Yes, you can achieve very-high protein targets in your tube fed ICU patients!

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BACKGROUND

- Providing adequate protein to critically ill patients may improve morbidity, mortality and nitrogen accretion [1-5]
- Guidelines suggest up to 2- 2.5 g protein/kg/day [6-8]
- Most ICU patients receive less than 0.7g protein/kg/day [9-13]
- Delivering ≥ 80% of prescribed protein has been associated with improved outcomes and suggested as a quality metric for nutrition delivery [14]
- Success of a tube feeding regime may also depend on patient tolerance. Incidence of tube feeding intolerance in the ICU has been reported to range from 30-60% and has been associated with reduced delivery of EN [15-17]
- Clinicians have advocated for well-tolerated, higher protein enteral formulas with lower non-protein calorie: nitrogen ratios (NPC:N) [18,19]

OBJECTIVE

To demonstrate that a specialized EN formula with 37% calories from protein will deliver at least 80% of prescribed protein needs to ICU patients within the first 5 days of feeding and to describe formula tolerance and clinicians' indications for use.

METHODS

Study Design: Quality improvement (QI) study

Participating Sites: 10 Canadian ICUs (ICU size: range 12-46 beds)

- RD's assessed 5-10 patients per site with "high protein needs" who required exclusive EN for up to 5 days

Data Collected

- Rationale for using the 37% protein formula, Peptamen® Intense High Protein [1.0 Kcal/mL, 92 g protein/L, NPC:N ratio 43:1, peptide-based 100% whey, with MCT]
- Patient's BMI, protein and energy targets
- Daily protein and energy delivered (including modular protein and lipid based medication)
- Feeding interruptions and general tolerance

Statistical Analysis

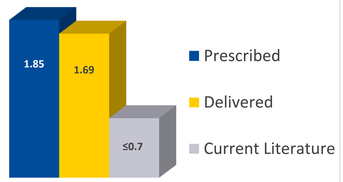
- The proportion of daily protein and energy intake achieved was calculated on each of the 5 study days for patients with ≥ 2 days of reported data
- Patients were flagged as to whether they met 80% of daily protein and total energy needs on each study day
- Bar charts and simple descriptive statistics were calculated. Open ended responses were presented as tabulations

RESULTS

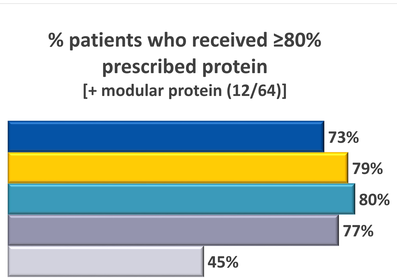
- Data was collected from July 2015– July 2016
- 64/69 patients received the 37% protein formula ≥ 2 days.

Protein Prescribed (Ave)	Protein Delivered (Ave Days 2-5)	Energy Prescribed (Ave)	Energy Delivered (Ave Days 2-5)
134.5 g/day	123.2 g/day	1720 kcal/day	1515 kcal/day
1.85 g/kg	1.69 g/kg		

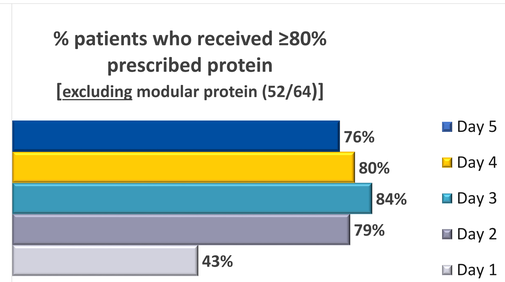
Protein Prescribed & Delivered vs Current Literature
(Ave g/kg)



% patients who received ≥80% prescribed protein
[+ modular protein (12/64)]



% patients who received ≥80% prescribed protein
[excluding modular protein (52/64)]



Formula Tolerance	
No GI symptoms Reported	55/64 (86%)
Primary Reason for Prescribing the 37% Protein Formula*	
Obesity	34 (50%)
Propofol	17 (25%)
High Protein Needs	10 (15%)
Renal Dialysis	11 (16%)
Sepsis	9 (13%)
Trauma	8 (11.5%)
Protein/Energy Ratio	8 (11.5%)

*more than one reason was provided for many patients

DISCUSSION & CONCLUSIONS

- This study was consistent with findings from a recent small, prospective observational study which demonstrated tolerance, safety and efficacy of this same higher protein formula in helping reach protein goals in a group of obese ICU patients [20]
- A specialized EN formula with 37% calories from protein will help achieve higher protein targets while avoiding overfeeding in a variety of ICU patients and is well tolerated

STRENGTHS & LIMITATIONS

Strengths

- This study reports on the real-life experience of Canadian clinicians across 10 ICUs
- This data confirms that it is possible to meet higher protein needs enterally – providing valuable insights as this data is currently lacking in the literature

Limitations

- Small sample size
- As with any observational study, some difference in patient and site characteristics may explain the differences in nutrition performance observed
- Larger trials needed to explore impact of protein delivery on outcomes

IMPLICATIONS

The data collected in this QI study confirms that it is possible to meet higher protein needs enterally without overfeeding calories, and contributes to the small but growing body of literature in this area of medical nutrition.

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