Enhanced Protein-Energy Provision via the Enteral Route in Critically Ill Patients:

A Single center feasibility trial of The PEP uP Protocol

Daren K. Heyland MD, FRCPC [1,2, 3,] Naomi E Cahill RD, MSc[2,3], Rupinder Dhaliwal RD[3], Miao Wang, MSc[3], Andrew G Day, MSc[3], Ahmed Alenzi MD[1], Fiona Aris RD[4], John Muscedere MD FRCPC[1], Roy Ilan MD, FRCPC[1], John W Drover MD, FRCSC[5], Stephen A. McClave, MD[6]

[1]Department of Medicine, Queen's University, Kingston, ON, Canada [2]Department of Community Health and Epidemiology, Queen's University, Kingston, ON, Canada [3]Clinical Evaluation Research Unit, Kingston General Hospital, Kingston, ON, Canada [4]Clinical Nutrition, Kingston General Hospital, Kingston, ON, Canada [5] Department of Surgery, Queen's University, Kingston, ON, Canada [6] Department of Medicine, Louisville School of Medicine, Louisville, KY

Background: Clinical Practice Guidelines recommend early enteral nutrition (EN) as the preferred strategy for feeding critically ill patients. Historically, feeding protocols have been used to initiate and guide dose titration for EN. A review of current practice in ICU patients demonstrated that the actual amounts of energy and protein delivered by standard feeding protocols are well below what is prescribed. A change in approach to providing EN is required if we are going to opitmize nutrition in the ICU and thereby improve outcomes.

Objective: The purpose of this pilot study is to assess the feasibility, acceptability, and safety of a new feeding protocol designed to enhance the delivery of EN in mechanically ventilated critically ill patients.

Methods: In a prospective, before and after study, we evaluated the new protocol coupled with a nursing educational intervention compared to our standard feeding protocol. Innovative elements of the new protocol included setting daily volume based goals instead of hourly rate targets, initiating motility agents and protein supplements on day 1, and the option to use trophic feeds in selected patients, and. Bedside nurses filled out questionnaires to assess the acceptability of the new approach. We collected data on the characteristics, type and amount of nutrition received, and outcomes at 60 days of 20 consecutive patients before and 30 patients after implementation of the new feeding protocol. We then compared the nutritional and clinical outcomes between patients who had received the new protocol to those who had not.

Results: We enrolled 20 mechanically ventilated patients who stayed in the ICU more than 3 days in the before group and 30 such patients in the after group. On a scale where 1=totally unacceptable and 10=totally acceptable, 30 nurses rated the new protocol as 7.1 (range 1-10) and no incidents compromising patient safety were observed. In the before groups, on average, patients received 58.8% of their energy and 61.2% of their protein requirements. In the after group, patients received 67.9% and

73.6% of their energy and protein requirements respectively (p=0.30 and 0.14). In the subgroup of patients prescribed to receive full volume feeds in the after group were evaluated (n=18), they received 83.2% and 89.4% of their energy and protein requirements respectively (p=0.01 for energy and 0.002 for protein compared to before group). The rates of vomiting, regurgitation, aspiration, and pneumonia were similar between the 2 groups.

Conclusions: This new feeding protocol seems to be feasible, safe, and acceptable to critical care nurses. It may be associated with enhanced delivery of EN but large scale randomized trials are warranted to evaluate its effect on nutritional and clinical endpoints.