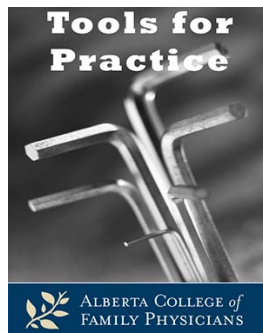


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Reviewed: July 26, 2016
Evidence Updated: New evidence
Bottom Line: Large change
First Published: August 13, 2012



Probiotics C the Difference for the Prevention of C diff

Clinical Question: Do probiotics prevent *Clostridium difficile*-associated diarrhea (CDAD) in patients taking antibiotics?

Bottom Line: Probiotics may reduce the incidence of CDAD in patients on antibiotics, preventing one case of CDAD in 29 but no benefits are seen in studies not funded by manufacturers. Furthermore, the ideal product, length of therapy, and safety of probiotics (particularly in the immunocompromised) is unknown.

Evidence:

- Cochrane review¹ of 31 Randomized Controlled Trials (RCTs) of 4492 mostly adult inpatients using a variety of probiotics for a variable length of time (majority for duration of antibiotic use or up to 14 days after antibiotics finished):
 - Outcomes:
 - Reduction in CDAD incidence:
 - Probiotics 2.0%, placebo 5.5%, number needed to treat (NNT)=29.
 - Limitations:
 - 13 trials missed up to 45% of CDAD data.
 - Eight trials did not report CDAD.
 - Most studies funded by probiotic manufacturer.
- Similar results found in older systematic reviews.²⁻⁴
- RCT⁵ of 2981 elderly inpatients given probiotic (containing *L acidophilus* and *Bifidobacterium*) or placebo for 21 days.
 - No difference in CDAD (probiotic 1.2%, placebo 0.8%), but event rate lower than in other studies.
 - Systematic review⁶ including this study found similar results to Cochrane review.
- With the above RCT⁵ the Cochrane meta-analysis¹ was re-run examining the influence of funding,⁷ the relative risk (confidence intervals) of CDAD was:
 - 0.79 (0.41-1.53) in public funded, no effect.

- 0.34 (0.24-0.48) in industry funded, reduced CDAD with probiotics.

Context:

- Risk factors for CDAD:⁸⁻¹⁰
 - Primarily: antibiotic use (especially cephalosporins, clindamycin and quinolones) and hospitalization.
 - Also: Advancing age, concurrent diseases (especially inflammatory bowel disease), use of corticosteroids, PPIs and H₂RAs.
- Probiotics also decrease antibiotic-associated diarrhea in adults and children (NNT=13).¹
- Cases of fungemia and bacteremia reported in immunocompromised patients given probiotic,¹¹ but overall adverse events seem similar to placebo.^{1,11}
- American guidelines¹² do not endorse probiotics for CDAD prevention, but they do not cite systematic reviews discussed here.
- The Canadian Pediatrics Society provide conflicting^{13,14} recommendations regarding probiotics for CDAD prevention.
- Approximate Canadian cost for 14 days of probiotics with evidence for CDAD prevention:
 - Bio-K+ (*L acidophilus*, *L casei*): \$13
 - TuZen (*L plantarum* 299v): \$37
 - Florastor (*S boulardii*): \$45
 - VSL#3 (8 species): \$112

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