# Presentation or Poster

## Sarcopenia assessed by using novel digital software is prevalent in pancreatic exocrine insufficiency: A prospective study

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Category: Benign

Aim  
  
The aim of this study is to assess the prevalence of sarcopenia in patients with pancreatic exocrine insufficiency (PEI).  
  
  
  
Methods  
  
Ongoing prospective recruitment of patients referred for endoscopic ultrasound examination. Patients undergoing assessment of chronic pancreatitis and those with unexplained abdominal pain were recruited. A single computed tomography (CT) image at the level of the third lumbar vertebra was obtained to measure skeletal muscle index (SMI) using sliceOmatic V5, Tomovision Software. Other body composition measurements included subcutaneous adipose tissue index (SCATI) and visceral adipose tissue index (VATI). Sarcopenia was defined as SMI <41cm2/m2 (female), and SMI <53 if BMI ? 25 kg/m2 or SMI < 43 if BMI < 25 (male). Muscle attenuation (Myosteatosis) was defined as mean Hounsfield Unit (HU) < 41 if BMI < 25 or <33 HU if BMI ? 25. Faecal elastase-1 <200 mg/g was considered PEI. Data collection included age, body mass index, smoking and alcohol intake history. Analysis was conducted by grouping patients as PEI vs no-PEI (control). P value <0.05 was considered to be significant.  
  
Results  
  
One hundred and fourteen patients were recruited. Final analysis conducted on 96 patients (49 female) with available EUS, CT images and FEL-1 results. Age was not significantly different between PEI group and control 57 vs 54 years, p=0.3. The number of female patients in control group was higher compared to PEI group, 63.3% vs 34.2%, p=0.007. Although BMI in PEI group was lower than control, but median BMI of both groups was in the overweight and obese category, respectively.  
  
  
  
Sarcopenia was highly prevalent in PEI group compared to control group, 74.2% vs 35.9% p=0.004. The presence of both sarcopenia and myosteatosis was significantly higher in PEI group, 41.9% vs 12.9%, p=0.02. Median SCATI was significantly lower in PEI group 52.8 vs 75.3 cm2/m2, p=0.006. VATI was not different between the two groups.  
  
  
  
Patients with PEI had higher pack-year smoking history compared to control group   
  
13.7 vs 8.5, p=0.03. Alcohol consumption per week was higher in PEI but without reaching significance.   
  
  
  
Conclusion  
  
Assessment of body compositions using the new software in patient with PEI is feasible. Patients with PEI are at increased risk of developing sarcopenia and loss of subcutaneous fat. Sarcopenia and low SCATI can be adjunctive tool in the diagnosis of PEI. BMI alone is inadequate in assessing malnutrition in PEI patients. We recommend longitudinal studies to assess nutritional intervention effect on body compositions in PEI patients.

## Dietary iron and niacin are inversely associated with the development of symptomatic gallstones in women, but not men: a UK prospective cohort study using 7-day food diaries.

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Category: Benign

Aims  
  
Acute pancreatitis is a serious complication of gallstones, although the aetiology of the latter is largely unknown. Dietary factors may be involved, including a low iron and niacin intake. Iron increases the activity of cholesterol 7-?-hydroxylase, which converts cholesterol to bile acids. Niacin increases plasma high density lipoprotein and lowers triglycerides levels, which are both associated with reduced rates of gallstones. This study investigated whether dietary iron and niacin reduces the risk of developing symptomatic gallstone diseases, including acute pancreatitis, for the first time using 7-day food diaries (7-DFDs), the most accurate dietary assessment method in large prospective studies.  
  
  
  
Methods  
  
25 639 participants (54.7% women), aged 40–74 years, were enrolled into the European Prospective Investigation into Cancer-Norfolk (EPIC-Norfolk). At recruitment, participants completed 7-DFDs which recorded one week’s diet including information on the: type of foods and drinks, recipes, brands, cooking methods, and portion sizes. Nutrient intakes were calculated using a computer program containing nutrient information on 11 000 foods and 55 000 portion sizes. The cohort was monitored for 14 years for participants developing incident symptomatic gallstones. Cox proportional hazards regression models estimated the sex-specific hazard ratios (HRs), for symptomatic gallstones for quartiles of iron and niacin intake, adjusted for covariates.  
  
  
  
Results  
  
Symptomatic gallstone disease developed in 200 women (mean time to diagnosis=6.0 years, SD=2.9 years) and 95 men (mean time to diagnosis=5.9 years, SD=3.0 years), and 10.3% of diagnoses were acute pancreatitis. Total dietary iron was associated with a reduced risk of symptomatic gallstones in women (highest vs lowest quartile HR=0.51, 95% CI=0.31-0.83; HR trend=0.82, 95% CI=0.70-0.96, p=0.015), as was niacin (highest vs lowest quartile HR=0.59, 95% CI=0.39-0.91; HR trend=0.85, 95% CI=0.74-0.98, p=0.022). In women, the population attributable fractions for total iron and niacin intakes were 24.9% and 16.3%, respectively. In men, there were no significant associations found for iron (HR trend=1.08, 95% CI=0.86-1.36, p=0.506) or niacin (HR trend=0.92, 95% CI=0.75-1.13, p=0.430).  
  
  
  
Conclusions  
  
This data supports a role for dietary deficiencies of both iron and niacin in the development of symptomatic gallstones in women, but not men. Possible reasons for the gender discrepancies may be that these nutrients interact with other risk factors for symptomatic gallstones such as hormone replacement therapy and parity. Further epidemiological studies are needed to confirm our findings. If so, then dietary recommendations to increase iron and niacin intake may significantly reduce complications of gallstones, such as acute pancreatitis.

## Outcomes From Pilot Multi-Disciplinary Chronic Pancreatitis Clinic

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Category: Benign

Aims – To assess the efficacy of a pilot Chronic Pancreatitis Multidisciplinary clinic by evaluating relevant patient outcomes in nutrition, glycaemic control, analgesic requirements, psychological parameters and bone mineral density.   
  
  
  
Methods – An analysis was conducted on 60 patients referred to the clinic since its inception in 2017. Anthropometric data, dietary intake, blood serology, malabsorption, and the uptake and efficacy of pancreatic enzyme replacement therapy (PERT) were monitored, evaluated, and optimised in the clinic. Glycaemic control in established diabetic patients was assessed via HbA1C and blood glucose levels. Clinical or biological evidence of exocrine pancreatic insufficiency was also sought. Opiate use (pre and post clinic) was standardised to comparable units utilising the RCOA opiate table. Quality of life (QoL) was assessed using a validated measure (EORTC QLQ-C30). Bone mineral density (BMD) data was collated from DEXA scan reports.   
  
Results – 70% of patients referred to the clinic were male. The average age was 51.27 (+/- 12.75). The most common aetiology was alcohol (55%). 69% of patients required dose adjustments to pre-existing PERT, whilst 20% of patients were commenced on PERT. Up to half of the patients were deficient in one or more micronutrients. 52% of patients had no evidence of diabetes mellitus, with at least 28% being type 3c diabetics, all of whom were first diagnosed in the clinic. There was an average daily reduction of 6mg of morphine usage per patient with a concurrent decline in median pain scores from 83.3 to 63.3. Of those who took the QLQ-C30 questionnaire, the median QoL score was 33.3 compared to a score of 75 from the reference general population provided by the questionnaire. We identified an increase in QoL scores from 30.9 to 37.3 in patients at follow up appointments. 72.5% of patients had abnormally low BMD, with median 10 year major osteoporotic and hip fracture risks of 6.95% and 1.2%, respectively.   
  
  
  
Conclusion - The data suggest that chronic pancreatitis patients have significant (and often undiagnosed) nutritional deficiencies as well undiagnosed diabetes, poor pain and glycaemic control which negatively impacts on quality of life. Assessment in a multi-disciplinary clinic ensures diagnosis and treatment of these health problems.

## Sarcopenia: An Assessment Into the Prevalence and Disease Burden in Patients Referred to the Multidisciplinary Chronic Pancreatitis Clinic

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Category: Benign

Aim – To evaluate the prevalence and disease burden of sarcopenia in the patients referred to a Multidisciplinary Chronic Pancreatitis (CP) Clinic at the University Hospitals of Leicester.  
  
  
  
Methods –Anthropometric data was obtained from the patients’ medical records. All the patients within the cohort who had undergone cross-sectional imaging in the form of computational tomography for diagnostic or follow-up purposes were identified and their most recent scans selected. Control scans were gathered from a series of CT colonograms carried out on non-pancreatitic patients on 2WW colorectal cancer pathway (with no evidence of cancer). The images were manually measured by two trained personnel. The psoas muscle index (PMI) was calculated using the formula: total psoas muscle cross-sectional area at the level of the third lumbar vertebra (cm2)/the square of the patient’s height (m2). This quantitative data was stratified by gender and evaluated using Student’s t-test, where P <0.05 was considered statistically significant. PMI cut-off values were <6.31cm2/m2 and <3.91cm2/m2 for males and females, respectively. Any values below these cut-offs were considered sarcopenic.   
  
  
  
Results – Of the 60 patients enrolled in the chronic pancreatitis clinic, 39 males and 18 females had CT scans available for analysis. 62 suitable control scans were identified, comprising 36 males and 26 females, the groups were age matched.   
  
69.54% of CP patients had a PMI below the cut-off value for their respective gender, compared to 55.7% of the control group. The mean PMI (±SD) for male chronic pancreatitis patients and male controls were 5.54cm2/m2 (±1.60) and 6.73 cm2/m2 (±1.54), respectively (P = 0.0008). The mean PMI (±SD) for female chronic pancreatitis patients and female controls were 3.82 cm2/m2 (+/- 1.46) and 4.98 cm2/m2 (+/- 1.43), respectively (P = 0.006).   
  
  
  
Conclusions – Both male and female chronic pancreatitis patients had a mean PMI index below the cut-off value, indicating the patients in the clinic are largely sarcopenic. Our results also strongly suggest that chronic pancreatitis is an important contributor to the development of sarcopenia.  
  
Currently, the evidence base for the management of sarcopenia is limited. A systematic review by Yoshimura et al showed that there is some evidence that optimising exercise and nutrition may be effective in treating sarcopenia in the elderly. As malnutrition is a significant element of chronic pancreatitis, it is our hope that the optimisation of nutrition, facilitated by various members of the multidisciplinary team, will aid in the treatment of sarcopenia.

## A network meta-analysis of techniques of surgical management of chronic pancreatitis: Impact on pain and quality of life.

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Category: Benign

ABSTRACT  
  
Background   
  
Several surgical surgical techniques are currently available for improving pain in patients with chronic pancreatitis. The best surgical technique to improve quality of life (QoL) and pain after surgery for chronic pancreatitis remains unknown.   
  
Methods   
  
The Scopus, EMBASE, Medline and Cochrane databases were systematically searched observing PRISMA methodology to identify all randomised controlled trials (RCTs) comparing surgical techniques for chronic pancreatitis management. The primary outcomes were pain relief and QoL.   
  
Results   
  
Four surgical techniques of chronic pancreatitis management were directly compared to in eight randomised controlled trials including 597 patients. The patients, recruited between 1984 and 2013, were predominantly male (79%, 474/597) with alcoholic chronic pancreatitis (85%, 382/452). Surgical techniques included; pancreatoduodenectomy (224, 38%), the Berne procedure (168, 28%), the Beger procedure (133, 22%), and the Frey’s procedure (72, 12%). The Frey’s procedure was consistently ranked the best technique with regards to improved postoperative QoL and lower rates of postoperative pancreatic fistula (94% and 75% respectively), while also ranking second in improvement of postoperative pain (28%). Similarly, the Frey’s procedure had the best balance between the two primary outcome measures when surface under cumulative ranking curve scores (SUCRA) were plotted for both QoL and postoperative pain relief.   
  
Conclusion   
  
The Frey’s procedure is associated with the best postoperative quality of life among all techniques of surgical management for chronic pancreatitis with durable pain relief. Further randomised controlled trials are needed to confirm and validate the findings from this network meta-analysis.

## Do patients with both chronic pancreatitis and diabetes have more complications than those without diabetes?

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Aim  
  
In chronic pancreatitis (CP), progressive destruction of the islet cells results in diabetes mellitus (DM), defined as type 3c DM (T3cDM) or pancreatogenic DM. Despite clinically-important differences between T3cDM and types 1/2 DM, T3cDM is frequently misclassified and poorly managed. Long-standing DM causes micro- and macrovascular complications in addition to the typical complications of CP, such as exocrine impairment and malnutrition. Whether CP patients with DM develop other complications more frequently than non-DM patients is not clear. We therefore sought to compare CP patients with DM to matched CP patients without DM in terms of clinical indices, complications, and service utilisation.   
  
  
  
Methods  
  
Following ethical approval, our local DM database (of 327 patients), the Diamond Diabetes Database (DD), and Department of Surgery Pancreatic Database (PD) were interrogated over a 13 yr period (2004-2017). The databases were cross-matched for common patients (pancreatic patients with concurrent DM, termed DMCP patients). DMCP patients with CP of long duration (>10yr) were then matched with non-diabetic CP patients from the PD database (termed non-DMCP patients). The groups were matched for age, gender, and duration of disease (Table 1). Data were compared using student’s t-test or chi-square (categorical data).  
  
  
  
Results  
  
N=75 DMCP patients and n=75 non-DMCP patients comprised the study groups. The two groups did not differ in age, gender or duration of disease (Table 1). The most common cause of CP was alcohol excess in both groups. All patients with gallstones-related CP had DM. There were more current smokers and alcohol drinkers in the non-DMCP group than in the DMCP group. There was no difference in mortality. There was no statistical difference in the prevalence of complications, with the exception of vitamin deficiency (higher in the DMCP group). There was a trend towards higher PERT usage in the DMCP group. DMCP patients were more likely to have had surgery and radiological interventions, and required higher intensive care unit (ICU) admissions, but had accessed less pain management services.   
  
  
  
  
  
Conclusion  
  
Although groups were similar in age, gender and duration of CP, they differed in important clinical aspects. Non-DMCP patients were more likely to be current smokers or drinkers, and were more likely to access pain services. Those with DMCP had more vitamin deficiency, surgery, radiological interventions and ICU admissions. Characterisation of T3cDM in CP will allow for more rational allocation of resources, and will aid in the development of protocolised care, which will improve management and outcomes for patients with CP.

## Role of ductal imaging in acute gall stone pancreatitis patients undergoing a cholecystectomy

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Category: Benign

Aims  
  
To decipher whether liver function tests and ductal imaging had any correlation in patients with acute gallstone induced pancreatitis who had undergone a cholecystectomy.   
  
Methods  
  
All patients who underwent a cholecystectomy for gallstone pancreatitis from January to December 2018 were retrospectively analysed. Biliary pancreatitis was represented by acute pancreatitis and the presence of gallstones on MRCP, EUS, CT or abdominal US in the absence of any history, laboratory or radiological findings indicating another aetiology of pancreatitis. Online patient data radiology records, laboratory investigations, and patient notes were used to collect the data. We looked at the liver function biochemistry at presentation, prior to surgery and at the time of discharge. We also looked at all the imaging done to confirm gallstones and ductal calculi. We excluded those patients with a recurrent gall stone pancreatitis, gall stone pancreatitis associated with chronic pancreatitis and those who did not have any investigations for ductal imaging at the time of collecting the data. We calculated the sensitivity, specificity, positive and negative predictive values with regards to LFT and ductal calculi  
  
Results  
  
In 2018, 28 patients diagnosed as gallstone pancreatitis underwent a cholecystectomy. 22 patients in total were imaged using ultrasound, 20 patients underwent MRCP and 8 patients had IOC.   
  
None of the patients who presented with normal LFTs (n=3) demonstrated ductal calculi on ultrasound (n=2), MRCP (n=2) or intra-operative cholangiogram (n=1).   
  
A Total of 16 patients had abnormal LFT’s on admission and all improved at the time of cholecystectomy and discharge. 11 patients who had abnormal LFTs had no ductal stones on pre operative MRCP. 5 patients were confirmed to have ductal calculi on imaging (4 MRCP and 1 CT scan). All had abnormal LFT’s on admission. The mean bilirubin was 71 (Range 15-247). The mean ALP was 398.8 (Range 137-953). The mean ALT was 455.4 (Range 35-975). None of the patients with normal liver function tests had ductal calculi on pre or intra – operative imaging. The positive predictive value and accuracy of abnormal LFT and ductal calculi was 31.25 and 42.11. None of the patients with normal liver function tests had ductal calculi on imaging.   
  
Conclusions  
  
Further work and patient numbers are needed to improve reliability. However, this pilot study suggests that LFTs are a good negative predictor and obviate pre-operative MRCP reducing cost and hospital stay

## Abstracts title

Authors: Steve Stevens - IR Freeman,  
Category: Benign

Abstract content

## Prognostic significance of early weight loss during chemotherapy in patients (pts) with inoperable pancreatic cancer (PC)

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Category: Malignant

Aim: Weight loss at diagnosis is common in pts with PC and is known to adversely affect quality of life, tolerance to treatment and overall survival (OS). Little is known about the impact that weight loss occurring during treatment has on survival outcomes. This study aimed to investigate if early weight loss during systemic treatment for inoperable PC affects OS.  
  
  
  
Method: This retrospective study included newly diagnosed pts with inoperable PC. Consecutive pts starting first-line palliative chemotherapy (chemo) between Jan’15 – Jan’19 with data on percentage weight loss at week 4 following commencement of treatment (%WLWeek4) were eligible. %WLWeek4 was dichotomised using 5% cut-off. OS was measured from cycle 1, day 1 of chemo. Survival analysis was performed using Cox regression (Stata version 12).   
  
  
  
Results: Of 255 eligible pts the median age was 67 years (range 25-85), 54.5% male; 59.2% had head/neck PC; 52.6% metastatic. Eastern Cooperative Oncology Group Performance Status (ECOG-PS) 0-1: 86.3%. Palliative chemo: triplet (32.2%), doublet (42.7%), monotherapy (25.1%).   
  
  
  
At the start of chemo, the median weight was 68kg (range 37.1-127kg). The median %WLWeek4 was -2.05% (95% confidence interval (CI) -2.5 to -1.7); %WLWeek4 was ?5% in 59/255 pts (23.1%). Pts on triplet chemo were more likely to develop %WLWeek4 of ?5% [35.4% (triplet) vs 19.3% (doublet) vs 14.1% (monotherapy); P=0.005].  
  
  
  
Median OS was 9.7 months (m) (95% CI 8.5-10.4). Multivariable Cox regression demonstrated shorter OS if %WLWeek4 ?5% (median OS 7.4m (95% CI 6.3-10.0) vs. 9.9m (95% CI 9.2-12.1); HR 2.37 (95% CI 1.64-3.42), P=0.000); maintained when adjusted for other factors [stage (HR 1.76 (95% CI 1.32-2.36), P=0.000), age (HR 0.98 (95% CI 0.96-0.99), P=0.024), number of chemo drugs (HR 0.44 (95% CI 0.33-0.57), P=0.000), ECOG-PS (HR 1.51 (95% CI 1.07-2.15), P=0.020)], including the response to therapy [progression at first CT scan (HR 4.14 (95% CI 2.99-5.73), P=0.000)] supporting that %WLWeek4 impacted OS regardless of response to therapy.   
  
  
  
Conclusion: Early weight loss of ?5% is associated with shorter OS, regardless of disease progression/response to therapy and seems more prevalent in pts undergoing triplet chemo. Intervention studies targeting the causes of weight loss should be considered to optimise patient outcomes.

## Outcomes of Surgical Resection of Isolated Pancreatic Metastases from Renal Cell Carcinoma

Authors: Jenny Wright - Upper GI & HPB Surgery Royal Stoke University Hospital & Keele University ,  
Category: Malignant

Outcomes of Surgical Resection of Isolated Pancreatic Metastases from Renal Cell Carcinoma  
  
  
  
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Royal Stoke University Hospital (RSUH), Department of Hepato-pancreatico-biliary surgery  
  
  
  
Introduction  
  
Isolated pancreatic metastases from renal cell cancer (isPM) is a rare entity with these comprising only 1.5 – 3% of all metastatic RCC cases [1]. Synchronous disease is exceptionally rare with only four case reports in the literature [2]. Our case series examined the outcomes of patients who underwent resection of the pancreas due to renal cell carcinoma with isolated metastasis.  
  
  
  
Methods   
  
This is a retrospective analysis of data on patients with known RCC undergoing pancreatic resection at RSUH over a 25-year period. Kaplan-Meier survival plots were used to assess survival rate and disease-free time. Cox-proportional regression analysis was performed to determine factors associated with survival.   
  
  
  
Results   
  
Twelve patients were histologically identified as having isPM-RCC. Median age was 68 (49–80) with a 2:1 female to male ratio. The median age of primary clear cell RCC diagnosis was 53. The majority were metachronous (n=11) with one incidence of synchronous disease. The median time to first metastasis was 88 months (4–382). Nine cases underwent distal pancreatomy, three were performed laparoscopically; two underwent a pancreaticoduodenectomy and one had a total pancreatectomy. Thirty-six months disease free probability post isPM-RCC resection was 66.7%. Survival rate and disease-free time were not associate with being symptomatic, smoking history, hypertension, site of pancreatic disease or type of resection performed (Wald test= 0.55, 5 df, p=1).   
  
  
  
Conclusion  
  
Isolated pancreatic metastasis of clear cell renal carcinoma is a rare phenomenon with protracted latency and a good prognosis. The three-year post resection survival rate was 100%.  
  
  
  
References  
  
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2. Sellner, F. (2018). Isolated pancreatic metastases from renal cell carcinoma: an outcome of a special metastatic pathway or of specific tumor cell selection? Clinical and Experimental Metastasis, 35(3), 91–102

## Assessing the Potential Impact PET/CT in the Staging and Management of Pancreatic Cancer in an HPB Cancer centre

Authors: Jeremy French - HPB Surgery Freeman Hospital,  
Category: Malignant

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Introduction  
  
  
  
Recent NICE guidelines (PET-CT) as part of the gold standard for staging in patients with localised pancreatic cancer as recent studies suggest 16% of patients could have management change. The aim of PET-CT is to detect extrapancreatic/extrahepatic disease not seen with other imaging modalities and direct patients to non-surgical options.   
  
  
  
Our objective was to determine whether pre-operative PET-CT could potentially have changed management in patients undergoing resection for pancreatic adenocarcinoma.  
  
  
  
Methods  
  
  
  
Radiology, laboratory investigations, surgical/clinical data and follow up (at least 6 months) of all patients with localised pancreatic cancer undergoing surgery with curative intent at the Freeman Hospital during 2018 were analysed. Patient imaging was reviewed by a Consultant HPB Radiologist.  
  
  
  
Results  
  
  
  
41 patients with pancreatic ductal adenocarcinoma underwent surgery with curative intent.  
  
Prior to surgery 41 patients had a triple phase pancreatic protocol CT, 34 had a chest CT, and only 1 underwent PET-CT.  
  
3 patients had a bypass procedure –at surgery 1 patient had liver metastases detected, 1 patient had peritoneal disease detected and 1 patient had an abandoned trial dissection (local vascular involvement).  
  
38 had a resection with curative intent.  
  
At 6 months following post resection 1 patient had died (metabolic failure) and 6 had developed recurrence (2 had surgical bed/3 liver/1 lung)  
  
  
  
The metastases of patients (4) with liver or lung metastases were detected a mean of 174 days post resection.  
  
  
  
Conclusion  
  
  
  
Currently we are not following NICE guidelines as only 1 patient had a CT-PET and 34 had a chest CT.  
  
We conclude that only 1 patient (the patient with peritoneal disease detected at operation) may have had management change. It is likely that the 1 patient (lung) with a 4mm metastases detected 150 days following resection would have been so too small to be detected pre-operatively with CT PET.  
  
  
  
We suggest that only 1/41 (2.4%) patient management would have changed with preoperative CT-PET. A nationwide audit of the utility of PET/CT alongside optimum CT staging for patients diagnosed with pancreatic cancer will provide further data to confirm/refute whether CT-PET should be continued to be recommended as part of the gold standard of staging for patients with pancreatic adenocarcinoma.

## 'NICE' Quality Standards in Pancreatic Cancer - are we meeting them?

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Category: Malignant

AIM  
  
  
  
Early diagnosis and surgical resection of pancreatic ductal adenocarcinoma (PDAC) confers the greatest chance of survival at five years. NICE published five quality statements in February 2019 on pancreatic cancer diagnosis and management. The purpose of this audit is to compare regional outcomes to published standards to further improve regional services.   
  
  
  
METHODS   
  
  
  
Data was collected retrospectively to include all cases of histologically confirmed PDAC between February 2018 and February 2019. These cases were then reviewed against each of the five quality statements including; multidisciplinary (MDT) diagnosis and care plan, FDG-PET/CT completion preoperatively, appropriate inclusion in the fast-track jaundice pathway (FTJP) without preoperative biliary drainage (PBD), use of pancreatic enzyme replacement therapy (PERT) and psychological assessment.   
  
  
  
RESULTS  
  
  
  
None of the five quality statements were fully met. 90.2% of patients had full MDT discussion, 48.5% had preoperative FDG-PET/CT. Challenges obtaining an appointment for FDG-PET/CT for patients on FTJP were identified. Inappropriate PBD occurred in 14.2% of patients presenting with obstructive jaundice. 50.5% of patients received preoperative dietician assessment with view to PERT, however this figure went down to 25% if on the FTJP. 24.2% of patients were offered psychological assessment.   
  
  
  
Comparisons between time from initial CT to definitive surgery were made between groups presenting with obstructive jaundice and on the FTJP and those not selected for FTJP. For example; patients on the FTJP have the shortest CT-to-surgery median time of 6.5 days. Where PBD is performed in the presence of obstructive jaundice median time is 33 days. Where patients did not present with obstructive jaundice median time is 47 days. Although results demonstrate we met government targets for treatment of cancer, our results demonstrate a delay to surgery incurred by patients not on the FTJP.   
  
  
  
CONCLUSION  
  
  
  
Recommendations for improvement to meet the quality standards include implementation of an agreed protocol for the FTJP to ensure prompt referral for FDG-PET/CT scans and preoperative dietician assessment. The use of protected urgent timeslots for this patient cohort may be considered. Additionally, an SMDT proforma checklist may help ensure all patients are considered for FTJP, FDG-PET/CT and dietician assessments preoperatively. To improve HNA completion, a follow up phone call/face-to-face meeting with the CNS may be considered, with concurrent utilisation of the clerical team to support the CNS recording this data.   
  
  
  
Dissemination of audit results and a collaborative approach to service improvement helps ensure continued service development across the North West HPB network.

## Differentiating Pancreatic Ductal Adenocarcinoma (PDAC) from individuals with symptoms suggestive of PDAC, including type II diabetes, with ROC AUC values above 0.95

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Category: Malignant

Aims  
  
Discriminating PDAC from non-PDAC symptomatic individuals represents a more challenging task than distinguishing PDAC from healthy controls.  
  
Currently available tests have been shown to be inadequate in delivering clinically actionable results, e.g. CA19-9 cannot alone discriminate between PDAC and other disease conditions in the gastrointestinal tract.  
  
This study aimed to evaluate if IMMray™ PanCan-d could, with high accuracy, separate patients with PDAC (stage I-IV) from individuals with various non-specific but concerning symptomatic conditions not caused by PDAC, which mirrors the clinical setting for gastrophysicians.  
  
  
  
Methods  
  
Patient samples from 136 PDAC (stage I-IV), 570 non-PDAC symptomatic individuals and 217 healthy individuals were tested using IMMray™ PanCan–d as well as a CA19-9 ELISA assay.  
  
To minimize confounding and pre-analytical variables, all patient samples were collected and processed using the same standard operating procedures, stored at -80°C and tested within a year after collection. Data analysis was performed using Immunovia software algorithms and SVM ROC AUC-values were determined for the different groups.  
  
  
  
Results  
  
In total, 937 individuals were analyzed. Combining IMMray™ PanCan-d with CA19-9, the results showed SVM ROC AUC-values of 0.97, 0.98 and 0.96 differentiating PDAC vs. non-PDAC symptomatic individuals, healthy controls and type II diabetes, respectively. Similar results were achieved for all stages of PDAC.  
  
The classification of PDAC Stages I & II, using microarray biomarker signature + CA19-9. Combining IMMray™ PanCan-d with CA19-9, the result showed SVM ROC AUC-value of 0.98 differentiating PDAC Stages I & II vs. controls (symptomatic + healthy + diabetes).  
  
  
  
Conclusions  
  
The current study showed for the first time that IMMray™ PanCan-d has the capacity to differentiate between symptomatic, non-PDAC individuals, including type II diabetes, and all different stages of PDAC. These findings have significant clinical implications for individuals attending primary and secondary care units with non-specific but concerning symptoms where PDAC may be suspected.  
  
Prospective validation studies are underway with 10,000 subjects in the three high risk groups for pancreatic cancer; PanFAM-12 (hereditary/familial), PanSYM-1 (early symptoms) and PanDIA-1 (new onset type II diabetes after 50 years of age).

## Tumour-Stromal Interaction in Pancreatic Adenocarcinoma

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Category: Malignant

Introduction: Pancreatic adenocarcinoma is the 5th most common cause of cancer deaths due to late diagnosis and rapid growth. Tumour tissue induces healthy pancreatic cells to supply it with lactate for energy via monocarboxylate transporters (MCT) 1 and 4, inhibition of which may provide novel therapeutic mechanisms to disrupt this lactate transport.   
  
  
  
Aims: We firstly sought to study the differential MCT expression in non-cancerous and cancerous tissue, and the effects of oxidative stress caused by antioxidants on their function, followed by changes in miRNA expression of treated cells and the exosomes they produce to influence their microenvironment.   
  
  
  
Results: MCT1 and MCT4 expression differed between the two tissue types; MCT1 was preferentially expressed within non-cancerous tissue while MCT4 was preferentially expressed within tumour tissue. Following antioxidant treatment, decreased extracellular lactate levels and corresponding increased pH were observed indicating greater inhibition of MCT4 than MCT1. Significant differential expression of cellular miRNA known to down-regulate known oncogenic, angiogenic and metastasis-inducing proteins were observed following antioxidant treatment, however insufficient volumes of exosomes made their miRNA analysis unfeasible.  
  
  
  
Conclusions: Antioxidant treatment of pancreatic cancer cells shows inhibition of MCT4, while microscopy revealed cancer cells express higher levels of MCT4 than non-cancerous tissue. Thus disruption of MCT4 function by antioxidants preferentially targets cancer cells, with altered miRNA expression indicating down-regulation of numerous cancer-promoting target proteins. Further work is required to reveal the magnitude of this effect. Studying MCT-1 and -4 expression within oxidative and hypoxic tumour microenvironments would characterise differential vulnerability to antioxidant treatment.

## An audit to determine the effect of PET-CT (Positron emission tomography – computerised tomography) on the suitability of patients with pancreatic and peri-ampullary malignancy for surgical treatment

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Category: Malignant

Aims  
  
  
  
To describe the impact of the introduction of PET-CT (Positron emission tomography – computerised tomography) in staging pancreatic cancer in March 2018 at University Hospital Bristol NHS Foundation Trust. This included: 1. Noting any additional findings on PET-CT that were not initially obvious on CT (Computerised tomography) alone and whether this altered treatment approach, 2. If additional findings were present, whether these required further investigations which ultimately delayed surgery, and 3. Noting the proportion of tumours that were PET avid.   
  
  
  
Methods  
  
  
  
Multi-Disciplinary Team meeting lists from March 2018 to June 2019 were accessed and screened to identify patients with pancreatic malignancy who underwent PET-CT scanning. Details of these patients were noted and information regarding age, gender, confirmed diagnosis, CT scan findings, PET scan additional findings and effect of these findings on treatment intent were recorded.  
  
  
  
Results  
  
  
  
Fifty-nine patients were included of whom 39 (64%) patients were male. In patients who underwent PET-CT scanning (n=59), additional findings were found in 42 (71%). Additional investigations were only undertaken in 16 patients (27%). Of these patients, only two patients are described as having true positive results where the additional PET-CT findings changed their surgical management. In the two cases described, both patients underwent a hepatic MRI which identified liver metastases and precluded surgery.  
  
The malignant mass was detectable in 42 patients (71%) on both CT and PET-CT, 12 (20%) were visualized on PET-CT but not CT, and 5 (8%) were not detected on PET-CT but identified by CT. Thus 54 (92%) of lesions were PET-CT avid.  
  
PET-CT did not alter the plan for surgery in most patients (n=42; 71%), however it was found that 9 (15%) of patients were provisionally listed for surgery pre-PET-CT who were subsequently not offered surgery due to PET-CT findings. In patients who were unlikely to undergo surgery due to suspected inoperable disease or associated comorbidity (n=8), PET-CT scanning allowed one patient to be offered subsequent resection whilst the remaining seven were confirmed to be in-operable.   
  
  
  
Conclusions  
  
  
  
Despite the small sample size, this study suggests that in the majority of patients, PET-CT does not change the management of potentially resectable pancreatic cancer but may lead to additional investigations and potentially delayed surgery. Thus the use and role of PET-CT needs careful consideration in current pancreatic surgery practice.

## An inverse association between a moderate alcohol intake and the development of PDAC – data from a cohort study with implications for prevention.

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Category: Malignant

Aims: There are plausible biological mechanisms for how a moderate alcohol intake may prevent pancreatic ductal adenocarcinoma (PDAC), but these are not supported by the epidemiological data. The latter has methodological limitations which we addressed by investigating a moderate alcohol intake, within UK recommended limits and in high risk groups for the first time, using validated 7-day food diaries (7DDs) recording a greater range of drinks and adjusting for covariates in a cohort study.  
  
  
  
Methods: The European Prospective Investigation into Cancer in Norfolk (EPIC-Norfolk) recruited 24,083 men and women aged 40-79 years between 1993-1997. Baseline information on alcohol intake was collected using 7DDs. The cohort was followed up to 31st December 2017, and PDAC cases identified by linkage to the Eastern Region Cancer Register. Alcohol consumption was categorised into: <1 unit/week (1 unit = 8g ethanol), 1-14 units/week (moderate intake) and >14 units (high intake), reflecting UK guidance. Cox proportional hazard regression models calculated hazard ratios (HRs) and 95% confidence intervals, and sensitivity analyses performed.  
  
  
  
Results: 125 participants developed PDAC (51.2% men, mean age at diagnosis 63.0 years). A moderate alcohol intake was inversely associated with PDAC (HR = 0.62, 95% CI; 0.41-0.94, p=0.024), with an inverse association with moderate white wine (HR = 0.57, 95% CI; 0.33-0.99, p=0.047), but not other alcohol types. There was an inverse association with moderate alcohol intake in participants with BMI <25kg/m2 (HR = 0.41, 95% CI; 0.21-0.80), but not if BMI ?25kg/m2 (HR = 0.84, 95% CI; 0.49-1.45) or according to smoking status (HR = 0.59, 95% CI; 0.33-1.05). The population attributable fraction for the potential protective effect of moderate alcohol was 21.9% of all PDAC cases (95% CI; 0.02-37.82%).   
  
  
  
Conclusions: The data are supportive for a moderate consumption of alcohol, within UK recommended guidance, protecting against PDAC, particularly in people with a normal BMI. These findings need to be confirmed in other populations before a moderate alcohol intake is recommended to reduce the risk of PDAC.

## Pasireotide and postoperative pancreatic fistula: a meta-analysis of available evidence

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Category: Malignant

Aims  
  
The role of pasireotide in the prevention of postoperative pancreatic fistula in patients undergoing pancreatic surgery is poorly defined. The aim of this meta-analysis was to evaluate the effect of routine administration of pasireotide on postoperative pancreatic fistula following pancreatic resections (pancreaticoduodenectomy and distal pancreatectomy).  
  
  
  
Methods  
  
A systematic review of published literature was performed in accordance with PRISMA guidelines, and included a search of PubMed, MEDLINE and SCOPUS databases. All studies evaluating the role of pasireotide in pancreatic resections were included, regardless of the type of the operation. The primary outcome measure was the incidence and severity of clinically relevant postoperative pancreatic fistula. Secondary outcomes were delayed gastric emptying, length of hospital stay, readmission and mortality.   
  
  
  
Results  
  
Five studies including 1954 patients who underwent pancreatic resections (pancreaticoduodenectomy or distal pancreatectomy) were included in this meta-analysis. The included studies were from the four different surgical departments in the United States of America. One randomized controlled study and four large single centre cohorts were included in the final analysis. The use of pasireotide reduced the incidence of postoperative pancreatic fistula (14.3% vs. 20.4%, OR 0.67, 95% CI 0.48-0.95, p=0.02) and the incidence of clinically relevant pancreatic fistula (12.6% vs. 14.8%, OR 0.69, 95% CI 0.50-0.97, p=0.03). However on subgroup analysis, there was no difference in the incidence of pancreatic fistula in patients undergoing pancreaticoduodenectomy (12.7% vs 11.8%, OR 0.95, 95% CI 0.58-1.56, p=0.84) or distal pancreatectomy (18.2% vs 18.2%, OR 1.14, 95% CI 0.28-4.59, p=0.85). The use of pasireotide did not influence delayed gastric emptying (7.4% vs. 16%, OR 0.83, 95% CI 0.55-1.24, p=0.35), length of hospital stay (7.9 vs. 8.3 days, OR 0.34, 95% CI 0.29-0.96, p=0.29) or mortality (1.4% vs. 1.4%, OR 1.41, 95% CI 0.55-3.61, p=0.47). Readmission rates were lower on patients receiving pasireotide (16.8% vs. 23.3%, OR 0.65, 95% CI 0.47-0.88, p=0.006).  
  
  
  
Conclusions  
  
The routine use of pasireotide may reduce the incidence of postoperative pancreatic fistula in patients undergoing pancreatic resections. Further RCT’s with specifically looking at the impact of Pasireotide in reducing POPF in patients undergoing PD and DP separately are warranted to confirm its efficacy.

## Survival advantage of upfront surgery for pancreatic head cancer without preoperative biliary drainage

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Category: Malignant

Aims  
  
Clear evidence demonstrates pancreaticoduodenectomy, without preoperative biliary drainage (PBD), among jaundice patients reduces risks and delays. Although ‘fast track’ surgery significantly increases the resectability rate, it is unknown whether this translates into a survival benefit. This study evaluated the effect of upfront surgery on long-term survival using an intention-to-treat (ITT) analysis.   
  
Methods  
  
Patients were identified from a prospectively maintained database stratified according to whether or not they underwent PBD.   
  
Results  
  
Among 157 patients, 84 (54%) underwent PBD. Of these, 73% underwent surgery, compared to 100% of those without PBD (p<0.001). Reasons for not undergoing surgery were progression of cancer (N=11), progressive frailty (N=6), or PBD-related complication (N=6). In those who underwent surgery, PBD was associated with a longer time from diagnosis to surgery (median: 59 vs. 14 days, p<0.001), and a higher rate of unresectable cancer at surgery (26% vs. 3%, p<0.001). On an ITT basis, patients treated with PBD had significantly shorter survival, at a median of 15 vs. 19 months (HR: 1.59, 95% CI: 1.07 – 2.37, p=0.023). However, for the subset of patients who underwent resection, survival was similar in the two groups (HR: 1.07, 95% CI: 0.66 – 1.73, p=0.773).  
  
Conclusions  
  
A reduced time to surgery with avoidance of PBD offers survival benefit. This is only appreciated on ITT analysis, which includes patients who are initially considered candidates for surgery, but ultimately do not undergo surgery. Considering this ‘hidden’ cohort of patients is important when considering optimal pathways for the treatment of resectable pancreatic cancer.

## How are we benchmarking performance for pancreatic surgery? A systematic review of published quality metrics.

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Category: Malignant

Aims. Pancreatic resection is highly specialised surgery performed in relatively few centres. There are no internationally agreed quality metrics for pancreatic surgery, and it remains unclear how published metrics compare with each other. This study aimed to systematically review published literature to summarise metrics that define quality standards for pancreatic surgery.  
  
Method. A search of MEDLINE, EMBASE and CENTRAL was undertaken until June 2019. All articles that developed or validated quality metrics for pancreatic surgery were included. Metrics were classified into three domains according to the Donabedian framework, and their quality assessed using the AIRE Instrument.  
  
Results. 18 studies included quality metrics, of which 7 developed new metrics, and the remaining 11 studies validated previously published metrics against their own data. There was heterogeneity in the methods of metric development (RAND Appropriateness Methodology, Delphi Consensus, survey of experts, statistical control technique). All metrics demonstrated moderate quality scores. There was consensus in some metrics (e.g. <10 hours total operative duration), and lack of consensus for others (e.g. lymph node yield ?10 vs. ?15). There were no metrics related to patient reported outcomes.  
  
Conclusions. Published quality metrics for pancreatic surgery predominantly arise from seven studies. There was heterogeneity in how the metrics were developed, and metrics were of moderate quality. While there was some consensus between groups for some metrics, there was also lack of consensus for others. Metrics need to be reviewed as new data emerge, technologies develop, and opinions change, and should adhere to reporting standards for guideline-based performance measures.

## Network meta-analysis comparing techniques and outcomes of stump closure after distal pancreatectomy

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Category: Malignant

Background: The incidence of postoperative pancreatic fistula (POPF) after distal pancreatectomy remains high, and different pancreatic stump closure techniques have been used to reduce the incidence.  
  
A network meta-analysis was undertaken to compare the most frequently performed pancreatic stump closure techniques after distal pancreatectomy and determine the technique associated with the lowest POPF rate.  
  
  
  
Methods: A systematic search of the Scopus, PubMed, MEDLINE and Embase databases was conducted to identify eligible RCTs. The primary outcome was the occurrence of clinically relevant POPF.  
  
Secondary outcomes were the duration of operation, blood loss, intrabdominal collections, postoperative complications and 30-day mortality.  
  
  
  
Results: Sixteen RCTs including 1984 patients and eight different pancreatic stump closure techniques were included in the network meta-analysis. Patch coverage of the pancreatic stump (round ligament or seromuscular patch) after stapler or suture closure ranked best, with the lowest rates of clinically relevant POPF, lowest volume of intraoperative blood loss, fewer intra-abdominal abscesses, and lower rates of overall complications and 30-day mortality. Round ligament patch closure outperformed seromuscular patch closure in preventing clinically relevant POPF with a significantly larger cohort for comparative analysis. Pancreaticoenteric anastomotic closure consistently ranked poorly for most reported postoperative outcomes.  
  
  
  
Conclusion: Patch coverage after stapler or suture closure has the lowest POPF rate and best outcomes among stump closure techniques after distal pancreatectomy.

## Important predictors of omission of adjuvant chemotherapy following a pancreaticoduodenectomy complicated by a post operative pancreatic fistula

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Category: Malignant

Aim  
  
To decipher any correlation with weight loss and modified glasgow prognostic score (mGPS) with regards to omission of chemotherapy following a pancreaticoduodenectomy (PD) for malignancy complicated by a post operative pancreatic fistula (POPF)  
  
Methods  
  
We retrospectively analyzed the data that underwent PD between 2013-2017. We reviewed all patients who experienced Grade B POPF defined by ISGPF criteria. We treated our POPF, with NPO, TPN and onctreotide infusions for a minimum of 7 days until the drain amylase normalized and/or drain effluent was less than 30ml. We categorised the patients into two groups. Those who received adjuvant chemotherapy (Group 1) and those who didn't (group 2). We looked at the mGPS and greater than 10% weight loss in these two groups treated for a POPF. We also looked at the length of treatment in these 2 groups. We excluded those patients in whom adjuvant chemotherapy for a malignancy was not indicated.   
  
Results  
  
58 patients had a Grade B POPF and all were treated for POPF. The Grade B pancreatic fistula rate was 13%. Median ages of the patients were 69. Median hospital stay was 30.5 days. Parenteral nutrition was administered for an mean of 20 days. The mean BMI on discharge was 26.5 with an average weight difference of -4.9%. 35 patients were advised adjuvant chemotherapy following discharge and were included. There were 14 patients in group 1. Of these patients , 4 could not tolerate the intended duration of chemotherapy. The mean mGPS at the time of diagnosing POPF and discharge were 2 and 1.35 respectively. Only 2 (14%) patients had more than 10% weight loss at the time of discharge. The average length of treatment was 16.1 days.   
  
21 patients were included in group 2. 2 patients had wound problems and 1 had received neo adjuvant treatment. The rest did not receive chemotherapy. The mean mGPS at time of diagnosing POPF and discharge were 2 and 1.85 respectively. 8 (38%) patients had more than 10% weight loss at the time of discharge. The average length of treatment was 34.5 days.   
  
Conclusion  
  
We concluded that weight loss, mGPS at the time of discharge and length of treatment had a significant contribution to the omission of adjuvant chemotherapy after a pancreaticoduodenectomy for malignancy. These could be prognosticators for recurrence as adjuvant therapy has an important role in disease free survival.

## Serum markers predict response to neoadjuvant chemotherapy in borderline and locally advanced pancreatic cancer

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Category: Malignant

Aims  
  
Given the pro-tumorigenic inflammatory microenvironment in pancreatic ductal adenocarcinoma (PDAC), various serum markers reflective of systemic inflammation have been investigated as potential predictors of prognosis. However in cases of borderline resectable (BRPC) and locally advanced pancreatic cancer (LAPC) limited studies have examined the association with response to neoadjuvant chemotherapy, which is a treatment strategy where optimal patient selection is key with the hope of inducing a response which facilitates surgical resection.  
  
  
  
Methods  
  
Data on 170 patients with BRPC/LAPC who underwent neoadjuvant chemotherapy from 8 centers across Europe was collected, with a minimum follow-up of 12 months. Various serum markers pre- and post-chemotherapy, including percentage changes, were analysed using appropriate statistics as potential predictors for response, with outcomes including OS, radiological response (RECIST criteria), resection rates and tumour pathology.  
  
  
  
Results  
  
The following serum markers/ratios predict improved OS; pre-treatment neutrophils (low; p=0.042), neutrophil:lymphocyte ratio (NLR; low; p=0.03) and albumin (high; p=0.017), post-treatment fibrinogen (low; p=0.006) and albumin (high; p=0.03), and percentage reduction in neutrophils (low; p=0.049). The following predict increased resection rate; pre-treatment NLR (low; p=0.048), fibrinogen (low; p=0.003) and ca19-9 (low; p=0.004), post-treatment PTT (high; p=0.01), fibrinogen (low; p=0.007), albumin (high; p<0.0001) and ca19-9 (low; p<0.0001), and percentage change in neutrophils (high; p=0.029) and ca19-9 (high; p<0.0001). The following predict partial or complete radiological response; pre-treatment albumin (high; p=0.04), fibrinogen (low; p=0.017) and ca19-9 (low; p=0.02), post-treatment NLR (low; p=0.004), albumin (high; p=0.0004) and ca19-9 (low; p=0.0001), and percentage change in ca19-9 (high; p=0.004). In patients who then underwent resection, additional significant results were observed with respect to predicting complete pathological response, T and N stage, and R0 rates.  
  
  
  
Conclusions  
  
Various serum markers have the ability to predict response to neoadjuvant chemotherapy. Further prospective validation is required to determine whether these could be used in clinical practice to help determine optimal patient selection.