



PERFECT protocol: volume-based feeding in ventilated adults



Underfeeding in critical illness is common and associated with poor outcomes. Researchers in the UK designed a before-and-after study to evaluate the safety, efficacy and clinical outcomes associated with volume-based feeding (VBF) compared to rate-based feeding (RBF) in a single intensive care unit (ICU).

The prospective before-and-after study suggests that VBF safely and effectively increased the delivery of energy and protein to critically ill, mechanically ventilated patients, and that increased protein delivery may improve extubation rate, but these factors did not influence mortality or ICU length of stay (ICU-LOS).

The study adds weight to the ICU literature supporting VBF, and the growing evidence which advocates for enhanced protein delivery to improve patient outcomes. The VBF protocol used in this study is called "Protein & Energy Requirements Fed for Every Critically ill patient every Time" (PERFECT). The protocol was adapted from PEPuP, or Enhanced Protein-Energy Provision via the Enteral Route in Critically Ill Patients; however, unlike PEPuP, baseline semi-elemental feeds, protein supplements and prophylactic prokinetics were not used.

The study sample included consecutively admitted critically ill adults, mechanically ventilated for at least 72 hours and fed enterally for a minimum of 48 hours. The first cohort (n = 46) was fed using RBF, the second (n = 46) using VBF, and observed for 7 days, or until extubation or death. Statistical comparison of percentage feed volume, energy and protein delivered, plus indices of feed intolerance, were the primary outcomes of interest. Secondary observations included ventilation period, mortality, and ICU-LOS.

The two groups were comparable in baseline clinical and demographic characteristics and nutrition practices. Volume delivered to the VBF group increased significantly by 11.2% ($p \leq 0.001$), energy by 13.4% ($p \leq 0.001$) and protein by 8.4% ($p = 0.02$), compared to the RBF group. In the VBF group, patients meeting > 90% of energy requirements increased significantly from 47.8 to 84.8% ($p \leq 0.001$); those meeting > 90% of protein requirements changed from 56.5 to 73.9% ($p = 0.134$).

VBF did not increase symptoms of feed intolerance. Adjusted binomial logistic regression found each additional 1% of prescribed feed delivered decreased the odds of vomiting by 0.942 (5.8%), 95% CI [0.900–0.985], $p = 0.010$. No differences in mortality or ICU-LOS were identified.

The researchers also found a significantly increased extubation rate in patients receiving > 90% of protein requirements compared to those meeting < 80%, ($p = 0.006$). They also observed that the daily probability of being extubated tripled in patients receiving > 90% of their protein needs compared to the group receiving < 80%, hazard ratio 3.473, $p = 0.021$, 95% CI [1.205–10.014].

The suggestion that increased protein delivery predicted the probability of earlier extubation in the PERFECT study is exciting, and links to the recent call to research by Hurt et al. to explore protein-related improvements in short-term outcomes.

To optimise interpretation and generalisability of the study results, large, multicentre randomised controlled trials must be designed to measure outcomes related to improved protein delivery, using adequately powered samples for pre-specified effect sizes, a priori determined patient outcomes, and subject to powerful statistical analysis.

Source: [Critical Care](#)

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