

5.1 Strategies to optimize delivery and minimize risks of EN: Feeding protocols

June 28th, 2005

Recommendation:

There are insufficient data from randomized trials to recommend the use of a feeding protocol in critically ill patients. If a feeding protocol is to be used, based on one level 2 study, a protocol that incorporates prokinetics (metaclopramide) at initiation and a higher gastric residual volume (250 mls) should be considered as a strategy to optimize delivery of enteral nutrition in critically ill adult patients.

Discussion: The committee noted the paucity of data (no level 1 or level 2 studies) that demonstrates feeding protocols (or checking residual volumes) affect clinical outcomes in critically ill patients. The small treatment effect on surrogate endpoints of the one study (gastric residual volumes, time to reach goal rate of EN) that compared a feeding protocol with a higher gastric residual volume threshold and mandatory prokinetics to one with a lower gastric residual volume threshold was noted. Given the favourable safety and feasibility considerations and low cost, it was decided that the use of such a feeding protocol be considered as a strategy to optimize nutritional intake.

Values	definition	Score: 0, +, ++, +++
Effect size	magnitude of the absolute risk reduction attributable to the intervention listed--a higher score indicates a larger effect size	1+ (surrogate)
Confidence interval	95% confidence interval around the point estimate of the absolute risk reduction, or the pooled estimate (if more than one trial)--a higher score indicates a smaller confidence interval	1+
Validity	refers to internal validity of the study (or studies) as measured by the presence of concealed randomization, blinded outcome adjudication, an intention to treat analysis, and an explicit definition of VAP--a higher score indicates presence of more of these features in the trials appraised	2+
Homogeneity	similar direction of findings among trials--a higher score indicates greater similarity of direction of findings among trials	0
Safe	estimated probability of avoiding any significant harm that may be associated with the intervention listed--a higher score indicates a lower probability of harm	2+
Feasible	ease of implementing the intervention listed--a higher score indicates greater ease of implementing the intervention in an average ICU	3+
Low cost	estimated cost of implementing the intervention listed--a higher score indicates a lower cost to implement the intervention in an average ICU	3+

5.1 Topic: Strategies to optimize delivery and minimize risks of EN: Feeding Protocols

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Question: Does the use of a feeding protocol result in better outcomes in the critically ill adult patient?

Summary of evidence: There were no randomized trials found that directly address the question: "Does the use of a feeding protocol result in better outcomes in the critically ill adult patient?" One randomized controlled trial was found that compared outcomes of a feeding protocol with a higher gastric residual volume threshold (250 mls) and mandatory prokinetics to a feeding protocol with a lower gastric residual volume threshold (150 mls).

Mortality: Mortality not reported.

Infections: The incidence of infections did not differ between groups.

LOS and Ventilator days: Not reported.

Other complications: There was a lower number of elevated gastric residual aspirations in the group that received the protocol with higher residual volume threshold + prokinetics ($p < 0.005$). There was a trend towards less time taken to reach goal rate of feeding in the group that received the protocol with a higher gastric residual volume threshold + prokinetics ($p < 0.09$). There was no difference in the percentage of nutritional needs met between the 2 groups.

Conclusion: Feeding protocols with prokinetics and a higher gastric residual volume threshold (250 mls) are associated with a trend towards a reduction in gastric residual aspirations and less time taken to reach goal feeding rate in the critically ill.

Level 1 study: if all of the following are fulfilled: concealed randomization, blinded outcome adjudication and an intention to treat analysis.

Level 2 study: If any one of the above characteristics are unfulfilled.

Table 1. Randomized studies evaluating feeding protocols in critically ill patients

Study	Population	Methods (score)	Intervention	Mortality # (%)		RR (CI) **	Infections # (%) ‡		RR (CI) **
				High RV	Low RV		High RV I	Low RV	
ID # 46 Pinilla 2001	Mixed ICU's N = 96	C.Random: not sure ITT: yes Blinding: no (9)	Feeding protocol with a higher gastric RV threshold (250 mls) + prokinetics vs feeding protocol with lower RV (150 mls)	NA	NA	NA	1/44 (2)	0/36 (0)	2.47 (0.10-58.8)

Study	LOS days		Nutritional Outcomes		Other		RR (CI) **
	High RV	Low RV	High RV	Low RV \	High RV	Low RV	
ID # 46 Pinilla 2001	9.5 ± 6.4 (44) ICU	13.2 ± 18.3 (36) ICU	Hours to reach goal rate 15 ± 10	22 ± 22	intolerances 20/44 (45)	21/36 (58)	0.78 (0.51-1.19)
			% nutritional needs met 76 ± 18	70 ± 25	high GRV aspirations 10/44 (23)	19/36 (53)	0.43 (0.23-0.81)

C.Random: concealed randomization
 ITT: intent to treat
 RV: residual volume
 GRV: gastric residual volume
 Ventilator days: not reported

± () : mean ± Standard deviation (number)
 ‡ refers to the # of patients with infections unless specified
 NA: not available
 ** RR= relative risk, CI= Confidence intervals

TOPIC: 5.1 Feeding Protocols

(Reviewers: Shannon Mackenzie and Sabrina Martin)

Article inclusion log

Criteria for study selection

Type of study: RCT or Meta-analysis
Population: critically ill, ventilated patients (no elective surgery patients)
Intervention: TPN and /or EN
Outcomes: mortality, LOS, QOL, functional recovery, complications, cost. Exclude studies with only biochemical, metabolic or nutritional outcomes.

ID #		Author	Journal	I	E	why rejected
46.	1.	Pinilla	JPEN 2001	√		
	2.	Martin (ACCEPT trial)	In submission		√	Does not compare the use of a feeding protocol
	3.	Spain	JPEN 1999		√	Not RCT
	4.	Heyland	NCPractice 1999		√	Not RCT
	5.	Hedberg	JADA 1999		√	Not RCT
	6.	Lown	J Burn Care Rehab 1991		√	Not RCT
	7.	Kozars	J Surgical Research 2002		√	Not RCT

I = included, E = excluded