

ACHIEVING PROTEIN TARGETS IN THE ICU USING A SPECIALIZED HIGH-PROTEIN ENTERAL FORMULA: A QUALITY IMPROVEMENT PROJECT

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Background

To meet protein needs in critical illness (CI), guidelines suggest 1.2–2.5 g protein/kg/d; however, most intensive care unit (ICU) patients receive 0.7 g/kg/d. Higher protein enteral nutrition (EN) formulas may be part of the solution to provide prescribed protein.

Objective

To demonstrate that an EN formula with 37% protein can deliver 80% of prescribed protein, without overfeeding calories within the first 5 days of feeding and to describe ICU clinicians' experience.

Methods

This quality improvement (QI) project included patients requiring exclusive EN for up to 5 days from 6 Canadian ICUs. Rationale for choosing the formula*, patient's BMI (kg/m²), nutrition targets, daily protein and energy delivered, feeding interruptions, and general tolerance were recorded.

*The formula is a complete nutrition formula containing 1 kcal/mL, 37% protein (92 g/L), 31% carbohydrate, 32% fat (50% medium chain triglycerides [MCTs]; added eicosapentaenoic acid/docosahexaenoic acid), NPC:N ratio of 43:1, and osmolality of 345 mOsm/kg water (Peptamen Intense, Nestlé Health Science).

Results

- 44/49 patients received the formula 2 days. Protein and energy prescribed and delivered in table 1
- 75 – 83% of patients received 80% prescribed protein on days 2–5
- The formula was well tolerated with no gastrointestinal symptoms reported in 38 (86%) patients
- The most common reasons to prescribe the formula were obesity and use of fat-based medications

Table 1: . Nutrition Prescription and Intake Over First 5 Study Days (n = 44) ^{a,b}

Protein Prescribed	Protein Delivered	
137.5 g/d ± 24.2 [82.5–200]	116.9 g/d ± 36.7 [33.5–188]	
1.9 g/kg/d ± 0.28 [1.5–2.5]	1.6 g/kg/d ± 0.46 [0.4–2.4]	
Energy Prescribed	Energy Delivered	
	Formula Alone ^c	Formula + Fat-Based Medication
1638.6 kcal/d ± 317.2 [990–2500]	1230.93 kcal/d ± 431.5 [362.5–2142]	1523.9 kcal/d ± 403.6 [693.0–2557.5]
17.8 kcal/kg/d ± 5.4 [11–26]	12.5 kcal/kg/d ± 4.7 [4.3–24.8]	17.3 kcal/kg/d ± 5.2 [8.7–27.8]

a. Among patients who received formula for 2 or more days. b. Mean protein and energy prescribed; mean protein and energy delivery over the 5 study days, ± standard deviation [range]. c. Energy delivered from formula alone includes all patients with 2+ days of feeding and is calculated using energy intake only from formula.

Conclusion

We demonstrated in a QI study that a high-protein EN formula was well tolerated in a small heterogeneous group of ICU patients and was effective in meeting prescribed protein targets without overfeeding.

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