

Pancreatic Diseases Update

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Belfast Health and
Social Care Trust

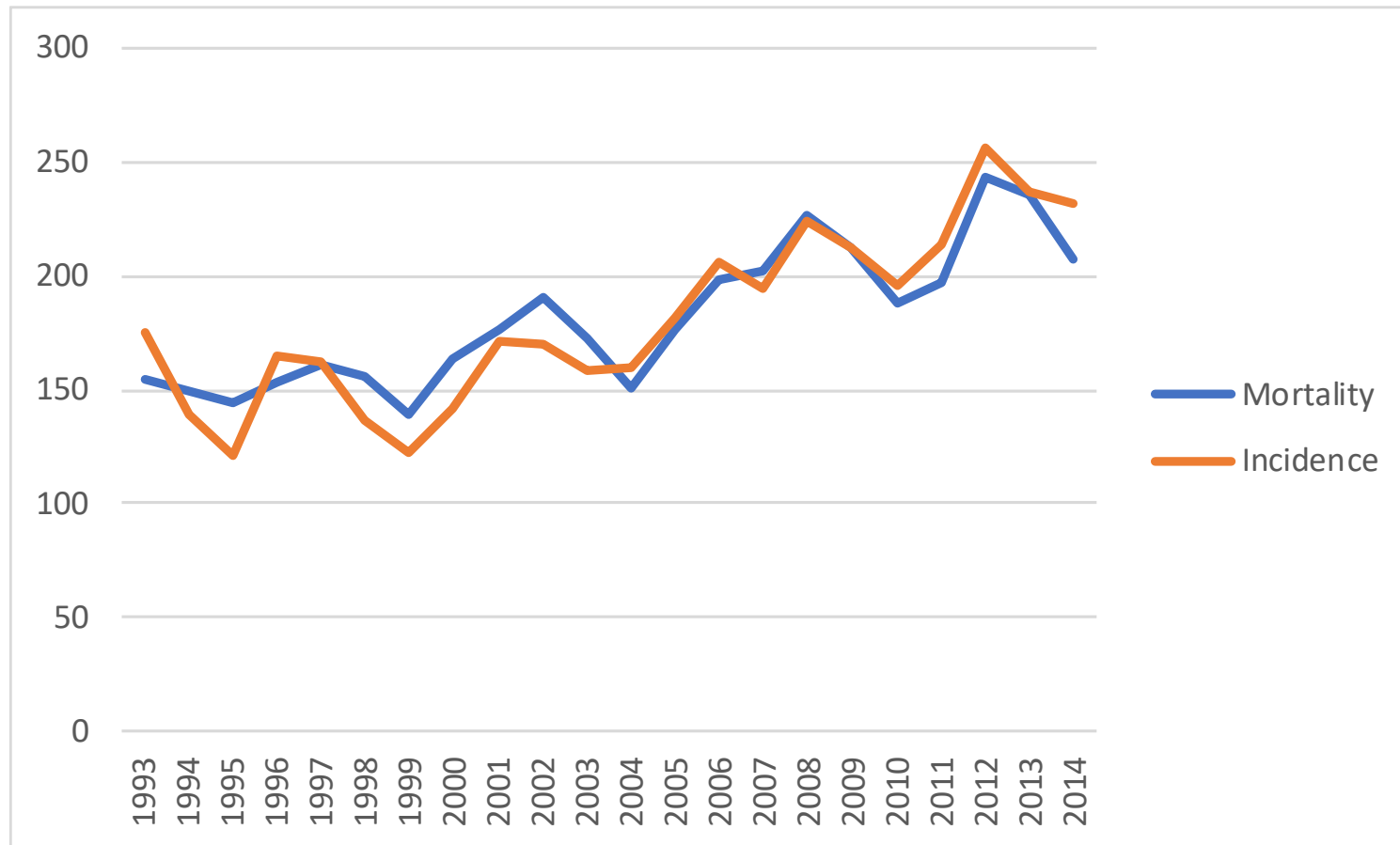
Objectives

- Indications of Resectional Pancreatic Surgery
- Resectional Pancreatic Surgery
- Potential complications
- Pancreatitis

Indications of Resectional Pancreatic Surgery

- Pancreatic cancer
- Neuroendocrine tumours
- IPMN
- Other tumours

Pancreatic Cancer in Northern Ireland



Source: Northern Ireland Cancer Registry

Sporadic pancreatic neuroendocrine tumors (p-NETs) of grades 1 et 2

Localized disease

Advanced disease

Tumor <2 cm

Tumor >2 cm

Resectable metastases

Non resectable metastases

Wait and see

Surgery

Surgery +/- Liver-directed therapies

Medical treatment

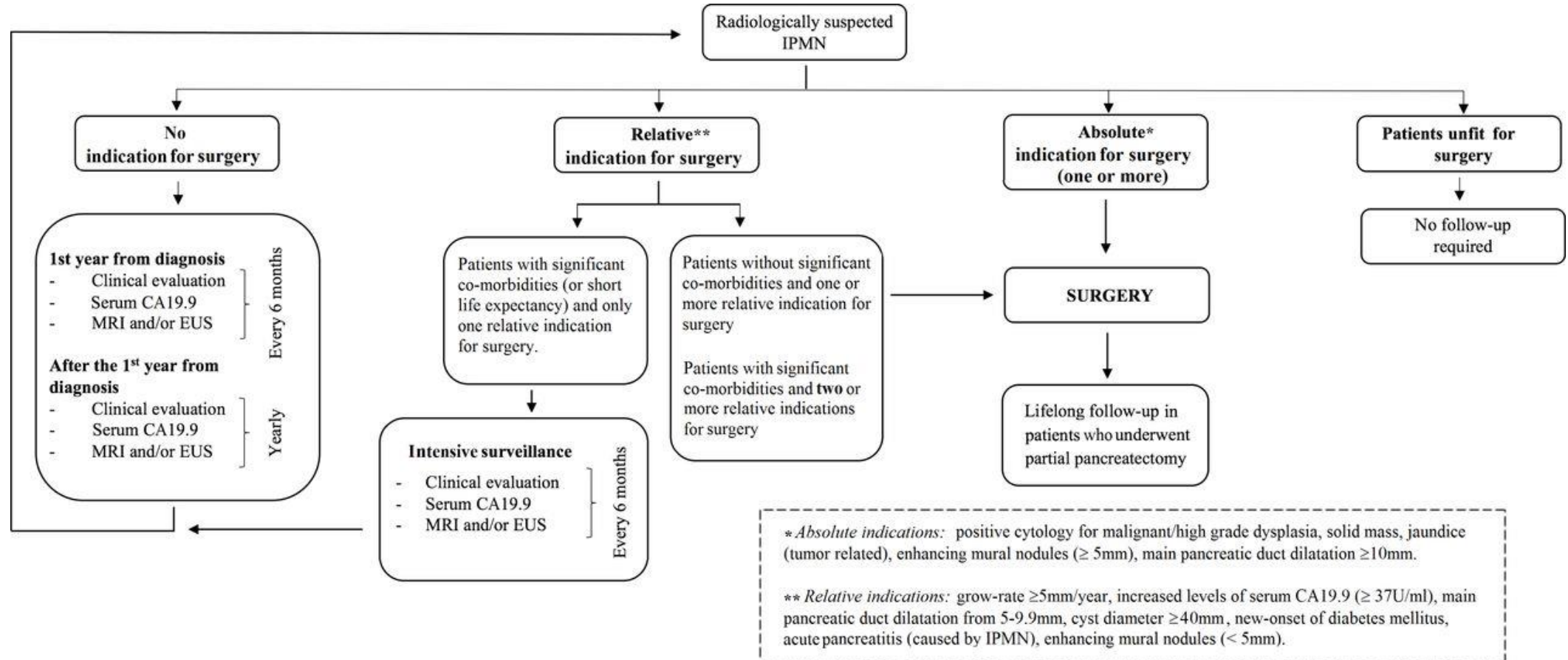
No adjuvant treatment

First-line:
Surveillance, SSA, chemotherapy, combinations

Second-line:
SSA, chemotherapy +/- bevacizumab, everolimus, sunitinib, PRRT, liver-directed therapies

Always consider clinical trials at any disease stage
Concomitant treatment of functional syndrome

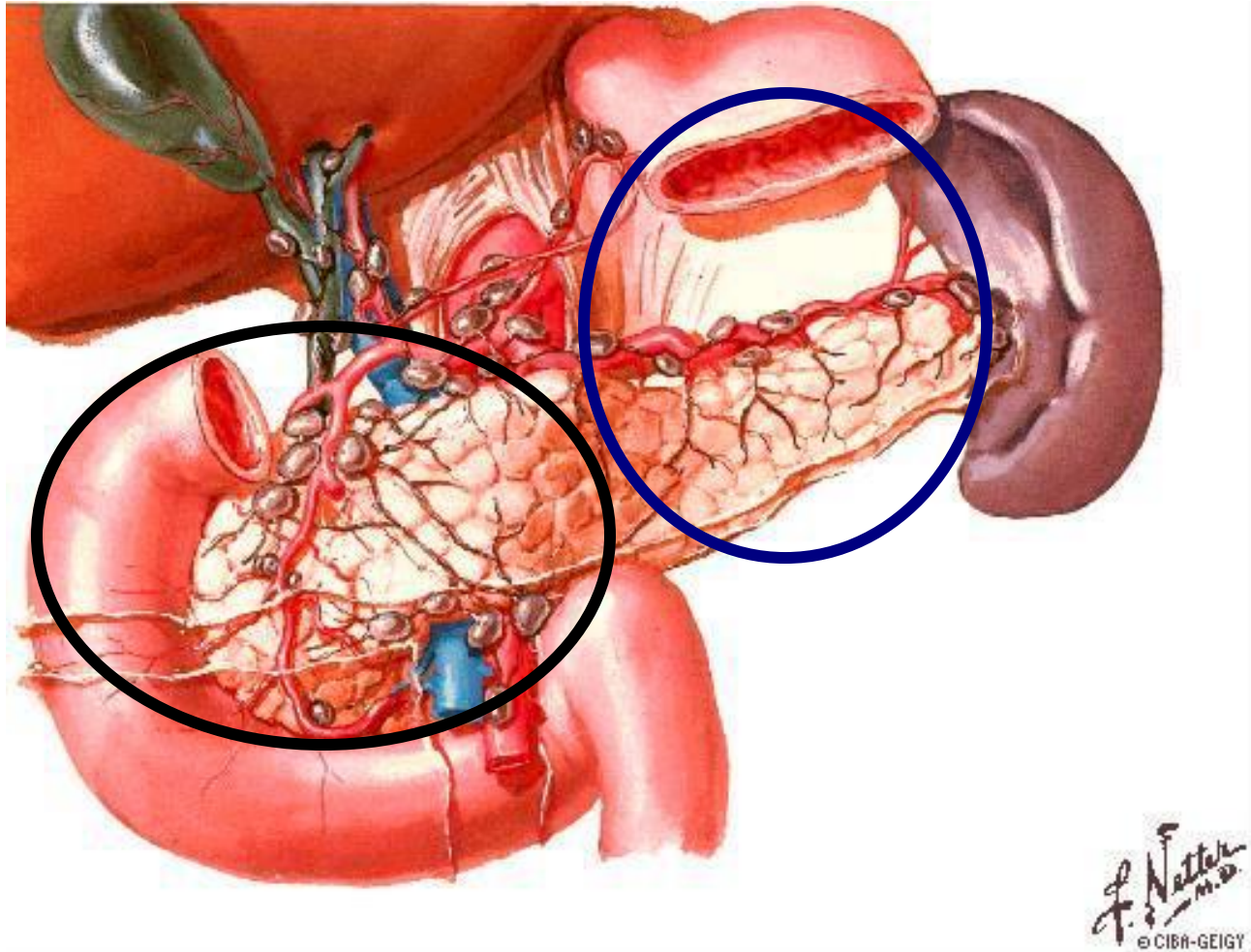
Indications for surgery in IPMN



The European Study Group on Cystic Tumours of the Pancreas Gut 2018;67:789-804



Pancreatic cancer



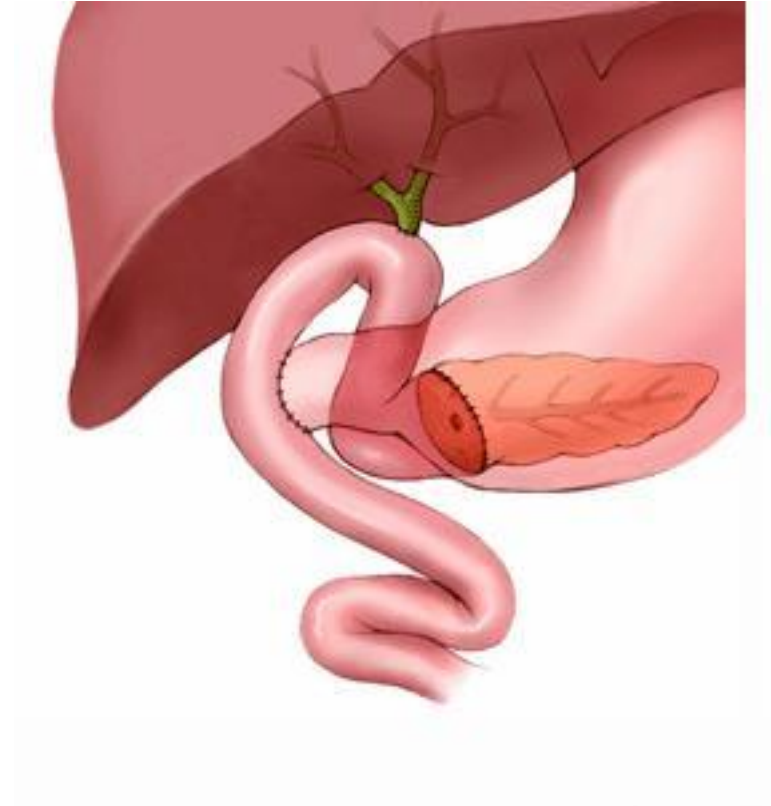
1. Head of Pancreas

2. Body and Tail

Whipples Procedure

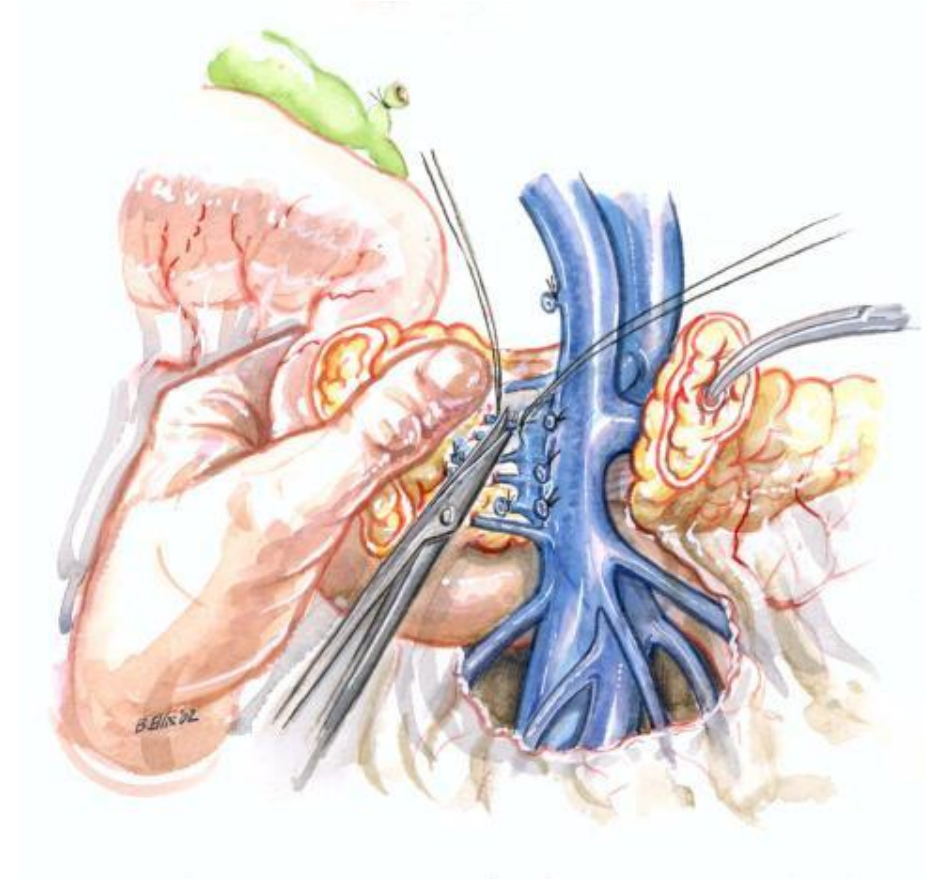
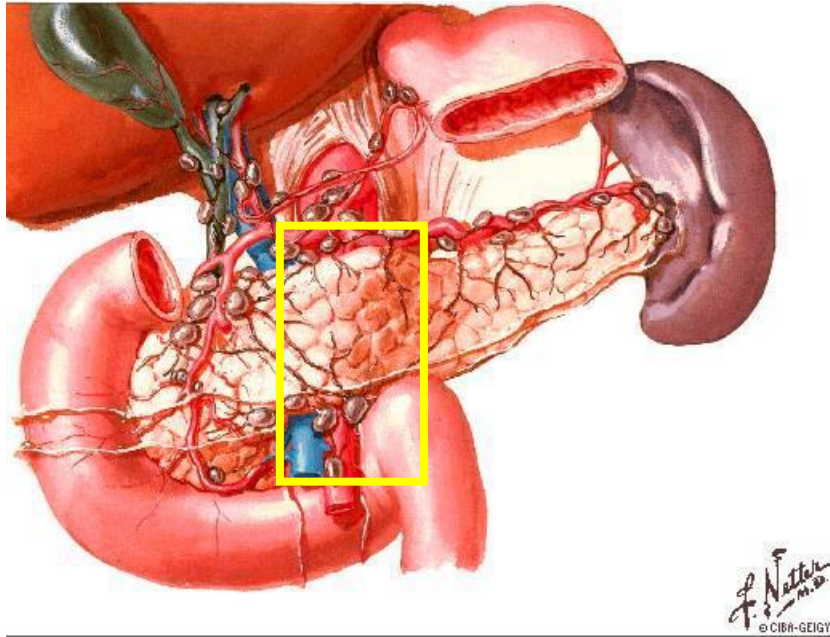


Organs removed during a Whipple

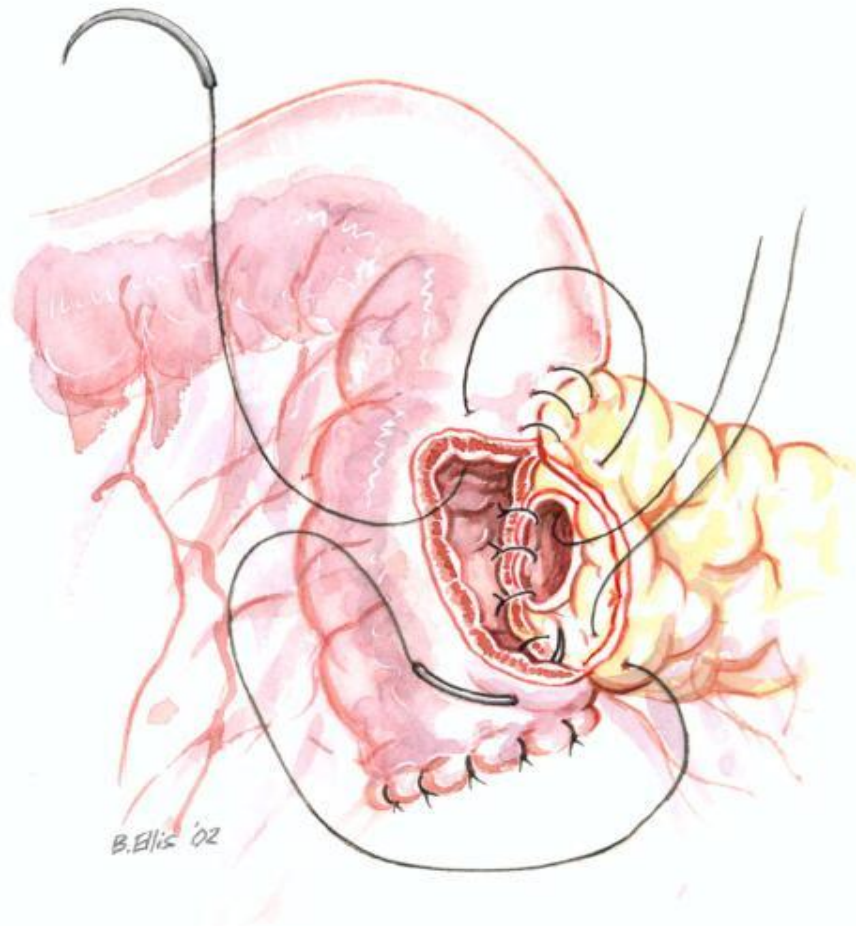


Most common anatomy after Whipple

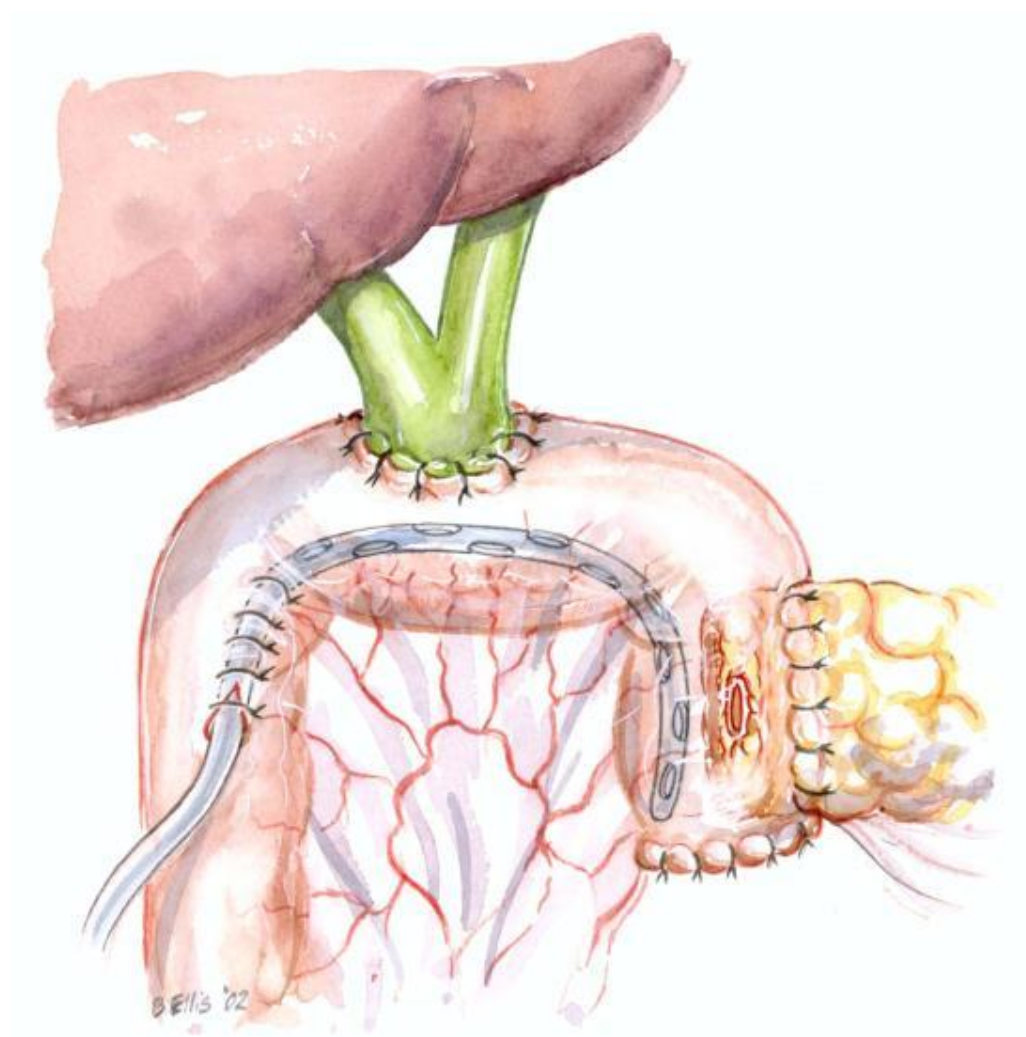
Whipple pancreaticoduodenectomy



Pancreatic Anastomosis

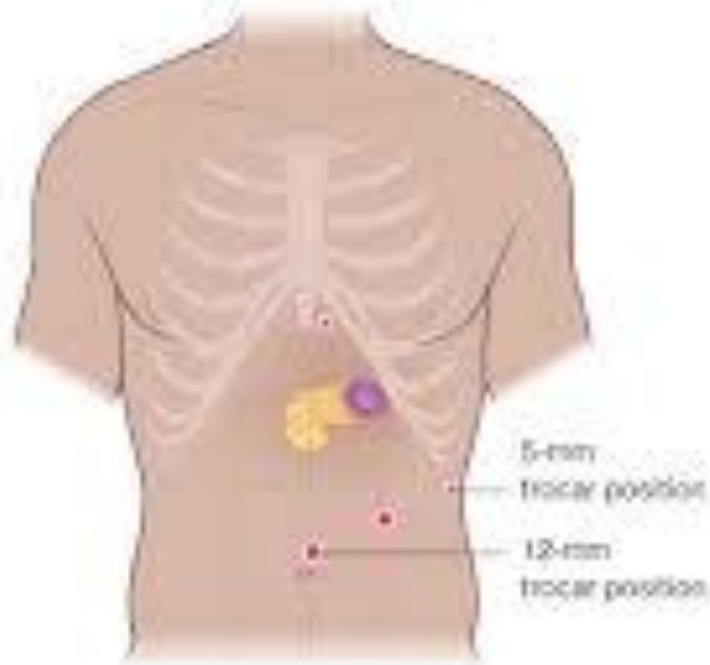


Biliary Anastomosis

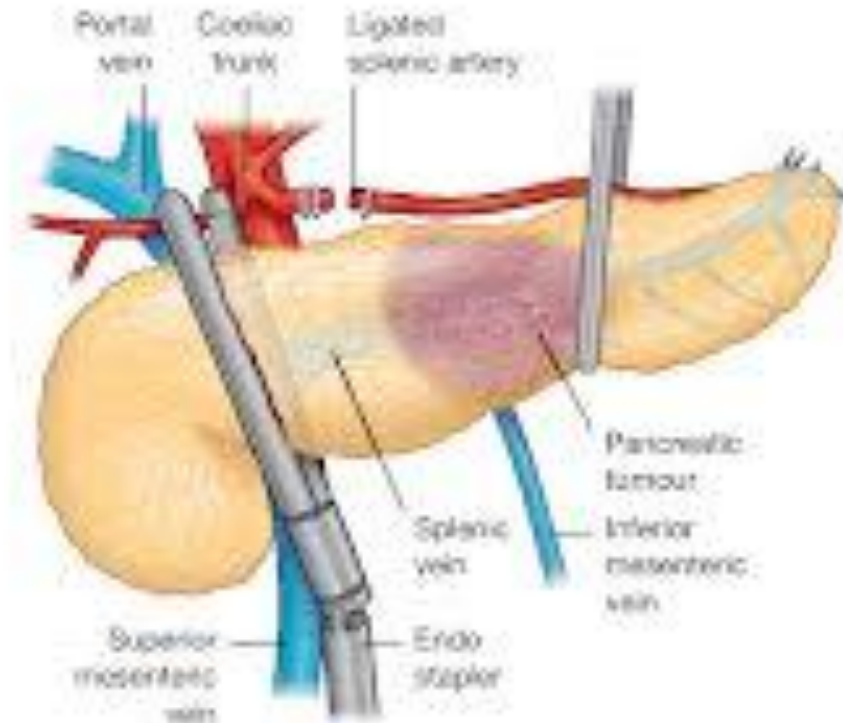


Distal Pancreatectomy & Splenectomy

a Placement of trocars



b Location and removal of the lesion



Borderline Resectable Pancreatic Cancer

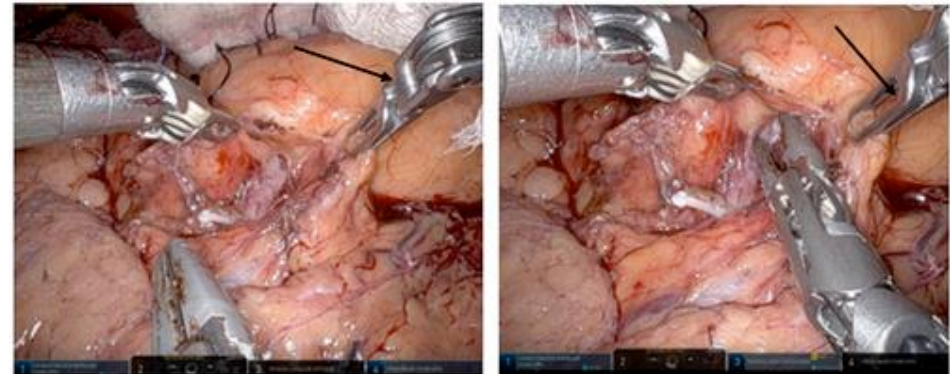
- Definition
 - SMV/PV tumour contact > 180 degrees
 - SMA/CA tumour contact < 180 degrees without deformity
 - Common hepatic artery tumour contact
 - CA19-9 > 500
 - Regional Lymph Nodes

Borderline Resectable Pancreatic Cancer

- Rationale
 - Increase R0 resections
 - Downstage disease
 - Reduce surgical postop complexity

The future – robotic approach

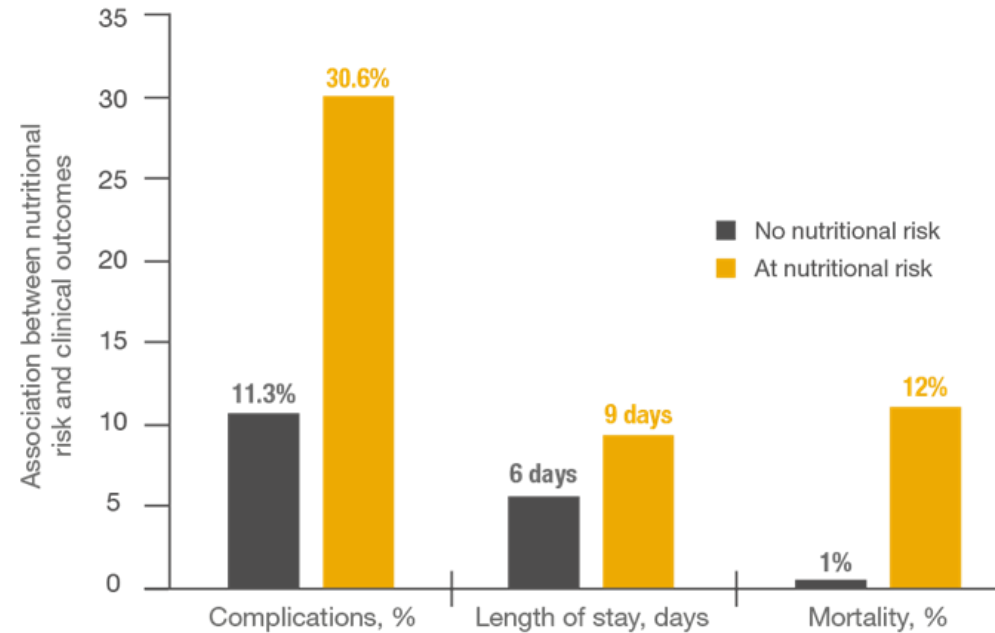
- Robotic pancreaticoduodenectomy (RPD) has demonstrated equivalent or superior surgical outcomes to open (OPD).
- The concept of ‘Therapeutic Value’ was introduced by Hashiguchi et al., in 2011 to ‘investigate the survival benefit of lymph node dissection’.
- •Totally-robotic surgical technique can be a safe and feasible alternative to open surgery for Whipple's procedure.



Malnutrition

- Poor dietary intake
- Malabsorption – exocrine/endocrine/vitamin deficiency
- Increased catabolism – acute inflammation/infection
- Surgical effects – ileus/DGE/Pancreatic fistula/Chylous ascites

Nutritional risk increases complications, hospital stays and mortality



Ockenga et al., *HPB* 2009²

Assessment of pancreatic function

- Loss of pancreatic parenchyma can lead to new onset endocrine and exocrine insufficiency, conditions that greatly affect postoperative QoL, cardiovascular health and nutrition status
- Endocrine Function – assessment of beta cell function to diagnose diabetes
- Exocrine Function – direct assessment using faecal elastase or CCK test.

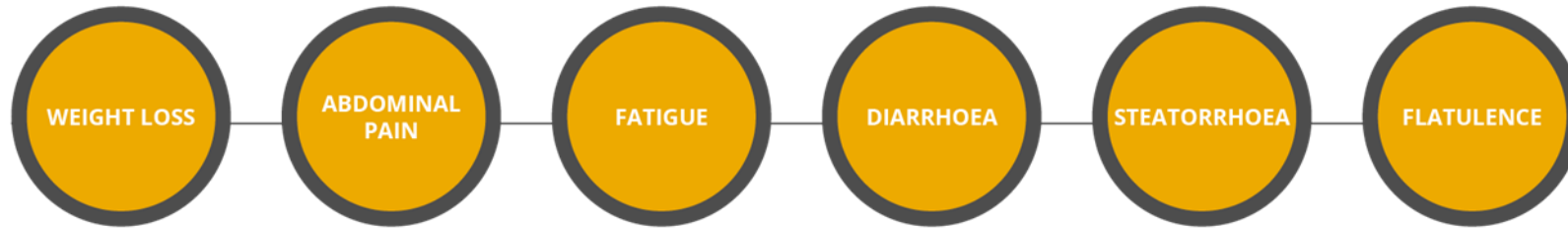
Diabetes

- Of 1165 patients who underwent pancreatic resectional surgery
- 41.8% had preexisting diabetes
- Out of the remaining 678, at a median of 3.6 months, 40.4% developed diabetes

Elliott IA et al. Perm J 2017;21:16

Pancreatic Exocrine Insufficiency (PEI)

- Significant reduction of exocrine secretion postoperatively
- Leads to malabsorption of fat, protein and carbohydrates
- Results in



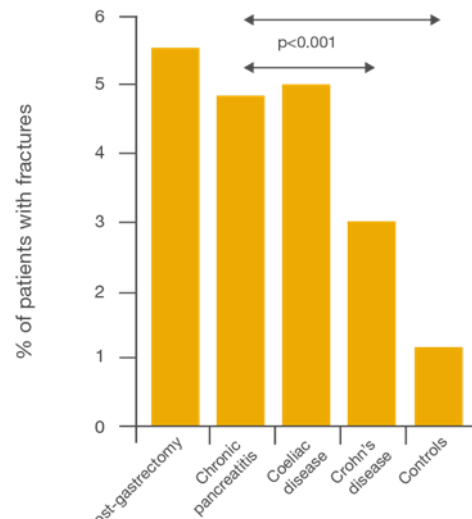
Matsumoto et al 2006; Klapdor et al 2012.

- Sikkens et al 2014 observed 75% of patients had PEI at presentation increasing to 92% within 2 months

- Complications from maldigestion and malabsorption may have a progressive and detrimental effect on a patient's wellbeing and increase morbidity and mortality.^{2,18,19}
- Complications include:

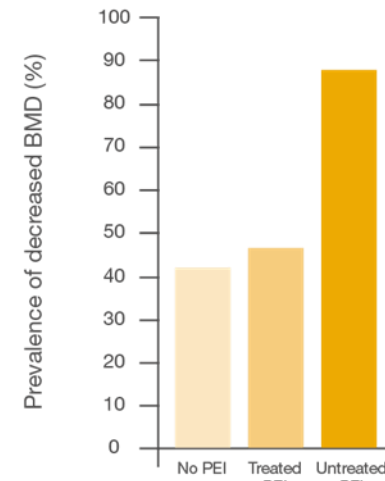


- Low bone mineral density in chronic pancreatitis patients is a consequence of vitamin D deficiency, secondary to PEI²⁰
- Low bone mineral density may result in a significantly higher risk of low trauma fractures, especially in the vertebrae, hip and wrist²¹



Fractures are more common in conditions with PEI

Adapted from Tignor AS *et al. Am J Gastroenterol.* 2010²¹

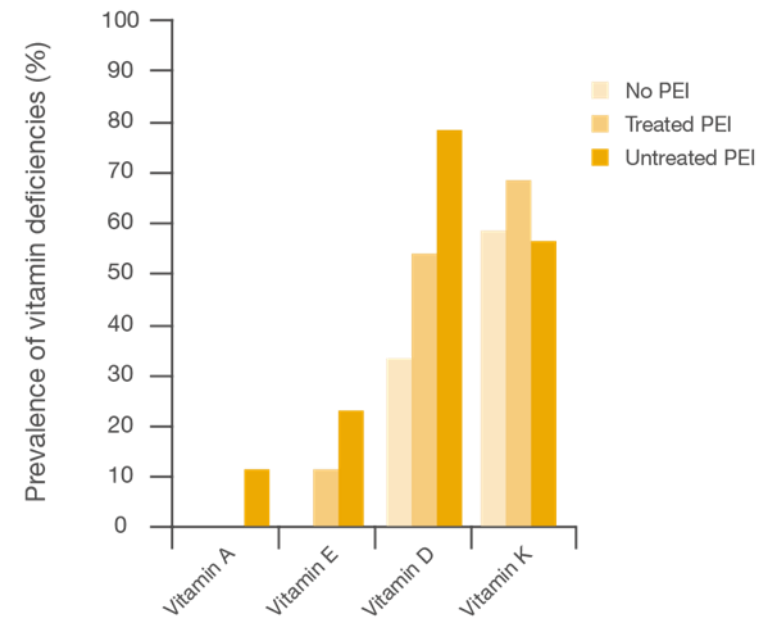


Treatment of PEI prevents reduction in bone mineral density

Adapted from Sikkens ECM *et al. Pancreatology* 2013²⁰

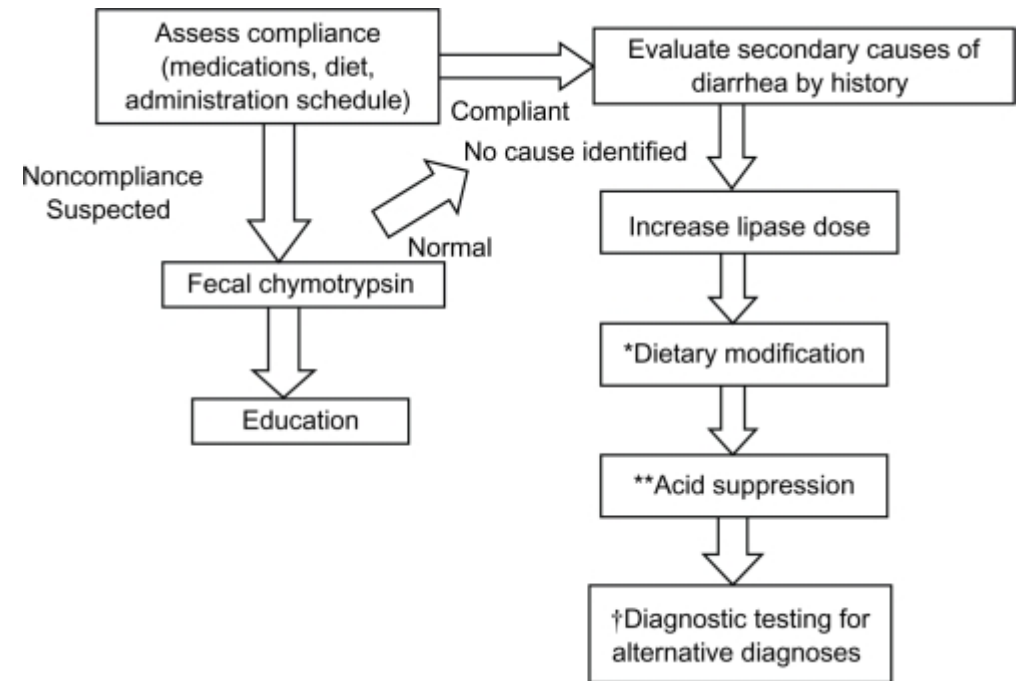
- As a result of malnutrition, chronic pancreatitis patients can develop nutritional deficiencies, especially of fat soluble vitamins such as vitamins A, D, E, and K.²⁰
- Vitamin deficiency can lead to serious health problems:²⁰
 - Decreased immune competence (Vitamin A)
 - Osteopenia/osteoporosis (Vitamin D)
 - Neurological disorders (Vitamin E)
 - Blood coagulation disorders and osteopenia/osteoporosis (Vitamin K)

Treating PEI reduces the prevalence of vitamin deficiencies



Management of PEI

- Sufficient dose of pancreatic enzymes
- Flexible and patient tailored
- Depends on
 - Remaining pancreatic function
 - Post surgical anatomy
 - Dietary fat intake



PERT

- The healthy pancreas produces approximately 720,000 lipase units following a 300-600 kcal meal.¹⁷
- Adult patients should be started on the recommended initial doses.
- Higher titration of PERT doses have shown to improve from baseline:²³
 - Fat and nitrogen absorption
 - Clinical symptoms
 - Quality of life

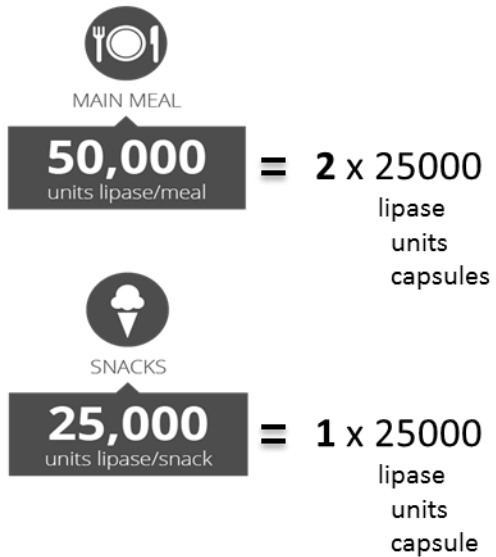
Recommended initial doses of PERT^{4,24-28,30}



Dose titration

Dose should be titrated according to the individual's response and experience, until an adequate response achieved^{4,25,27,28}

Recommended initial doses of PERT^{4,24-28,30}



If treatment **unsuccessful** after 2 weeks

Double the dose

4 x 25000
lipase units
capsules

Double the dose

2 x 25000
lipase units
capsules

If treatment **unsuccessful** after 4 weeks

Increase the dose further

3 x 40000
lipase units
capsules

Increase the dose further

1 or 2 x 40000
lipase units
capsules

Increase dose again. If still unsuccessful, consider an alternative formulation

Check compliance. If patient is still symptomatic or requires more than 100,000 lipase units/meal, consider titrating up to a higher strength (40,000 units capsules) to reduce pill burden

Delayed Gastric Emptying (DGE)

- Most common complication following pancreatic surgery
- Represent inability to return to a standard diet by the end of one week postoperatively and includes prolonged NG intubation of patients



Grades of DGE

	NG Tube required	Unable to tolerate oral intake	Vomiting/Gastric distension	Use of Prokinetics
A	4-7 days or reinsertion >POD 3	7	+/-	+/-
B	8-14 days or reinsertion >POD 7	14	+	+
C	>14 days or reinsertion >POD 14	21	+	+

DGE

- DGE is a complex phenomenon
- Associated with prolonged morbidity
 - Delay in resumption of oral intake
 - Prolonged hospital stay
 - Increased costs
- Increased risk associated with
 - Pancreatic fistula
 - Sepsis
 - Reoperation

Frontiers in Surgery 2016;3:25

HPB 2013; 15(10): 763

Pancreatic Fistula

- Most dreaded complication of pancreatic surgery
- Multitude of factors contribute
 - Surgical techniques
 - Gland texture
 - Pancreatic duct size
 - Stent placement

Kanda et al 2011



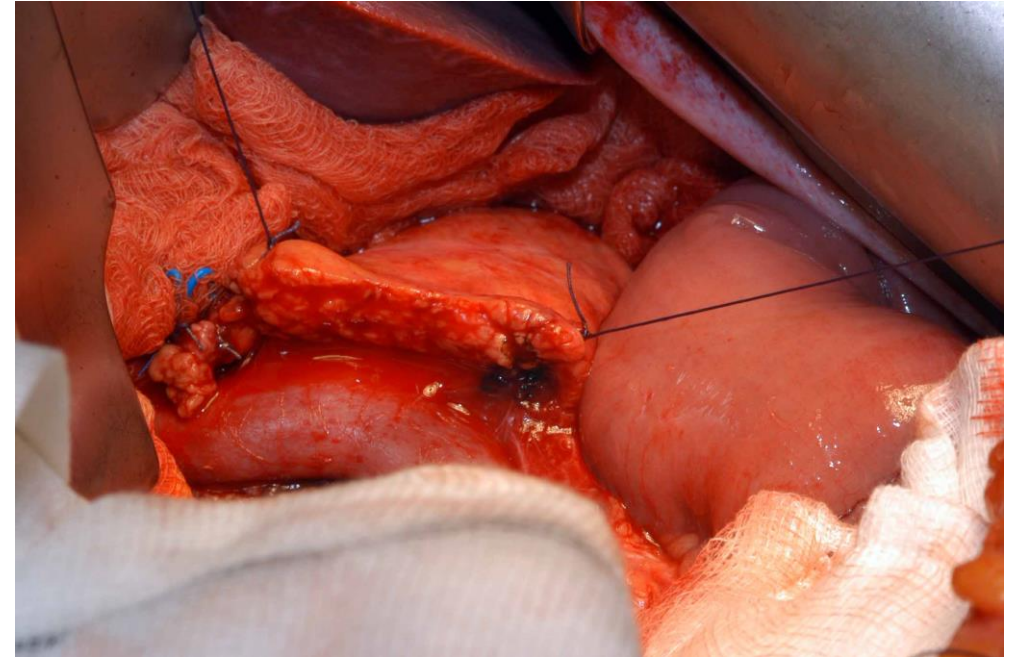
Clinical Presentation

- Non-specific abdominal symptoms
- Pyrexia
- Elevated WCC/CRP
- Drain effluent
- Drain amylase
- DGE



Grading of pancreatic fistula

Parameter	Grade A	Grade B	Grade C
Clinical conditions	Well	Often well	Ill appearing/bad
Specific treatment*	No	Yes/no	Yes
US/CT (if obtained)	Negative	Negative/positive	Positive
Persistent drainage (after 3 weeks)**	No	Usually yes	Yes
Re-operation	No	No	Yes
Death related to POPF	No	No	Possibly yes
Signs of infections	No	Yes	Yes
Sepsis	No	No	Yes
Readmission	No	Yes/no	Yes/no



GRADING

- **Grade A** - has no major clinical impact, and its occurrence should not be associated with a major delay of the patient's hospital discharge
- **Grade B** - lead to therapeutic consequences (the need for transfusion), and potential invasive therapeutic interventions (relaparotomy or embolization)
- **Grade C** - should always be considered potentially life threatening. Immediate diagnostic and therapeutic consequences are mandatory

Fistula Risk Score

Risk factor	Parameter	Points
Gland texture	Firm	0
	Soft	2
Pathology	Pancreatic adenocarcinoma or pancreatitis	0
	Ampullary, duodenal, cystic, islet cell, metastatic, or other	1
Pancreatic duct diameter (mm)	Greater than or equal to 5	0
	4	1
	3	2
	2	3
	Less than or equal to 1	4
Intraoperative blood loss (mL)	Less than or equal to 400	0
	401–700	1
	701–1000	2
	Greater than 1000	3

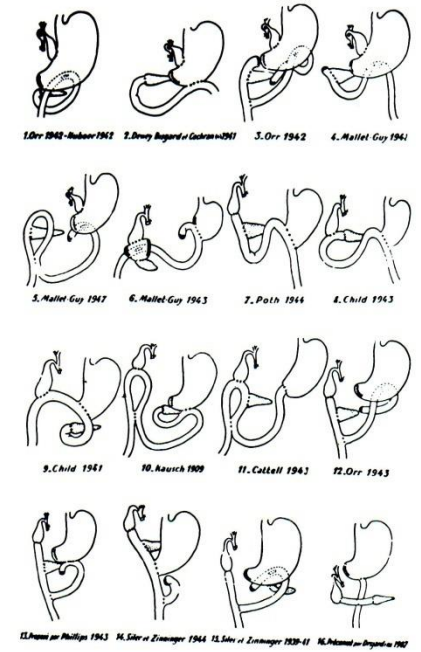
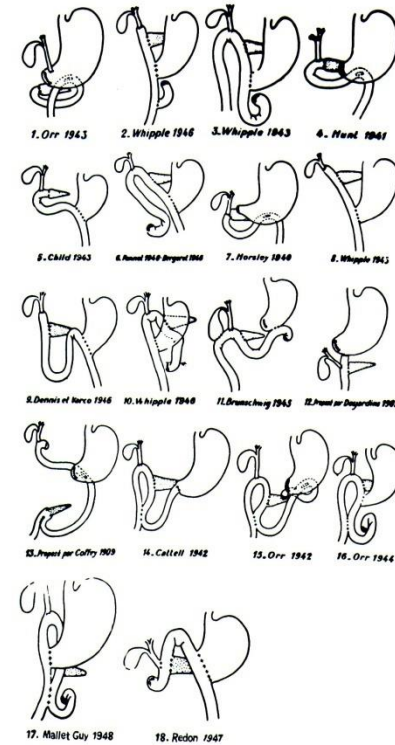
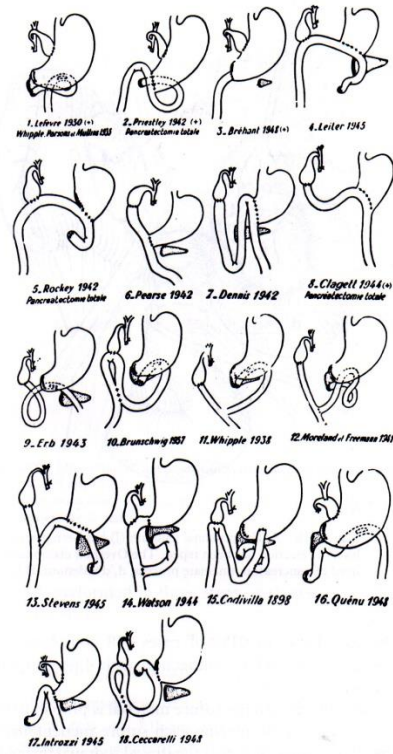
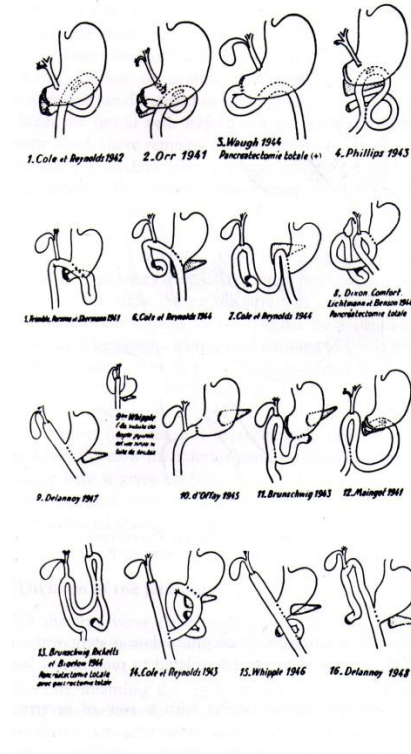
Negligible = 0 (0%)

Low = 1-2 (6.6%)

Moderate = 3-6 (12.9%)

High = 7-10 (28.1%)

Options for reconstruction



Management of Pancreatic Fistula

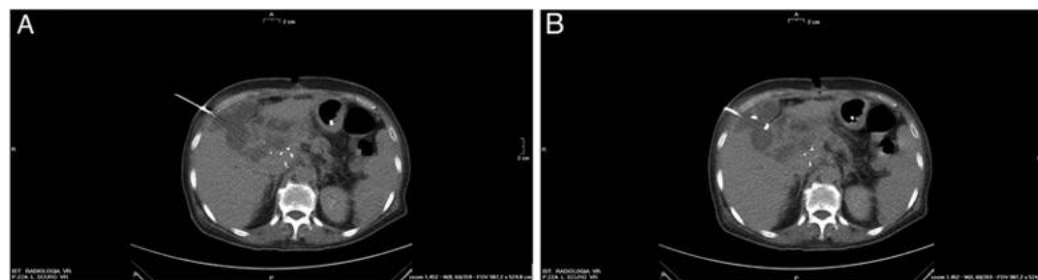
1. Nutrition

- POPF leads to increased catabolic process and basal energy expenditure
- High output fistula (>200mls/24 hours) is associated with fluid, electrolyte imbalance and nutritional depletion.
- Klek et al found enteral nutrition has more than a two fold probability of fistula closure, shortened time to closure and faster recovery

2. Octreotide Analogues

- Powerful inhibitor of somatostatin
- Anticipated effects are to reduce output of digestive fistulae
- European Studies show a perioperative protective effect
- North American studies failed to demonstrate any benefit
- Some studies advocate its use in selective cases – soft pancreas and small PD

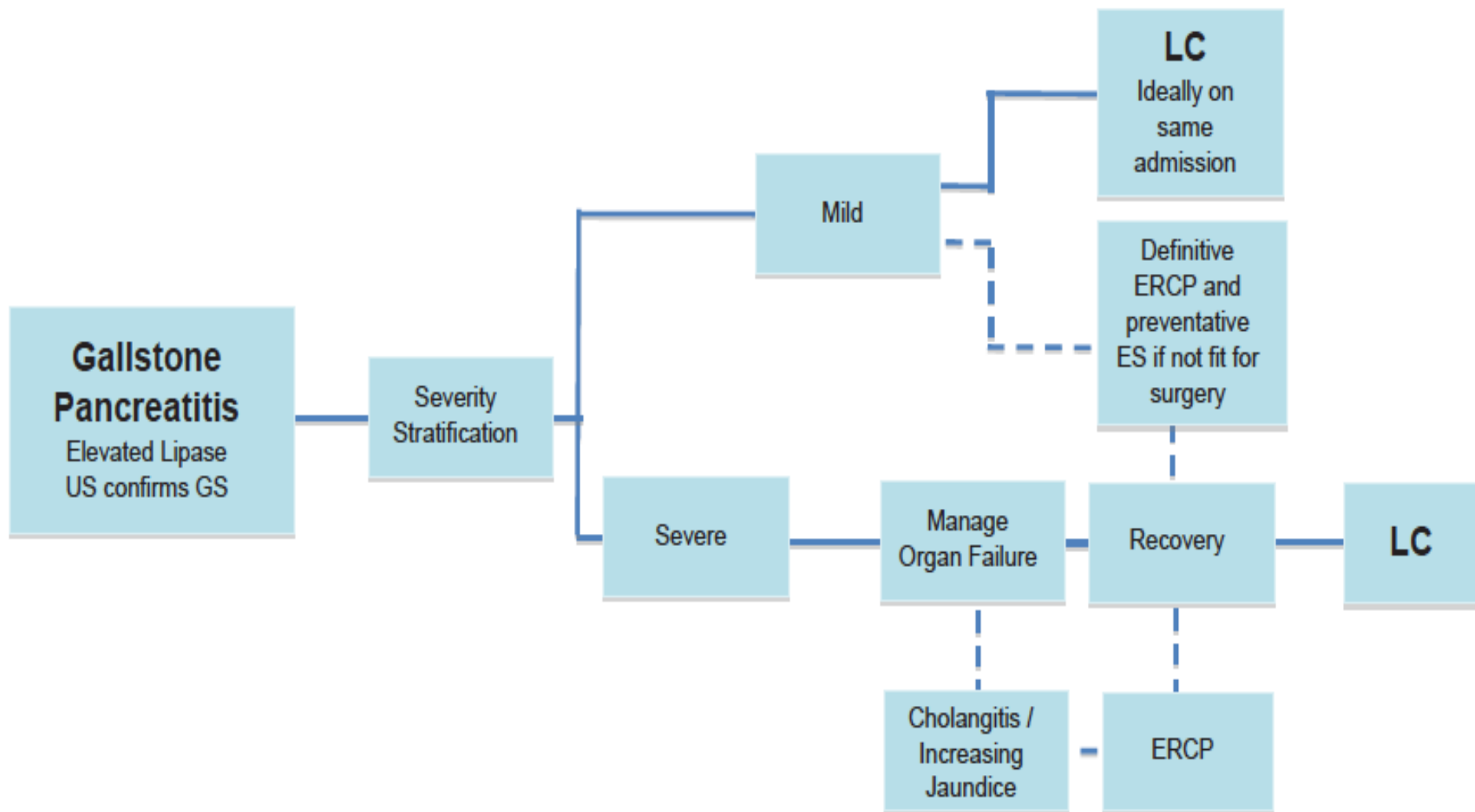
3. Role of intraperitoneal drains and IR



4. Surgical management

- Most POPF are managed conservatively, however some require re-operative surgical intervention
- Consider in cases of deteriorating general condition despite maximum care, sepsis inaccessible by radiological drain, suspected peritonitis and necrosis, serious bleeding from pseudoaneurysm when IR fails or is contraindicated
- Surgical options
 - Debridement and drainage
 - Attempted repair of pancreato-enteric anastomosis
 - Construction of new anastomosis
 - Completion pancreatectomy

Pancreatitis





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Pancreatology

journal homepage: www.elsevier.com/locate/pan



Original article

IAP/APA evidence-based guidelines for the management of acute pancreatitis



Working Group IAP/APA Acute Pancreatitis Guidelines^{a,b,*}

^aInternational Association of Pancreatology, UNSW Clinical School Locked Bag 7103, Liverpool, BC NSW 1871, Australia

^bAmerican Pancreatic Association, PO Box 14906, Minneapolis, MN 55414, USA

Diagnosis of acute pancreatitis

- 2 out of 3 of the following criteria
 1. Clinical – upper abdominal pain
 2. Lab – amylase or lipase > 3 times upper limit of normal
 3. Imaging
- Determine aetiology
- If considering idiopathic pancreatitis, EUS recommended
- If negative – MRCP and CT
- Genetic counseling

Prediction of severity

- SIRS predicts severe acute pancreatitis at admission , and persistent SIRS at 48 hours
- Assoc. with a mortality of 25%
- SIRS
 - Temp < 36 or > 38
 - Heart rate $> 90/\text{min}$
 - RR $> 20/\text{min}$
 - WCC < 4 or > 12

Prediction of severity

- 3 dimensional approach
 1. Host risk factors – comorbidity, BMI
 2. Clinical risk stratification – persistent SIRS
 3. Monitoring response to initial therapy

Preventing infectious complications

- Early fluid resus within 24 hours of admission has reduced rates of persistent SIRS and organ failure
- IV antibiotic prophylaxis is not recommended for prevention
- Selective gut decontamination may have some benefits but further studies are needed
- Probiotic prophylaxis is not recommended

Indications for intervention in necrotising pancreatitis

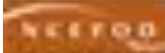
- Indications
 - Suspected or documented infected necrotising pancreatitis with clinical deterioration, preferably when the necrosis has become walled-off
 - Ongoing organ failure for several weeks after the onset of acute pancreatitis
 - ACS
 - Ongoing acute bleeding
 - Bowel ischaemia
 - Obstruction
- Routine FNA is not indicated
- Indications in sterile necrotising pancreatitis
 - Ongoing gastric outlet, intestinal or biliary obstruction (>4-8 weeks)
 - Persistent symptoms
 - Full transection of the pancreatic duct

Timing of intervention in necrotising pancreatitis

- Patients with infected necrotising pancreatitis – invasive intervention should be delayed where possible until > 4 weeks after initial presentation to allow the collection to become walled off
- Surgical necrosectomy should be delayed until collections are walled off – typically 4 weeks after onset
- No subgroup was identified to benefit from earlier or delayed intervention.

Treat the Cause

A review of the quality of care provided to patients treated for acute pancreatitis.



Improving the quality of healthcare

Thank you