6.1 Enteral Nutrition (Other): Closed vs. Open System March 2013

There were no new randomized controlled trials since the 2009 update and hence there are no changes to the following Summary of Evidence.

Recommendation: *There are insufficient data to make a recommendation on the administration of EN via closed vs. open system in the critically ill.*

Discussion: The committee noted that despite favourable safety and feasibility considerations, there was a small effect size of aseptic techniques of enteral nutrition on diarrhea, based on the results of one small study (N=36 patients). The merits of a closed system (aseptic) i.e. less bacterial contamination/enteritis/diarrhea when compared to an open (non-septic) were discussed.

Semi Quantitative Scoring

Values	Definition	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	1 (diarrhea)
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	2
Homogeneity or Reproducibility	Similar direction of findings among trials--a higher score indicates greater similarity of direction of findings among trials	0
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)	1
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	2
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	3

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Question: Does the use of a closed system for enteral feeding result in better outcomes when compared to an open system in the critically ill adult patient?

Summary of evidence: There was one level 2 study that compared the incidence of bacterial contamination and diarrhea using a closed system i.e. aseptic techniques (ready to use bags, aseptic insertion of feeding tubes, tube changes every 24 hours) vs. an open system i.e. routine technique of enteral nutrition administration (open system).

Mortality: Not reported.

Infections, LOS, ventilator days: Not reported.

Diarrhea: The use of a closed system/aseptic technique of enteral nutrition administration vs. open system/routine resulted in less bacterial contamination and the incidence of diarrhea was lower in the group receiving aseptic vs routine enteral feeds (p=0.06 from article, p=0.11*).

Conclusion:

1) Closed system/aseptic techniques of enteral nutrition compared to open/routine are associated with a trend towards a reduction in diarrhea 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

*p-value calculated using Review Manager 5.1

Table 1. Randomized studies evaluating a closed vs. open system in critically ill patients

Study	Population	Methods (score)	Intervention	Other	RR (CI)*
1) Mickschl 1990	ICU N=36	C.Random: not sure ITT: yes Blinding:no (7)	Aseptic EN vs routine EN	Aseptic Routine # Contaminated Feeds 1/18 (6) 7/18 (39) p=0.06* Diarrhea 5/18 (28) 10/18 (57) p=0.11*	RR 0.14, 95% CI 0.02, 1.05 RR 0.50, 95% CI 0.21, 1.17

C.Random: concealed randomization
ITT: intent to treat
NA: not available
Mortality, Infections, LOS days, Ventilator days and Cost: not reported
*p-values, RR= relative risks & CI= Confidence intervals calculated using Review Manager 5.1