R . . c R

WNE

As with any product on the market for consumer use, the safety of probiotic products is a major consideration. In the meta-analysis conducted by Blaabjerg et al, the researchers further analyzed ten trials reporting adverse events with probiotic use.[4] The review demonstrated that there was no statistically significant difference in the incidence of adverse events between the intervention and control group, suggesting that the use of probiotics is safe for patients without compromised immune systems. In a review conducted by Hempel et al, researchers analyzed eighty-two studies to evaluate relative risk of AAD among patients taking antibiotics and probiotics compared to those who were taking antibiotics alone; twenty-three of the probiotic studies discussed adverse outcomes and none was found.[15]

However, probiotics must be used with caution. Due to their bacterial nature, probiotics may not be appropriate for patients with compromised immune systems.[16] In addition to immunocompromised patients, other patient populations might be at risk by taking probiotics. In 2008, a study published in *The Lancet* demonstrated that adult patients with acute pancreatitis who received probiotics had an increased mortality over those who did not.[17]

Furthermore, a study based in Germany showed an increase in wheezing bronchitis in infants born to women who were treated with *Lactobacill s* during the perinatal period of their pregnancies with the intention of preventing atopic dermatitis in infants.[18]

Additionally, there are concerns over probiotic product quality. According to the National Center for Complementary and Integrative Health (NCCIH), a branch of the National Institute of Health (NIH), some probiotic products have been found to contain fewer numbers of live microorganisms or different bacterial strains than those labeled on the product. The U.S. Food and Drug Administration (FDA) has not approved any probiotics icr sj-22.117 fny ppihe National

References:

1.

Consideration of proph la is against CDI

Previous guidelines do not address prophylaxis against CDI. The 2018 guideline acknowledges that patients who need to receive other antibiotics during or shortly after the end of CDI therapy are at higher risk for recurrence. While guidelines do not currently give a recommendation due to lack of data, they do state the following: "if the decision is to institute CDI prevention agents, it may be prudent to administer low doses of vancomycin or fidaxomicin (eg, 125 mg or 200 mg, respectively, once daily) while systemic antibiotics are administered." The updated guideline also recognizes that probiotics have shown potential in preventing CDI recurrence. A variety of probiotics have been evaluated, though *Saccharom ces bo lardii* and *Lactobacill s spp*. have been most commonly used in clinical trials. One systematic review and meta-analysis analyzed data Lactobacillus spp

References:

1. Lawson PA, Citron DM, Tyrrell KL, Finegold SM. Reclassification of Clostridium difficile as Clostridioides difficile (Hall and O'Toole 1935) Prévot 1938. *Anaerobe*. 2016; 40:95-9.
2. McDonald LC, Gerding DN, Johnson S, et al. Clinical practice guidelines for Clostridium difficile infection in adults and children: 2017 update by the Infectious Diseases Society of America (IDSA) and Society for Healthcare Epidemiology of America (SHEA) [published online February 15, 2018]. *Clin Infect Dis*. doi: 10.1093/cid/cix1085
3. Zar FA, Bakkanagari SR, Moorthi KM, Davis MB. A comparison of vancomycin and metronidazole for the treatment of Clostridium difficile-associated diarrhea, stratified by disease severity. *Clin Infect Dis*. 2007; 45:302-7.
4. Johnson S, Louie TJ, Gerding DN, et al; Polymer Alternative for CDI Treatment (PACT) Investigators. Vancomycin, metronidazole, or tolevamer for Clostridium difficile infection: results from two multinational, randomized, controlled trials. *Clin Infect Dis.* 2014; 59:345-54.
5. Louie TJ, Miller MA, Mullane KM, et al; OPT-80-003 Clinical Study Group. Fidaxomicin versus vancomycin for Clostridium difficile infection. *N Engl J Med.* 2011; 364:422-31.
6. Cornely OA, Crook DW, Esposito R, et al; OPT-80-004 Clinical Study Group. Fidaxomicin versus vancomycin for infection with Clostridium difficile in Europe, Canada, and the USA: a double-blind, non-inferiority, randomised controlled trial. *Lancet Infect Dis*. 2012; 12:281-9.
7. Crook DW, Walker AS, Kean Y, et al; Study 3/4 Teams. Fidaxomicin versus vancomycin for Clostridium difficile infection: meta-analysis of pivotal randomized controlled trials. *Clin Infect Dis.* 2012; 55(Suppl 2):S93-103.
8. van Nood E, Vrieze A, Nieuwdorp M, et al. Duodenal infusion of donor feces for recurrent Clostridium difficile. *N Engl J Med.* 2013; 368:407-15.
9. Shen NT, Maw A, Tmanova LL, et al. Timely use of probiotics in hospitalized adults prevents clostridium difficile infection: a systematic review with meta-regression analysis. *Gastroenterolog* . 2017; 152:1889-1900.