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Choosing the appropriate probiotic for your patient based on strain and disease specificity

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Probiotics are living microbes, when used in adequate amounts, have a beneficial effect on the health of humans. As the popularity of different types of probiotics have become available, it has become increasingly difficult to know which types should be used for specific diseases.

Methods: A systematic review using standard databases (PubMed, Google Scholar) from 1977-December 2018 was conducted for randomized controlled trials (RCTs) of probiotics. Meta-analyses were done to determine if efficacy was strain-specific and/or disease-specific. A graded review was done to determine which probiotic strains had strong evidence for 19 different diseases.

Results: Results of the meta-analyses showed clear evidence that probiotics are both strain and disease specific, hence efficacy needs to be evaluated based on separate probiotic type and disease sub-groups. Of 816 RCTs screened, only 249 had at least 2 RCTs/probiotic type for specific diseases (prevention of 11 different diseases or treatment of 8

different diseases). Of the 22 different types of single-strain or multi-strain mixtures, 15 (68%) had strong evidence of efficacy. For example, of the 61 RCTs for the prevention of antibiotic-associated diarrhea, only four types of probiotics had strong-moderate evidence for efficacy (*S. boulardii* I-745, *L. casei* DN114001, *E. faecalis* SF-38 and a three-strain mixture (Bio-K+), while 4 other probiotic types had non-significant findings of efficacy. For the treatment of eight different diseases, the treatment of acute pediatric diarrhea had the most RCTs (n=61) and 7 different types of probiotics had strong evidence of efficacy, while one mixture had only moderate evidence. There was no 'universal' probiotic that was effective for every disease.

Conclusion: This analysis clearly demonstrated that not all probiotics are equally effective and the choice should be based on the evidence for the specific strain or strains for each specific disease.

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