



Clinical
Evidence for
**Enteral Nutrition
Feeding
Protocols**

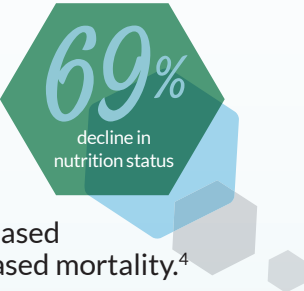
The Benefits of **Volume-Based Feeding (VBF)** vs. Traditional Rate-Based Feeding (RBF)

VBF establishes a 24-hour enteral feeding volume, administered daily to utilize **"catch up" phases** to account for interruptions in feeding to reach goal calorie and protein needs. An appropriate approach for patients determined to be at high nutritional risk.¹

RBF utilizes slow titration and fixed hourly goal rate, regardless of interruptions in feeding.²

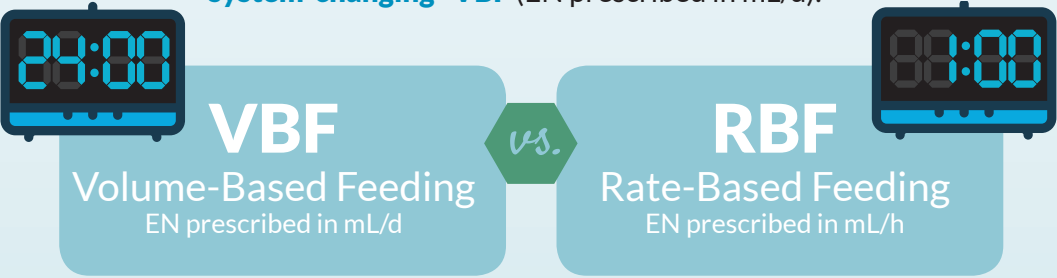
Facts about
NUTRITIONAL INADEQUACY in the ICU:

- 1. Up to 69% of patients experience a decline in their nutrition status during hospitalization, likely due to inability of Rate-Based Feeding (RBF) protocols to meet calorie and protein needs.
- 2. Critically ill patients receive, on average, 40-50% of prescribed nutritional requirements, leading to increased complications, prolonged ICU length of stay and increased mortality.
- 3. A delay in initiation of EN is also common, and when started, surgical and trauma ICU patients are likely to get fewer goal calories delivered (45.8% vs. 56.1%, P<0.05) vs. medical ICU patients, due to holding of feeds for diagnostic testing and multiple operative procedures.
- 4. Feeding delays and inadequacies of EN delivery have been shown to increase complications and mortality.



Benefits of VBF vs. RBF

- 1. In 2010, the introduction of VBF, a component of the PepUP protocol, changed the focus of EN delivery from the "traditional" RBF (EN prescribed in mL/h) to a "system-changing" VBF (EN prescribed in mL/d).

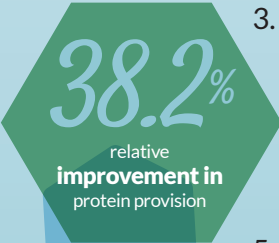


- 2. Instead of a prescribed rate per hour (60 mL/h), patient would have a prescribed volume per day (1440 mL/24 hours). This provides nurses freedom to adjust the hourly rate as needed to reach the prescribed daily volume "catch-up" for hours when the EN was held for procedures or diagnostic testing.

A sample schedule from CriticalCareNutrition.com is found below:

Volume-Based Feeding Schedule

Goal total mL formula per 24 hours	Hours remaining in the day to feed 24 hour volume																							
	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
2400	100	104	109	114	120	126	133	141	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
2350	98	102	107	112	118	124	131	138	147	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
2300	96	100	105	110	115	121	128	135	144	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
2250	94	98	102	107	113	118	125	132	141	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150
2200	92	96	100	105	110	116	122	129	138	147	150	150	150	150	150	150	150	150	150	150	150	150	150	150
2150	90	93	98	102	108	113	119	126	134	143	150	150	150	150	150	150	150	150	150	150	150	150	150	150
2100	88	91	95	100	105	111	117	124	131	140	150	150	150	150	150	150	150	150	150	150	150	150	150	150
2050	85	89	93	98	103	108	114	121	128	137	146	150	150	150	150	150	150	150	150	150	150	150	150	150
2000	83	87	91	95	100	105	111	118	125	133	143	150	150	150	150	150	150	150	150	150	150	150	150	150
1950	81	85	89	93	98	103	108	115	122	130	139	150	150	150	150	150	150	150	150	150	150	150	150	150
1900	79	83	86	90	95	100	106	112	119	127	136	146	150	150	150	150	150	150	150	150	150	150	150	150
1850	77	80	84	88	93	97	103	109	116	123	132	142	150	150	150	150	150	150	150	150	150	150	150	150
1800	75	78	82	86	90	95	100	106	113	120	129	138	150	150	150	150	150	150	150	150	150	150	150	150



- 3. When VBF was initiated, patients who receive VBF protocols saw a 38.2% relative improvement in protein provision vs. the RBF control group.
 - 4. Additionally, patients were started on peptide-based formulas, as a "safe-start" strategy, designed to promote tolerance in this patient population.
 - 5. With an improvement in protein provision, VBF patients are more likely to reach protein goals.
- Protein achievement is tied to length of stay, as patients who achieve 80% or more of their protein target have a 33% reduction in LOS.

Typical Intensive Care Unit (ICU) Enteral Nutrition (EN)
PATIENT JOURNEY
Results in Nutritional Inadequacy

ADMITTED to the ICU.



DAILY CALORIE and PROTEIN GOAL established by healthcare team; appropriate EN formula selected.



STARTS EN (hemodynamically stable, no contraindications for enteral nutrition).



HOURLY RBF established to deliver the goal calories and protein over a 24-hour period.



INTERRUPTION!

TUBE FEEDING PLACED ON HOLD for testing, bedside procedures, operations, radiology procedures, anticipated extubation, etc., and RBF NOT DELIVERED for select periods of time.



OUTCOMES
Malnutrition at admission or developed during hospitalization adversely affects;

- ICU LOS
- morbidity
- mortality



Tools and resources for initiating a VOLUME-BASED FEEDING (VBF) Protocol in your ICU

www.CriticalCareNutrition.com

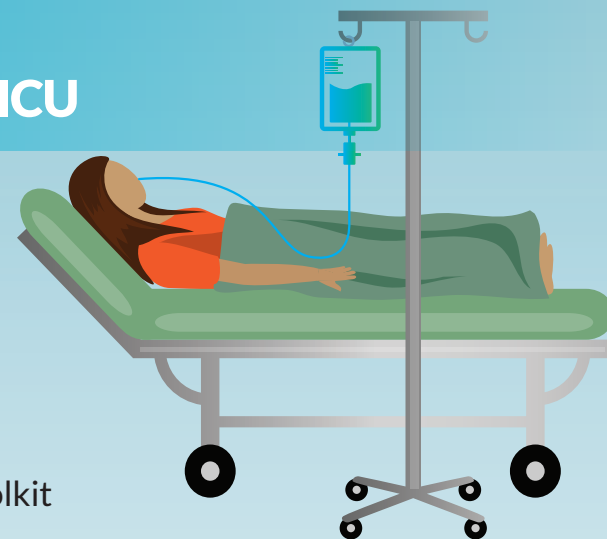
- VBF Schedule
- VBF Calculation Examples
- Sample Paper Order Sets
- Videos

www.ENactNutrition.com

- Quality Improvement Protocols to help track protein delivery
- Click “Act” and download the “Optimizing Protein Delivery in the ICU” toolkit
- Quality Improvement Training Course for Dietitians

www.MyCEeducation.com

- Continuing Education Programs to raise awareness of evidence supporting VBF protocols
- Select “View Catalog” on landing page to review list of available courses



For more information about VBF protocols or to inquire about education programs,
contact your Nestlé Health Science sales representative.



Recommended Protocol

Peptide-based diets, including PEPTAMEN® and IMPACT® Peptide 1.5 formulas, can be used as a “safe-start strategy” for feeding initiation at 25cc/hr for the first ICU day, advancing to VBF on day two, as tolerated.⁹

USE UNDER MEDICAL SUPERVISION

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References: 1. McClave SA, et al. *JPEN* 2016;40(2):159-211. 2. Holyk A, et al. *CCM* 2017;46(1S). 3. Sungurtekin H, et al. *Nutr Clin Pract* 2008;23(6):635-641. 4. Heyland DK, et al. *CCM* 2011 39:2619-2626. 5. Drover JW, et al. *JPEN* 2010;34(6):644-652. 6. Lewis SJ, et al. *J Gastrointest Surg* 2009;13(3):569-575. 7. Heyland DK, et al. *Crit Care* 2010;14(2):R78. 8. Heyland DK, et al. Poster 56: A.S.P.E.N. Clinical Nutrition Week 2012. 9. Heyland DK, et al. *CCM* 2013;41(12):2743-2753. 10. Yeh, et al. *NCP* 2017;32(2):175-181. 11. Kim H, et al. *J Crit Care* 2012;27(6):702-713. 12. Fuhrmann K, et al. *SW Resp and CC Chronicles* 2013;1(4):8-14.