

5.6 Strategies to Optimize the Delivery of EN: Discarding Gastric Residual Volumes

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There were no new randomized controlled trials since the 2013 update and hence there are no changes to the following summary of evidence.

2013 Recommendation: There is insufficient data to make a recommendation to return gastric residual volumes up to a certain threshold in critically ill adult patients. Based on 1 level 2 study, re-feeding GRVs up to a maximum of 250 mls or discarding GRVs may be acceptable.

2013 Discussion: The committee noted that a single study (Juve-Udina 2009) showed that reintroducing aspirated gastric content up to a maximum of 250 mls does not increase the risk of complications (gastric emptying delay, hyperglycemia, diarrhea and abdominal distention) when compared to discarding residuals. There were no effect on clinical outcomes and it was agreed that further RCTs are needed before a recommendation could be made.

Semi Quantitative Scoring

Values	Definition	2013 Score (0,1,2,3)
Effect size	Magnitude of the absolute risk reduction attributable to the intervention listed--a higher score indicates a larger effect size	0
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	0
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 outcomes--a higher score indicates presence of more of these features in the trials appraised	1
Homogeneity or Reproducibility	Similar direction of findings among trials--a higher score indicates greater similarity of direction of findings among trials	n/a
Adequacy of control group	Extent to which the control group presented standard of care (large dissimilarities=1, minor dissimilarities=2, usual care=3)	3
Biological Plausibility	Consistent with understanding of mechanistic and previous clinical work (large inconsistencies=1, minimal consistencies=2, very consistent=3)	2
Generalizability	Likelihood of trial findings being replicated in other settings (low likelihood i.e. single centre=1, moderate likelihood i.e. multicentre with limited patient population or practice setting=2, high likelihood i.e. multicentre, heterogenous patients, diverse practice settings=3)	1
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
Feasible	Ease of implementing the intervention listed--a higher score indicates greater ease of implementing the intervention in an average ICU	3
Safety	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

5.6 Strategies to Optimize the Delivery of EN: Discarding Gastric Residual Volumes

Question: Does the use of returning or discarding high gastric residual volumes (GRVs) result in better outcomes in the critically ill adult patient?

Summary of evidence: There was one level 2 study that compared the return of gastric residual volume up to a maximum of 250 mls vs. discarding the residuals.

Mortality: Not reported.

Infections: Not reported.

LOS: There were no differences in ICU length of stay between the groups (WMD -0.70, 95% CI -3.61, 2.21, $p=0.64^*$). Ventilator days were not reported.

Ventilator days: Not reported.

Other: There were no differences in diarrhea ($p=0.71$), abdominal distention ($p=0.07$), or patients with hyperglycemia ($p=0.55$), while the episodes of delayed gastric emptying were significantly lower in the GRV return group ($p=0.001$).

Conclusions:

- 1) Re-feeding GRVs is not associated with more gastric complications when compared to discarding GRVs.

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 gastric residual volume in critically ill patients

Study	Population	Methods (score)	Intervention	Mortality # (%)†		Infections # (%)‡	
				GRV return NR	GRV discard NR	GRV return NR	GRV discard NR
1) Juve-Udina 2009	ICU patients fed via EN or PN N=125	C.Random: no ITT: No Blinding: No (5)	GRV>250 mL discard excess, refeed 250mL vs. if GRV>250 mL discard entire feed				

Table 1. Randomized studies evaluating gastric residual volume in critically ill patients (Continued)

Study	Length of Stay		Mechanical Ventilation		Other
	GRV return ICU 16 ± 8.1 (61)	GRV discard ICU 16.7 ± 8.3 (61)	GRV return NR	GRV discard NR	GRV return GRV discard
1) Juve-Udina 2009					Diarrhea 25/61 (41) 22/61 (36) p=0.71 Abdominal distention 13/61 (21) 17/61 (29) p=0.07 Pts with hyperglycemia 41/61 (67) 45/61 (73) p=0.55 # episodes of Hyperglycemia 1352 (62) 1376 (53) p=0.001 # episodes delayed gastric emptying 2170 2580 p=0.001 Mean administered ENT (ml) 1296.3 1291.5 p=0.89 Mean ENT duration (days) 8.2 ± 4.2 9.9 ± 1.4 p=0.28 ENT feeding delays, patient, no, (%) 11 (26.8) 8 (22.2) p=0.91 ENT feeding delays, episodes, mean 1.68 2.26 p=0.11

C.Random: concealed randomization

† presumed hospital mortality unless otherwise specified

± () : mean ± Standard deviation (number)

ITT: intent to treat; NA: not available

‡ refers to the # of patients with infections unless specified