

# Probiotics Treat and Prevent Antibiotic-Associated Diarrhea

Aaron Pongvacharak, BSN, RN

Shainy Varghese, PhD, APRN, CPNP / Sonya Wade, DNSc, APRN, FNP-BC

## Practice Concern

- “More than a third of patients taking antibiotics develop AAD, and in 17% of cases, AAD is fatal” (Rodgers, Kirley, & Mounsey, 2013).
- Infection with CDAD increases the rate of comorbidities by 20-65% (Sluder, 2011).
- CDAD infections cost roughly 1.3 billion dollars a year (Rodgers, Kirley, & Mounsey, 2013).
- AAD prolongs hospital stays by an average of 3.6 days with each day at a cost of roughly 3,669.10 dollars (Avadhani, & Miley, 2011).

## Needs Assessment

- *Clostridium difficile*-associated diarrhea (CDAD) is the most serious form of AAD (Selinger et al., 2013).
- Interventions to prevent CDAD have been few in number (Sluder, 2011).
- AAD is a readily treatable and preventable condition that still frequently causes complications (Hempel et al., 2012).
- The addition of AAD to individuals already in a poor state of health increases mortality and places them at an increased risk of a poor outcome (Xie, Li, J., Wang, Li, Q., & Chen, 2015).

## PICOT Question

How does probiotic administration compared to no probiotic administration over a six month period affect antibiotic-associated diarrhea in adults 18-65 years of age?

## Literature Review

**Databases:** CINAHL and Cochrane Library.

**Keywords:**

- “Probiotic”, “diarrhea”, and “antibiotic” together yielded 46 articles.
- “Probiotic” and “antibiotic” together yielded 205 articles.
- “Probiotic” and “diarrhea” together yielded 128 articles.

**Inclusion Criteria:**

- Research aimed at treatment and prevention of AAD with probiotics.
- Articles from 2010 – 2018 with adults as patients.

**Exclusion Criteria:**

- Cochrane Library filter for Cochrane Reviews was enabled.
- Articles older than 2010, pilot studies, involving only children.

**Level of Evidence:**

- Ten articles: Six Level I, two Level IV, and two Level II.

**Summary:**

- Probiotics reduces AAD recovery time and severity of symptoms.
- Use of probiotics with antibiotics prevents and treats AAD.
- Reduction in diarrhea improves compliance with antibiotic regimen.
- Most over-the-counter probiotic preparations with multiple strains and enough colony-forming units produce the desired results.
- “Short-term use of probiotics appears to be safe and effective when used along with antibiotics in patients who are not immunocompromised or severely debilitated” (Goldenberg et al., 2013).

## EBP Guidelines

**Guideline Implementation Steps**

- Identify probiotic supplement that satisfies adequate requirements for effectiveness.
- Establish if patient is immunocompromised or severely debilitated.
- An oral dosage of 5 billion colony-forming units or greater per day is recommended to produce the desired results (Wilkins & Sequoia, 2017).
- “Patients should start probiotics on the first day of antibiotic treatment and continue for one to two weeks following completion of antibiotic therapy” (Wilkins & Sequoia, 2017).
- Evaluate for adverse reactions and effectiveness.

## Theoretical Framework

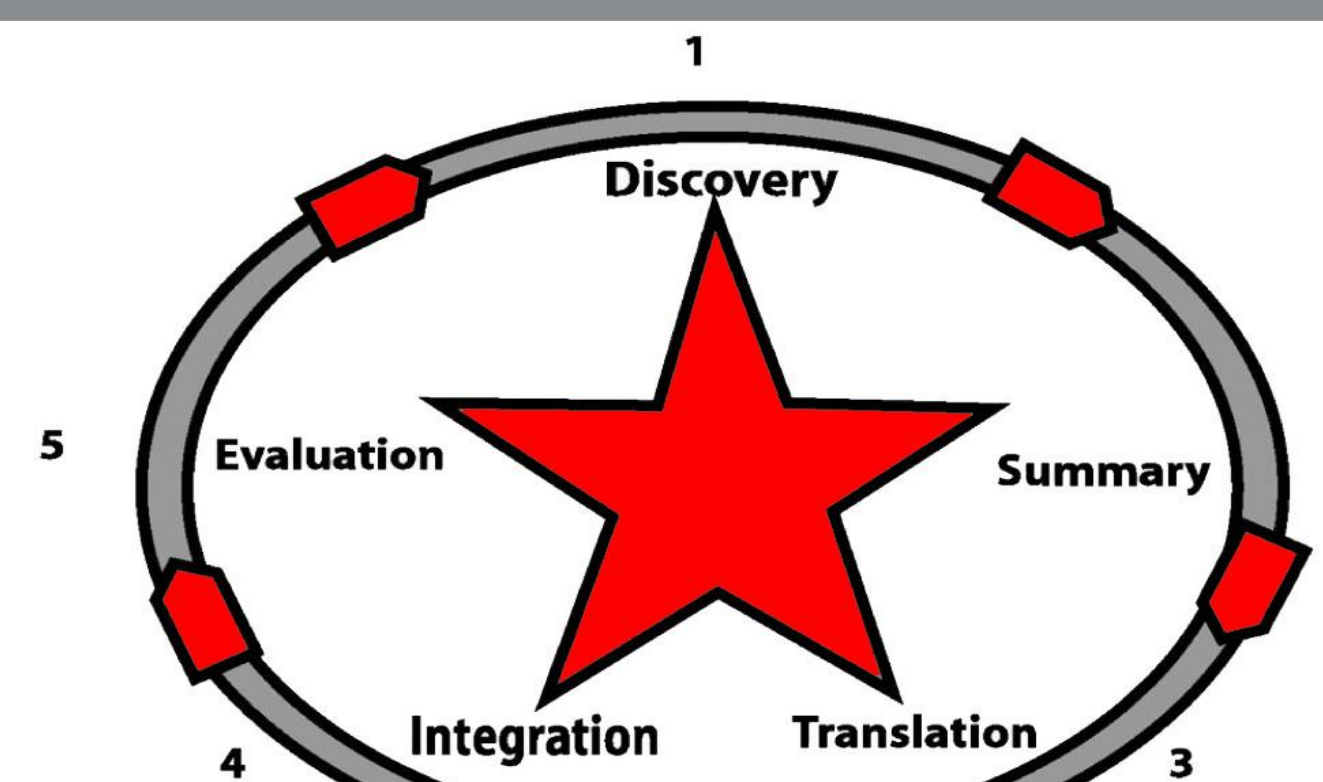


Figure. ACE Star Model of EBP: Knowledge Transformation. K. R. Stevens (2004)

## Implementation

**Discovery**

- Data identified regarding probiotic therapy in research.

**Evidence Summary**

- Applicable research data identified and summarized.

**Translation**

- Summarized data translated into practice recommendations.

**Integration**

- Present practice recommendations to leadership.
- Primary care providers are in-serviced.
- Handouts provided showing the evidence as well as the guidelines for treatment.
- Allow for Q & A session in the last ten minutes to address any questions.

## Evaluation

**Six month chart review**

- Identify 50% increase in prescribing of the providers.
- Compare number of office visits related to AAD before and after implementation.
- Continue to follow current research on probiotics for further updates.
- Adjust practice recommendations as necessary according to newly identified data.

## Selected References

- Agamennone, V., Krul, C. A. M., Rijkers, G., & Kort, R. (2018). A practical guide for probiotics applied to the case of antibiotic-associated diarrhea in The Netherlands. *BMC Gastroenterology*, 18(1), N.PAG.
- Wilkins, T., & Sequoia, J. (2017). Probiotics for Gastrointestinal Conditions: A Summary of the Evidence. *American Family Physician*, 96(3), 170-178. Additional references available upon request.

## Acknowledgements

**Special Thanks to:**

- My family and my professors
- Mr. Charles M. Lusk, III
- J. Dunn Foundation for their financial support

