Evidence Tables:
NUTRI 2: In patients with acute alcohol-related pancreatitis, what is the safety and efficacy of:

a) **nutritional supplementation vs. no supplementation**
b) **early (first 48hrs) vs. late supplementation**
c) **enteral vs. parenteral nutrition**
d) **NJ vs. NG**

1. Enteral vs. parenteral (+ parenteral vs. none/enteral vs. none)

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding
Petrov MS, Pylypchuk RD, Emelyanov NV. Systematic review: Nutritional support in acute pancreatitis. *Alimentary Pharmacology and Therapeutics.* 2008; 28(6):704-712.	1+ SR Jadad scale used to assess quality of studies None of the included studies were double-blinded. Drop outs seen in 6/15 studies (range 1-4 drop outs). Method of treatment assignment was not reported in 7/15 studies.	N=15 studies N= 617 patients N= 266 in enteral nutrition group N= 280 in the parenteral nutrition group N=71 with no supplementary nutrition	N=9 studies included patients with severe acute pancreatitis. N=6 studies included patients with mild and severe acute pancreatitis. N=11 studies compared enteral vs. parenteral nutrition N=3 studies compared parenteral nutrition vs. no supplementary nutrition. N=1 study compared enteral nutrition vs. no supplementary nutrition.	1) enteral nutrition 2) parenteral nutrition 3) enteral nutrition	1) parenteral nutrition 2) no supplementary nutrition 3) no supplementary nutrition	Not reported	Total infectious complications, in-hospital mortality.	None reported

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding

Effect Size

Outcomes

1. Enteral nutrition vs. parenteral nutrition (11 RCTS, n=453 patients)

- Infectious complications
  - Enteral nutrition resulted in a significantly significant 59% reduction
  - Enteral group 33/204; parenteral group 89/226
  - Risk ratio 0.41 (95% CI 0.30, 0.57) P<0.00001
- In-hospital mortality
  - Enteral nutrition resulted in a non-significant 40% reduction
  - Enteral group 16/191; parenteral group 34/213
  - Risk ratio 0.60 (95% CI 0.32, 1.14) p=0.12

N.B. Heterogeneity explained by random variation.

2. Parenteral nutrition vs. supplementary nutrition (3 RCTs, n=113 patients)

- Infectious complications
  - Parenteral nutrition resulted in a statistically non-significant increase of 36% in the risk of infectious complications
  - Parenteral group 8/49; no nutrition group 8/49
  - Risk ratio 1.36 (95% CI 0.18-10.40) p=0.77 (moderate heterogeneity between study results)
- In-hospital mortality
  - Parenteral nutrition resulted in a statistically significant 64% reduction
  - Parenteral group 4/56; no nutrition group 13/57
  - Risk ratio 0.36 (95% CI 0.13, 0.97) p=0.04 (no heterogeneity)

3. Enteral nutrition vs. no supplementary nutrition (1 RCT, n=27 patients)

- As there was not enough data for direct meta-analysis, indirect adjusted meta-analysis was applied (validated by a number of authors and applied in a number of clinical settings).
- Infectious complications
  - Risk reduced non-significantly by 44% with the use of enteral nutrition over no nutrition
  - Ratio of RRs (95% CI): 0.56 (0.07-4.32) p=0.58
  - This difference was probably non-significant due to the small sample size.
- In-hospital mortality
  - Enteral nutrition resulted in a 78% reduction in risk

<table>
<tr><th>Reference</th><th>Study type/ Evidence level</th><th>Number of patients</th><th>Patient characteristics</th><th>Intervention</th><th>Comparison</th><th>Length of follow-up</th><th>Outcome measures</th><th>Source of funding</th></tr>
<tr><td colspan="9">- Ratio of RRs (95% CI): 0.22 (0.07-0.70) p= 0.01
• Limitations of indirect adjusted meta-analysis:
- The findings may not completely correspond to the results of a meta-analysis of direct head-to-head randomized comparisons.
Limitations:
- No mention of aetiology of pancreatitis- unclear number alcohol related.</td></tr>
<tr><td>McClave SA, Greene LM, Snider HL et al. Comparison of the safety of early enteral vs parenteral nutrition in mild acute pancreatitis. Journal of Parenteral & Enteral Nutrition. 1997; 21(1):14-20.</td><td>1+ RCT

Randomised, blinding and allocation concealment unclear

Underpowered</td><td>N=32</td><td>Inclusion criteria: patients with acute pancreatitis or an acute flare of chronic pancreatitis, characterized by abdominal pain with elevated amylase and lipase.
Exclusion criteria: patients with evidence of short bowel syndrome, Crohn’s disease, major pancreatic resection, or failure to start total enteral nutrition (TEN) or total parenteral nutrition (TPN) within 48hrs of admission. Patients were excluded if they failed to adhere to dietary restrictions or to the protocol terms for enteral tube placement.
Patient Characteristics: no significant differences between the 2 groups with respect to age, sex, aetiology, initial Ranson criteria, APACHE III, or MOF scores.

<table><tr><th></th><th>TEN</th><th>TPN</th></tr><tr><td>Age (yrs)</td><td>47.6±4.0</td><td>45.1±4.2</td></tr><tr><td>% Male</td><td>68.7±12.0</td><td>81.2±10.1</td></tr><tr><td>% alcohol related</td><td>75.0±11.2</td><td>62.5±12.5</td></tr><tr><td>Initial Ranson</td><td>1.3±0.35 (43.7%)</td><td>1.3±0.35 (27.5%)</td></tr></table></td><td>TPN –infused through a central or peripheral line

Both groups were placed on isocaloric-isonitrogenous feedings.

N=16</td><td>TEN – Peptamen infused through NJ tube

N=16</td><td>Until discharge (not specified)</td><td>Safety parameters, Ranson criteria, APACHE III criteria, MOF score, pain score, nosocomial infection, mortality, percent of goal calories achieved, days to advancement to diet by mouth, and length of hospitalization.</td><td>Clintec Nutrition Company</td></tr>
</table>

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding
			criteria (%>2)					
			Initial APACHE III score: 17.5±4.1 / 22.4±5.0					
			Initial MOF score: 1.3±0.45 / 1.1±0.49					

Effect Size

Outcomes

1. Length of stay (days)

- TEN: 9.7± 1.3
- TPN: 11.9 ± 2.6

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding
Abou-Assi S, Craig K, O'Keefe SJ. Hypocaloric jejunal feeding is better than total parenteral nutrition in acute pancreatitis: results of a randomized comparative	1+ RCT Randomised, ITT unclear allocation concealment and blinding	N=53	**Inclusion criteria:** patients with acute pancreatitis who were in need of nutritional support, with acute abdominal pain, 3-fold elevation of serum pancreatic enzymes, amylase, lipase. **Exclusion criteria:** not reported **Patient Characteristics:** EN group / TPN group Age (yr): 48 (3) / 50 (3) F/M: 10/16 / 14/13 Ethnicity (balck/whie/ hispanic): 14/11/1 / 14/12/1 Ranson's criteria: 3.1 (0.5) / 2.5 (0.4)	TPN (via central line) N=27	EN (via NJ tube) N=26	3 days post weaning from nutritional support	Duration of hospitalization, duration of intervention, tolerance, cost-effectiveness	American College of gastroenterology and the Medical College of Virginia Hospitals

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding
study. *Am J Gastroenterol* . 2002; 97(9):2255-2262.			Duration of nutrition (days) 6.7 (1.1)* 10.8 (1.7) * p=0.03 62% alcohol related					
Effect Size Outcomes **1. Length of hospital stay (days)** • EN group: 14.2 (1.9) • TPN group: 18.4 (1.9)								

Reference	Study type Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Sourc of fundir
Eckerwall GE, Axelsson JB, Andersson RG. Early nasogastric feeding in predicted severe acute pancreatitis: A clinical, randomized study. *Annals of Surgery.* 2006; 244(6):959-965.	RCT 1+ Randomisation – balanced with the use of four blocks Concealment allocation – sealed number envelopes Blinding - none	N=50	Patients with a clinical diagnosis of acute pancreatitis Inclusion criteria: abdominal pain, amylase 3 or more time the upper limit of normal, onset of abdominal pain within 48 hrs, APACHE II 8 or more and/or CRP of 150 mg/L or more and/or pancreatic liquid shown on CT Exclusion criteria: acute pancreatitis due to surgery, chronic pancreatitis exacerbation Patient population: parental Mean age 68, alcohol aetiology 4.26, APACHE II mean 9 Enteral	Parental N=26 Feeding through peripheral route except for 2 patients who received a central venous catheter Duration not specified	Enteral N=24 Feeding through clinicfeeding tube (75%) and NG tube (25%) Duration not specified	10 days	Multiple organ failure Length of stay	None

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding
			Mean age 71 yrs, alcohol aetiology 3.24, APACHE II mean 10 Total Alcohol related:14% There were no differences at baseline					
Effect Parental vs enteral Length of stay Median 9 (7 to 14) vs 7 (6 to 14) days (p=0.19) Multiple organ failure 1/26 vs 1/24								
Petrov MS, Kukosh MV, Emelyanov NV. A randomized controlled trial of enteral versus parenteral feeding in patients with predicted severe acute pancreatitis shows a significant reduction in mortality and in infected pancreatic complications	RCT 1+ Randomisation – no details Concealment allocation – computerised Power analysis ITT Blinding not specified	N=70 Drop-outs N=1	Patients with severe acute pancreatitis within 72 hrs of onset. Diagnosis was based on clinical and biochemical presentation (upper abdominal pain and serum amylase at least three time the upper reference limit). Predicted severe acute pancreatitis was defined as: APACHE II of 8 or more and/or CRP level > 150 mg/l Patient population: Enteral Mean age 51 yrs, male:female 27:8, APACHE II mean 12, alcohol aetiology 11/35 Parental Mean age 52 yrs, male:female 24:10, APACHE II mean 12.5, alcohol aetiology 15/34	Parental N=34 Minimum duration 7 days Feeding through central venous catheter Duration not reported	Enteral N=35 Minimum duration 7 days Feeding through NJ tube Duration not reported	Discharge	Multiple organ failure	None report

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding	
with total enteral nutrition. *Digestive Surgery.* 2006; 23(5-6):336-344			There were no differences at baseline						
Effect Parental vs enteral Multiple organ failure 17/34 vs 7/35 (p=0.02)									
Gupta R, Patel K, Calder PC et al. A randomised clinical trial to assess the effect of total enteral and total parenteral nutritional support on metabolic, inflammatory and oxidative markers in patients with predicted severe acute pancreatitis (APACHE II > or =6). *Pancreatology.*	RCT 1+ Randomisation – no detail Concealment allocation – sealed envelopes Blinding not specified	N=17	Patients with acute pancreatitis (defined as abdominal pain and serum amylase concentration of 1000 U/I or more). The diagnosis of predicted severe acute pancreatitis was established by the pressure of acute physiology, age and chronic health evaluation score (APACHE II) of 6 or more Patient population: Enteral Mean age 65 yrs, male:female 4:4, APACHE II mean 8, alcohol aetiology 1/8 Parental Mean age 57 yrs, male:female 3:6, APACHE II mean 10, alcohol aetiology 5/9 There were no differences at baseline	Parental N=9 Feeding through central inravenous line Feeding was started as soon as possible after the diagnosis	Enteral N=8 Feeding through NJ tube Feeding was started within 6 hrs of the diagnosis of predicted severe acute pancreatitis being made	Discharge	Length of stay Non-respiratory failure	Nutric

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding	
2003; 3(5):406-413.									
Effect Parental vs enteral Length of stay 10 (7 to 26) vs 7 (4 to 14) (p=0.05) Non-respiratory failure 3 vs 0									
Kalfarentzos F, Kehagias J, Mead N et al. Enteral nutrition is superior to parenteral nutrition in severe acute pancreatitis: results of a randomized prospective trial. *British Journal of Surgery.* 1997; 84(12):1665-1669.	RCT 1+ Randomisation – no details Concealment allocation – numbered envelopes Blinding not specified	N=38	Patients wit acute severe pancreatitis Inclusion criteria: 3 or more criteria according to the Imrie classification or APACHE II score of 8 or more, C-reactive protein > 120 mg/l within 48 hrs of admission, and grade D or E by CT according to Balthazar criteria Patient population: Enteral Mean age 63, male:female 8:10, alcohol aetiology 3/18, mean APACHE II score 12.7 Parental Mean age 67, male:female 7:13, alcohol aetiology 2/20, mean APACHE II score 11.8 There were no differences at baseline	Parental N=20 All patients required intensive monitoring for more than 72 hrs. Fluid replacement, prophylactic antibiotic and NG tube inserted Feeding through subclavian polyurethane catheter Duration not reported	Enteral N=18 Through nasoenteric feeding tube	Discharge	Length of stay ARDS	None report
Effect Enteral vs parental Hospital stay 40 (25 to 93) vs 39 (22-73)									

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding	
ARDS 2 vs 4									
Olaah A, Pardavi G, Belaagyi T et al. Early nasojejunal feeding in acute pancreatitis is associated with a lower complication rate. *Nutrition.* 2002; 18(3):259-262.	RCT 1+ Randomisation - no details Concealment allocation – by birth date No power analysis Blinding not specified	N=89	Patients with acute pancreatitis admitted to the surgical ward Inclusion criteria: clinical symptoms and laboratory signs of pancreatitis (amylase > 200 U/L) Patients were included if they were admitted within 24 to 72 hrs after the onset of symptoms Exclusion criteria: evidence of biliary tract disease, patients with acute exacerbations of chronic pancreatitis Patient population: parental Mean age 43.8 yrs, male:female 42:6, alcohol aetiology:other 39:9 Enteral Mean age 47.2 yrs, male:female 33:8 alcohol aetiology:other 33:8 No differences at baseline reported	Parental N=48 Therapy was initiated within 24 hrs of admission Placement of NG tube, gut rest (no oral feeding), and parental nutrition Duration range 5 to 16 days	Enteral N=41 NJ tube within 24 hrs of admission Duration 5 to 9 days	Discharge	Multi organ failure	None report
Effect Parental vs enteral MOF 5/48 vs 2/41 (ns) Severe pancreatitis – MoF									

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding	
5/10 vs 2/7 (ns)									
Windsor AC, Kanwar S, Li AG et al. Compared with parenteral nutrition, enteral feeding attenuates the acute phase response and improves disease severity in acute pancreatitis. *Gut.* 1998; 42(3):431-435.	RCT 1+ No details of randomisation No details of Concealment allocation No power analysis Radiologist blind	N=34 No drop-outs reported	Patients with acute pancreatitis with a serum amylase of > 1000 IU Exclusion criteria: patients without clinical evidence of acute pancreatitis and presenting more than 48 hrs after admission Patients were stratified according to the Glasgow score: 3 or more points = severe disease and less than three points mild/moderate disease Patient population: Parental Mean age 63 yrs, female:male 11:7, severe disease 7/18, mild/moderate disease 11/18, APACHE II score 4.5, alcohol aetiology 2/18 Enteral Mean age 63 yrs, female:male 9:7, severe disease 6/16, mild/moderate disease 10/16 APACHE II score 8, alcohol aetiology 2/16 There were no significant differences at baseline	Parental nutrition N=18 Severe disease: delivered through central venous catheter Mild/moderate: peripheral long line 48 hrs enrolment, 7 day nutritional support	Enteral nutrition N=16 Severe disease: delivered through radiologically placed NJ tube Mild/moderate: oral nutrition supplements 48 hrs enrolment, 7 day nutritional support	Discharge	SIRS MOF LoS	None report
Effect Enteral vs parental MOF 0 vs 5 LoS									

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding
Median 12.5 (9.5 to 14) vs 15 (11 to 28) days (ns)								

2. Nutritional support vs. no nutritional support

Eckerwall GE, Tingstedt BB, Bergenzaun PE et al. Immediate oral feeding in patients with mild acute pancreatitis is safe and may accelerate recovery--a randomized clinical study. *Clinical Nutrition.* 2007; 26(6):758-763.	RCT 1+ Randomised, allocation concealment, unable to blind	N=60 N=59 completed (1 drop out in oral feeding group)	**Inclusion criteria:** clinical signs of mild acute pancreatitis, pancreas amylase ≥ 3 times above normal, onset of abdominal pain within 48h, acute physiological and chronic health evaluation score (APACHE) II <8 and C-reactive protein (CRP) <150mg/L. **Exclusion criteria:** if acute pancreatitis was caused by surgery, trauma or cancer and if inflammatory bowel disease, stoma, short bowel, pregnancy or chronic pancreatitis with exacerbation were present and if the age was below 18. **Patient characteristics:** (see table below)	**Fasting** (+ iv fluids) - oral fluids and diet reintroduced in a traditional step-wise manner as tolerated. N=30 See table below for more details	**Immediate oral feeding** (+ iv fluids when needed) N=30 (1 dropped out n=29 completed) See table below for more details	3 months	Pancreas-specific amylase, systematic inflammatory response (markers CRP + leukocytes), feasibility (abdominal pain+ frequency of GI symptoms); length of hospital stay.	Swedish Nutrition Foundation, Swedish Research Council, Foundation for Gut and Intestinal Research

	Fasting	Oral feeding	P value
Age (years)	52 (38-60)	56 (48-72)	0.22
Sex male:female	14:16	13:17	1.00
Aetiology			
Biliary	14	18	0.44
Alcohol	5	3	0.71
ERCP	2	2	1.00
Other	1	2	1.00

			Idiopathic	8	5	0.53				
			APACHE II	5 (3-6)	6 (4-6)	0.45				

Effect Size

Outcomes

1. Nutritional outcome (mean values)

	Fasting (n=30)	Oral feeding (n=29)	P value
iv fluids (days)	4 (3-6)	2 (1-3)	<0.001
Fasting (days)	3 (2-3)	0 (0-1)	<0.001
Solid food, on day	5 (4-7)	3 (2-4)	<0.001

2. Systematic inflammatory response (CRP, leukoyctes)

- CRP values:
  - Fasting group: 81 (45-139)mg/L
  - Oral feeding group: 61 (26-127)mg/L
- Leukocyte values
  - Fasting group: 7.7 (6.4-10.8) 10 9/L
  - Oral feeding group: 6.6 (6.3-10.2) 10 9/L
- NS difference between groups in either marker of SIR (no figures provided)

3. Mortality

- No mortality in either group

4. Pancreatic complications

- No complications such as necrosis, abscess or pseudocysts in either group

5. Operative interventions

- No significant difference was seen between groups concerning the number of interventions performed during hospital stay (cholecystectomy and endoscopic retrograde cholangio-pancreatography)
  - 7/30 vs. 6/29, p>0.30

6. Length of hospital stay

- Significantly shorter in the oral feeding group compared to the fasting group:
  - 4 vs. 6 days; p=0.047
- By follow-up after 3 months, no. of readmissions was not significantly different across groups:

- Fasting group: 3 (10%)
- Oral feeding group: 2 (7%)
- p>0.30

Authors' conclusion: ' *…the present study in patients with mild acute pancreatitis shows that immediate oral feeding was feasible and safe and may accelerate recovery without adverse gastrointestinal events.'*

Limitations:

- not blinded (not possible)
- small sample size

Reference	Study type/ Evidence level	Number of patients	Patient characteristics	Intervention	Comparison	Length of follow-up	Outcome measures	Source of funding
Xian-li H, Qing-jiu M, Jian-guo L et al. Effect of total parenteral nutrition (TPN) with and without glutamine dipeptide supplementation on outcome in severe acute pancreatitis (SAP). *Clinical Nutrition Supplements.* 2004; 1(1):43-47.	RCT 1+ Randomised, blinding and allocation concealment unclear	N=64	**Inclusion criteria:** patients with severe acute pancreatitis (SAP) diagnosed by clinical evaluations, clinical biochemistry and CT scanning of the pancreas, according to the universal standard for SAP diagnosis in China. **Exclusion criteria:** patients with acute fulminant pancreatitis; patients admitted more than 3 days after the onset of symptoms and patients with renal or liver dysfunction. **Patient characteristics:** There was no difference between the 3 groups with regards to age, sex, status of illness and pathology. Gp I: Age (yrs) 39.6±5.2; Sex (M/F) 12/11; Aetiology; Biliogenic 20; Pancreatitis- 3 Gp II: 40.2±7.8; 11/10; 18; 2 Gp III: 39.4±8.6; 11/9; 19; 2	**Gp I: traditional conservative therapy** (iv fluids, electrolyte replacement, starvation treatment, NG decompression, analgesics, pancreatic exocrine secretion suppression, prophylactic antibiotics and necessary infudion of albumin or fresh plasma)	**Gp II: traditional conservative therapy + TPN** (iso-caloric + iso-nitrogenous) n=21 **Gp III: traditional conservative therapy + TPN + additional glutamine dipeptide-supplementation** n=20 Both groups commenced TPN within 24-48h after the liquid resuscitation and	At least 2 weeks	Serum albumin, body weight, mortality, complications (ARDS, MOF,stress ulcer), pancreatic infection, recovery time of blood amylase, recovery time of abdominal distension, length of stay (LOS)	Not reported

			crapulence *(alcohol-related)*				n=23	continued for at least 2 weeks.			

Effect Size
Outcomes
1. MOF

- Gp I (conservative treatment): 4/23
- Gp II (conservative treatment+TPN): 2/21
- Gp III (conservative treatment +TPN+ additional glutamine dipeptide-supplementation): 0/20

2. LOS

- Gp I (conservative treatment): 39.1 ±10.60 days
- Gp II (conservative treatment+TPN): 28.6 ± 6.90 days (p<0.05 vs. Gp I)
- Gp III (conservative treatment +TPN+ additional glutamine dipeptide-supplementation): 25.3 ± 7.60 days (p<0.01 vs. Gp I)

Reference	**Study type/ Evidence level**	**Number of patients**	**Patient characteristics**	**Intervention**	**Comparison**	**Length of follow-up**	**Outcome measures**	**Source of funding**
Sax HC, Warner BW, Talamini MA et al. Early total parenteral nutrition in acute pancreatitis: lack of beneficial effects. *American Journal of Surgery.* 1987; 153(1):117-124.	1+ RCT Randomized, blinding and allocation concealment unclear	N= 54	**Inclusion criteria:** patients with acute abdominal pain,clinical findings of abdominal tenderness in the left upper quadrant, nausea, or vomiting; a history of alcohol abuse or gallbladder disease; and laboratory findings of an increased amylase level +/- radiographic confirmation of pancreatic calcifications consistent with chronic pancreatitis. **Exclusion criteria:** not reported **Patient Characteristics:** Early TPN / Control Age (yr): 39.8± 2 / 39.6± 3 M/F: 19/10 / 21/5 Average Ranson's: 1.1± 0.20 / 0.92± 0.17	TPN + conventional therapy (see comparison) started within 24 hrs of admission. n=29	Conventional therapy (iv fluids, analgesics, antacids, nasogastric insertion) n=26	At least 15 days	Death, exacerbation of symptoms, length of hospital stay, complications	Nutritional support service.

			criteria score						
			Cause (%)						
			Alcohol	86	76				
			Biliary	7	8				
			Mixed	3	12				
			Undetermined	3	4				
Effect Size Outcomes **1. Length of stay** • TPN + conventional therapy (n=29): mean no. of days 16 • Conventional therapy (n=26): mean no. of days 10 • P<0.04									

3. NG vs. NJ

Petrov MS, Correia MITD, Windsor JA. Nasogastric tube feeding in predicted severe acute pancreatitis. A systematic review of the literature to determine safety and tolerance.	SR 1+ 8 parameter quality score- range from 0-16 (16 as highest quality)- assessed 1. Method of selection 2. Baseline comparability 3.Withdrawals 4. Allocation concealment 5. Method of allocation 6. blinding 7. protocol of intervention 8. co-interventions Of the 2 studies included in the meta-	N=4 studies N=92 patients N=2 studies in meta-analysis N=79 patients	**Study characteristics (2 studies included in meta-analysis):** RCTs of nasogastric versus nasojejunal feeding in patients with severe acute pancreatitis. EATOCK 2005 / KUMAR 2006 APACHE II score: 10 (median range 7-18) / 10.5±3.8 (mean±SD) Feeding start: <72 h after onset / 48-72 h of admission Feeding formula: Semi-elemental / Semi-elemental Duration of nutrition (days): 5 / 7 Characteristics of patients receiving NG feeding	Enteral nutrition via nasogastric feeding N=43	Enteral nutrition via nasojejunal feeding N=36	5-7 days	Mortality, diarrhoea, pain exacerbation, intolerance of feeding (length of stay, Infected pancreatic necrosis, Patients with MOF, surgery - but not in meta-analysis)	Not reported

***Journal of the Pancreas.* 2008; 9(4):440-448.**	analysis, 1 had a quality score of 14 and the other 13.							

	EATOCK 2005	KUMAR 2006
No. patients	27	16
Age (years)	63 (median range 47-74)	43.3±12.8 (mean±SD)
Male:female	14:13	14:2
Aetiology		
Biliary	16	8
Alcohol	6	4
Other	5	4

Effect Size

Outcomes

1. Mortality

- Nasogastric feeding resulted in a non-significant reduction in the risk of death:
  - RR 0.77; 95% CI 0.37- 1.62; p=0.50
  - NG feeding: 10/43; NJ feeding 11/36

Authors' Conclusion:

'The meta-analysis also demonstrated that there was no difference between nasogastric and nasojejunal tube feeding with respect to safety and tolerance in the two available RCTs.'

'An adequately powered randomized trail on nasogastric versus nasojejunal feeding is required to support this approach before early nasogastric tube feeding can be established as the standard of care.'

Limitations

- EATOCK 2005: some data on certain essential clinical outcomes were not reported. Plus jejunal tube feeding in this trial was probably duodenal because jejunal placement would have been difficult with the type of tubes and placement techniques they were using- meaning that both trial arms would have been equally as pro-inflammatory, thus affecting the results.
- KUMAR 2006: there was considerable delay after symptom onset in the NG and NJ groups (7.8±6.5; 5.7±4.7 days) in commencing enteral feeding.
- Both trials were underpowered to detect any difference or to prove equivalence between the groups for any clinical outcome.

Reference	**Study type/ Evidence level**	**Number of patients**	**Patient characteristics**	**Intervention**	**Comparison**	**Length of follow-up**	**Outcome measures**	**Source of funding**

<table>
<tr>
<td>Kumar A, Singh N, Prakash S et al. Early enteral nutrition in severe acute pancreatitis: a prospective randomized controlled trial comparing nasojejunal and nasogastric routes. Journal of Clinical Gastroenterology. 2006; 40(5):431-434.</td>
<td>RCT 1+

Randomised, ITT, unable to blind, allocation concealment unclear.

Underpowered</td>
<td>N=31</td>
<td>Inclusion criteria: patients with severe acute pancreatitis. The severity was defined according to Atlanta criteria- presence of organ failure and acute physiology and chronic health evaluation score of ≥8 or CT severity score ≥7.
Exclusion criteria: delay of >4 weeks between the onset of symptoms and presentation to the hospital, if they were already taking oral feeding at presentation, if there was acute exacerbation of chronic pancreatitis, or if they were in shock at the time of randomisation.
Patient characteristics:
No statistically significant difference in any baseline characteristics in the 2 groups
<table>
<tr><td></td><td>NJ group</td><td>NG group</td><td>P value</td></tr>
<tr><td>Age (yrs)</td><td>35.57± 12.53</td><td>43.25± 12.76</td><td>0.108</td></tr>
<tr><td>M/F</td><td>11/3</td><td>14/2</td><td>0.642</td></tr>
<tr><td>Aetiology</td><td></td><td></td><td></td></tr>
<tr><td>Gallstones</td><td>4</td><td>7</td><td></td></tr>
<tr><td>Alcohol</td><td>4</td><td>4</td><td>0.85</td></tr>
<tr><td>Gallstones + alcohol</td><td>1</td><td>1</td><td></td></tr>
<tr><td>idiopathic</td><td>5</td><td>4</td><td></td></tr>
<tr><td>Mean APACHE II score</td><td>9.64± 4.99</td><td>10.50± 3.78</td><td>0.597</td></tr>
</table>
</td>
<td>Nasojejunal (NJ) feeding

Both groups started treatment 48-72 hrs after transfer to hospital and were continued on treatment for 7 days

N=14</td>
<td>Nasogastric (NG) feeding

See intervention for more details

N=16</td>
<td>7 days (and then until discharge, death or surgery)</td>
<td>Recurrence of pain, tolerance of feeding, biochemical parameters, length of hospital stay, death, infection rate, surgery.</td>
<td>Not reported</td>
</tr>
</table>

Effect size

1. length of stay (days)
    - NJ gp: 29.93 ± 25.54
    - NG gp: 24.06 ± 14.35
    - P=0.437
2. infection rate (includes positive blood culture, tracheal aspirate, pancreatic aspirate and bile culture)
    - NJ gp: 6/14
    - NG gp: 7/16
    - P=0.467
3. Surgery
    - NJ gp: 2/14
    - NG gp: 1/16

<table>
<tr>
<td>Eatock FC, Chong P, Menezes N et al. A randomized study of early nasogastric versus nasojejunal feeding in severe acute pancreatitis. American Journal of Gastroenterology. 2005; 100(2):432-439.</td>
<td>RCT 1+

Randomised, ITT, unable to blind, allocation concealment unclear.

Underpowered</td>
<td>N=49</td>
<td>Inclusion criteria: patients with both a clinical and biochemical presentation of acute pancreatitis (abdominal pain + serum amylase at least 3 times the upper limit of the reference range), and objective evidence of disease severity (Glasgow prognostic score 3 or more, or a APACHE II score 6 or more or a CRP level >150 mg/L)
Exclusion criteria: patients under 18 yrs and pregnant females.
Patient characteristics:
<table>
<tr><td></td><td>NG group</td><td>NJ group</td><td>P value</td></tr>
<tr><td>Age median (IQR)</td><td>63 (47-74)</td><td>58 (48-64)</td><td>0.47</td></tr>
<tr><td>M/F</td><td>14/13</td><td>12/10</td><td>-</td></tr>
<tr><td>Feeding start-hrs from onset of pain (IQR)</td><td>72 (24-72)</td><td>72 (24-72)</td><td>-</td></tr>
</table>
Aetiology:
Gallstones: 65.3% (16 in each group)
Alcohol abuse: 24.5%
Idiopathic:6.1%</td>
<td>Nasogastric feeding

N=27</td>
<td>Nasojejunal feeding

N=22</td>
<td>4 days</td>
<td>CRP, APACHE II score, pain score, analgesic requirement, need for conversion from EN to PN feeding, hospital and intensive care stay, mortality.</td>
<td>Not reported</td>
</tr>
<tr>
<td colspan="8">Effect Size
1. Length of stay (days)
• NG group: 16 (10-22)
• NJ group: 15(10-42)</td>
</tr>
</table>