

# Review: Enteral immunonutrition reduces infection risk, days on ventilation, and hospital stay in critically ill patients

Beale RJ, Bryg DJ, Bihari DJ. Immunonutrition in the critically ill: a systematic review of clinical outcome. *Crit Care Med.* 1999 Dec;27:2799-805.

## QUESTION

What is the effectiveness of enteral nutrition with an immune-enhancing feed in patients who are critically ill?

## DATA SOURCES

Studies were identified by searching MEDLINE (1967 to January 1998) using the terms human, enteral nutrition, arginine, nucleotides, omega-3 fatty acids, immunonutrition, IMPACT, and Immun-Aid. Authors and manufacturers of IMPACT (Novartis Nutrition, Switzerland) and Immun-Aid (McGaw, USA) were contacted.

## STUDY SELECTION

English-language, randomized, controlled trials were selected if they included patients who were critically ill and required enteral nutrition by a nasogastric or jejunostomy tube; had obtained approval by an institutional review board and informed consent; compared standard enteral feed with an enteral feed enriched with arginine with or without glutamine, nucleotides, and omega-3 fatty acids; and reported on clinically important outcomes.

## DATA EXTRACTION

2 reviewers extracted data on study quality, patient diagnosis, type of feeds, mortality,

infection, days on mechanical ventilation, hospital length of stay, intensive care unit length of stay, days of diarrhea, Acute Physiology and Chronic Health Evaluation II score, and calorie and nitrogen intake.

## MAIN RESULTS

15 studies were identified, and 12 (1482 participants) were included in the analysis. Immune-enhancing feed reduced the risk for infection ( $P = 0.005$ , 8 studies), days on mechanical ventilation ( $P = 0.04$ , 5 studies), and hospital length of stay ( $P = 0.002$ , 10 studies) more than did standard feed (Table); no difference existed for overall mortality (relative risk 1.05, 95% CI 0.79 to 1.41,  $P = 0.76$ , 12 studies), intensive care unit length of stay ( $P = 0.2$ , 6 studies), or days of diarrhea ( $P = 0.78$ , 3 studies).

## CONCLUSION

Enteral nutrition with an immune-enhancing feed reduces the risk for infection, days on mechanical ventilation, and hospital length of stay in patients who are critically ill.

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## Immune-enhancing feed vs standard feed for critically ill patients\*

Outcomes	Cumulative event rates		RRR (95% CI)	NNT (CI)
	Immune-enhancing feed	Standard feed		
Infection	29%	38%	23% (7 to 37)	11 (7 to 40)
Weighted mean decrease (CI)				
Mechanical ventilation, <i>d</i>	2.6 (0.1 to 5.1)			
Hospital length of stay, <i>d</i>	2.9 (1.4 to 4.4)			

\*Abbreviations defined in Glossary. Weighted event rates, RRR, NNT, and CI calculated from data provided by author. Follow-up data not available.

## COMMENTARY

As implied by a previous meta-analysis (1) and individual studies (2, 3), the main concern about immunonutrition is a question of increased mortality. Does the article by Beale and colleagues provide sufficient evidence to alleviate such fears and to warrant clinical recommendations? The authors limited their search to English-language studies, used only MEDLINE, and combined only studies of Impact and Immun-Aid. Interpreting differences in duration of mechanical ventilation and hospital length of stay is difficult when more deaths occur in the experimental group and when those that occur happen earlier in the course of illness (2). Immunonutrition reduces infection rates (consistent signal across studies, including the meta-analyses). However, further work needs to be done to define which subgroups benefit or are harmed and especially whether a different treatment effect exists in elective surgical compared with critically ill patients. Only then can we recommend immunostimulating ingredients to all critically ill patients.

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## References

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