

## 4.5 Composition of Enteral Nutrition: Strategies for optimizing EN and minimizing risks of EN: Fibre

**Question:** Do enteral feeds with fibre, compared to standard feeds result in better outcomes in the critically ill adult patient?

**Summary of evidence:** There were 1 level 1 and 9 level 2 studies reviewed. Four studies looked at the effects of soluble fibres (Spapen 2001, Rushdi 2005: hydrolyzed guar; Hart 1988, Heather 1991: psyllium), one study (Dobb 1990) examined the effects of a formula containing soy polysaccharide (mainly insoluble fibre), two studies (Karakan 2007, Chittawatanarat 2010) looked at the effects of formulas containing both soluble and insoluble fibres, one study (Schultz 2000) looked at the effects of soluble fibre (pectin) and also compared fibre-containing formula to fibre free formula, one study (Xi 2017) looked at soluble fibre (pectin), and one study compared the use of a fibre-containing formula plus soluble fibre supplementation vs. a fibre-containing formula without additional fibre supplementation (Majid 2013).

**Mortality:** When the data from the 4 studies that reported mortality were aggregated, fibre was associated with a trend towards a reduction in mortality (RR 0.39, 95% CI 0.15, 1.03,  $p = 0.06$ , heterogeneity  $I^2=0\%$ ; figure 1).

**Infections:** When the data from the 3 studies that reported infections (Spapen, Karakan, Xi) were aggregated, no differences were found between the 2 groups (RR 0.79, 95% CI 0.35, 1.79,  $p = 0.57$ , heterogeneity  $I^2=72\%$ ; figure 2).

**Length of Stay:** Five studies reported both hospital and ICU length of stay (Schultz, Karakan, Chittawatanarat, Spapen, Xi), however, data from the Schultz study could not be aggregated since it reported LOS for only its sub-groups and Spapen and Karakan did not report this data as mean $\pm$ SD. When the data from Xi and Chittawatanarat were aggregated, enteral feeds with fibre were associated with a significant reduction in hospital LOS (RR -8.99, 95% CI -14.37, -3.61,  $p = 0.001$ , heterogeneity  $I^2=0\%$ ; figure 3), and ICU LOS 4.5 (RR -5.03, 95% CI -8.66, -1.41,  $p = 0.007$ , heterogeneity  $I^2=15\%$ ; figure 4).

**Ventilator days:** Not studied as an outcome

**Diarrhea:** When the data from the 6 studies reporting on number of patients with diarrhea by group were aggregated, fibre had no effect on diarrhea (RR 0.77, 95% CI 0.50, 1.18,  $p = 0.23$ , heterogeneity  $I^2=51\%$ ; figure 5). Majid 2013 showed no difference in # patients with diarrhea or the # diarrhea days between the two groups.

### Conclusions:

- 1) Enteral feeds with fibre compared to standard feeds have no effect on diarrhea
- 2) Enteral feeds with fibre compared to standard feeds may be associated with a reduction in mortality and hospital length of stay.
- 3) Enteral feeds with fibre compared to standard feeds have no effect on ICU length of stay.

**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 enteral feeds with fibre in critically ill patients**

Study	Population	Methods (score)	Intervention	Mortality # (%)†		Infections # (%)‡	
				Fibre	Control	Fibre	Control
1. Hart 1988	ICU patients N=68	C.Random: not sure ITT: yes Blinding: single (9)	Standard formula (Osmolite HN) + Fybogel vs. Standard formula (Osmolite HN) + placebo	NR	NR	NR	NR
2. Dobb 1990	ICU patients N=91	C.Random: yes ITT: no Blinding: double (10)	Formula with soy polysaccharide (Enrich) vs Standard (Ensure)	NR	NR	NR	NR
3. Heather 1991	ICU CCU, general wards(ICU 41/49) Nutritionally compromised N=49	C.Random: not sure ITT: no Blinding: no (3)	Standard formula (fibre free) + Hydrocil (psyllium) vs. Standard formula (fibre free)	NR	NR	NR	NR
4. Schultz 2000	Critically ill patients receiving antibiotics N=80	C.Random: yes ITT: no Blinding: double (10)	(A) Fibre (Jevity Plus or Nepro) + pectin vs (B) Fibre free (Osmolite, Promote) + pectin vs (C) Fibre (Jevity Plus or Nepro)+ placebo (D) Fibre free (Osmolite, Promote) + placebo	NR	NR	NR	NR
5. Spapen 2001	Patients with severe sepsis, septic shock, ventilated N=35	C.Random: yes ITT: no Blinding: double (11)	Formula with soluble fibre (partially hydrolyzed guar) vs No fibre (standard)	<b>Hospital</b> 1/13 (8)	<b>Hospital</b> 4/12 (33)	<b>Soluble fibre</b> 13/13 (100)	<b>Standard</b> 12/12 (100)
6. Rushdi 2005	ICU patients N=30	C.Random: yes ITT: no Blinding: double (8)	Standard formula (Sandosource) + soluble Guar gum (Benefibre) vs. Fibre-free formula (Propeptide)	NR	NR	NR	NR

<b>7. Karakan 2007</b>	Patients with severe acute pancreatitis who stopped EN X 48 hrs N=30	C.Random: yes ITT: yes Blinding: double (10)	Standard formula plus a prebiotic multifibre supplement of soluble fibres and insoluble fibres (1.5 gms/100 mls) vs,standard formula alone. Both groups fed via NJ and received peripheral parenteral nutrition	<b>Not specified</b> 2/15 (13)	<b>Not specified</b> 4/15 (27)	3/15 (20)	6/15 (40)
<b>8. Chittawatanarat 2010</b>	Surgical ICU, septic patients receiving broad spectrum antibiotics and enteral nutrition N=34	C.Random: no ITT: yes Blinding: double (10)	Standard formula (Nutren fibre), 1.5 gm fibre/L, soluble fibres (FOS, pectin), insoluble fibres (cellulose, lignin, hemicellulose) vs. standard formula without fibre (Nutren Optimum).	<b>Not specified</b> 1/17 (6)	<b>Not specified</b> 2/17 (12)	NR	NR
<b>9. Majid 2013</b>	Adult critically ill pts N=47	C.Random: yes ITT: no Blinding: double (10)	Fibre/prebiotic enriched EN formula (Nutrison Multifibre vs. Nutrison protein plus Multifibre – both had 10% oligofructose, 20% inulin, 0.7 g/100ml soluble fibre, 0.8 g/100ml insoluble fibre) + 7 g/d oligofructose/inulin vs same EN formula choices + 7 g/d multidextrin	NR	NR	NR	NR
<b>10. Xi 2017</b>	Adults ICU patients requiring EN N=166	C.Random: yes ITT: no Blinding: no (5)	EN + 6 grams of pectin administered 4h before EN started on days 2 to 6 vs EN only. For both groups: 5% glucose at 25 ml/h started on day 1. EN (Peptisorb) started on day 2, EN advanced to goal slowly with goal to be achieved after day 7. EN given continuously over 20h per day.	<b>30 day</b> 1/62	<b>30 day</b> 3/63	<b>Infectious complication events</b> 7 (11.3%)	<b>Infectious complication events</b> 9 (14.3%)

Table 1. Randomized studies evaluating enteral feeds with fibre in critically ill patients (continued)

Study	LOS days		Other
	Fibre	Control	

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C.Random: Concealed randomization

† Presumed ICU mortality unless otherwise specified

‡ Refers to the # of patients with infections unless specified\*\* RR= relative risk

ITT: Intent to treat

NR: Not reported

CI: Confidence intervals

\* Compared A+B+C to D for effect of fibre and/or pectin to placebo

Figure 1. Mortality

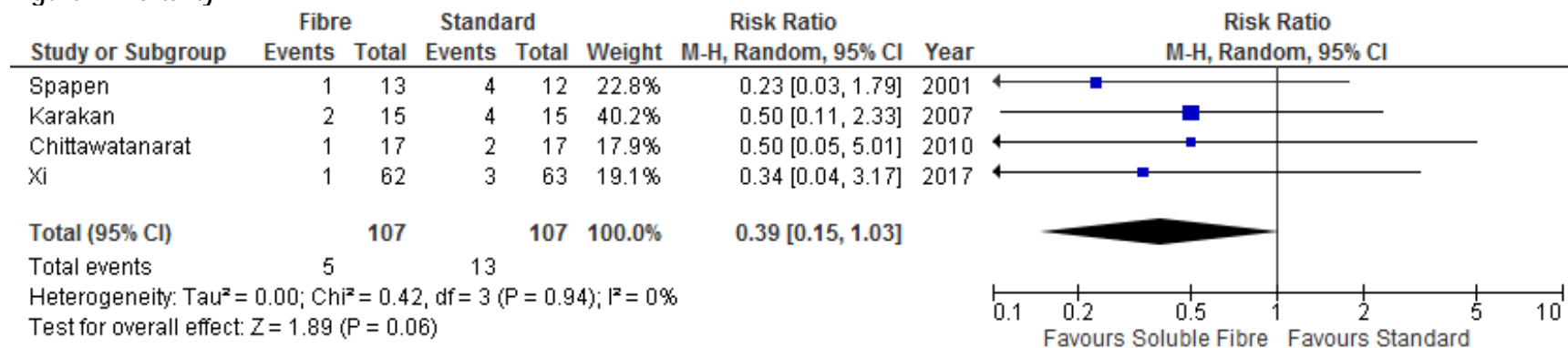


Figure 2. Infections

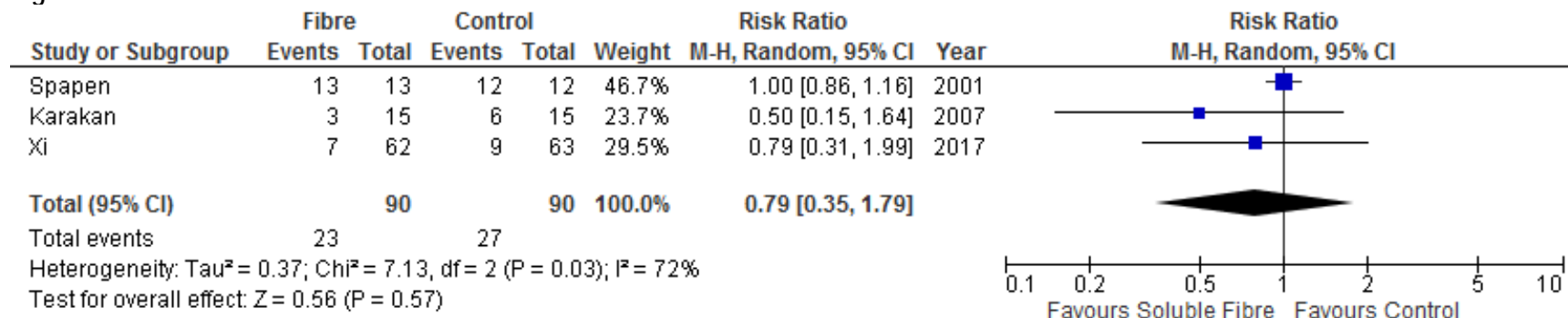


Figure 3. Hospital LOS

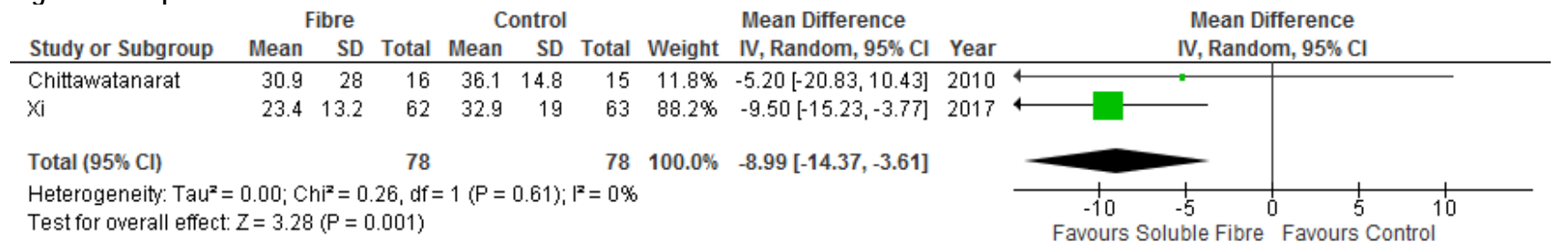


Figure 4. ICU LOS

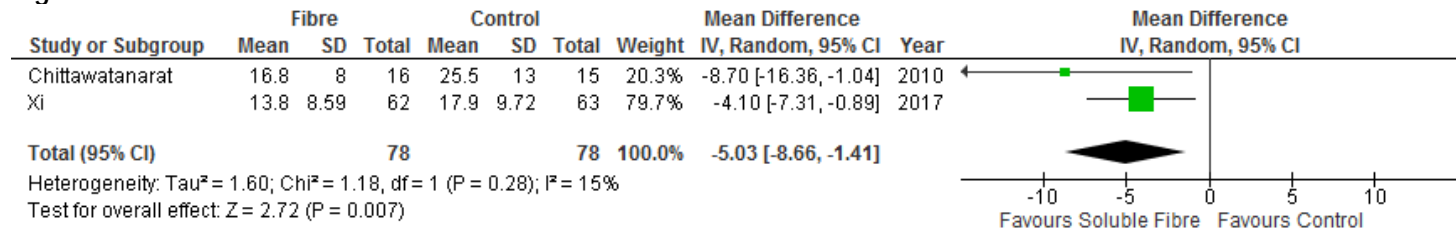


Figure 5. Diarrhea

