

Probiotic Use in Chronic Kidney Disease Patients

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PROBIOTIC USE IN chronic kidney disease (CKD) patients continues to be an area of interest among renal health care professionals. It is becoming more widely accepted that people with CKD have altered gut flora.¹⁻³ This is an area of interest because altered gut flora impacts the patient in a myriad of ways. In the forefront is gastrointestinal (GI) health and uremic toxins. Restoring balance to intestinal flora favorably impacts the CKD patient as it would any individual and improves any GI issues such as constipation or diarrhea as well as promotes healthy digestion and improved immunity.⁴ These are the important issues with regard to the patient's quality of life and nutritional status. Reducing uremic toxins by probiotic supplementation has shown promise in several studies.^{5,6} However, there is no significant data at this time that allow health care providers to recommend specific products with confidence. Availability of commercial probiotics that specifically target uremic toxins is limited as well. At this time, Renadryl by Kibow Biotech is the only product available. More information on this product can be found at <http://www.renadryl.com/home>. There are many other probiotic supplements available that can help resolve issues such as constipation, diarrhea, and prevent antibiotic associated diarrhea.^{7,8} This can potentially improve the quality of life, digestion, nutrient absorption, as well as improve appetite and decrease inflammation.^{1,7}

Probiotic supplementation is generally preferred over food sources because of the high potassium, phosphorus, sodium, and sugar content of many foods containing probiotics. In addition, when using quality supplements, one is able to better control the amount of probiotic ingested. Much of the data reviewed suggest probiotic use for GI health improvement to be a blend of bacteria with at least 10 billion colony forming units taken daily.^{4,8}

Figure 1 is a screening tool to assist health care providers in identifying patients with altered gut flora.

Table 1 lists probiotic specific strains and commercial products that have been extensively and clinically studied.

It includes both food and supplement products to be recommended at the health care provider's discretion. Table 2 contains more commercial products but is more focused on cost and availability rather than clinical evidence. Most of the products contain a blend of probiotics and are generally recommended for GI health. Prices will vary based on state and store, which is evidenced by products listed multiple times with different prices. However, it does provide a general idea for health practitioners to recommend products based on patient's budgets. Table 3 lists food sources of probiotics along with approximate amount of probiotic. Yogurt is a common food source of probiotic and protein. For more detailed nutrition facts of many varieties of Greek yogurt, see the product review in November 2012 in the Journal of Renal Nutrition.⁹

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Question	Yes	No
Have you taken an antibiotic within the past 12 months?		
Have you experienced constipation or diarrhea within the past 3 months?		
Do you experience abdominal cramping a few hours after eating?		
Is abdominal pain relieved after passing gas?		
Do you experience pain during bowel movements?		
Do your abdominal discomforts, constipation and/or diarrhea get worse with stress?		
Are you frequently bloated?		
Do you experience heart burn or burning in your stomach?		
Do you have trouble losing weight?		
Do you have food allergies?		
If your patient answers yes to 3 or more questions, there is a high likelihood of altered gut bacteria.		

Figure 1. Probiotic screening tool.¹⁰

Table 1. Probiotic Strains and Health Benefits^{7,8}

Species and Strain	General Health	GI Health	Viral Diarrhea	Antibiotic			Urinary Tract Infection	Cold and Resp Virus	Product Including Species
				Assoc. Diarrhea	<i>C Difficile</i> Diarrhea				
<i>Bifidobacterium animalis</i> DN-173 010	x	x						Activia	
<i>Bifidobacterium infantis</i> 35624	x							Align	
<i>Bifidobacterium lactis</i> Bb-12	x	x	x				x	Yo-Plus	
<i>Bifidobacterium lactis</i> HN019, DR10	x	x	x					Danisco	
<i>Lactobacillus casei</i> DN-114 001	x	x	x				x	DanActive	
<i>Lactobacillus casei</i> Shirota	x	x		x				Yakult	
<i>Lactobacillus plantarum</i> 299v	x	x						GoodBelly	
<i>Lactobacillus rhamnosus</i> GG, LGG, (5)	x	x	*	*	x			Culturelle	
<i>Lactobacillus rhamnosus</i> GR-1	x					x		Fem-dophilus	
<i>Saccharomyces boulardii</i> Iyo	x	x	*	*	*			Florastor	

x: strain shows positive response in human and animal studies; *: recommended by 2005 Yale University Workshop.

Table 2. Probiotic Products With Brands, Prices, and CFUs

Store	Product	Brand	Price/Serving (\$)	CFUs/Capsule
Albertsons	4x probiotic	Equaline	0.62	5 Billion
	TruBiotics	Bayer	0.63	10 Billion
	Digestive Health Probiotic	Nature Made	0.63	20 Billion
Fred Meyer	Culturelle	Culturelle	0.77	10 Billion
	Probiotic CD Intestinal Release System		0.50	12 Billion
	Culturelle	Culturelle	0.75	10 Billion
	Probiotic All Flora	New Chapter	0.85	8 Billion
	Ultimate Flora Daily Probiotic	Renew Life Formulas	0.97	15 Billion
GNC	Super 10 Billion Probiotic Complex	GNC Probiotic	0.44	10 Billion
Walgreens	Acidophilus		0.20	2 Billion
	Probiotic	Finest Nutrition	0.27	10 Billion
	Digestive Probiotic	Finest Nutrition	0.57	10 Billion
Wal-Mart	Super Strength Acidophilus	Spring Valley	0.19	2 Billion
	Adult Probiotic	Probaclac	0.47	12 Billion
	Culturelle	Culturelle	0.60	10 Billion
	Ultimate Flora	Renew Life Formulas	0.60	15 Billion
	Florastor	Florastor	1.96	250 mg
www.dialyvite.com	Dialyvite Probiotic	Dialyvite	0.29	10 Billion

CFU, colony forming units.

Table 3. Probiotic Food Sources⁸

Food	Amount of Probiotic
Yogurt 6-8 oz	Can vary significantly, many yogurts have the live active cultures seal, which requires that product to contain 20 billion live cultures in an 8-oz serving at the time of manufacture.
Kefir, 8 oz	3-10 billion at the time of manufacture
Aged cheese, 1.5 oz	3-10 billion at the time of manufacture
Sauerkraut, kimchi, miso and pickles	Varies depending on product, but raw, uncooked varieties are significantly higher.