

A Volume-Based Feeding Protocol Improves Nutrient Delivery and Glycemic Control in a Surgical Trauma Intensive Care Unit

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Objective:

To determine if a volume-based feeding (VBF) protocol would improve the provision of $\geq 80\%$ of nutritional needs in a high risk surgical trauma intensive care unit (STICU) population.

Methods:

Retrospective review of adults admitted to a Level 1 Trauma Center that received exclusively enteral nutrition. Nutritional risk was determined via Subjective Global Assessment (SGA). Body Mass Index (BMI- admission or ideal) was used to calculate protein needs (1.5–2.5 g/kg/d) and caloric needs (25-40 kcal/kg). Patients prescribed VBF (n=295) were nearly all prescribed a semi-elemental 1.5 kcal/mL high protein immunonutrition formula with supplemental arginine, n-3 fatty acids and nucleotides (IMPACT® Peptide 1.5). VBF was initiated at 25 mL/hour on Day 1 of feeding and increased to goal rate on Day 2. Nursing was trained to adjust the rate after feeding interruptions to achieve a daily total volume target. Patients in the control group (n=197) received traditional rate feedings (RBF) of various whole protein (WP) formulas and protein modules.

Results:

Patient Data	RBF – WP (n=197)	VBF – IMPACT® Peptide 1.5 (n=295)	P value
STICU length of stay (LOS)	13	13	0.898
Injury Severity Score (ISS)	17	21	0.008
Pneumonia	83 (42.1%)	37 (12.5%)	<0.0001
Blood glucose >200 mg/dL, d	356 (14.1%)	264 (8.7%)	<0.0001
Blood glucose < 70 mg/dL, d	29 (1.2%)	19 (0.6%)	0.037
Emesis, d	29 (1.2%)	34 (1.1%)	0.93
Met/exceeded protein goal, d (%)	470 (18.6%)	1737 (57.4%)	<0.0001
Protein, g/d	18.2	83.6	<0.0001
Met/exceeded calorie goal, d (%)	678 (26.9%)	1726 (57%)	<0.0001
Calories, kcal/d	347.4	1310.4	<0.0001

✓ Despite ISS trending higher, the VBF STICU patients:

- Received 4.6x more protein vs. RBF group (57.4% reached $\geq 80\%$ of needs)
- Had 38% fewer days of hyperglycemia vs. RBF group
- Had fewer cases of pneumonia (12.5% in VBF vs. 42.1% in RBF group)

Conclusion:

- The VBF STICU protocol supported large increases in the adequacy of protein and calories provided.
- Clinical outcomes (blood glucose management, pneumonia) were also improved with the VBF immunonutrition protocol.

Summary prepared by Nestlé Health Science.

The complete study may be accessed online:

<https://onlinelibrary.wiley.com/doi/abs/10.1002/jpen.1712>