/10 powder packets (250 mg/packet)
Treatment of Acute Infectious Diarrhea	<i>Lactobacillus reuteri</i> (DSM 17938)	<b>Pediatrics: A</b> (10 <sup>8</sup> CFU twice daily)	<b>BioGaia</b> <i>Lactobacillus reuteri</i> protectis 1x10 <sup>8</sup> CFU/dose	<a href="http://www.childrensprobiotics.com/">http://www.childrensprobiotics.com/</a>	\$39.50/ 50 mL; \$25.39/ 30 chewable tablets; \$29.99/30 straws
	<i>Lactobacillus rhamnosus</i> (GG)	<b>Pediatrics: 1a/A</b> (10 <sup>10</sup> -10 <sup>11</sup> CFU twice daily)  <b>Adults 2b</b> (10 <sup>9</sup> CFU twice daily)	<b>Culturelle</b> 10x10 <sup>9</sup> CFU/ day To support digestive health and immune function Twice per day for digestive upset	<a href="http://www.culturelle.com/">http://www.culturelle.com/</a>	\$18.52/30 capsules (1 x 10 <sup>10</sup> CFU/capsule); \$15.82/30 powder packets (1.5 x10 <sup>9</sup> CFU/packet)
	<i>Saccharomyces cerevisiae</i> var. boulardii	<b>Pediatrics: 1a/A</b> (200 mg three times daily)  <b>Adults: 1b</b> (10 <sup>9</sup> CFU per capsule of 250 mg, 2-6 capsules per day)	<b>Florastor</b> Saccharomyces boulardii (lyophilized [lyo]) 250 mg <i>Contraindicated with central venous catheter</i>	<a href="http://florastor.com/">http://florastor.com/</a>	\$35.50/50 capsules (250 mg/capsule); \$19/10 powder packets (250 mg/packet)
Prevention of Antibiotic-associated Diarrhea	<i>Lactobacillus acidophilus</i> (CL1285) and <i>Lactobacillus casei</i> (LBC80R)	<b>Adult: 1b</b> (5x10 <sup>10</sup> CFU once or twice daily)	<b>BioK+</b> Cultured food or capsules	<a href="https://www.biokplus.com/en-us/home">https://www.biokplus.com/en-us/home</a>	Capsules available \$12.00/15 capsules (12.5 x10 <sup>9</sup> CFU/capsule); \$20.00/15 capsules (25 x10 <sup>9</sup> CFU/capsule); \$31.50/15 capsules (50 x10 <sup>9</sup> CFU/capsule)
	<i>Lactobacillus casei</i> (DN-114 001)	<b>Adult: 1b/A</b> (10 <sup>10</sup> CFU twice daily)	<b>DanActive</b> Lactobacillus immunitas Plus starter cultures Yogurt or cultured food <sup>d</sup>	<a href="http://www.dannon.com/ourproducts.aspx">http://www.dannon.com/ourproducts.aspx</a>	Price varies by store
	<i>Lactobacillus rhamnosus</i> (GG)	<b>Pediatrics: 1b/A</b> (10 <sup>10</sup> CFU once or twice daily)  <b>Adult: 1b</b> (10 <sup>10</sup> - 10 <sup>11</sup> CFU twice daily)	<b>Culturelle</b> 10x10 <sup>9</sup> CFU/day To support digestive health and immune function 10x10 <sup>9</sup> CFU/twice per day for digestive upset	<a href="http://www.culturelle.com/">http://www.culturelle.com/</a>	\$18.52/30 capsules (1 x 10 <sup>10</sup> CFU/capsule); \$15.82/30 powder packets (1.5 x10 <sup>9</sup> CFU/packet)
	<i>Saccharomyces cerevisiae</i> var. boulardii	<b>Pediatrics: 1a/A</b> (250 mg twice daily)  <b>Adults: 1b</b> (1 g or 4x10 <sup>9</sup> CFU daily)	<b>Florastor</b> Saccharomyces boulardii (lyophilized [lyo]) 250 mg <i>Contraindicated with central venous catheter</i>	<a href="http://florastor.com/">http://florastor.com/</a>	\$35.50/50 capsules (250 mg/capsule); \$19/10 powder packets (250 mg/packet)

**Disclaimer:** It is hoped that information in this activity will be useful in the management of your patients. Any procedures, medications, or other courses of diagnosis or treatment discussed or suggested in this activity should not be used by clinicians without evaluation of their patients' conditions, review of any applicable manufacturers' product information, and comparison with recommendations of recognized authorities. The information in this activity is provided to medical professionals for information purposes only. It is NOT to be disseminated to patients or for any other purpose. In particular, no information contained within this activity is intended to be used for medical diagnosis or treatment.

## Probiotics for GI Health in 2012: Issues and Updates

INDICATION	GENUS/SPECIES/STRAIN	PATIENT POPULATION: STRENGTH OF EVIDENCE <sup>a</sup> / EFFECTIVENESS <sup>a</sup> (Evidence-based dose)	COMMERCIAL PRODUCT/ PROPRIETARY MICROBE NAME/ MANUFACTURER'S RECOMMENDED DOSE	MANUFACTURER'S WEBSITE	COST/QUANTITY <sup>c</sup>
Prevention of <i>C. difficile</i> diarrhea	<i>Lactobacillus acidophilus</i> (CL1285) and <i>Lactobacillus casei</i> (LBC80R)	<b>Adult: 1b</b> (5x10 <sup>9</sup> CFU once or twice daily)	<b>BioK+</b> Cultured food or capsules	<a href="https://www.biokplus.com/en-us/home">https://www.biokplus.com/en-us/home</a>	\$12.00/15 capsules (12.5 x10 <sup>9</sup> CFU/capsule); \$20.00/15 capsules (25 x10 <sup>9</sup> CFU/capsule); \$31.50/15 capsules (50 x10 <sup>9</sup> CFU/capsule)
	<i>Lactobacillus casei</i> (DN-114 001)	<b>Adult: 1b</b> (10 <sup>10</sup> CFU twice daily)	<b>DanActive</b> Lactobacillus immunitas Yogurt or cultured food <sup>d</sup>	<a href="http://www.dannon.com/ourproducts.aspx">http://www.dannon.com/ourproducts.aspx</a>	Price varies by store
	<i>Lactobacillus rhamnosus</i> (GG)	<b>Adult: B/C</b>	<b>Culturelle</b> 10x10 <sup>9</sup> CFU/ day To support digestive health and immune function 10x10 <sup>9</sup> CFU/ twice per day for digestive upset	<a href="http://www.culturelle.com/">http://www.culturelle.com/</a>	\$18.52/30 capsules (1 x 10 <sup>10</sup> CFU/capsule); \$15.82/30 powder packets (1.5 x10 <sup>9</sup> CFU/packet)
	<i>Saccharomyces cerevisiae</i> var. boulardii	<b>Adult: 1b/B/C</b> (2-3 x10 <sup>9</sup> CFU daily for 28 days, followed for another 4 weeks)	<b>Florastor</b> Saccharomyces boulardii (lyophilized [Iyol]) 250 mg <i>Contraindicated with central venous catheter</i>	<a href="http://florastor.com/">http://florastor.com/</a>	\$35.50/50 capsules (250 mg/capsule); \$19/10 powder packets (250 mg/packet)
<b>Inflammatory Bowel Diseases (IBD)</b> Treatment of mildly active UC or pouchitis	<i>Bifidobacterium breve</i> , <i>Bifidobacterium longum</i> , <i>Bifidobacterium infantis</i> , <i>Lactobacillus acidophilus</i> , <i>Lactobacillus plantarum</i> , <i>Lactobacillus paracasei</i> , <i>Lactobacillus bulgaricus</i> , <i>Streptococcus thermophilus</i>	<b>Pediatrics: 1b</b> (4-9x10 <sup>11</sup> CFU twice daily)	<b>VSL#3</b> <i>For use under the supervision of a physician</i> (Strains not indicated on product)	<a href="http://www.vsl3.com/">http://www.vsl3.com/</a>	Capsules that contain 112.5 billion live bacteria \$54/60 capsules (\$7.20/2x 9x10 <sup>11</sup> CFU dose); Packets that contain 450 billion live bacteria \$86/ 30 packets (\$5.73/2x9x10 <sup>11</sup> CFU dose); Double Strength (DS) packets that contain 900 billion live bacteria. Price not given
<b>IBD</b> Induction of remission		<b>Adults: 1b</b> (2-9x10 <sup>11</sup> CFU twice daily)			
<b>IBD</b> Prevention and maintenance of remission of pouchitis		<b>Pouchitis: C</b> <b>UC: B</b>			
<b>IBD</b> Maintenance of remission of ulcerative colitis		<b>Adults: 1b/A</b> (9x10 <sup>11</sup> CFU twice daily)			
<b>Irritable Bowel Syndrome</b> Symptomatic relief	<i>Bifidobacterium infantis</i> (35624)	<b>Adults: 1b/B</b> (10 <sup>8</sup> CFU once daily)	<b>Align</b> Bifantis 1x10 <sup>9</sup> CFU/ day As 1 capsule	<a href="http://www.aligngi.com/">http://www.aligngi.com/</a>	\$44.99/42 capsules (\$1.07/capsule)
	<i>Bifidobacterium animalis</i> subsp. <i>lactis</i> (DN-173 010) + starter cultures	<b>Adults: 1b/C</b> (10 <sup>10</sup> CFU twice daily)	<b>Activia</b> Bifidobacterium regularis Yogurt <sup>d</sup>	<a href="http://activia.us.com/">http://activia.us.com/</a>	Price varies by store
<b>Pediatric functional bowel disorders</b> - Symptomatic relief	<i>Lactobacillus reuteri</i> DSM 17938	<b>Pediatrics: 1b</b> (10 <sup>8</sup> CFU twice daily)	<b>BioGaia</b> <i>Lactobacillus reuteri</i> protectis 1x10 <sup>8</sup> CFU/dose	<a href="http://www.childrensprobiotics.com/">http://www.childrensprobiotics.com/</a>	\$39.50/50 mL (107 CFU/5 drops); \$25.39/30 chewable tablets (107 CFU/tablet); \$29.99/30 straws (107 CFU/straw)
	<i>Lactobacillus rhamnosus</i> (GG)	<b>Pediatrics: 1a</b> (10 <sup>10</sup> -10 <sup>11</sup> CFU twice daily)	<b>Culturelle</b> 10x10 <sup>9</sup> CFU/day To support digestive health and immune function 10x10 <sup>9</sup> CFU twice per day for digestive upset	<a href="http://www.culturelle.com/">http://www.culturelle.com/</a>	\$18.52/30 capsules (1 x 10 <sup>10</sup> CFU/capsule); \$15.82/30 powder packets (1.5 x10 <sup>9</sup> CFU/packet)

**Disclaimer:** It is hoped that information in this activity will be useful in the management of your patients. Any procedures, medications, or other courses of diagnosis or treatment discussed or suggested in this activity should not be used by clinicians without evaluation of their patients' conditions, review of any applicable manufacturers' product information, and comparison with recommendations of recognized authorities. The information in this activity is provided to medical professionals for information purposes only. It is NOT to be disseminated to patients or for any other purpose. In particular, no information contained within this activity is intended to be used for medical diagnosis or treatment.

## Probiotics for GI Health in 2012: Issues and Updates

<sup>a</sup>World Gastroenterology Organization (WGO) levels of evidence are defined as: 1a, systematic review with homogeneity of randomized controlled trials; 1b = individual randomized, controlled trial with narrow confidence interval; or 2b, individual cohort study, including low-quality RCT

<sup>b</sup>Effectiveness ratings assigned by the Yale working group are defined as: A = strong, positive studies in the literature; B = based on positive controlled studies, but presence of some negative studies that did not support the primary outcome; C = some positive studies but clearly inadequate amount of work to establish certainty

<sup>c</sup>Prices were taken from various websites for US distributors on August 16, 2012

<sup>d</sup>The CFU/per serving is not available for some yogurts and fermented milk preparations. Patients may wish to try consuming 2 to 3 servings a day and adjust their dose as needed

<sup>1</sup>Guarner F, Khan AG, Garisch J, et al. World Gastroenterology Organisation Global Guidelines: Probiotics and prebiotics, October 2011. *J Clin Gastroenterol*. 2012;46(6):468-481. Available at [http://www.worldgastroenterology.org/assets/export/userfiles/Probiotics\\_FINAL\\_20110116.pdf](http://www.worldgastroenterology.org/assets/export/userfiles/Probiotics_FINAL_20110116.pdf).

<sup>2</sup>Floch MH, Walker WA, Madsen K, et al. Recommendations for probiotic use-2011 update. *J Clin Gastroenterol*. 2011;45 Suppl:S168-171.

**Content Disclaimer:** The authors are exclusively responsible for the respective content. Accordingly, no responsibility is assumed by the contributing faculty, educational grant providers, and Primary Care Network and its affiliates associated with this activity for any injury and/or damage to persons or property as a matter of product liability, negligence or otherwise; or from any use or operation of any methods, products, instructions or ideas contained in the material herein. Any procedures, medications, or other courses of diagnosis or treatment discussed or suggested in this activity should not be used by clinicians without medically appropriate (1) evaluation of (a) their patients' conditions and (b) indications and possible contraindications, warnings, and adverse effects or dangers in use; (2) review of any applicable manufacturers' prescribing and other product information; (3) comparison with recommendations of recognized authorities; and (4) independent verification of diagnostic methods, therapeutic methods, results of research, and measurement of medical doses.