



# Prophylactic Probiotics for Necrotizing Enterocolitis

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## Background and Significance

- Necrotizing Enterocolitis (NEC) is the leading cause of morbidity and mortality among infants in the Neonatal Intensive Care Unit (NICU), affecting approximately 7% of preterm infants, who are at increased risk for developing NEC due to their low birth weight<sup>10</sup>.
- Infants diagnosed with NEC are at risk for several short and long-term complications, including gastrointestinal dysfunction, delayed neurodevelopment, and death<sup>10</sup>.
- The overall mortality rate of infants with confirmed NEC is 23.5%, with varying rates when stratified by birth weight and severity<sup>4</sup>.
- Human milk feeding, utilization of feeding protocols, and avoidance of antacids are recommended for decreasing the incidence of NEC and recognizing its occurrence in a timely manner<sup>5</sup>.
- While human milk feeding has been shown to reduce the incidence of NEC, many premature babies continue to be affected by this condition. Newer research exploring the use of probiotics for NEC suggests that this alternative intervention may be beneficial in the NICU.

## Purpose

The purpose of this literature review is to compare the use of probiotics and human milk feeding (HMF) for the prevention of (NEC) among preterm infants in the NICU.

## Search Methods

- **Database:** PubMed
- **Keywords:** (preterm) AND (probiotic) AND (necrotizing enterocolitis) AND (prevention)
- **Inclusion criteria:** published 2015 or later, human subjects, English language, infant: birth-23 months
- **Results:** 16 studies returned; 5 studies that investigated relevant outcomes were selected to be included in this review.

## Evidence Summary

Authors	Results	Level of Evidence	Overall Quality
Chowdhury et al. (2016)	The use of probiotics combined with human milk feeding is effective in preventing NEC in preterm infants.	II	A
Costeloe et al. (2016)	The use of B Breve BBG-001 is not particularly effective in preventing NEC.	II	B
Dilli et al. (2015)	Probiotic (Bifidobacterium lactis) and synbiotic (Bifidobacterium lactis & inulin) are effective in decreasing the incidence of NEC among VLBW infants, but prebiotic (inulin) alone is not.	II	A
Gómez-Rodríguez et al. (2019)	Incidence of NEC was similar among infants who received single strain and multispecies probiotic.	II	B
Nandhini et al. (2015)	Synbiotic supplementation in addition to breastmilk has the potential to decrease the incidence of NEC among preterm infants.	II	B

## Summary and Conclusions

- It is difficult to recommend the general use of probiotics for the prevention of NEC, considering the inconsistency of the evidence; only two of the five studies demonstrated that probiotics for preventing NEC was statistically significant.
- However, all five studies reported lower rates of NEC among the intervention groups. Additionally, synbiotics appear to have the strongest impact on rates of NEC as compared to probiotics or prebiotics.
- Further research is required to determine if probiotic supplementation for the prevention of NEC is clinically effective, which type and strain are most effective, any long-term adverse effects that may be associated with the use of these products, and which specific populations of infants would benefit most from this intervention.
- Ultimately, the use of probiotics is a simple and affordable measure that has the potential to reduce rates of NEC among preterm infants.

## Acknowledgement

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## CNL Role

- The CNL is responsible for incorporating their knowledge of evidence-based practices into the lateral integration of patient care by working together with the interdisciplinary care team in order to improve the quality, safety, and outcomes of care delivery.
- Patient advocate- stay up to date on current literature regarding NICU care practices; the CNL should be skilled in asking clinical questions, searching for and appraising the evidence, integrating the evidence into practice, facilitating change, and evaluating the outcomes.
- Communicator and collaborator- communicate to the care team about any concerns that may be indicative of NEC and collaborate with relevant members of the team in order to devise a solution that is maximally beneficial to the patient; the CNL should be open-minded, inclusive, and skilled in conflict resolution.
- Educator- informs parents of infants in the NICU about the plan of care, explains why specific interventions are implemented, and discusses all possible outcomes; teaches staff the importance of reducing the incidence of NEC; disseminates the knowledge obtained from their research about best practices regarding prevention and treatment of NEC.

## Implications for Nursing Practice

- The evidence reveals that in comparison to HMF, probiotic supplementation does not necessarily reduce cases of NEC. While quality of care, patient safety, and patient outcomes may not improve with the incorporation of probiotics in neonatal care, they are not negatively affected either.
- Further research regarding the use of probiotics for NEC prevention is required to determine the effect on quality of care and patient safety, as no adverse effects were discovered within these studies.

## References

