

## 4.4 Composition of Enteral Nutrition: pH

June 28<sup>th</sup>, 2005

### Recommendation:

*There are insufficient data to make a recommendation regarding the use of low pH feeds in critically ill patients.*

**Discussion:** The committee noted the paucity of data on efficacy i.e. the lack of a demonstrable treatment effect from the 2 studies despite high internal validity. The committee was also concerned about the potential for harm and feasibility concerns with acidified feeds.

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	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	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 outcomes--a higher score indicates presence of more of these features in the trials appraised	3+
Homogeneity	similar direction of findings among trials--a higher score indicates greater similarity of direction of findings among trials	2+
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	1+
Feasible	ease of implementing the intervention listed--a higher score indicates greater ease of implementing the intervention in an average ICU	1+
Cost	estimated cost of implementing the intervention listed--a higher score indicates a lower cost to implement the intervention in an average ICU	2+

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**Question:** Do acidified feeds (low pH) compared to standard feeds result in better outcomes in the critically ill adult patient?

**Summary of evidence:** There were 2 level 2 studies that were reviewed.

**Mortality:** Heyland et al found that acidified feeds were associated with a trend towards an increase in mortality ( $p = 0.10$ ). Tulamiat et al found no difference in mortality between the groups.

**Infections:** There were no difference in infections between the groups in one study (Tulamiat  $p = 0.7$ ) and a trend towards a reduction in infections was seen in the patients receiving the acidified feeds (Heyland RR 0.40,  $p = 0.19$ ).

**LOS and Ventilator days:** There were no differences between the groups (Heyland)

**Other complications:** There was no difference in the incidence of GI bleeds between groups.

#### **Conclusions:**

- 1) Insufficient data to determine the effect of low pH feeds on clinical outcomes.
- 2) Inconclusive data on the effects of acidified feeds on mortality in critically ill patients

*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 acidified feeds in critically ill patients

Study	Population	Methods (score)	Intervention	Mortality # (%)†		RR (CI)**	Infections # (%)‡		RR (CI)**
				Acid feeds	Standard		Acid feeds	Standard	
1) Heyland 1999	Critically ill ventilated patients Multicentre trial N = 120	C.Random: yes ITT: no Blinding: double (12)	Acidified feeds, vital HN + HCL pH 3.5 vs standard feeds, Vital HN (pH 6.5)	15/49 (31)	7/26 (15)	2.01 (0.90-4.49)	3/49 (6)	7/46 (15)	0.40 (0.11-1.46)
2) Tulamait 2005	Patients recovering from prolonged ventilation N = 30	C.Random: yes ITT: no Blinding: double (10)	Acidified feeds, pH 4.5 (added potassium sorbate) vs standard feeds	1/16 (6)	2/13 (15)	0.41 (0.04-4.00)	3/16 (19)	1/13 (8)	2.44 (0.29-21)

Study	LOS days		Ventilator days		Cost		Other	
	Acid feeds	Standard	Acid feeds	Standard	Acid feeds	Standard	Acid feeds	standard
1) Heyland 1999	13.0	12.0	7.8	8.5	NA	NA	GI bleeds 2/49 (4)	GI bleeds 0/46 (0)
2) Tulamait 2005	NA	NA	NA	NA	NA	NA	GI bleeds 0/16 (0)	GI bleeds 1/14 (7)

C.Random: concealed randomization  
ITT: intent to treat  
NA: not available

† presumed ICU mortality unless otherwise specified  
‡ refers to the # of patients with infections unless specified  
\*\* RR= relative risk, CI= Confidence intervals

**TOPIC: 4.3 Composition of EN: pH**

*(Reviewers: Voula Christofilos & Rupinder Dhaliwal)*

**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.

	Author	Journal	I	E	why rejected
1.	Heyland	CCMedicine 1999	√		
2.	Tulamait	J Critical Care 2005	√		
3.	Spilker	Chest 1993		√	Not RCT

I = included, E = excluded