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# Nutrition in acute pancreatitis (A.P)

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*Acknowledgements:*

*Sinead Duggan, Trinity College Dublin; Linda Crozier, BHSCT; Oonagh Griffin, SVUH , Dublin; Mary Phillips; Royal Surrey*

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# Aim & Objectives

## Aim

- To update Dietitians on nutritional management of patients with acute pancreatitis

## Objectives

- To provide an overview of acute pancreatitis
- To assist Dietitians in recognising how to assess & manage dietary aspects of pancreatitis

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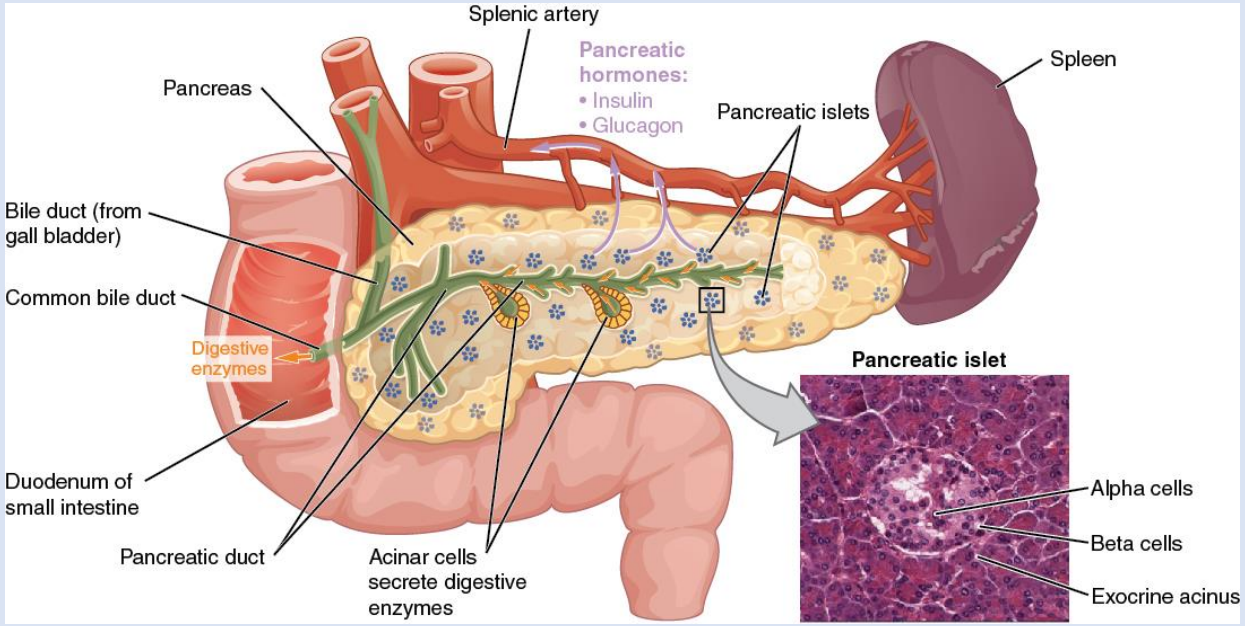
# The Pancreas

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## Endocrine

- Cells arranged in diffusely distributed nests (islets)
- Only about 1% of weight, higher concentration in tail
- Insulin (anabolic hormone)
- Glucagon (induces hyperglycaemia)

## Exocrine

- 95-98% of pancreas per weight
- Acinar, centroacinar, ductal cells
- 2.5L of exocrine fluid per day
- Nutrients in the intestines stimulate exocrine function
- Influenced by caloric content, nutrient composition, physical properties

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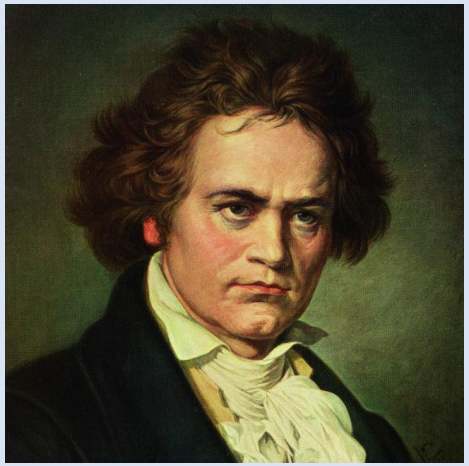

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# Acute pancreatitis (A.P)

***An acute inflammatory process of the pancreas that frequently involves peri-pancreatic tissue and/or remote organ systems***
**(Atlanta, 2012)**

## Requires 2 of 3 features

1. Abdo pain suggestive of AP
2. Serum lipase (or amylase) activity
3. Imaging consistent with AP

**(revised Atlanta classification, 2016)**

## Severity in AP

**Mild –** No organ failure or local/systemic complications

**Moderately severe** – Transient organ failure or local systemic complications (resolves within 48hrs)

**Severe** – Persistent organ failure, for more than 48hrs

(revised Atlanta, 2016)

## Predicting severity

- Imrie Glasgow score
- APACHE II
- CRP
- CT – severity index

## Sub-types

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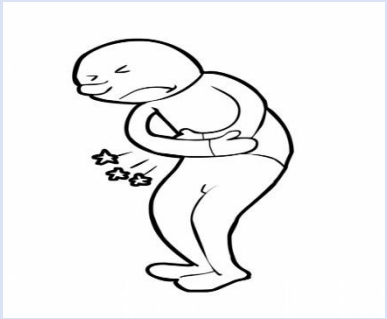
# Clinical Aspects

## Presentation

- Abdominal pain - obvious and severe
- Radiates towards back
- Vomiting and diarrhoea
- Shock



## Aetiology

- Alcohol & gallstones (80%)
- Metabolic (Trigs)
- Microlithiasis
- Hereditary causes
- Autoimmune pancreatitis
- Duct obstruction (e.g. tumour)
- Medications
- Anatomical anomalies

(NICE, 2018)

## Incidence

- Rising
- N.I – 530 cases/year

(NCEPOD, 2016)

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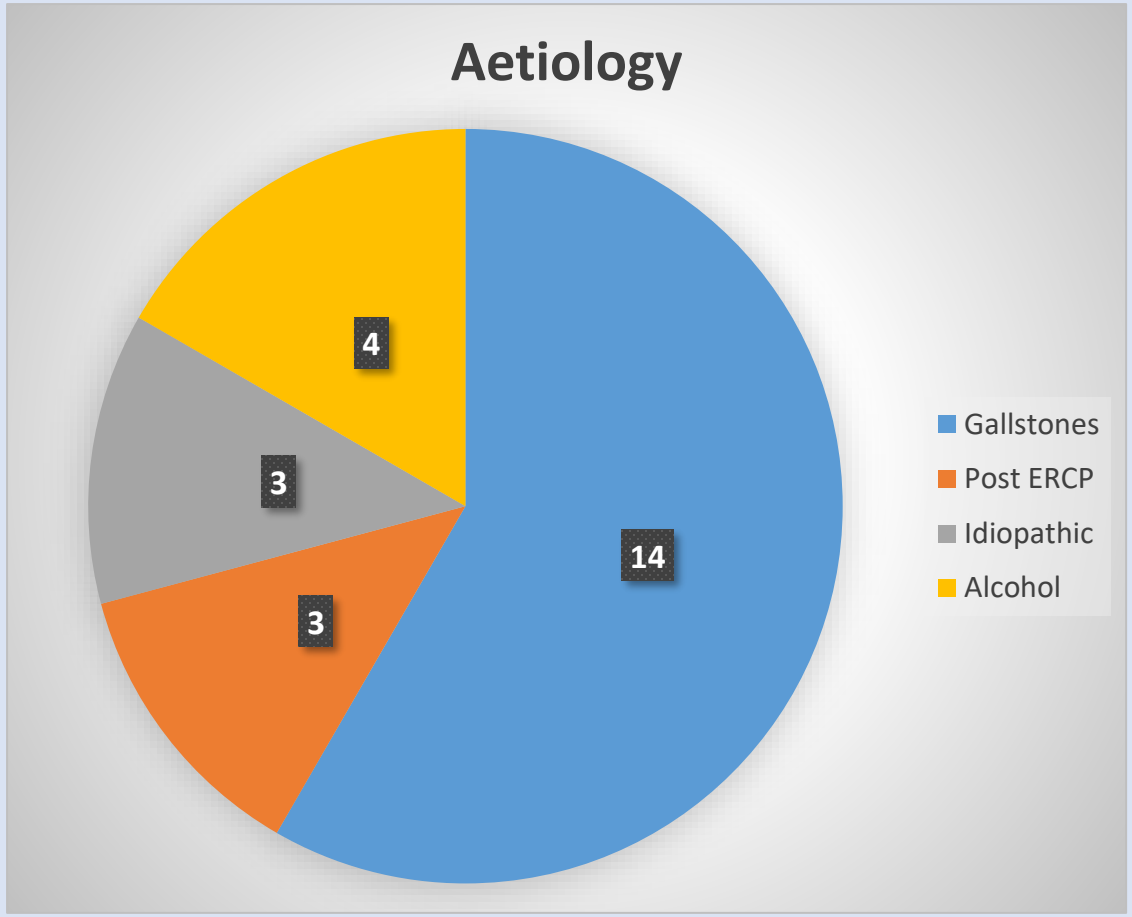
# Aetiology in HPB service

- Majority relating to gallstone disease 15 total; 14 primary and 1 secondary to ERCP for choledocholithiasis.
- Of all gallstone disease, 4/15 (26%) on waiting list for laparoscopic cholecystectomy, while rest were first admission.
- Of ERCP, 1 for benign stricture, 1 for cholangiocarcinoma, 1 for gallstone disease.




*Local audit: Jones, Dorrian, McGreevy, Robinson, 2021*

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# Nutrition in A.P

## Mild A.P

- Low mortality, uncomplicated disease
- Patient usually restarts diet within days
- No benefit to feeding
  - RCT (NG *vs* NPO), less abdo pain, better food tolerance in NG group (Petrov 2013)
  - Already malnourished patient?

## Severe A.P

- High mortality
- Complications, SIRS, increased metabolic demands
- Higher TEE, catabolic, negative nitrogen balance
- Feeding considered essential
- Considerations
  - Under-nutrition
  - Alcoholism
  - Obesity

**Controversies in feeding**

- Timing?
- How to feed?
- Feed types? ESPEN, 2020
- Pancreatic exocrine insufficiency?

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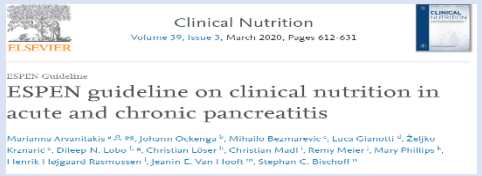
# Guidelines

## ESPEN


Clinical Nutrition
Volume 39, Issue 3, March 2020, Pages 612-631

ESPEN Guideline

ESPEN guideline on clinical nutrition in acute and chronic pancreatitis

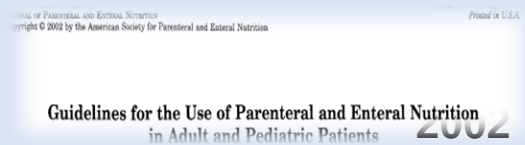
**2020**

**2009**

**2006**

**2002**

## ASPEN


Guidelines for the Use of Parenteral and Enteral Nutrition in Adult and Pediatric Patients 2002

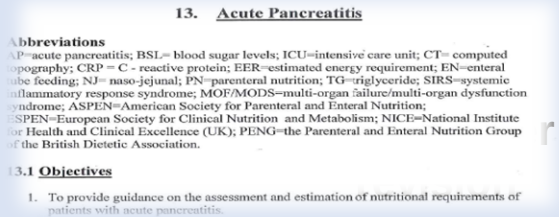
## BSG


GUIDELINES

UK guidelines for the management of acute pancreatitis

UK Working Party on Acute Pancreatitis 2005

## INDI


13. Acute Pancreatitis

Abbreviations

AP=acute pancreatitis; BSL= blood sugar levels; ICU=intensive care unit; CT= computed topography; CRP = C - reactive protein; EER=estimated energy requirement; EN=enteral tube feeding; NJ= naso-jejunal; PN=parenteral nutrition; TG=triglyceride; SIRS=systemic inflammatory response syndrome; MOF/MODS=multi-organ failure/multi-organ dysfunction syndrome; ASPEN=American Society for Parenteral and Enteral Nutrition; ESPEN=European Society for Clinical Nutrition and Metabolism; NICE=National Institute for Health and Clinical Excellence (UK); PENG=the Parenteral and Enteral Nutrition Group of the British Dietetic Association.

13.1 Objectives

1. To provide guidance on the assessment and estimation of nutritional requirements of patients with acute pancreatitis.

## PENG

**2018 & 2013**

## NICE


NICE guideline

NICE guideline
Published: 5 September 2018 nice.org.uk/guidance/ng104

**2018**

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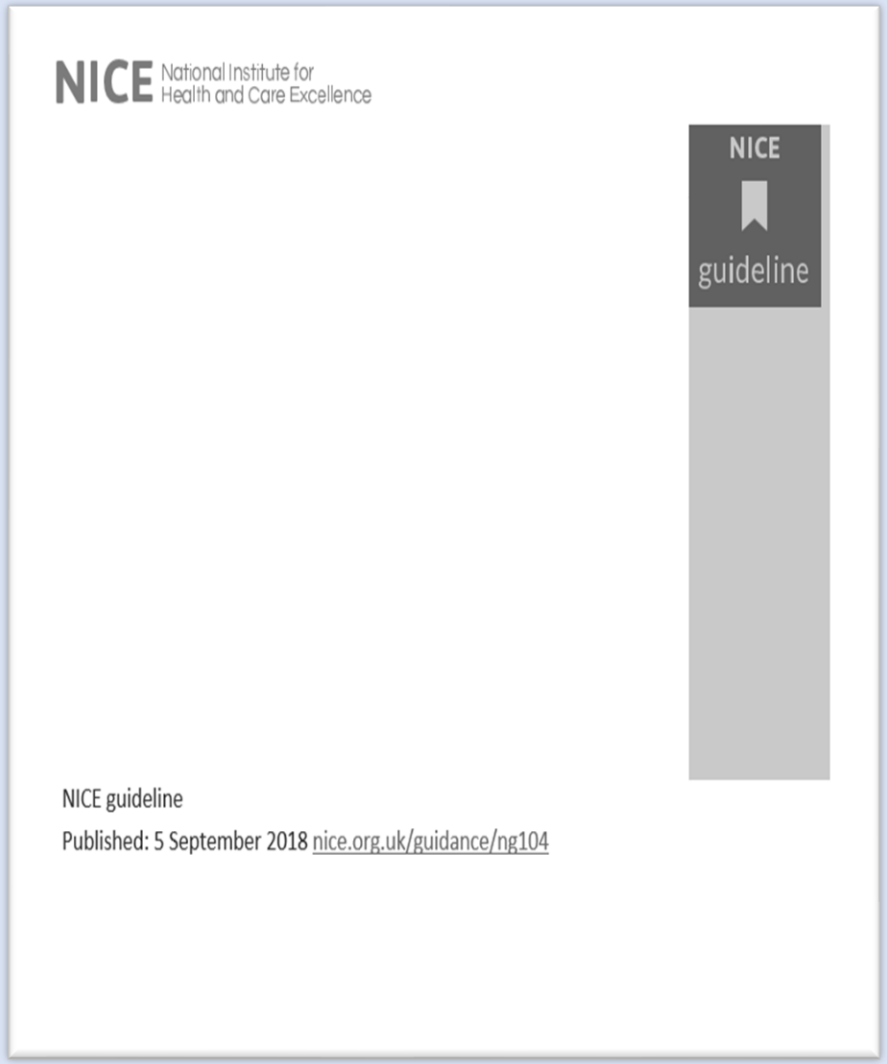


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Clinical Nutrition

Volume 39, Issue 3, March 2020, Pages 612-631


ESPEN Guideline

# ESPEN guideline on clinical nutrition in acute and chronic pancreatitis

Marianna Arvanitakis [a], Johann Ockenga [b], Mihailo Bezmarevic [c], Luca Gianotti [d], Željko Krznarić [e], Dileep N. Lobo [f, g], Christian Löser [h], Christian Madl [i], Remy Meier [j], Mary Phillips [k], Henrik Højgaard Rasmussen [l], Jeanin E. Van Hooft [m], Stephan C. Bischoff [n]

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Pancreatic disease

BMJ Open Gastroenterology

# Consensus for the management of pancreatic exocrine insufficiency: UK practical guidelines

Mary E Phillips ,[1] Andrew D Hopper,[2] John S Leeds ,[3] Keith J Roberts ,[4] Laura McGeeney,[5] Sinead N Duggan,[6] Rajesh Kumar[7]

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# When to feed?

- Early oral Vs delayed oral?
- Early EN Vs on-demand EN?
- Early EN Vs delayed EN?

# Poll question – when should you aim to start nutritional support for a pt with acute pancreatitis?

- A) within 24hours
- B) within 48hours
- C) within 72hours
- D within 1 week

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# When to feed?

- Ensure no *nil by mouth &* do not have food withheld unless there is a clear reason (NICE, 2018)
- Offer EN to anyone with severe or moderately severe A.P - Start within 72 hours of presentation & aim to meet nutritional requirements A.S.A.P (NICE, 2018, ESPEN 2020, Rec B 24-72 hours)
- Other considerations: lay members & Committee (NICE, 2018)

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# Which route: EN or PN?

**PN:** quick, easy to start, well-tolerated, expensive

**EN:** safe, cheaper, likely better health outcomes

***EN***

- Safest first line
- Lower mortality
- Reduced pancreatic & systemic infections
- Lower hospital LOS
- Less severe adverse incident
- Less Sx interventions required

***PN***

- Where EN not possible or tolerated, central route
- Do not give lipid-containing PN if Trigs >12 mmol/L (ESPEN, 2009)

**NICE 2018**

- EN should be offered to anyone with moderate / severe A.P
- Offer PN only if EN has failed or is Contra-indicated

**ESPEN 2020**

- With A.P pts & inability to feed orally EN shall be preferred to PN (Rec A)
- PN should be administered when EN not tolerated / unable to tolerate targeted nutritional requirements (GPP)

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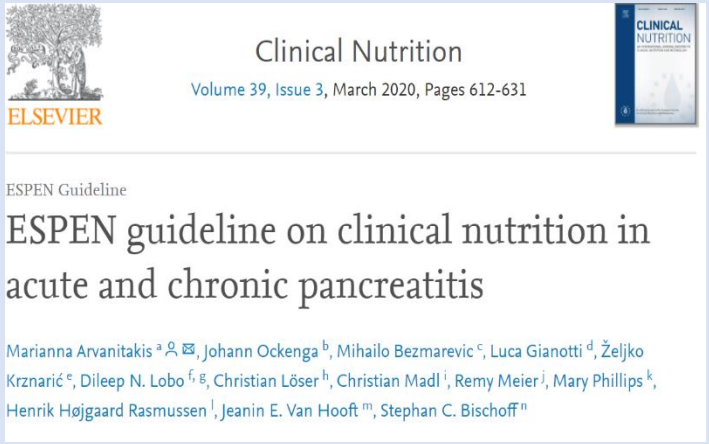
# Immuno-nutrition

## Glutamine

- 0.2g/kg glutamine added to PN is indicated (GRADE B evidence), otherwise no role
- RCTs show reduced mortality rate in moderate pancreatitis, reduced complications and shorter length of stay. No data comparing optimal dose.
- No recommendations for enteral glutamine



# Poll question
# A pt with acute pancreatitis is not meeting nutritional requirements orally (diet & ONS), what route of EN would you recommend?

- A) NG (nasogastric)
- B) NJ (nasojejunal)

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# Which EN route – NG / NJ?

## EN route

- Majority of studies low or very low quality, imprecision & bias
- Jejunal feeding shown to be safe & NOT less effective than PN
- NO evidence to support belief that NG feeding is inappropriate
- Evidence debates benefits & harms, outcomes, quality of the evidence

Bing images

## NICE 2018

- Not specified
- Clinical judgement & case-by-case basis

## ESPEN 2020 (Rec B)

- NG first
- NJ in case of digestive intolerance

# Type of EN?

- Standard polymeric feed (ESPEN 2020, Rec A)
- Peptide feeds may ↓ but may not remove the need for PERT
- Both polymeric & semi-elemental formulas feasible, safe & well tolerated: small RCT, Tiengou *et al.* 2006 Vs meta-analysis studies that show no difference between formulas but in severe AP with malabsorption, semi-elemental may be of interest.
- Lower feed rates over long periods may decrease the risk of overwhelming digestive capacity

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| | Kcal / 1000mls, Protein(g) /1000ml | Protein source | Fat Source<br>% MCT | Osmolality Mosm/kg |
|---|---|---|---|---|
| Peptamen (Nestle, UK) | 1000 kcal 40g | Peptide | 70.3% | 265 |
| Peptamen HN (Nestle, UK) | 1330 kcal 66g | Peptide | 69.4% | 430 |
| Vital 1.5 (Abbott, UK) | 1501 kcal 67.5g | Peptide | 63.6% | 630 |
| Perative (Abbott, UK) | 1309kcal 67g | Peptide | 37% | 385 |
| Survimed OPD (Fresenius, UK) | 1000 kcal 45g | Peptide | 51.4% | 350 |
| Survimed OPD HN (Fresenius, UK) | 1330 kcal 67g | Peptide | 51.9% | 460 |
| Nutrison Peptisorb (Nutricia, UK) | 1000 kcal 40g | Peptide | 47% | 535 |
| Nutrison MCT (Nutricia, UK) | 1000 kcal 50g | Peptide | 60.6% | 315 |
| Emsogen (Nutricia, UK) | 880 kcal 25g | Amino acid | 83% | Depends on dilution used |
| Elemental 028 Extra Liquid (Nutricia, UK) | 860 kcal 25g | Amino acid | 35% | 725 |

Table adapted from Phillips, ? year

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# Pancreatic Exocrine Insufficiency (PEI)

***Definition:*** *a reduction of pancreatic exocrine activity in the intestine at a level that prevents normal digestion*

- Reduction of lipase, protease, amylase
- Lipase particularly vulnerable, so fat malabsorption occurs first and may be most evident
- Steatorrhoea becomes apparent when >90% function lost
- Leads to **malabsorption**

DiMagno *et al*. 1973; Philips *et al.* 2021

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# Signs and symptoms of PEI

Steatorrhoea (pale, floating, oily stool)

Loose, watery stool

Undigested food in stools

**Late symptoms**

Post-prandial abdominal pain

Nausea / colicky abdominal pain

Gastro-oesophageal reflux

Bloating / food intolerance

Malnutrition

Weight loss

Vitamin deficiencies (especially A, D, E, K)

Hypoglycaemia in diabetes

British Dietetic Association, A Pocket Guide to Clinical Nutrition (2018), 5th Edition. Table 19.7 Chapter authors (Pancreatic disease in adults): Philips, M; Freeman, K; McGeeney, L; Griffin, O; Dann, S.

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# Use of PERT in A.P

- Should not be supplemented generally EXCEPT if obvious PEI (ESPEN, 2020)
- PEI can occur following severe AP, especially in those with necrosis, recurrent AP or in the presence of pseudo-cysts (grade 2B; 100% agreement). Patients with acute necrotising pancreatitis should be routinely started on PERT once they are able to consume oral intake (Phillips *et al.* 2021)
- In BHSCT if pt unable to take PERT orally & has enteral feeding tube – tend to recommend Pancrex V powder 1-2g, 2hourly with feed (Pancrex V capsules are another option)
- If in doubt / need advice contact specialist RD

# Other issues

## Re-introducing diet

**Following mild A.P**

- Once pain controlled, as soon as clinically tolerated, allow to start eating (ESPEN Rec A)
- Low fat, soft diet (ESPEN Rec A)
- Revert to oral fluids if pain worsens on eating

**Following severe A.P**

- Insufficient evidence re: optimal timing / type of diet
- Start with small amounts CHO/protein-rich foods.
- Careful reintroduction of fat x3-6 days.
- Restart ‘normal’ diet.
- PERT may be required for some.
- Counsel re: alcohol avoidance.

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# Other Issues

**Probiotics**

Considered unsafe and are *not* recommended in severe AP due to risk of gut ischaemia and higher mortality (ESPEN, 2020)

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# Prolonged stays

*(Local audit: Jones, Dorrian, McGreevy, Robinson, 2021)*

- Inpatient Stay Data
- MEAN inpatient stay 79 days TOTAL, MEDIAN 60 days, with range of 14-243 days.
- MEAN regional inpatient stay 48 days, MEDIAN 31 days, from range of 7-191 days.
- MEAN time in admitting hospital prior to BCH transfer 30.8 days.

# Post D/C

- 20-50% develop new onset DM
- >40% ongoing abdominal symptoms
- 3-13% incidence of chronic pancreatitis
- “post traumatic stress” effects of prolonged ITU stay
- Reduced quality of life

Hochman *et al.* 2006; Hasibeder *et al.* 2009

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# NCEPOD “Treat the cause” A.P Report 2016

- 215 NHS hospitals England, Scotland & NI
- 712 questionnaires & casenotes over 6months, 2014
- Overall Mx of nutrition considered adequate in only 85% of cases & by 77% of clinicians
- NST in place: 87.5%
- Nutritional screening: 67.4%
- Referrals to dietitian & NST: 39%
- Supplemental nutrition considered: 43.2% (further 9% should have)

18 recommendations (1 nutrition related)

- ALL pts admitted with A.P should be assessed for risk of malnutrition (MUST) & provides basis for referral to dietitian or a NST & subsequent timely & adequate nutrition support (also supported by ESEPN, 2020, Rec B)

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# Case-study

***Prior to transfer:***

- 3 month admission, had been NG fed for a period until dietary intake & ONS (Procal shot) established.

- CREON started (75,000iu with meals & 25,000iu with snacks).

- 12.7kg wt loss in ~2.5months (14.1% wt loss). BMI 25kg/m2

***On transfer:***

- c/o insulin by DSN.

- Poor oral intake due to intermittent N&V post drainage & developed HAP.

- Need for EN raised & risk of re-feeding highlighted however T/F back to referring hospital & care transferred to local RD.

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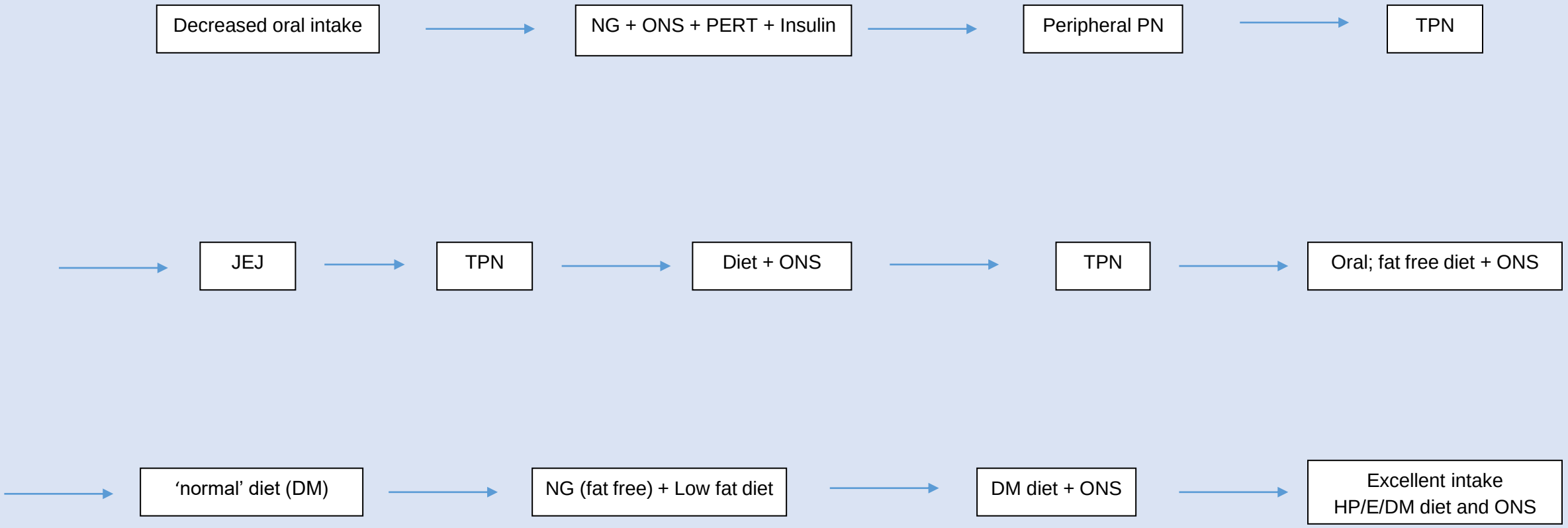
# Case-study



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# Take home messages

- Complex, many prolonged stays
- Roller-coaster / close monitoring with changing nutritional needs
- Aggressive nutritional support needed
- Polymeric / Semi-elemental feed
- Monitor need for PERT
- High risk of DM
- Contact specialist RD for advice if needed

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# ***Thank-you for listening!***

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