

Early Introduction of a Semi-Elemental Formula May Be Cost Saving Compared to a Polymeric Formula Among Critically Ill Patients Requiring Enteral Nutrition: A Cohort Cost-Consequence Model

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Objective:

This US-based cost-consequence model was designed to quantify the cost of gastrointestinal (GI) intolerance and identify the cost implications of initiating enteral nutrition (EN) with a semi-elemental versus standard polymeric EN formula in intensive care units (ICUs).

Materials and Methods:

Utilizing a comprehensive literature review of data from 2005–2015, the economic burden of GI intolerance in the ICU was determined. A cost-consequence model was created to compare the total ICU costs for patients with and without GI intolerance who are receiving EN in the ICU, largely based on a previously published retrospective analysis of an observational cohort study on the prevalence and risk factors associated with GI intolerance in the ICU (Gungabissoon, et al. *JPEN* 2015;39:441–448). This cost-consequence model assumed that for every 100 ICU patients receiving EN, 31 will develop GI intolerance and 69 will remain GI tolerant throughout the ICU stay. In addition, Gungabissoon calculations of a mean ICU length of stay was utilized: 14.4 days for GI intolerant and 11.3 days for GI tolerant patients.

Estimated ICU stay cost was \$4714/day. Formula cost was calculated as an average of 8 days of EN at 1.5 liters/day, using the cost of \$10.17/liter for standard formula or Isosource® and \$36.67/L for semi-elemental or Peptamen®, equating to a total EN formula cost/patient of \$122.04 and \$440.04, respectively.

Results:

For purposes of the cost-consequence model, results for 100 patients were calculated, showing costs of 31 GI-intolerant and 69 GI-tolerant patients.

- Estimated ICU length of stay is 1226.1 days in the intolerant group and 1130.0 days in the tolerant group, or 96.1 additional ICU days of stay for intolerant patients at an additional cost to the facility of \$453,015 (96.1 days x \$4714/day = \$453,015).
- Even if only 7% of intolerant patients received a semi-elemental feeding, cost savings would be achieved.

Discussion:

- Prolonged ICU stays are associated with an increased risk for hospital readmission, death within 30 days of hospital discharge and long-term physical disability
- GI intolerance is associated with frequent feeding interruptions and a reduction in delivery of daily protein and calories.
- GI intolerance is an independent risk factor for prolonged ICU stay and higher mortality rate..
- The cost of a semi-elemental formula is low relative to the overall daily cost of an ICU stay.

Conclusion:

This model showed that the use of a semi-elemental EN formula would be cost-saving if it led to 7% fewer feeding interruptions due to GI intolerance, as compared to a standard polymeric EN formula.

Study summary prepared by Nestlé Health Science.

The complete study can be accessed at:
<https://doi.org/10.2147/CEOR.S155312>

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