

THE ASSOCIATION BETWEEN MAINTAINING ENTERAL NUTRITION POST ICU DISCHARGE AND 30-DAY READMISSION: A RETROSPECTIVE STUDY

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INTRODUCTION

- Individuals surviving their critical illness often have some degree of malnutrition and face many barriers to adequate nutrient intake in the post-intensive care unit (ICU) period.
- Nutrient intake post-ICU period is often inadequate when relying solely on oral intake, and adequate when fed enterally.
- Evidence on the impact of post-ICU enteral nutrition on patient outcomes is limited.
- The objective of this study was to understand the association between maintaining EN post ICU discharge and unplanned 30-day hospital readmission.

METHODS

- Single-centre, retrospective study of adult, ventilated, medical/surgical/neurological /trauma ICU patients, fed EN for 3+ days in ICU and discharged alive from ICU.
- Data abstracted from medical charts included:
 - demographics and clinical factors at admission, hospital and ICU LOS, prescribed and delivered energy/protein intakes during and post-ICU; EN maintenance status at ICU discharge, reason for EN discontinuation; acute care discharge location (home, rehab, other hospital, hospice, other) and 30-day readmission (yes/no).

RESULTS

- Of 102 subjects meeting inclusion criteria, 45 (44.1%) maintained EN (ENM group) and 57 (55.9%) discontinued EN (END group) upon ICU discharge, with no significant differences in demographics or clinical measures at admission (Table 1).
- The most common (71%) reason for EN discontinuation was per ward culture (removal of all tubes) with feeding tube already removed at ICU discharge being the second most common (18.7%).
- ENM was associated with significantly longer ICU stays compared to END (23.0 (sd 19.6) vs 11.8 (6.4) p<0.0013 respectively).
- ENM was also associated with being discharged to rehab, local hospital, or other locations significantly more often compared to END (p=0.002), who were discharged home more often.
- There were no differences in Charlson Comorbidity Index, APACHE II or use of inotropes between ENM and END groups.
- Unplanned 30-day hospital readmission occurred in 17 (16.7%) subjects, with no significant differences in demographics, severity of illness measures, or reasons for readmission between subjects that were and were not readmitted.
- Among the readmissions, 5 (11.1%) occurred in the ENM group, and 12 (21.1%) in the END group (crude odds ratio [OR] 0.47, 95% CI 0.15, 1.45, p=0.188). Adjusting the model for age, sex, BMI, total LOS, MV and nutritional adequacy in ICU was suggestive of a reduction in odds of readmission among the ENM group (OR 0.37, 95% CI 0.09, 1.57, p=0.176) (Table 2).

Maintenance of EN on ICU discharge was associated with a clinically relevant reduction in odds of 30-day hospital readmission.



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DISCUSSION / CONCLUSION

- Enteral nutrition has been shown to improve nutrition intake in the post-ICU period.
- In our study maintenance of EN on ICU discharge was associated with a clinically relevant reduction in odds of hospital readmission.
- The care of recovering critically ill patients should include a focus on optimizing nutrition. We can do this by identifying and addressing individual barriers to oral intake, changing the culture of removing feeding tubes and maintaining EN post-ICU discharge.

References: 1. van Zanten ARH, De Waele E, Wischmeyer PE. Crit Care. 2019;23(1):368. 2. Moisey LL, et al. Nutr Clin Pract. 2021;36(1):201-12.

Table 1. Subject Demographics, Clinical Measures and Hospital stay characteristics, by EN status

Characteristic	All Subjects N=102	Maintained EN after ICU N=45	Did Not Maintain EN after ICU N=57	p-value ^a
	Mean [SD]	Mean [SD]	Mean [SD]	
Age, years	60.5 (15.3)	62.1 (16.2)	59.2 (14.6)	0.333
Male	60 (58.8%)	27 (60.0%)	33 (57.9%)	0.830
BMI, kg/m ²	N=84 26.5 (5.9)	N=36 26.5 (5.2)	N=48 26.6 (6.4)	0.936
Use of inotropes/vasopressors	N=101	N=45	N=56	0.537
Yes	64 (63.4%)	30 (66.7%)	34 (60.7%)	
APACHE II score	N=67 21.7 (7.4)	N=26 20.0 (6.2)	N=41 22.7 (7.9)	0.149
Charlson comorbidity index	N=102 1.7 (1.9)	N=45 1.8 (2.3)	N=57 1.6 (1.5)	0.547
Total hospital LOS, days	59.6 (67.6)	89.9 (85.3)	35.7 (34.6)	<0.0001
ICU LOS, days	16.7 (14.9)	23.0 (19.6)	11.8 (6.4)	0.0013
ICU Nutrition adequacy	n=63	n=26	n=37	
% ICU days ≥80% of protein goal	48.8 (31.3)	59.4 (32.3)	41.4 (28.7)	0.024
met % ICU days ≥80% of energy goal	38.3 (31.5)	53.1 (33.1)	27.9 (26.1)	0.001
Discharge location from acute care				0.002
Home	59 (57.8%)	18 (40.0%)	41 (71.9%)	
Rehabilitation	23 (22.5%)	15 (33.3%)	8 (14.0%)	
Long-term care	12 (11.8%)	5 (11.1%)	7 (12.3%)	
Repatriation to local hospital	4 (3.9%)	3 (6.7%)	1 (1.8%)	
Other location	4 (3.9%)	4 (8.9%)	0 (0%)	

^aStudent's t-test was used for continuous variables, and a chi-square or Fisher's exact test was used for categorical variables.

Table 2. Unplanned 30-Day Readmission, by EN status

		EN maintained post-ICU Discharge		Crude (unadjusted) Odds Ratio (95% CI)	Adjusted Odds Ratio* (95% CI)
		N (%)	N (%)		
Readmitted within 30 days	Yes	5 (11.1%)	12 (21.1%)	0.47	0.37
	No	40 (88.9%)	45 (78.9%)	(0.15, 1.45) 0.188	(0.09, 1.57) 0.176

^{*}Logistic regression model adjusting for Charlson comorbidity score, length of stay, age, and BMI.

^aThere were 15 readmissions among the 84 subjects in this model.



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