

Pregnancy and breastfeeding

Insufficient reliable data.

Contraindications

Safety has not been established in patients with liver or renal disease or in young children.

Interactions

Anticholinergic drugs: Theoretically, PS could increase acetylcholine levels and negate the anti-cholinergic action.¹⁸

Cholinergic drugs: Theoretically, PS could potentiate the cholinergic action due to increased acetylcholine levels.¹⁸

Heparin: Preliminary studies indicate synergistic anticoagulant effect with PS.¹⁵ Monitor for signs of bleeding.

Common dosage ranges

100 mg three times daily has been used in clinical studies for Alzheimer's disease, senile dementia, and age-related cognitive or memory impairment.¹⁸

probiotics

(a diverse range of live micro-organisms, often sourced from cultured milk products)

Probiotics are used to suppress the growth of pathogenic bacteria, block epithelial attachment by pathogens, enhance mucosal function, and modulate immune responses of the host.

Common uses

Acute infectious diarrhoea (viral)

Evidence: Several Cochrane reviews and meta-analyses have found convincing evidence to support the effectiveness of probiotics, with the most supporting evidence for *Lactobacillus rhamnosus* GG (LGG) and *Saccharomyces boulardii*. A pooled estimate of one meta-analysis showed LGG reduced the duration of diarrhoea by 1.2 days. There is no evidence to support efficacy in diarrhoeal illness of bacterial origin.¹⁵⁸

Prevention of antibiotic-associated diarrhoea

Evidence: An RCT of 269 children concluded that for every 10 patients receiving *S. boulardii* with antibiotic use one fewer would develop diarrhoea.¹⁵⁹ The findings have been supported by other trials and meta-analysis. Two systematic reviews have found no evidence to support the routine use of probiotics to treat or prevent *Clostridium difficile* induced diarrhoea.¹⁵⁸

Travellers' diarrhoea

Evidence: A meta-analysis of 12 studies showed that probiotics decreased the risk of traveller's diarrhoea (RR, 0.85; 95% CI 0.79–0.91; P<0.001).¹⁶⁰

Ulcerative colitis

Evidence: A 2007 Cochrane review of four RCTs comparing conventional therapy with combined conventional therapy and a probiotic did not find any improvement in overall remission rates in mild to moderate ulcerative colitis. There were significant variations in design between the trials, and all were considered to have methodological limitations.¹⁶¹

Other reported uses: Irritable bowel syndrome, necrotising enterocolitis, inflammatory bowel disease and atopy.

Notes

Probiotics are generally well tolerated.

Pregnancy and breastfeeding

Insufficient reliable data.

Contraindications

Avoid in immuno-compromised patients or those with severe underlying illnesses due to the risk of bacteraemia and fungaemia.

Interactions

None reported.

Common dosage ranges

There is significant variation in the number and strains of bacteria in available products. Optimum dose, frequency and duration of treatment of specific probiotics for specific conditions or in different populations have not been established.¹⁶² Examples of other bacteria used are *Bacillus coagulans* and *Bifidobacteria*.

Acute infectious diarrhoea (viral): Effectiveness is increased if used early in the course of the illness, and at doses of at least 10 billion colony-forming units (CFU). LGG has been used in many of the trials.

Antibiotic-associated diarrhoea: LGG in doses of 10–20 CFU daily has been found beneficial. *Lactobacillus acidophilus*, *L. casei* and *S. boulardii* have also been used.¹⁵⁸

propolis

(Bee glue)

Propolis is a resinous material used by bees to maintain their hives. Harvesting a pure product is difficult, and preparations may be contaminated with allergenic beehive by-products.

Common uses

Upper respiratory tract infection

Evidence: A case-control study using an aqueous nasal spray (*Nivcrisol*) in children with acute and chronic