Abstracts of the UGI Congress 2021
Assembly Rooms Belfast, 13 – 15 October 2021

Oral Presentations
Thursday 14 October 2021

Bariatrics Papers (12:00 - 13:00) O-B01 – O-B06
Benign UGI Papers (11:30 - 13:00) O-BN01 - O-BN09
Emergency UGI Papers (11:30 - 13:00) O-EGS01 – O-EGS09
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Poster Presentations
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**Oral Presentations**

**Category:** Bariatrics

**O-B01**

**Role of Ursodeoxycholic acid in prevention of gallstones formation in bariatric patients: need to amend recent BOMSS guidelines**

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**Background**

During rapid weight-loss phase following bariatric procedures, biliary cholesterol homeostasis is altered leading to increased propensity to gallstone formation. Incidence of gallstone formation following bariatric procedures is shown to be 10-38%. There is no consensus regarding its prevention and current BOMSS guidelines do not address this issue. This meta-analysis aims to pool high level evidence (RCTs) to assess efficacy of Ursodeoxycholic acid (UDCA) in reducing risk of gallstone formation in this cohort of patients and the need for revision of current guidelines.

**Methods**

A systematic literature search was performed using electronic databases (Medline, EMBASE, Cochrane Central Register of Controlled Trials (CENTRAL), Web of Science, PROSPERO and Google Scholar) in line with PRISMA guidelines. Only randomised controlled trials were included without restrictions on study language, year, status of publication and patient’s age. Meta-analysis was performed using Review Manager Software to calculate pooled risk ratios (RR) using random-effects model.

**Results**

Fifteen trials were included (3952 patients analysed, 2487 in UDCA and 1465 in placebo group). The overall rate of gallstone formation was 16.0% (6.4% in UDCA vs 31.4% in placebo group). Trials included various bariatric procedures (SG/RYGB/OAGB/AGB/Gastroplasty). UDCA dose ranged from 300 to 1200mg per day. UDCA significantly reduced the risk of post-operative gallstone formation (3952 patients, RR 0.24, 95% CI 0.16-0.37, p < 0.0001). The absolute risk reduction and number needed to treat (NNT) were 25% and 4 respectively.

**Conclusions**

Oral Ursodeoxycholic acid treatment following restrictive bariatric surgical procedures significantly reduces the risks of gallstone formation. As such, its regular use in first 6 months (rapid weight-loss phase) can significantly reduce the risk of complications associated with gallstones. Such treatment would be cost effective and benefit 1 in 4 patients. There is significant evidence available on benefits of using UDCA in post-operative bariatric patients and that this should be added to the recent BOMSS guidelines.
O-B02
Robotic versus Laparoscopic Roux-en-Y Gastric Bypass: A comparison of short-term outcomes and weight loss
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Background
The benefits of robotic over laparoscopic surgery for Roux-en-Y gastric bypass (RYGB) are debatable, with current evidence suggesting no significant differences in short-term outcomes. This study compares short-term outcomes and excess weight loss (EWL) % difference between these two techniques.

Methods
A retrospective study of patients undergoing RYGB between January 2016 and November 2020 at a single centre. Demographic, peri-operative and EWL% data were analysed.

Results
424 RYGB procedures were performed by three surgeons including 77 robotic (RRYGB) and 347 laparoscopic (LRYGB) operations. The first 8 RRYGB were excluded being early in the learning curve and the operative technique was modified afterwards. There were no statistically significant demographic differences. The median operative time was 179 (151 – 195) and 149 (123 -171) minutes in the RRYGB and LRYGB groups respectively (P<0.001). There were no statistically significant differences between both groups in complications, length of stay, 30-day readmission and EWL% at 6 and 12 months. The EWL% at 2 years was 88.5 (+/-19.1) and 66.6 (+/-29.8) in the RRYGB and LRYGB groups respectively (P=0.003).

Conclusions
RRYGB increases the operative time with no significant short-term outcome differences. The EWL% was higher at 2 years, probably due to a narrower hand-sewn gastro-jejunal anastomosis.
Bariatric Surgery in Patients Awaiting a Kidney Transplant - Systematic Review and Personal Experience from a High Volume Bariatric Centre

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Background
Morbid obesity in end stage renal disease (ESRD) is a barrier to kidney transplantation due to potential suboptimal post-transplant outcomes. Bariatric surgery is the most effective treatment for morbid obesity and has been shown to improve transplant eligibility through weight loss. There is no national UK guidance with regards to the role of bariatric surgery in patients requiring a kidney transplant. We present a decade of experience from a large NHS tertiary referral bariatric centre of performing bariatric surgery for weight loss in a cohort of high BMI ESRD patients.

Methods
A retrospective review was conducted of all patients undergoing bariatric surgery between 2007-2017. All patients with chronic kidney disease (CKD) at the time of bariatric surgery were identified. Patient records for those with CKD stage 4 and Stage 5 (or ESRD) were reviewed and data extracted for analysis. A systematic review was also conducted of reported experiences of bariatric surgery in CKD patients as a bridge to kidney transplantation.

Results
Of 3119 patients operated on in the identified period 22 were identified as having CKD at the time of surgery. Sleeve gastrectomy was the most commonly performed procedure. There was no recorded post-operative complications or 30-day mortalities. Median LOS was 4 days (range:2-6), pre-operative BMI 45 (Range:37-69), 12m post-op excess weight loss 17.3±14.4%, final EWL 22.3±14.8% at 32 months follow-up (Range: 6-52). 57% were subsequently transplant wait listed, 28% proceeded to transplantation 18.5months after listing (Range:7-30months). Systematic review of 15 studies suggests bariatric surgery in these patients is safe and facilitates 1/4 of patients being listed and transplanted.

Conclusions
Experience from a large UK NHS bariatric centre shows weight-loss surgery in high BMI patients with CKD4/5 is safe, with minimal peri-operative morbidity and mortality. 1 in 2 patients proceeded to being listed for transplantation, and 1 in 3 progressed to transplantation. We should consider formalising the role of bariatric surgery in the pre-listing workup of high BMI ESRD patients in the UK to give all patients equal chances for transplantation.
The effect of high fat diet and subsequent intentional weight loss on tumour burden in an animal model of spontaneous endometrial cancer


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Background
Obesity drives endometrial cancer (EC). Metabolic surgery (MS) induces sustained weight loss, reduces EC risk and has been shown to reverse histological changes of endometrial hyperplasia. One mechanism is increased GLP-1 post surgery. Few interventional studies have been conducted in the BDII/Han rat; an animal model of spontaneous EC. This study aimed to examine whether high fat diet (HFD) and weight gain, as well as subsequent intentional weight loss using Liraglutide (a GLP-1 receptor agonist) alters EC tumour biology and burden in the BDII/Han rat. A rat imaging protocol was validated to assess development and longitudinally track tumours.

Methods
An imaging protocol was developed and validated. 7 BDII/Han rats were fed normal chow (NC) and 8 weight-matched rats fed HFD from 3 months of age. Longitudinal PET-CT was conducted at 7, 9, 12 and 15 months. Abdominal visceral fat was analysed from L1-L5 on CT. Subsequently, an intervention study compared the 8 HFD-Control rats to 8 weight-matched HFD-fed rats treated with Liraglutide from 12-15 months. PET-CT was used to assess disease progression. Analysis of histological, immunohistochemical and transcriptomic parameters were used to compare cohorts. All rats were euthanased aged 15-months. Imaging was correlated with necropsy findings and histopathology.

Results
HFD rats had more abdominal fat on CT imaging (8.6cm³±0.7vs4.0cm³±0.6;p<0.0005) and 10% higher body-weight than NC rats (232.5g±4.9vs209.4g±2.0;p=0.001) at the study end. Histopathology demonstrated EC in 57%(n=4) of NC and 50%(n=4) of HFD rats. PET-CT was 87.5% sensitive and 86% specific. Liraglutide induced significant reduction in final body weight (208.3g±5.7vs232.5g±4.9;p=0.006) and abdominal fat on CT compared to controls (4.4cm³±0.4vs8.6cm³±0.7;p=0.0001). 2 tumours were identified in the Liraglutide group (25%) compared to 4 in the control group (50%). GLP-1 receptor expression was not detected in benign or malignant BDII/Han uterine tissue.

Conclusions
This study has established a safe, sensitive and specific imaging protocol for longitudinal assessment of EC progression in BDII/Han rats. The HFD intervention used did not accelerate EC burden. However, it did create an obese phenotype and gave new information on the pathological variations of EC in the BDII/Han rat. Intentional weight loss from Liraglutide halved EC burden compared to controls in this study. An absence of GLP-1R expression may suggest weight loss dependent mechanisms. This novel pilot study is a foundation for future studies assessing the effect of intentional weight loss using metabolic surgery in obesity-related cancer.
O-B05
Does rapid or gradual weight loss following bariatric surgery affect lean body mass depreciation?

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Background
Controversy exists regarding the influence of the rate of weight loss on long-term body composition. The objective of this study was to compare body composition changes in patients with successful and unsuccessful weight loss 12 months after bariatric surgery.

Methods
A prospective analysis was completed on patients undergoing bariatric surgery at St Vincent’s Hospital Melbourne between 2017 and 2021. Body composition was measured with dual-energy X-ray absorptiometry immediately before surgery, and at 12 months post-operatively. Fat mass (FM), lean body mass (LBM) and skeletal muscle index (SMI) trajectories were analysed between patients, with either successful weight loss (SWL) or unsuccessful weight loss (USWL) stratified based on an excess weight loss (EWL) threshold of \geq 50%.

Results
Thirty-seven patients were included in this series (SWL n=25, USWL n=12). Compared to those with USWL, SWL demonstrated a greater mean loss in BMI (12.3 vs 7.3 kg/m\textsuperscript{2}; p<0.001) and weight (34.4 vs 20.3 kg; p<0.001). SWL demonstrated a significantly greater reduction in tissue fat\% than USWL, with patients losing 7.3\% more tissue fat on average. SWL was associated with an improved mean SMI\% when compared with USWL (5.5 vs. 2.42\%; p<0.0009). However, the difference in FM:LBM loss ratio between the two groups did not demonstrate statistical significance (7.07 vs 4.62, p = 0.2519).

Conclusions
This data suggests that SWL is associated with a more optimal body composition outcome than USWL, which is at least partly due to a relative skeletal muscle-sparing effect in this group. Further research is warranted in understanding the implications of these changes on resting energy expenditure and the risk of weight regain.
The Impact of Covid-19 on Bariatric surgery in England during 2020

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Background
The Covid-19 pandemic had a significant impact on NHS services across England. Due to the significant rise in demand for beds in both ward and ITU environments, trusts were forced to reduce the number of operations carried out to help reduce the burden on secondary care services. Whilst efforts were made to preserve operations where possible, the Covid-19 burden has had a significant impact on bariatric surgery throughout 2020. The following research looks at the true impact of Covid-19 on bariatric surgery in England and analyses this in relation to the Covid-19 burden.

Methods
Data relating to operation numbers was taken from The Surgical Workload Outcomes Audit (SWORD) database. The SWORD database was interrogated for the years 2017 – 2020. A mean number of operations was calculated using the 2017-2019 data and compared to data from 2020 for gastric bypass, sleeve gastrectomy, gastric banding and biliopancreatic diversion. Operations performed and other demographic data was analysed regionally and compared to Covid-19 deaths throughout England. Covid-19 data was obtained from the national government dashboards.

Results
The results of the study show that Nationally there was a significant decline in bariatric surgery operations carried out throughout 2020 due to the Covid-19 pandemic. Overall there was a 53.5% reduction in bariatric surgery operations carried out in 2020. Looking at the individual operation types, there was a 50.7% reduction in gastric bypass surgery, a 50% reduction in biliopancreatic diversion and a 51.9% reduction in sleeve gastrectomy. There was a greater reduction in gastric bands, with a 78.1 % reduction in procedures which may also reflect changes in current practice with regards to the use of gastric bands. On reviewing data at a local level, all trusts were significantly impacted by the pandemic with the reduction in services ranging from 50% to 100% reduction in operations performed.

Conclusions
Overall, despite national efforts to preserve as many operations as possible, there was a significant reduction in the delivery of bariatric surgery services throughout England during the Covid-19 pandemic. Due to this reduction in service provision, it is likely that there are now much larger waiting lists which will need to be addressed as we recover from the Covid-19 pandemic. Whilst there was a similar reduction in services across most trusts due to the elective nature of the operations, variation should be further analysed to allow for better planning and resource allocation for future waves or future pandemics.
Background
Patients with a para-oesophageal hernia (POH) report a complex range of symptoms and quality of life (QOL) issues. Clinicians often utilise existing health related quality of life tools to (1) identify patients who are eligible for surgical management and (2) to evaluate the benefit of surgical intervention. However, the most commonly used tools for this purpose are not disease specific. As such, crucial POH specific symptoms which impact QOL may not be captured. In order to address this issue, a modified Delphi consensus study was undertaken to establish a HRQOL instrument specific to POH.

Methods
A two-round modified Delphi consensus study was conducted with a group of international experts. Participants were identified through (1) their authorship in landmark POH studies and (2) the professional networks of the study investigators. Prior to the Delphi process, a scoping survey was undertaken in order to generate a list of candidate items. Participants were asked to rate the items’ importance in assessing patients with POH using a 5-point Likert scale. The a priori threshold for inclusion was 80% for scores of 4 or 5. If consensus was not achieved, the item was carried through to the next round.

Results
The candidate list of items consisted of 64 symptoms, refined to 20 for inclusion within the first modified Delphi round. Four symptoms; ‘difficulty getting solid foods down’, ‘chest pain after meals’, ‘difficulty getting liquids down’ and ‘shortness of breath only after meals’, reached consensus threshold of 80% in the first round and one additional symptom, ‘early feeling of fullness after eating’, reached consensus in the second. A total of 26 participants took part in the first and 24 in the second round. These five symptoms have been identified to form the initial version of the Para-Oesophageal Hernia Symptom Tool (POST).

Conclusions
POST is the first tool that aims to capture POH-specific symptoms that impact upon HRQOL. Prior to clinical use, this tool will be presented in international patient workshops to assess its construct validity. Following this, we aim to assess the content validity of the tool through a longitudinal study in a cohort of patients with POH who are undergoing repair. We hope that this tool will serve as a decision support tool for clinicians who are evaluating the risk-benefit of surgical intervention in this cohort of patients.
O-BN02
Laparoscopic subtotal cholecystectomy for difficult gallbladders: A lifesaving bailout or an incomplete operation? A systematic review

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Background
Cholecystectomy is one of the commonest abdominal operations performed worldwide. Sometimes, the operation can be technically difficult due to dense adhesions in Calot’s triangle. Conversion to open surgery or subtotal cholecystectomy have been described to deal with these situations. A recent systematic review and meta-analysis on STC suggested high perioperative morbidity associated with STC. These findings are at odds with a previous systematic review and meta-analysis on the topic which concluded that morbidity rates for STC were comparable to those reported for total cholecystectomy. However, both these reviews included patients undergoing Open Subtotal Cholecystectomy (OSTC). This makes it difficult for us to understand the outcomes of LSTC as surgeons are not faced with the choice of converting to open surgery to perform a subtotal cholecystectomy. The choice they face is whether they should perform a LSTC or convert to open surgery to perform a total cholecystectomy. It is, therefore, important to establish the outcomes of LSTC alone (without including patients who underwent OSTC). This is all the more important during COVID-19 pandemic when the complexity of gall stone disease appears to have worsened. There is thus an enhanced need to understand technical nuances and outcomes of LSTC alone.

Methods
Search strategy: We searched PUBMED (Medline), Google Scholar, and Embase for all relevant English language articles describing experience with LSTC in adult human population (≥18 years) anywhere in the world using key-words like “subtotal cholecystectomy”, “gallbladder resection”, “gallbladder excision”, “gallbladder removal”, “partial”, “incomplete”, “insufficient”, “deroofing”, and “near-total”. Case reports, articles only published as conference abstracts, case series with <5 cases, and reviews were excluded. Only English-language studies were included. Participants: All studies with 5 or more cases, describing any experience with an adult cohort (≥18 years) of patients undergoing STC while attempting a Laparoscopic Cholecystectomy were included. Studies on patients who underwent preoperative cholecystostomy were excluded. Studies that had LSTC as part of another surgery were also excluded as we wanted to understand the morbidity and mortality of LSTC alone. Studies on patients who underwent OSTC (Open from start) were excluded as were those where the LSTC cohort was merged with the OSTC cohort and outcomes of LSTC were not separately reported. Study outcome: Primary outcome measure was early (≤30 days) morbidity and mortality. Secondary outcome measures were bile duct injury, bile leak rates, conversion to open surgery rates, duration of hospital stay, and late (>30 days) morbidity.

Results
45 studies were identified, with a total of 2166 patients. Mean age was 55 +/- 15 years with 51% females; 53% (n=390) were elective procedures. The conversion rate was 6.2% (n=135). Most common indication was acute cholecystitis (n=763). Different techniques were used with the majority having a closed cystic duct/gallbladder stump (n=1188, 71%). The most common closure technique was intracorporeal suturing (53%) followed by endoloop closure. There were a total of four, 30-day mortality [1] in this review. Early morbidity (≤30 days) included bile duct injury (0.23%), bile leak rates (18%), intra-abdominal collection (4%). Reoperation was reported in 23 patients (1%), most commonly for unresolving intra-abdominal collections and failed ERCP to control bile leak. Long term follow-up was reported in 30 studies with a median follow up period of 22 months. Late morbidity included incisional hernias (6%), CBD stones (2%), and symptomatic gallstones in 4% (n=41) with 2% (n=22) requiring completion of cholecystectomy.

Conclusions
Laparoscopic subtotal cholecystectomy is an acceptable alternative in patients with a “difficult” Calot’s triangle. However, this has to be taken seriously as it is associated with a high early and late morbidity and mortality.

O-BN03
Laparoscopic Common Bile Duct Exploration – Delivered within UK NHS Healthcare Framework

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Background
Cholelithiasis is a common problem in the UK affecting approximately 15% of the population. The incidence of synchronous choledocholithiasis is approximately 10-18%. The approach to bile duct stones is variable. Single stage bile duct exploration and cholecystectomy (LC) vs two stage ERCP followed by LC has been shown to be equally safe and as effective with reduced length of stay and number of procedures. We describe the results of a single, high volume centre performing laparoscopic common bile duct exploration (LCBDE) as an alternative to ERCP.

Methods
All patients undergoing LCBDE at our institution from November 2013 – July 2021 were included in the study. Data were collected from a prospectively maintained institutional database and data points corroborated by electronic patient data on hospital systems.

Results
304 patients underwent LCBDE. Median age was 68 (range 21-94). Most cases were performed as urgent/emergency (n=204, 67% vs n=100, 33% elective). Bile duct stones were diagnosed pre-operatively in 32.8% cases (n=100). Intra-operative diagnosis was made using laparoscopic ultrasound (n=221, 73%), cholangiogram (n=44, 15%) or combination of both (n=31, 10%). Laparoscopic completion rate was 92%. Successful stone clearance rate was 98%. 56% were via choledochotomy and 44% trans-cystic. Incidence of bile leak was 4.9% (n=15). Median length of stay was 2 days post-operatively (range 0–62). The rate of all complications was 13.2%. The rate of mortality was 0.66%.

Conclusions
This is the largest single case series of LCBDE published. This study has demonstrated that a safe and effective LCBDE service can be delivered within the NHS, with outcome data comparable to defined performance standards. With the evolution of specialist training, intra-operative imaging +/- LCBDE is likely to be the preferred modality of treatment.
O-BN04
Laparoscopic assisted robotic Heller’s cardiomyotomy in achalasia: a 12-year experience

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Background
Heller’s cardiomyotomy (HC) using a computer-enhanced (robotic) laparoscopic platform allows for a more precise dissection. This is achieved by utilizing the superior optics of a 3D camera and greater degrees of freedom provided by robotic instrumentation. Our aim was to assess short to long term outcomes in terms of mucosal integrity, hospital stay and symptom improvement and quality of life.

Methods
A retrospective review of prospectively collected data was performed of patients who underwent robotic HC between July 2009- May 2021. HC was performed using a Da Vinci robot S and Xi (Intuitive Surgical Inc.) with 4 laparoscopic ports and liver retractor. Anterior mobilization of the oesophagus was performed leaving the posterior component of phreno-oesophageal ligament intact. A longitudinal myotomy was made extending into the proximal stomach. An anti-reflux procedure (ARP) was not routinely performed. Data collected including demography, Eckardt symptom score, Quality of Life (QoL) with SF-36, surgical technical data and surgical outcome (post-op morbidity, mortality, hospital stay).

Results
Fifty-seven patients underwent surgery (28 males). Median age was 46 years (18-71). Two had surgery for recurrent dysphagia following laparoscopic HC elsewhere. Median length of myotomy was 8cm (5-11). No mucosal breaches were identified at surgery, but one had postoperative leak. Median length of hospital stay was 2 days (1-148). One had chest infection and another DVT. Median follow-up was 61 months (2-86). There was no mortality. Three patients (5%) needed oesophageal dilatation during follow-up. There was a significant improvement in Eckardt score from 10 (9-12) to 2 (0-6), and in all components of QoL (p<0.05).

Conclusions
Heller’s myotomy can be performed very precisely using a Da Vinci Robot. It minimises the risk of mucosal breach reflecting in the low leak rate. No patient had developed troublesome reflux which may well be due to the preservation of the posterior component of the phreno-oesophageal ligament. It also improves symptoms and quality of life for many years. Robotic HC may become the standard treatment for achalasia in the very near future.
O-BN05
The management of pancreatitis and complications that require intervention in a Benign Specialist Surgical Unit

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Background
Acute pancreatitis or inflammation of the pancreas is a common surgical pathology that presents with a spectrum of severity. The condition itself ranges from a mild/moderate self-limiting pathology to one associated with a systemic inflammatory response that can lead to organ dysfunction and death. We aim to investigate the aetiology/management and outcomes of patients presenting with pancreatitis in a benign specialist surgical unit with dedicated upper GI surgical care.

Methods
A retrospective analysis of all patients presenting and falling under surgical care with biochemical/radiological pancreatitis was conducted, using hospital archiving systems, reviewing operative notes and follow up events was conducted over an 8-year period.

Results
Within our benign specialist centre, 1393 patients were treated over an 8-year period. 73% of patients presenting with acute pancreatitis were male, whereas only 37% were female. The age range of patients presenting was 12 to 100 years, with the median age being 44 years. Within our population, 36.8% of acute pancreatitis was caused by gallstones, and 29.6% caused by alcohol and 33.6% other causes. 81% of patients seen had mild/moderate self-resolving pancreatitis requiring only fluids and analgesia. 19% had complicated pancreatitis requiring complex medical/surgical treatment. 4.8% patients developed pancreatic necrosis, and 3.7% developed pancreatic pseudocysts. 8 patients required necrosectomy, 19 patients required cystogastrostomy and 1 patient required distal pancreatectomy with no 90-day mortality.

Conclusions
Our specialist unit with the support of gastroenterology, nutrition team, radiology and ITU have managed a large cohort of pancreatic patients, the small number patients who require a surgical intervention have had good outcomes.
O-BN06
A Proposed Difficulty Grading System for Laparoscopic Bile Duct Exploration. Benefits to Practice and Research

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Background
A gap remains between the mounting evidence for single session management of bile duct stones and the obstacles to wider adoption of this approach. The practice of laparoscopic bile duct exploration (LCBDE) is limited not only by the availability of training opportunities and adequate equipment but also by the perception that the technique is difficult and requires a high skill-set. The aim of this analysis is to compare the preoperative and operative characteristics and the postoperative outcomes in easy vs. difficult LCBDE in a large consecutive series, according to a proposed 5 grade classification.

Methods
1326 LCBDEs were graded according to the location, number and size of ductal stones, retrieval techniques used, utilisation of choledochoscopy and specific biliary pathologies encountered. The cohort was divided into two groups: easy (Grades I A&B, and Grade II A&B, requiring transcystic or transductal exploration for up to 15 stones the largest being 15mm) and difficult (Grades III A&B, for over 15 stones or intrahepatic stones of any size needing transcystic choledochoscopy, IV and V with Mirizzi Syndrome, impacted stones, and ducts needing stenting, conversion or bilioenteric anastomosis). Various outcome parameters were compared.

Results
Age, sex, obesity and previous biliary admissions had no effect on operative difficulty. Emergency admission, obstructive jaundice, previous ERCP and dilated CBD were predictive of difficult explorations. 78.3% of patients with acute cholecystitis or pancreatitis, 37% of jaundice and 46% of cholangitis had easy explorations. Transcystic stone retrieval was possible in 77.7% of easy explorations and choledochotomy required in 62.3% of difficult explorations (vs. 33.6% in the whole series). Choledochoscopy was utilised in 23.4% of Grades I&II vs. 98% in difficult explorations. As expected more biliary drains, stenting, bilio-enteric anastomosis, conversions, operative time, biliary-related complications, hospital stay, readmissions and retained stones increased with difficulty. Grades I&II patients had 2 or more hospital episodes in 26.5% vs. 41.2% for grades III to V, the median presentation to resolution interval increasing from 1 to 3 weeks. There were 2 deaths in difficulty Grade V and one in Grade II B.

Conclusions
Difficulty grading of LCBDE is a useful tool of predicting outcomes. It facilitates comparison between studies and fair assessment of training. LCBDEs are easy in 72% and of these 77% can be completed transcystically. It is hoped this will encourage more units to adopt single session management of bile duct stones through establishing referral protocols, developing and refining the skills through training and acquiring the necessary equipment.
O-BN07
Transesophageal Endoscopic Resection of Mediastinal Cysts

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Background
Primary mediastinal cysts are infrequent lesions derived from a variety of mediastinal organs or structures. Complete surgical resection is the treatment of choice even in asymptomatic patients to prevent severe adverse events (AEs) and establish the diagnosis. Transesophageal endoscopic resection of benign mediastinal tumors has been proven feasible. The aim of this study is to evaluate the feasibility, safety and efficacy of transesophageal endoscopic surgery for mediastinal cysts.

Methods
From January 2016 to May 2021, patients with mediastinal cysts who underwent transesophageal endoscopic resection were retrospectively included. Clinicopathological characteristics, procedure-related parameters, AEs, and follow-up outcomes were analyzed.

Results
A total of 10 patients with mediastinal cysts were included in this study. The mean cyst size was 3.3±1.3 cm. Histopathology revealed 3 bronchogenic cysts (30.0%), 4 esophageal duplication cysts (40.0%), 2 gastroenteric cysts (20.0%), and 1 lymphatic cyst (10.0%). All procedures were performed uneventfully. En bloc resection was achieved in 6 patients (60.0%). Aggressive resection was avoided to prevent damage to the surrounding vital organs. Mean procedure time was 63.4±36.5 min. No major pneumothorax, bleeding, mucosal injury or fistula occurred. One patient had a transient febrile episode (>38.5°C). Mean postoperative hospital stay was 2.7±0.9 days. No residual or recurrent lesions were observed in any patient during a mean follow-up period of 29.8±19.5 months.

Conclusions
Transesophageal endoscopic surgery appears to be a feasible, safe, effective and much less invasive approach for mediastinal cyst resection. Larger prospective studies are required to fully assess the efficacy and safety of this novel technique.
Quality of Life 21 Years Following Gastric Pacing/ Gastric Electrical Stimulation for Gastroparesis – A real life data

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Background
Gastroparesis is defined as delayed emptying of the stomach in the absence of mechanical obstruction. Gastroparesis symptoms ranging from nausea, vomiting, bloating and abdominal pain with significant impact on overall quality of life (QALY). Gastric electrical stimulation (GES) for gastroparesis has been used in clinical practice since 1998 and was initially licensed as a “humanitarian” treatment when all else had failed. In the last two decades, it has been increasingly used in the treatment of refractory gastroparesis. We have been performing GES for refractory Gastroparesis since 2000 and we present our data on symptoms, quality of life and resource utilization

Methods
A prospective consecutive cohort study at a single center from December 2000 to July 2021 has been conducted. Data on patient demographics (gender and age), comorbidities, aetiology, the method of surgery, pre and post hospital stay, pre and post-operative SF-36 questionnaire (QALY) and symptom score (Likert Score), adjunct intervention, feeding regimen, mortality and morbidity were collated and subjected to student t-test for parametric data, the Wilcoxon test for non-parametric data, and McNemar’s test for binomial data

Results
A total of 162 patients underwent GES. There were 118 females. The median age was 36.5 years (range 6-80). Ninety-two patients were Idiopathic, 63 were Diabetic and 7 Post-Surgical. Overall QALY improved from a mean of 190/500 to 415/500(p=<0.001) with significant improvement in nausea (p=<0.001), abdominal pain (p=0.005) and bloating (p=0.001) severity score prior and following surgery. Number of hospital admissions (median) reduced post GES insertion from six to zero per year (p=0.002). The median length of stay was 3 days (range 1-45) and follow up was up to 129 months (6-252). There was no mortality from the procedure.

Conclusions
This is one of a few long-term studies looking at the outcome following GES for Gastroparesis. Our data shows that GES is a safe procedure with very little morbidity and no mortality. It improves symptoms and quality of life. It also reduces the health care utilization for these patients. The effects of GES are also very durable and hence should be considered as a mainstream treatment for patients with refractory gastroparesis.
O-BN09
The impact of the Covid-19 pandemic on benign upper GI surgery: The first 12 months at a single centre

Martin Michel, Helen Fifer, Emily Moran, Felix Hammett, Clare Bonner, Madara Kronberga, Mohamed Khawgali, Mohamed Balbola, Arin Saha
Huddersfield Royal Infirmary, Huddersfield, United Kingdom

Background
The road to recovery from the Covid-19 pandemic has started but no-one knows when it will end. 18 months on from the World Health Organisation declaring a global pandemic on the 11th March 2020 this has had a dramatic impact on both acute and elective hospital services. Whilst, quite rightly, the focus has been on prioritising cancer resections during the pandemic, many patients awaiting benign operations are facing lengthy waiting times. The aim of this study was to quantify the impact of the COVID-19 pandemic on benign upper GI surgery at a single centre compared to previous operating activity levels.

Methods
Retrospective analysis of computerised theatre records for the first 12 months of the pandemic (11th March 2020-11th March 2021) were compared to average historical data (HD) over the last five years (2015-2019) over the same time frame. Benign upper GI operations included were cholecystectomy, anti-reflux/hiatus hernia repairs, cardiomyotomies and bariatric procedures.

Results

<table>
<thead>
<tr>
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<td>399</td>
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<td>22</td>
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<td>12</td>
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<td>5</td>
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<td>696</td>
<td>628</td>
<td>571</td>
<td>661</td>
<td>440</td>
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</table>

Conclusions
The Covid-19 pandemic has dramatically affected benign upper GI surgery at our unit. Overall total operation numbers were down by 31% when compared to HD (440 vs 641). The largest deficit was in bariatics where no bariatric surgery was performed during the first 12 months of the pandemic, which has restarted as of July 2021. There was also a 30% reduction in the number of cholecystectomies performed likely due to initial guidance recommending non-operative management at the start of the pandemic. Hiatal work numbers remained consistent. This quantitative study can direct future service delivery and help guide the post-pandemic recovery.
Background
An emergency presentation with a hiatal hernia tends to be life-threatening with a high associated mortality rate. Operative management aims to reduce the herniated stomach, dissect the hernial sac and reapproximate the crura. This will often be followed by a fundoplication or a gastropexy to reduce the risk of recurrence. This study compares the recurrence rates between patients who underwent fundoplication and gastropexy.

Methods
Over 8 years, from October 2012 to November 2020, 80 patients were admitted to a tertiary oesophagogastric centre requiring emergency surgery to repair a giant hiatal hernia. We conducted a retrospective review and analysis of their admission and follow-up. The primary outcome measure was acute and post-discharge symptomatic recurrence of hiatal hernia, and secondary outcomes were patient mortality and readmission rate.

Results
Of the 80 patients requiring emergency hiatal hernia surgery, 38% had fundoplication procedures, 53% had gastropexy, and 3% had both (n=30, 42, 2 respectively). One patient had neither, and 6% (n=5) patients had a complete or partial resection of the stomach due to necrosis, so they were not suitable for gastropexy or fundoplication. Eight patients (10%) had symptomatic recurrence of hiatal hernia requiring a repeat operation; three within the index admission, five post-discharge. 50% had undergone fundoplication, 38% underwent gastropexy and 13% underwent a resection (n=4, 3, 1)(p-value=0.5). 19% (n=15) patients were readmitted. Post-operative mortality was 6% (n=5).

Conclusions
Emergency surgery for giant hiatal hernias is usually complex, and a significant cohort of these patients are elderly with significant co-morbidities. Nevertheless, there is no conclusive evidence in the literature favouring fundoplication versus gastropexy. Choice of technique is influenced by the surgeon’s experience and perioperative factors that influence the duration of the operation. This review, which includes the largest cohort of patients available in the literature, demonstrates that surgical technique does not influence the symptomatic recurrence rate in our patient group.
Effective use of afternoon Day Case Theatre Lists for Emergency Laparoscopic Cholecystectomy on Emergency Surgery Ambulatory Care (ESAC) Pathway

Rui Wei, Mishal Shahid, Jessica Barton, Lian Williams, Marianne Hollyman
Musgrove Park Hospital, Taunton, United Kingdom

Background
Gallstone disease is a common entity and affects up to 10-15% of the European population. The majority of these cases are asymptomatic but approximately 20% will develop complications such as severe biliary colic, cholecystitis, choledocholithiasis and pancreatitis. Early cholecystectomy in patients suffering from symptomatic gallstones can improve post-operative outcomes, avoid re-attendance and reduce overall length of hospital stay. We describe how two afternoon day case theatre lists were successfully utilised to prevent surgical admissions by enabling laparoscopic cholecystectomy on an urgent basis.

Methods
A sustainable pathway for symptomatic gallstones was introduced to Emergency Surgery Ambulatory Care (ESAC). Patients presenting with acute symptoms, well enough for ambulatory care, were referred to ESAC for diagnosis and management. Patients fit for surgery underwent pre-operative assessment before being operated on one of two weekly afternoon lists. A standardised, evidence-based approach was used for all laparoscopic cholecystectomies to ensure homogeneity of technique and patient care. This included pre-incision local anaesthetic, low flow and pressures intra-operatively, adequate analgesia to take home, and follow-up telephone consultation at 48hrs. Prospective data collection began in 2019 looking at hospital admission rate and 30-day re-presentation.

Results
Analysis was performed on data collected from September 2019 to July 2021. 151 patients had laparoscopic cholecystectomies, 107 were female and 44 male. Age range was 18-83 (median age 49) and median time to operation was 3 days. Overall, the spectrum of gallstone disease was 81 biliary colic, 44 cholecystitis, 20 pancreatitis and 6 choledocholithiasis. 18 patients were admitted post-operatively with length of stay ranging 1-6 days (median 1.5 days). 17 patients re-presented within 30 days, mainly for abdominal or pleuritic chest pain, although one patient required ERCP for CBD stones and another had pancreatitis.

Conclusions
Emergency surgery for symptomatic gallstone disease can be performed successfully on a day case basis. At our centre, the rate of post-operative admission was 12% and 30-day re-presentation was 11%. Standardisation of referrals, assessment and operative technique can achieve excellent outcomes with low rates of hospital admission and post-operative complications.
O-EGS03
Laparoscopic surgery versus Endoscopy in the management Common Bile Duct Stones: systematic review and Meta-analysis

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¹University of Edinburgh, Edinburgh, United Kingdom. ²Altnagelvin Area Hospital, Derry, United Kingdom

Background
With the advancement in minimally invasive surgery, a 1 stage Laparoscopic Common Bile Duct Exploration (LCBDE) followed by Laparoscopic Cholecystectomy (LC) is a great alternative to removing the gallbladder and CBD stones provided the surgeon possesses the necessary skills. The current guidelines for managing CBD stones is the 2 stage approach, Endoscopic Retrograde Cholangiopancreatography (ERCP) followed by (LC). The objective of this study is to assess whether LCBDE+LC should be the gold standard in managing CBD stones by comparing the clearance rate of common bile duct stones, morbidity, mortality, and the duration of hospital stay with ERCP+LC.

Methods
This is a systematic review with a meta-analysis that included RCTs of patients who were treated by the LCBDE/LC versus ERCP+LC. The PRISMA guidelines for reporting systemic reviews were followed. RCTs were collected by 2 authors Independently from Cochrane Central Register of Controlled Trials, Medline and Embase. Statistical analysis was carried out by a computer application called Review Manager using the Mantel–Haenszel method, the results were then plotted on a Forest Plot diagram and the 2 groups were then compared.

Results
849 patients from 7 RCTs were included in the study, 426 patients in the ERCP+LC arm and 423 in the LCBDE/LC arm. According to the Meta-analysis, Laparoscopic Common Bile Duct Exploration with Cholecystectomy was significantly superior to ERCP + LC in terms of successful Clearance of CBD stone, mortality rate, and Acute Pancreatitis. but had significantly higher rates in biliary leakages. There were no significant differences in Surgical Site Infections, Haemorrhages, Acute Cholangitis, Perforations, or duration of hospital stay between the two arms.

Conclusions
The current evidence suggests that LCBDE/LC is superior in successful CBD stone clearance, mortality, and acute pancreatitis. However, further RCTs will be needed to assess overall Morbidity, surgical site infections, Haemorrhages, Acute Cholangitis, perforations, or duration of hospital stay. The current guidelines must be reviewed to consider LCBDE/LC as the gold standard in managing patients with CBD stones.
O-EGS04

Is group and save necessary for all patients undergoing emergency cholecystectomy: A 6-year retrospective audit

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Lancashire Teaching Hospitals NHS Foundation Trust, Preston, United Kingdom

Background
Emergency cholecystectomy (EC) has a low perioperative bleeding risk. There is no current national guideline to suggest routine preoperative Group and Save (G&S) is necessary. Our Trust guideline recommends preoperative G&S for all EC operations. In 2018, a Trust-wide policy was adopted based on an audit, which concluded that routine preoperative G&S is unnecessary for elective cholecystectomy. All G&S require 2 samples taken separately, which can delay surgery. The cost to process one sample for G&S is £28. Therefore, a study was set up to assess the need for routine G&S in patients undergoing EC.

Methods
This retrospective observational study was based on a prospectively collected hospital database from March 2015 to March 2021 using MS-Excel. All patients who underwent EC (laparoscopic and/or open) within 10 days during index admission were included. All elective cholecystectomies were excluded. Patients were divided into GS-patients (patients with G&S) and NGS-patients (patients without G&S). The primary outcome is the difference between the incidence of ‘Perioperative blood transfusion’ (PBT) between the studied groups. The overall cost-effectiveness is considered as a secondary outcome. The categorical data were analysed using the Chi-square test; a p-value <0.05 is considered statistically significant.

Results
In this 6-year period, 2210 patients underwent cholecystectomy. Of these, 496 patients (22.4%) who underwent EC were included. 447 patients (90.1%) were in GS group and 49 patients (9.9%) were in the NGS group. None from the NGS group required PBT, whereas 3 patients (0.6%) in the GS group received blood transfusion. However, PBT was truly indicated in 1 patient due to the associated cardiovascular comorbidities. On the contrary, 2 patients did not fit the ‘restrictive transfusion threshold’ criteria of JPAC. There was no statistically significant difference in PBT requirement between the studied groups (p=0.331). Deferring routine G&S for EC could have saved our institution £24,976.

Conclusions
Our study has demonstrated that preoperative G&S is not indicated for all emergency cholecystectomies. It takes approximately 1 hour for G&S to be processed unless crossmatching is required. Group O-negative or O-positive blood can be provided to patients when urgent blood transfusion is needed depending on their age and gender. Thus, we conclude that G&S should be restricted to patients with low preoperative haemoglobin, bleeding and clotting disorders, those known to have abnormal blood antibodies and significant cardiovascular comorbidities.
O-EGS05

Ahmad H m Nassar, Rhona Kilpatrick, Mahmoud Sallam, Kiren Ali, University Hospital Monklands, Airdrie

Background
There is increasing evidence that single session laparoscopic cholecystectomy with cholangiography and, when necessary and available, bile duct exploration offers optimal clinical outcomes and superior cost benefits to patients with suspected bile duct stones.

There is a perception that preoperative endoscopic clearance of bile duct stones is necessary in patients presenting with pancreatitis and jaundice. However, most patients do not have severe disease and are fit for index admission surgical management. We aim to study the prevalence of bile duct stones in pancreatitis vs. jaundice and evaluate this management approach with regards to preoperative and operative parameters and postoperative outcomes.

Methods
Analysis of prospectively maintained database of 5774 consecutive laparoscopic cholecystectomies, cholangiography (IOC) with or without bile duct exploration was undertaken. Patients with suspected bile duct stones are referred to one firm with an intention of single surgical treatment in the index admission. Data of patients presenting with acute pancreatitis and obstructive jaundice was extracted. In the absence of suspected malignancy there was a limited role for preoperative MRCP and ERCP. The incidence of confirmed CBD stones requiring exploration, type of exploration, morbidity, re-operations and readmissions, hospital stay, number of episodes, and presentation to resolution intervals were compared in the two groups.

Results

<table>
<thead>
<tr>
<th></th>
<th>Pancreatitis</th>
<th>Jaundice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspected stones (2087)</td>
<td>415 (19.9%)</td>
<td>1037 (49.7%)</td>
</tr>
<tr>
<td>Previous admissions</td>
<td>84 (20%)</td>
<td>212 (20.4%)</td>
</tr>
<tr>
<td>Other units or hospitals</td>
<td>55 (65.4%)</td>
<td>147 (69.3%)</td>
</tr>
<tr>
<td>Preoperative MRCP</td>
<td>27 (6.5%)</td>
<td>145 (14%)</td>
</tr>
<tr>
<td>Preoperative ERCP</td>
<td>9 (2.1%)</td>
<td>77 (7.4%)</td>
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<tr>
<td>CBD stones</td>
<td>149 (35.9%)</td>
<td>673 (64.9%)</td>
</tr>
<tr>
<td>Transcystic CBD exploration</td>
<td>127 (85.2%)</td>
<td>391 (58%)</td>
</tr>
<tr>
<td>Cholecodochotomy exploration</td>
<td>22 (14.8%)</td>
<td>282 (42%)</td>
</tr>
<tr>
<td>Conversion</td>
<td>0</td>
<td>13 (1.2%)</td>
</tr>
<tr>
<td>Complications</td>
<td>57 (13.7%)</td>
<td>176 (16.9%)</td>
</tr>
<tr>
<td>Readmissions</td>
<td>16 (3.8%)</td>
<td>74 (7.1%)</td>
</tr>
<tr>
<td>Re-operation</td>
<td>1 (0.2%)</td>
<td>8 (0.7%)</td>
</tr>
<tr>
<td>Mortality</td>
<td>0</td>
<td>1 (0.9%)</td>
</tr>
<tr>
<td>Total Hospital Stay, Median/days</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Single index admission resolution (excl. previous and readmissions)</td>
<td>315 (76%)</td>
<td>751 (72%)</td>
</tr>
<tr>
<td>Presentation to resolution interval/ median/weeks</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Retained stones</td>
<td>0</td>
<td>12 (1.1%)</td>
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Conclusions
Single session surgical treatment of patients with acute pancreatitis and jaundice by specialist firms in the index admission (89% and 86% if previous admissions by other units is excluded) offers many advantages. MRCP and ERCP utilisation is minimised in favour of IOC; two thirds of pancreatitis patients and one third of jaundiced patients have no CBD stones. Simple transcystic explorations deals with most stones in both groups. The morbidity, open conversion, readmissions, retained stones and re-operations are low. Total hospital stay, number of treatment episodes and presentation to resolution are optimised and should persuade surgeons to avoid subjecting patients to multiple treatments.
O-EGS06
Trials and Tribulations: Educational Impact and Recommendations from the Implementation of Student-Led Recruitment in a Clinical Trial

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¹Department of Clinical Surgery, Edinburgh, United Kingdom. ²University of Birmingham, Birmingham, United Kingdom

Background
Medical students have an essential role in medical research, yet often feel unprepared and lack opportunities for involvement as recruiters within research studies. This study aimed to understand the educational effect of involvement in clinical trial recruitment on medical students, and to derive generalisable future recommendations.

Methods
Tracking wound infection with smartphone technology (TWIST) was a randomised controlled trial enrolling adult emergency abdominal surgery patients across two university teaching hospitals. All recruiters underwent pre-recruitment training based on “Generating Student Recruiters for Randomised Trials” (GRANULE) principles, and completed pre-and post-recruitment surveys. Respondent agreement with statements were assessed using 5-point Likert scales (from 1 [“strongly disagree”] to 5 [“strongly agree”]). Quantitative data were analysed using paired t-tests to compare differences pre- and post-involvement, and a thematic analysis approach adopted for anonymised free-text answers.

Results
Of 492 patients recruited to TWIST from 2016 to 2020, 86.0% (n=423) were recruited by medical students. Following student involvement, the monthly recruitment rate tripled (4.8 to 15.7 patients). Thirty student recruiters (96.8%), completed both surveys, reporting significant improvements in clinical and academic competencies. This included increased confidence in gaining and documenting consent, as well as interest in pursuing a clinical-academic career. Over half (58.2%) felt the undergraduate curriculum had not prepared them for involvement in clinical trials (mean:2.47, SD: 0.94). There were three emergent themes regarding recommendations for involvement of students, based on their engagement, preparation, and support during recruitment.

Conclusions
Student recruitment in clinical trials is feasible and provides a route to developing a research-active medical workforce. It also accelerates recruitment to clinical trials, as well as benefiting students through development of clinical competencies and provision of additional exposure to research. Adequate training, support, and selection of suitable trials are essential for successful student engagement.
O-EGS07
Early initiation of biochemical venous thromboembolism prophylaxis following traumatic spleen injury is safe and effectively reduce VTE events

Georges Rizkallah¹, Sheah Lin Lee¹,², Adel Mahmoud¹, Ishada Handa¹, Joe Long¹, Virginia Massella¹, Franko Shing Fun Ngan², Atiur Rahman¹, Jonathan Johns¹, Sachin Modi¹, Hassan Elberm¹
¹University Hospital Southampton NHS Foundation Trust, Southampton, ²University of Southampton, Southampton,

Background
The standard of care for managing patients with traumatic splenic injuries (TSI) has become non operative management (NOM)¹,³,⁴, but the safe window initiating chemical venous thromboembolism (VTE) prophylaxis, heparin or low molecular weight heparin (LMWH), is not well established ². Within the first 48h from injury, hypercoagulation state occurs which put trauma patients at risk of developing deep vein thrombosis(DVT), pulmonary embolism (PE) and lead to an increase rate in mortality ⁵,⁶. This study examines the safety and timing initiating VTE prophylaxis post splenic injury.

Methods
Patients with TSI were identified from prospectively maintained Trauma Audit and Research Network (TARN) database from 2015-2020 in a single tertiary trauma centre. Clinical and radio-logical information were collected retrospectively. TSI were graded using American Association for the Surgery of Trauma (AAST) splenic injury scale. Chemical venous thromboprophylaxis initiation were categorised as not given, <48h and >48h following the injury.

Results
In total 102 patient were included out of 136 patients identified with TSI. 34 patients were excluded for lack of electronic data, palliative decision or fatal condition on arrival. 12 patients out of 102 required operative management (OM) and 90 patients NOM. VTE prophylaxis was not given for 31 (30.4%). Medical reasons for this include severe brain injury and early discharge before 48 hours. VTE prophylaxis was initiated for 37 (36.3%) patients within 48 hours, and for 34 patients (33.3%) after 48 hours of admission. Seven patients developed thromboembolic events, majority of which (6/7) received VTE prophylaxis after 48 hours. Importantly, none of the patients who received VTE prophylaxis had rebleeding.

Conclusions
This study showed that early initiation of chemical VTE prophylaxis (<48h) is safe, resulted in lower incidence of DVTs/PEs without increasing the risk of bleeding. Results from this study supports recommendation from other studies ¹ to initiate chemical VTE prophylaxis after TSI as early as 24h post injury with no other contra-indications

<table>
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<th>AAST grade</th>
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<td>PE</td>
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Endoluminal Vacuum Therapy (EVT) for leaks in the upper gastrointestinal (UGI) tract; 10-years’ experience in a specialist Oesphagogastric centre

Zeeshan Afzal, Stavros Gourgiotis, Richard Hardwick, Peter Safranek, Vijayendran Sujendran, John Bennett, Robert O’Neill, Ayesha Noorani, Andrew Hindmarsh
Cambridge Oesophagogastric Centre, Cambridge University Hospital NHS Foundation Trust, Cambridge, United Kingdom

Background
Endoluminal vacuum therapy (EVT) is an emerging treatment strategy for UGI leaks. When compared to traditional treatments strategies EVT is reported to reduce morbidity and mortality, especially in patients with delayed presentation and established sepsis. We report the outcomes for patients with UGI leaks and perforations treated with EVT using an ad-hoc endoluminal vacuum device (EVD) in a tertiary UK hospital over a 10-year period.

Methods
Sixty-seven patients with UGI leaks from disparate causes were treated with EVT between April 2011 and July 2021. The ad-hoc EVD was constructed using a piece of open cell foam sutured around the distal end of a nasogastric tube, and placed endoscopically either through the perforation and into the extra-luminal leak cavity OR intraluminally depending on the morphology of the leak cavity. Continuous negative pressure (125mmHg) was applied. Endoscopic re-evaluation of the leak cavity with change of EVD was performed every 48-120 hours depending on the patients clinical condition. Information related to treatment and outcome was recorded prospectively.

Results
Patients had a median age of 66 years (range 23-92), and median Apache II score of 21 (range 4-36) at presentation. Fifty-two leaks were oesophageal (78%), 12 gastric (18%), 2 duodenal (3%), and 1 pharangeal (1%). The leak cause was anastomotic in 26 (39%), iatrogenic in 20 (30%), spontaneous in 19 (28%), and traumatic in 2 (3%). The median number of EVD changes required to heal the leak was 6 (range 1-27), and median length of hospital stay was 42 days (range 1-182). Successful resolution of the leak was achieved in 59 patients (88%). Eight (12%) patients died during treatment. There were no complications related to insertion of the EVD.

Conclusions
EVT is an effective treatment for UGI leaks which can be delivered safely in a tertiary oesophagogastric centre, and used to treat a wide range of leak causes in critically unwell patients. Further studies are required to develop a standardized procedure to improve the ease with which EVT can be delivered. This will enable broader adoption of EVT for this group of patients.
Effect of introducing an ambulatory care service on management of patients requiring acute cholecystectomy

Mishal Shahid, Marianne Hollyman, Rui Wei, Jessica Barton, Lian Williams
Musgrove Park Hospital, Taunton, United Kingdom

Background
Biliary pathology is a large tranche of the emergency surgical take, taking up many bed days, with many patients not receiving definitive management on their primary admission. An Emergency Surgical Ambulatory Care (ESAC) service was established at our hospital in 2019, aiming to provide a streamlined platform for diagnosis and surgical management of patients. Most notably this included patients with symptomatic gallstones which could be managed on a semi-urgent basis without hospital admission. We aim to analyse the efficiency of this novel service in hopes of identifying room for improvement so that we may enhance our patient outcomes.

Methods
Two time periods were retrospectively assessed; September-December 2018 (pre-ESAC) and September-December 2019 (six months after ESAC started). Patients with Cholelithiasis (ICD-K80) and Cholecystitis (ICD-K81) were identified, and those with either an incidental diagnosis of gallstones without symptoms, with gallstone pancreatitis, severe inflammation (empyema, gangrene, perforation), requiring ERCP or if they were unfit for surgery were excluded.

Data was collected on number of admissions, length of stay and rate of cholecystectomy. Patients were divided into 2018 SAU, 2019 SAU and 2019 ESAC to compare the difference in their outcomes. Data are presented as median (range).

Results
Some 57 patients presented acutely in 2018 compared to 82 in 2019.

<table>
<thead>
<tr>
<th></th>
<th>2018 SAU</th>
<th>2019 SAU</th>
<th>2019 ESAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients seen</td>
<td>57</td>
<td>82</td>
<td>41</td>
</tr>
<tr>
<td>Number of admissions</td>
<td>1-1(3)</td>
<td>1-0(3)</td>
<td>0-0(3)</td>
</tr>
<tr>
<td>Total length of stay</td>
<td>3-0(12)</td>
<td>3-0(15)</td>
<td>0-0(4)</td>
</tr>
<tr>
<td>Underwent cholecystectomy</td>
<td>44-(76%)</td>
<td>37-(90%)</td>
<td>39-(95%)</td>
</tr>
<tr>
<td>Emergency list</td>
<td>18-(41%)</td>
<td>14-(38%)</td>
<td>2-(5%)</td>
</tr>
<tr>
<td>ESAC list</td>
<td>-</td>
<td>13-(35%)</td>
<td>33-(86%)</td>
</tr>
<tr>
<td>Elective list</td>
<td>26-(59%)</td>
<td>10-(27%)</td>
<td>4-(10%)</td>
</tr>
<tr>
<td>Length of wait for operation</td>
<td>43.5</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Emergency list</td>
<td>2</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>ESAC list</td>
<td>-</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Elective list</td>
<td>115</td>
<td>59</td>
<td>79</td>
</tr>
</tbody>
</table>

The median wait to operation of 43.5 days in 2018 was significantly reduced to 7 days in 2019.

Conclusions
The introduction of an ESAC service in 2019 has allowed a reduction in number of admissions, total length of stay of patients and significantly reduced waiting time for surgery.

Use of ESAC has shown to be more efficient in terms of hospital bed occupation and indirectly, utilization of resources. The high surgical success rate also ensures fewer patients re-presenting with the same pathology to the acute take and hence contributes to reducing strain on the on-call team.

Further work is being done to reduce the number of patients presenting through the SAU pathway, and preferentially attending through ESAC.
Learning curve for laparoscopic liver resection: does it affect survival in colorectal liver metastasis?

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Background
After Gagner introduced laparoscopic liver resection (LLR) in 1992, it was not until 2004 that the first series with more than ten laparoscopic major liver resections was reported. Furthermore, a multicentre study by Allard et al., in 2015 revealed that laparoscopy was only used in 176 (6.7%) patients out of a total of 2620 patients treated for colorectal liver metastasis (CRLM). This lag time in the establishment of LLR was attributed to the steep learning curve (LC) due to technical complexity and caution about oncological safety. The aim of this study is to assess if the learning curve of LLR has affected survival of patients with CRLM.

Methods
All consecutive LLR performed by a single surgeon between 2000–2019 were retrospectively analysed. RA-CUSUM for conversion rate and the log regression analysis of the blood loss were used to identify two phases in the learning curve. LC was then applied to CRLM patients and the two subgroups were compared for oncological and survival outcomes. The analysis was repeated with propensity score-matched (PSM) groups

Results
A total of 286 patients were included in the learning curve analysis. Combining the results from the RA-CUSUM and the blood loss log curve identified two distinct phases in the learning curve. The early phase (EP, n=68) represented the initial learning experience, and the late phase (LP, n=218) represented increased competence and the introduction of more challenging cases.

The LC was applied to 192 patients with colorectal liver metastasis (EPc n= 45, LPc n=147). R0 resection was achieved in 93%; 100% in EPc and 90% in LPc (P=.02). The cohort median overall survival (OS) and was 60 months. The median recurrence-free survival (RFS) was 16 months. The 5-year OS and RFS were 51% and 33%, respectively. The overall and recurrence-free survival rates were not compromised by the learning curve; OS (HR: 0.78, 95% CI 0.51-1.2, p=.26), RFS (HR: 0.94, 95 % CI 0.64-1.37, p=.76). Results were replicated after PSM.

Conclusions
In our experience, the development of a laparoscopic liver resection program can be achieved without adverse effect on the long-term survival in CRLM.
Evaluation of the Utility of Prognostic Models for Patients Diagnosed with Peri-hilar Cholangiocarcinoma

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Background
Several potential prognostic models have been developed to stratify patients with peri-hilar cholangiocarcinoma (PHC) by Overall Survival (OS). The American Joint Committee on Cancer (AJCC) staging system is a post-resectional model utilising tumour-specific pathological parameters to stratify and predict OS. The Mayo Clinical (MC) scoring system has been developed utilising primarily clinical, serological, and radiological variables to predict survival in all patients with a diagnosis of peri-hilar cholangiocarcinoma. The objective of this study was to evaluate the utility of these models in determining prognosis for all patients presenting to a tertiary treatment centre with PHC.

Methods
Three hundred and two patients diagnosed with PHC referred to a regional tertiary referral centre between 2008 and 2019 had their demographic and survival data retrospectively analysed from a prospectively held database linked to Hospital Episode Statistics and Somerset Cancer Registry data. One hundred and twenty seven patients were surgically explored. Eight-four patients underwent resection. One hundred and seventy-four (57.6%) patients underwent palliative endoscopic therapy. Univariate and multivariate modelling was utilised to determine significant prognostic variables. Concordance Indices (C-Indices) were constructed for the prognostic models to determine internal validity within the cohort.

Results
Multivariate analysis demonstrated that: pre-interventional ECOG status (p<0.001); serum albumin (p<0.001); bilirubin levels (p<0.001); CA 19-9 levels (p<0.001) and resectional status (p<0.001) were significant predictors of OS. Patients stratified by the MC scoring system to early-stage disease had a significantly longer OS compared to patients fulfilling late-stage criteria (p<0.001). The predictive C-Indices for the MC model obtained significance in discriminating OS for the entire cohort (p<0.05) and un-resected patients (p<0.05). Neither model attained significant concordance for accurately discriminating OS in post-resectional patients.

Conclusions
The predictive performance of the stated prognostic models for OS have poor utility. Simple pre-interventional serological, functional and radiological variables appear to provide better prognostic indication of OS. Variables not incorporated in the AJCC registry have a significant effect upon post-resectional OS and require full incorporation into model prognostication.
Safety and Efficacy of Endoscopic Retrograde Cholangiopancreatography for Removal of Common Bile Duct Stones in the Nonagenarians: A Single Tertiary Centre Experience

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Sheffield Teaching Hospitals, Sheffield, United Kingdom

Background
It is estimated that one in four persons in the UK will be >65 years old by 2050. Endoscopic retrograde cholangiopancreatography (ERCP) is the recommended therapy for removals of common bile duct (CBD) stones. There is a lack of UK data on the outcome of ERCP in the very elderly. We aimed to investigate the safety and efficacy of ERCP in the management of CBD stones in the elderly >90 years old compared with those aged 65-89 years old.

Methods
We retrospectively analysed patients undergone ERCP between 2016-2020. Those with conditions other than suspected CBD stones were excluded. The following data was collected: general demographics, comorbidities, American Association of Anaesthesiology (ASA) grading, presence of dementia, anticoagulation therapy, endoscopic report on completed intention of treatment which is defined by either removal of stone and/or stent insertion. Also, post-procedure complications were collected including post-ERCP pancreatitis (PEP), bleeding, perforation, cholangitis, respiratory, and cardiovascular (CVS) events. Readmission within 7 days and death within 30 days were collected. Outcomes were reported as mean ± (SD) or n (%). Statistical significance was considered when P <0.05

Results
Total, 126 patients ≥ 90 years(group A) compared to 262 patients aged 65-89 years(group B). Higher rate of dementia, and anticoagulation therapy in Group A (17.4%) vs (0.4%), p <0.0001 and (36.5%) vs (17.9%), p <0.0001, respectively. Completed treatment was achieved in group A(90.5%) compared to group B(89.9%), p 0.7. One patient (0.8%) had PEP group A compared to 8(3.1%) group B, p 0.3. Overall complications (13.5%) group A vs (9.5%) group B, p 0.3. Four cases (3.2%) died within 30-day in group A compared to group B 5 (1.9%), p 0.5. There was no procedure-related death

Conclusions
ERCP for removal of CBD stones in >90 years old is effective. Risk of post-ERCP pancreatitis and overall adverse events were not higher in the > 90 years compared to 65-89 years old. We report a 30-day mortality rate of 3.2%. The most common cause of death was pneumonia including COVID-19 pneumonia.
Peri-operative thrombophilia in patients undergoing liver resection for colorectal metastases

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¹Hepatobiliary Unit, Hampshire Hospitals NHS Foundation Trust, Aldermaston Road, Basingstoke, Hampshire, RG24 9NA, United Kingdom. ²Haemophilia, Haemostasis & Thrombosis Centre, Hampshire Hospitals NHS Foundation Trust, Aldermaston Road, Basingstoke, Hampshire, RG24 9NA, United Kingdom. ³Department of Biochemical Sciences, University of Surrey, Guildford, Surrey, GU2 7XH, United Kingdom

Background
The risk of major haemorrhage during liver surgery has decreased considerably in the modern era. However, there remains reluctance amongst liver surgeons to give routine peri-operative chemical thromboprophylaxis, either because of the perceived risk of bleeding, or transient post-operative abnormalities in conventional coagulation studies. The aim of this study was to ask whether a defined, homogeneous population of patients undergoing liver resection for colorectal metastases (CRM) were at risk from venous thromboembolism (VTE) prior to surgery, and what the impact of liver resection was on that risk.

Methods
A single-centre prospective observational cohort study comparing pre-, peri- and post-operative haemostasis variables in patients undergoing liver resection for CRM. Patients with cirrhosis, history of VTE or anticoagulated were excluded, as were patients undergoing small wedge, or laparoscopic liver resections. Blood samples for coagulation assays were collected pre-operatively, peri-operatively (after transection) and first post-operative day (13–20 hours post-operatively). Pre- and post-operative Tissue Factor messenger ribonucleic acid (TFmRNA) activation was measured from peripheral blood mononuclear cells (PBMCs) using semi-quantitative polymerase chain reaction (PCR). Patients received peri-operative mechanical thromboprophylaxis until mobile, plus chemical thromboprophylaxis on the first post-operative day, after venesection.

Results
Of 336 hepatectomies performed October 2017-December 2019, 60 resections in 57 patients were recruited. This included 46.7% major resections, with median (interquartile range [IQR]) blood loss 150.0mls (76.3-263.7), no blood transfusions, post-operative VTE events or deaths. Patients were prothrombotic pre-operatively (high factor VIIIC and thrombin generation velocity index), an effect exacerbated post-hepatectomy. Major hepatectomies had a significantly greater drop in Protein C, rise in Factor VIIIC and von Willebrand Factor, versus minor resections (p=0.001,0.005,0.001 respectively). Patients with transection times greater than median (40minutes), had significantly increased median (IQR) PMBC-TFmRNA expression [1.65 (0.93-2.70)2ddCt], versus quicker transections [0.99 (0.69-1.28)2ddCt, p=0.020].

Conclusions
These data show the risk of major haemorrhage in elective liver resection in a high volume unit is low and administration of chemical thromboprophylaxis within 13-20 hours of surgery is safe and effective. The study demonstrates that patients with CRM are prothrombotic pre-operatively. Furthermore, this thrombophilia is exacerbated by liver resection, and most marked in patients with longer, more complex operations. These data suggest that chemical thromboprophylaxis should be considered earlier in the patient pathway, and has resulted in a change in practice for the authors.
Do Subsets of Patients with Intrahepatic Cholangiocarcinoma and Combined Hepatocellular-Cholangiocarcinoma Benefit from Transplantation? A Systematic Review, Proportional Meta-Analysis and Meta-Regression

William Cambridge¹,², Thomas Drake², Cameron Fairfield², Rachel Guest²
¹The University of Edinburgh, Edinburgh, United Kingdom. ²Department of Clinical Surgery, Edinburgh, United Kingdom

Background
Resection remains the main curative treatment option for intrahepatic cholangiocarcinoma (iCCA) and combined hepatocellular-cholangiocarcinoma (cHCC-CCA), however, outcomes are poor. Recent retrospective analyses of patients found to have incidental iCCA and cHCC-CCA following transplantation have suggested that transplantation may be superior to resection. We performed a systematic review and proportional meta-analysis to estimate the benefit of transplantation for iCCA and cHCC-CCA.

Methods
MEDLINE, EMBASE, Scopus, and Web of Science were searched from January 1990 to December 2020. All studies reporting patients with iCCA and cHCC-CCA undergoing transplantation were identified. A proportional meta-analysis was performed, pooling overall survival (OS), disease-free survival (DFS), and recurrence rates post-transplantation. Sub-group analyses were performed for patients with ‘early’ iCCA, ‘advanced’ iCCA, Goodman type I cHCC-CCA, and Goodman type II cHCC-CCA. Univariable meta-regression was completed assessing the impact of variables reported by at least five studies on OS and DFS at 5-years, as well as recurrence post-transplant.

Results
Twenty-eight studies including 489 patients were identified (249 with iCCA and 240 with cHCC-CCA). Pooled OS and DFS at 5-years were lower in the iCCA group, 30.2% (95% CI 18.6% – 43.1%) and 29.2% (95% CI 20.4% – 38.9%), compared to the cHCC-CCA group, 55.0% (95% CI 47.2% – 62.8%) and 43.2% (95% CI 30.2% – 56.7%). In the ‘early’ iCCA group, pooled OS at 5-years was 66.5% (95% CI 47.2% – 83.3%). When separated by Goodman type, those with type II tumours reported higher pooled OS, 69.7% (95% CI 57.8% – 80.5%), compared to type I tumours, 61.3% (95% CI 46.1 – 75.5). Univariable meta-regression found only microvascular invasion impacted overall survival at 5-years and recurrence following transplantation in the iCCA group. At 5-years there was a negative correlation between the proportion of patients found to have microvascular invasion and overall survival (Adjusted R2 = 0.89, p = 0.017). There was a positive correlation between the proportion of patients with microvascular invasion on explant pathology and recurrence following transplantation (Adjusted R2 = 0.76, p = 0.047).

Conclusions
Subsets of patients with iCCA and cHCC-CCA may benefit from liver transplantation. However, further research, including clinical trials exploring transplantation in ‘early’ disease and in comparison to resection, is required to conclude which subsets of patients will benefit most from transplantation.
The use of tumour marker Ca19.9 in the follow up of patients with resected biliary tract cancer: Results from the BILCAP randomised clinical trial

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2Univeristy Hospital Southampton NHS Foundation Trust, Southampton, United Kingdom. 3University of Birmingham, Birmingham, United Kingdom. 4The Christie NHS Foundation Trust, Manchester, United Kingdom. 5University of Edinburgh, Edinburgh, United Kingdom. 6The Royal Marsden NHS Foundation Trust, London, United Kingdom.
7University College London, London, United Kingdom

Background
Even after resection biliary tract cancer has a poor outlook. Follow-up is commonly utilises and the sialyl-Lewis tetra saccharide antigen Ca19.9, a known tumour marker in pancreatic and biliary malignancy (upper limit of normal (ULN) 37U/ml). However, the evidence base for the utility of Ca19.9 is limited. The UK BILCAP trial examined the use of adjuvant capecitabine chemotherapy in resected biliary tract cancer and establishing a new global standard of care. Ca19.9 was regularly measured as part of the BILCAP protocol, this provides an opportunity to assess the use of this marker in a large trial with complete patient follow-up.

Methods
Between March 2006 and December 2014 447 patients underwent resectional surgery (R0 or R1) then were randomised to receive capecitabine chemotherapy or observation. CT imaging and Ca19.9 were performed 3 monthly in year 1, 6 monthly in year 2, and annually thereafter up to 5 years. Follow up was continued until all patients had 5 years follow-up. Recurrence was based mainly on imaging criteria combined with the clinical presentation. The cohort was divided into progression and non-progression groups and the Ca19.9 values recorded were investigated using descriptive analyses with cut-off of 37 (ULN), 100 and 400U/ml.

Results
Of 447 study patients 440 had at least one Ca19.9 measurement from either post-operative baseline (394) or a follow-up visit (422). Baseline Ca19-9 was elevated above 37U/ml in 96 patients and 82 (85%) went on to develop recurrence. The sensitivity, specificity, positive predictive value (PPV) and negative predictive values (NPV) of the Ca19.9 on follow up are shown in the table.

<table>
<thead>
<tr>
<th>Cut off</th>
<th>Recurrence Positive</th>
<th>No recurrence Positive</th>
<th>Recurrence Negative</th>
<th>No recurrence Negative</th>
<th>Sensitivity</th>
<th>Specificity</th>
<th>PPV</th>
<th>NPV</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;400</td>
<td>103</td>
<td>3</td>
<td>199</td>
<td>135</td>
<td>34.1%</td>
<td>97.8%</td>
<td>97.2%</td>
<td>40.4%</td>
</tr>
<tr>
<td>&gt;100</td>
<td>170</td>
<td>11</td>
<td>132</td>
<td>127</td>
<td>56.3%</td>
<td>92.0%</td>
<td>93.9%</td>
<td>49.0%</td>
</tr>
<tr>
<td>&gt; 37</td>
<td>217</td>
<td>35</td>
<td>85</td>
<td>103</td>
<td>71.9%</td>
<td>74.6%</td>
<td>86.1%</td>
<td>54.8%</td>
</tr>
</tbody>
</table>

Conclusions
Although high Ca19.9 levels predict recurrence as shown by acceptable positive predictive values at cut-offs of 100 and 400U/ml the negative predictive values are very poor as most patients develop recurrence without elevation of Ca19.9. Ca19.9 measurement is of very limited value in the follow up of patients with resected biliary cancer.
Role of liver resection for metastases from uveal melanoma: Experience from a supra-regional centre, current evidence, and future prospects

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Background
Management of liver metastases from uveal melanoma (LMUM) requires a ‘multi-modal’ approach including surgical resection. This study aimed to evaluate the role, safety, and oncological effectiveness of liver surgery for patients with LMUM in the context multidisciplinary management. A comprehensive treatment pathway developed upon current published evidence, prevalent national guidelines and novel treatment options is presented (Figure 2).

Methods
Retrospective review of prospectively maintained database between February 2005 to August 2018 was performed using the institutional electronic patient record system from oncology and surgical department. Demographic data, MDT outcome letters, operative records, clinic letters, letters from referring hospitals, discharge summaries, radiology reports, and histology findings were reviewed. Focused literature review was conducted to identify all relevant publications. All advanced statistical analysis was performed using SPSS version 27.0 software (IBM Corp., Armonk, NY, USA). A p-value of <0.05 was considered to be statistically significant. The work was approved by the institutional clinical governance department (Audit ID 6661).

Results
31 patients underwent diagnostic laparoscopy and 17 patients received 19 liver resections locally (Figure 1). 7 major (≥ 3 seg) and 12 minor liver resections (14 laparoscopic) were done without any mortality or major complications. 10/19 (52.6%) were R0 resections. Overall survival positively correlated with the time from UM to LMUM (r = 0.859, p<0.0001). R0 or R1 resection margin status did not significantly influence survival outcomes (OS 25 Vs 28, p = 0.404; RFS 13 Vs 6 months, p = 0.596), though R1 cohort had longer lead time (100 Vs 24 months, p = 0.0408).

Conclusions
Liver resection for LMUM is safe, effective and complements multimodal management. Lead time from development of UM to LMUM remains a key factor affecting survival outcomes. As novel treatment modalities for regional and systemic disease control for metastatic uveal melanoma continue to develop, surgical intervention will also continue to evolve as part of the multi-disciplinary management. We emphasise the need for developing a collaborative database at a national and international level. We present an evidence-based, multi-disciplinary management pathway for LMUM patients (Figure 2).
O-L08
Prognostic value of body morphometrics in patients undergoing surgery for hilar cholangiocarcinoma

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Background
Hilar cholangiocarcinoma is an aggressive cancer with poor prognosis. Complex pre-operative workup is required prior to major surgery that frequently involves an extended hepatectomy with biliary reconstruction and is associated with high levels of post-operative morbidity and mortality. Tools to predict overall and disease-specific outcome are required to better tailor pre-habilitation interventions and selection of patients for surgery. Here we investigate whether body morphometrics are associated with disease-free and overall survival.

Methods
Consecutive patients undergoing resection of hilar cholangiocarcinoma were identified within a prospectively maintained database in a single institution. The CoreSlicer web-based app was used to calculate body morphometrics at the L3 vertebral level (muscle, visceral and subcutaneous fat areas) from portal-phase CT images. Median cut-offs defined patient groups and height-normalised morphometric values were compared at diagnostic and subsequent pre-operative imaging. Multivariate analysis was used to identify relationships between body morphometrics at time of diagnosis, changes in body morphometrics in the pre-operative period and outcome.

Results
Body morphometrics were assessed in 88 patients at the time of diagnosis. Of these patients, 53 underwent re-staging enabling an assessment of change in body morphometrics during the pre-operative period. Men displayed significantly higher muscle area, visceral fat and lower subcutaneous fat than women. High visceral fat area at diagnosis was an independent predictor of reduced overall survival (HR 1.81, 95% CI 1.1-3.3, P=0.03), whilst loss of skeletal muscle area during the pre-operative period was an independent predictor of reduced disease-free survival (HR 2.90, 95% CI 1.0-8.8, P=0.05). Patients with higher visceral fat at diagnosis also appear at increased risk of post-hepatectomy liver failure (PHLF) and experience significantly higher 30-day mortality than those without elevated visceral fat.

Conclusions
The presented results identify potential value in assessing body morphometrics as a prognostic tool in patients undergoing surgery for hilar cholangiocarcinoma. External validation of these findings in larger patient cohorts will help to determine whether this can be utilised to guide pre-habilitation interventions and appropriately select patients for surgery.
O-L09
Determining the Prognostic Utility of Immuno-histochemically detected Trans-membranous Human Equilibriative Nucleoside Transporter 1 (hENT1) in Patients Undergoing Hilar Cholangiocarcinoma Resection

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¹University Hospital Aintree, Liverpool, United Kingdom. ²Health Education North West, Liverpool, United Kingdom

Background
Human equilibriative nucleoside transporter protein 1 (hENT1) is a trans-membranous protein which facilitates nucleoside transport into the cell. Immunohistochemically-detected hENT1 abundance is increased in cholangiocarcinoma tumour cells compared to matched non-tumour cells and increased in highly metabolising cells. The privately-held Mackey 10D7G2 hybridoma has demonstrated prognostic utility in Pancreatic Ductal Adenocarcinoma patients. The commercially available Proteintech Polyclonal hENT1 antibody’s prognostic utility has not been previously assessed. Cellular Ki67 expression has been linked to mitotic indices of tumour proliferation. This proof-of-concept study aims to assess the antibodies prognostic utility for hilar cholangiocarcinoma patients undergoing surgical resection.

Methods
Between February 2009 and February 2016 54 patients underwent resection for peri-hilar cholangiocarcinoma. Formalin-Fixed Paraffin Embedded (FFPE) blocks from a sub-set of 44 resected specimens were retrieved. Appropriate areas of tumour were sampled from the blocks and a Tissue-Matched Array (TMA) was constructed. The TMA underwent staining for each antibody. H-scores were utilised to determine intensity of expression. Correlation of expression between antibodies was determined by Pearson correlation co-efficient and Chi-squared where appropriate. Silencing RNA transfected HepG2 cell-lines was used to determine hENT1 staining by the Proteintech antibody. Demographic and survival characteristics for the patients were acquired from a prospectively held database linked to Hospital Episode Statistics. Survival characteristics were calculated with global log-rank calculations.

Results
There was significant correlation between the Mackey 10D7G2 and the Proteintech antibodies (p<0.001). There was significant correlation between the Proteintech hENT1 antibody expression and Ki67 expression (p= 0.02). Knockdown of hENT1 with silencing RNA transfected HepG2 cells was confirmed by Western blot in a time-dependent fashion over 72 hours. The antibodies (Mackey; Proteintech; Ki67) did not achieve significance for predicting OS (p= 0.75; 0.63; 0.22 respectively). Nodal stage (p= 0.03) and grade of tumour differentiation (p= 0.02) were the univariate tumour variables with prognostic utility.

Conclusions
While the Proteintech antibody demonstrates concordance with the 10D7G2 antibody in determining hENT1 expression the antibodies did not demonstrate significant prognostic ability in this proof-of-concept study. Standard histopathological co-variates retain prognostic utility within the cohort.
Development and validation of multivariate prediction model of long-term survival after oesophagectomy in patients with oesophageal cancer

Rohan R Gujjuri, Jonathan M Clarke, Jessie A Elliot, John V Reynolds, Sheraz R Markar, ENSURE Study Group

Background
Long-term survival after oesophagectomy remains poor, with recurrence a feared common outcome. Prediction tools can help clinicians identify high-risk patients and optimise treatment decisions based on their prognostic factors. This study developed and evaluated a prediction model to predict long-term survival and time-to-recurrence following surgery for oesophageal cancer.

Methods
Patients who underwent curative surgery between June 2009-2015 from the European Investigation of Surveillance After Resection for Esophageal Cancer study were included. Prediction models were developed for overall survival (OS) and disease-free survival (DFS) using Cox proportional hazards (CPH) and Random Survival Forest (RSF). Model performance was evaluated using discrimination (time-dependent area under the curve (tAUC)) and calibration (visual comparison of predicted and observed survival probabilities).

Results
This study included 4719 patients with an OS of 47.7% and DFS of 48.4% at 5 years. Sixteen variables were included in the final model. CPH and RSF demonstrated good discrimination with a tAUC of 78.2% (95% CI 77.4-79.1%) and 77.1% (95% CI 76.1-78.1%) for OS and a tAUC of 79.4% (95% CI 78.5-80.2%) and 78.6% (95% CI 77.5-79.5%) respectively for DFS at 5 years. CPH showed good agreement between predicted and observed probabilities in all quintiles. RSF showed good agreement for patients with survival probabilities between 20-80% and moderate agreement in the <20% and >80% quintile groups.

Conclusions
This study demonstrated the ability of a statistical model to accurately predict long-term survival and time-to-recurrence after surgery for oesophageal cancer, with CPH and RSF models showing good discrimination and calibration. Identification of patient groups at risk of recurrence and poor long-term survival can improve patient outcomes by enhancing selection of treatment methods and surveillance strategies. Future work evaluating prediction-based decisions against standard decision-making is required to improve understanding of the clinical utility derived from prognostic model use.
O-OGC02
Stage Migration in Newly Diagnosed Oesophago-gastric Cancer during the first wave of COVID-19 Pandemic

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Glasgow Royal Infirmary, Glasgow, United Kingdom

Background
Covid-19 has significantly disrupted elective and emergency health care provision including cancer care within the UK. The aim of the study was to investigate the impact of the pandemic on the staging of oesophago-gastric cancers at presentation, determine the time delay in performing gastroscopy and the multidisciplinary team (MDT) treatment outcomes.

Methods
A retrospective cohort study of all newly diagnosed oesophago-gastric cancers (adenocarcinoma and squamous cell carcinoma) in a single regional MDT was performed between 1st October 2019 and 30th September 2020. Electronic records were interrogated and patients dichotomised into two groups with those presenting before the introduction of the UK national lockdown of 23rd March 2020 compared to those presenting post-lockdown.

Results
349 new oesophago-gastric cancer patients were discussed in the MDT (192 pre-lockdown versus 157 post-lockdown). Demographics were evenly matched between the two groups. More patients presented as an emergency admission post-lockdown (28.0% vs 12.5%, p<0.001). Median waiting time for gastroscopy was longer post-lockdown (23 vs 14 days, p=0.035). Metastatic disease at presentation was more frequent post-lockdown (47.8% vs 33.3%, p=0.008). Overall, more patients had a palliative rather than curative treatment intent post-lockdown (71.3% vs 57.8%, p=0.005).

Conclusions
The Covid-19 pandemic has had a significant negative effect on the stage of oesophago-gastric cancers at presentation. This has translated into more patients receiving palliative treatment and ultimately having a poorer prognosis. This study highlights the importance of maintaining cancer services during the Covid-19 pandemic.
Real-time tracking and classification of tumour and non-tumour tissue in upper gastrointestinal cancer specimens using diffuse reflectance spectroscopy

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Background
Diffuse reflectance spectroscopy (DRS) is a technique that allows discrimination of normal and abnormal tissue based on spectral data. It is a promising technique for cancer margin assessment. However, application in a clinical setting is limited by the inability of DRS to mark the tissue that has been scanned and its lack of continuous real-time spectral measurements. This aim of this study was to develop a real-time tracking system to enable localisation of the tip of a handheld DRS probe to aid classification of tumour and non-tumour tissue.

Methods
A coloured marker was attached to the DRS fibre probe and was detected using colour segmentation. A Kalman filter was used to estimate the probe’s tip position during scanning of the tissue specimen. In this way, the system was robust to partial occlusion allowing real-time detection and tracking. Supervised classification algorithms were used for the discrimination between tumour and non-tumour tissue, and evaluated in terms of overall accuracy, sensitivity, specificity, and the area under the curve (AUC). A live augmented view with all the tracked and classified optical biopsy sites were presented, providing visual feedback to the surgeons.

Results
A green coloured marker was successfully used to track the DRS probe. The measured root mean square error of probe tip tracking was 1.18±0.58mm and 1.05±0.28mm for the X and Y directions, respectively, whilst the maximum measured error was 1.76mm. Overall, 47 distinct sets of tumour and non-tumour tissue data were recorded through real-time tracking of ex vivo oesophageal and gastric tissue. The overall diagnostic accuracy of the system to classify tumour and non-tumour tissue in real-time was 94% for stomach and 96% for the oesophagus.

Conclusions
We have been able to successfully develop a real-time tracking system for a DRS probe when used on stomach and oesophageal tissue for tumour detection, and the accuracy derived demonstrates the strength and clinical value of the technique. The method allows real-time tracking and classification with short data acquisition time to aid margin assessment in cancer resection surgery.
Peri-operative chemotherapy versus preoperative chemoradiotherapy in treatment of Esophago-gastric junctional adenocarcinomas: A 10-year cohort study

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Background
Esophago-gastric junctional (EGJ) cancers have been considered recently as distinct tumour entity with characteristic genetic profiles. However, the optimal multimodal therapy of advanced EGJ cancers is still debatable. In this comparative study, we analysed the outcomes of peri-operative chemotherapy (CT) versus pre-operative chemoradiotherapy (CRT) in treatment of advanced EGJ adenocarcinomas.

Methods
This study included patients with locally advanced but resectable EGJ adenocarcinomas who underwent surgical resection after oncological therapy between 2010 till 2019, at our institution. Follow up till May 2021 was done. The outcomes between CT and CRT groups were retrospectively analysed. The long-term follow up data was obtained via direct contact with the patients during our oncological clinics, cross-checked with our hospital/national patients’ electronic databases.

Results
107 patients had EGJ cancers; 90 (84%) patients met our inclusion criteria. Peri-operative chemotherapy was received in 65 (72%) patients. Overall median survival rate was 2.2 years in CRT-group compared to 2.4 years in CT-group (p-value 0.29), with comparable recurrence rates (48% vs 36% respectively). R0-resections were higher in CRT-group (84%) compared to CT-group (71%), yet insignificant p-value 0.197. Preoperative chemoradiotherapy achieved higher complete pathological response (28% vs 6%, p-value 0.009) and negative lymph nodes rates (64% vs 37%, p-value 0.014) compared to CT-group. Short-term outcomes (postoperative complications, morbidity rates and length of hospital stay) were similar across both groups.

Conclusions
Preoperative chemoradiotherapy was associated with higher complete pathological response and negative lymph nodes rates for EGJ adenocarcinomas compared to peri-operative chemotherapy, without increase in postoperative complications or morbidity rates. However, it wasn’t associated with improved overall or disease-free survival rates. These findings supported the use of CRT in treatment of advanced EGJ adenocarcinomas.
Every venesection counts – can we improve patient experience in high-risk upper gastrointestinal surgery patients?

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Background
Patients with upper gastrointestinal (UGI) malignancy undergo major surgical resections resulting in significant postoperative inpatient stays. Central venous access is utilised to aid management of intraoperative physiology, immediate post-operative care and perioperative complications, which are often complex. Central venous catheters (CVC) and peripheral intravenous (IV) cannulae have a relatively short safe duration; consequently, these patients undergo numerous unpleasant venous access attempts.

Our aim was to optimise quality of care and patient satisfaction in this high-risk patient group, by inserting Peripherally Inserted Central Catheters (PICCs) pre-operatively to facilitate administration of intravenous (IV) medications, fluids and perioperative blood sampling.

Methods
We reviewed venous access management in this group from October 2019 to May 2020; recording numbers of IV cannulae, CVCs and any associated complications. From September 2020, all patients deemed high-risk, undergoing a major UGI resection were offered a PICC, inserted pre-operatively. We recorded data on use of CVCs and alternative venous access devices, peripheral venous stabs, complications and overall patient experience.

Results
Over the first 6 month period we sited 30 PICCs - significantly fewer patients required a perioperative CVC (9% vs 64%) in the PICC group and these lines remained in situ for much longer than CVCs (mean 17 days vs 4.7 days). The PICC group required fewer peripheral cannulae (mean 2.73 vs 5.95 per patient). One patient suffered deep vein thrombosis (DVT) but there were no other adverse consequences. Two patients (9%) were treated for fast ventricular response to Atrial Fibrillation successfully on their surgical ward, with IV Amiodarone via their PICC, negating need for critical care admission. Patients in the baseline study required peripheral stabs for blood sampling most days of their inpatient stay (median 12.5 days), whereas the majority of samples were taken from PICCs in the post-intervention group. Satisfaction scores were high in 100% of cases.

Conclusions
The introduction of PICCs in our high-risk UGI patients has been a huge success, positively influencing the patient journey. There are demonstrable outcome benefits with reduction in CVCs, peripheral cannulations and phlebotomy attempts. In addition, it has facilitated easier and timelier perioperative administration of IV fluids and medication, optimising patients’ experiences and care.
O-OGC06
Genomic analysis of response to neoadjuvant chemotherapy in oesophageal adenocarcinoma

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Background
Oesophageal adenocarcinoma (OAC) is the ninth most common cancer worldwide, with an estimated mortality of over 500,000 deaths yearly. Neoadjuvant chemotherapy (NAC) followed by surgery is the standard of care (SOC) for locally advanced OAC. Although almost all patients receive chemotherapy as SOC, fewer than 20% obtain a clinically meaningful response and benefit before surgery. The OAC genome is complex and heterogeneous between patients, and it is not yet understood whether specific mutational patterns may result in chemotherapy sensitivity or resistance.

Methods
To identify associations between genomic events and response to NAC in OAC, a comparative genomic analysis was performed in 65 patients using whole-genome sequencing. We defined response to NAC using Mandard Tumour Regression Grade (TRG), with responders classified as TRG1-2 (n=27) and non-responders classified as TRG4-5 (n=38).

Results
We report a higher non-synonymous mutation burden in responders (median 2.08/Mb vs 1.70/Mb, P=0.036) and elevated copy number variation (CNV) in non-responders (282 vs 136/patient, P<0.001). We identified CNVs unique to each group, with cell cycle (CDKN2A, CCND1), c-Myc (MYC), RTK/PIK3 (KRAS, EGFR) and gastrointestinal differentiation (GATA6) pathway genes being specifically altered in non-responders. Of particular interest was the identification of the Neuron Navigator-3 (NAV3), a known tumour suppressor downstream of EGFR, which was mutated exclusively in non-responders with a frequency of 22%.

Conclusions
Our work characterises genetic features and mutations that are uniquely associated with response to NAC. We envision a treatment pipeline that incorporates driver mutation profiling in OAC, combining response prediction with targeted therapies to enhance response to NAC and improve survival outcomes.
Endoscopically derived oesophageal adenocarcinoma organoids to assess potential response to neo-adjuvant therapy and virotherapy

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Background
Organoids are 3D models that retain the architecture and function of the organ from which they are derived. Culture of oesophageal adenocarcinoma organoids from individual's standard endoscopic biopsies to assess response to therapy could dramatically alter the neo-adjuvant treatment paradigm, giving clarity over who will benefit from therapy, including novel treatment methodologies. Immune checkpoint blockade (ICB) has been shown to be effective in oesophageal adenocarcinoma. Combining Oncolytic Virotherapy with ICB could enhance the action of ICB alone, through selective infection of tumour cells accompanied by immunogenic cell death, with release of neo-tumour antigens and alteration of the tumour microenvironment.

Methods
This study uses organoids derived from endoscopic biopsies to assess the viability of an oncolytic herpes simplex virus in the treatment of oesophageal adenocarcinoma. Samples were taken at staging endoscopy using standard biopsy forceps. Tissue specimens were dissociated using the Miltenyi tumour dissociation kit before being suspended in Matrigel in conditioned media. Media was changed every 48 hours with domes being split every 7-10 days. After >6 passages organoids were incubated with an oncolytic herpes simplex virus lacking ICP 34.5 and 47. Growth was monitored, and green fluorescence protein expression measured using the Incucyte SX5 Live Cell Analysis system.

Results
Organoids were successfully established and cultured beyond 6 passages for patients with oesophageal adenocarcinoma. Organoids incubated with an oncolytic herpes simplex virus demonstrated significantly reduced growth compared to untreated organoids with increased expression of green fluorescence protein indicating viral infection.

Conclusions
We have demonstrated a successful methodology to culture Oesophageal adenocarcinoma organoids from endoscopic biopsies. Further work to determine their responses to standard chemotherapy used in the perioperative phase will help to assess their potential for providing bespoke therapy in the future. Oncolytic herpes simplex virus is able to infect and cause lysis of OAC organoids supporting its potential use in driving an increased inflammatory tumour microenvironment which could be combined with immune checkpoint blockade to induce durable responses for patients.
The Impact of Anastomotic Techniques on Post-operative Anastomotic Complications: Results of the Oesophago-Gastric Anastomosis Audit (OGAA)

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Background
The optimal anastomotic techniques in esophagectomy to minimize rates of anastomotic leakage (AL) and conduit necrosis (CN) are not known. The aim of this study was to assess whether anastomotic technique is associated with anastomotic failure after esophagectomy in the international Oesophago-Gastric Anastomosis Audit (OGAA) cohort.

Methods
This prospective observational multicenter cohort study included patients undergoing esophagectomy for esophageal cancer over nine months in 2018. The primary exposure was the anastomotic technique, classified as handsewn, linear stapled or circular stapled. The primary outcome was a composite of AL and CN, as defined by the Esophageal Complications Consensus Group. Multivariable logistic regression modelling was used to identify the strength of association between anastomotic techniques and anastomotic failure.

Results
Of the 2238 esophagectomies, the anastomosis was handsewn in 27.1%, linear stapled in 21.0% and circular stapled in 51.9%. Anastomotic techniques differed significantly between the anastomosis site (p<0.001), with the majority of neck anastomoses being handsewn (69.9%), whilst most chest anastomoses were stapled (66.3% circular stapled, 19.3% linear stapled). Rates of AL/CN differed significantly between the anastomotic techniques (p<0.001), from 19.3% in handsewn anastomoses, to 14.0% in linear stapled, and 12.1% in circular stapled. This was confirmed by multivariable analysis (Odds ratio (OR): 0.63, 95% CI: 0.46 - 0.86) for circular stapled vs. handsewn anastomosis. However, subgroup analysis by anastomosis site suggested that this effect was predominantly present in neck anastomoses, with AL/CN rates of 23.2% vs. 14.6% vs 5.9% for handsewn vs. linear stapled anastomoses vs circular stapled, compared to 13.7% vs. 13.8% vs 12.2% in chest anastomoses.

Conclusions
Handsewn anastomoses appear to be associated with higher rates of anastomotic failure for anastomoses in the neck. However, anastomotic failure rates in the chest were similar across techniques and there was no significant difference on multivariable analysis. Further research into standardization of approach and techniques may further improve outcomes.
O-OGC09
PD-1 inhibitors in Oesophageal Cancer: A systematic review of the oncological outcomes associated with PD-1 blockade and the evolving therapeutic landscape

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Background
Patients with oesophageal or gastro-oesophageal junction (GOJ) cancer that fail to respond to chemoradiotherapy have a poor clinical prognosis. Recent clinical trials have investigated the use of immune checkpoint inhibitors in these patients. The use of programmed cell death protein 1 (PD-1) inhibitors have emerged as exciting therapeutic options in other solid tumors, such as non-small cell lung cancer, renal cell carcinoma and melanoma. We assessed the efficacy and safety of PD-1 inhibitors in oesophageal and GOJ cancers.

Methods
This systematic review was performed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. A comprehensive electronic literature search from the EMBASE, Pubmed, Scopus, MEDLINE and Google Scholar databases was conducted up to April 1st 2021.

Results
This review identified nine eligible studies reporting outcomes of 2149 patients treated with PD-1 blockade compared with 1244 patients treated with either a placebo or the standard regimen of chemotherapy for oesophageal and GOJ cancer. Clinically significant improvements in median overall survival have been demonstrated in advanced and metastatic oesophageal and GOJ cancer while maintaining acceptable safety profiles. Promising survival data has also recently emerged from PD-1 blockade in the adjuvant setting.

Conclusions
PD-1 blockade in oesophageal and GOJ cancer has delivered impressive survival benefit whilst remaining well tolerated. Its use in the adjuvant setting may further advance our treatment options for this difficult-to-treat tumour, and more advancements in the immunotherapy landscape are highly anticipated. However, further characterization of the PD-1/PD-L1 pathway is required to optimise patient selection.
**Category: Pancreas**

**O-P01**

**Potential Utility of Intraoperative Fluid Amylase Measurement During Pancreaticoduodenectomy**

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**Background**

Postoperative pancreatic fistula (POPF) after pancreaticoduodenectomy (PD) is a source of major morbidity and mortality. Early diagnosis and treatment of POPF is mandatory to improve patient outcomes, and clinical risk scores may be combined with postoperative drain fluid amylase (DFA) values to stratify patients.

The aim of this study was to determine if intraoperative fluid amylase values (IFA) correlate with DFA1 and POPF.

**Methods**

In consecutive patients undergoing PD between February and November 2020, intraoperative samples of intra-abdominal fluid adjacent to the pancreatic anastomosis were taken and sent for fluid amylase measurement prior to abdominal closure. Data regarding patient demographics, postoperative DFA values, complications and mortality were prospectively collected.

**Results**

Patient Demographics: Data was obtained for 52 patients with a median alternative Fistula Risk Score (aFRS) of 9.4. Postoperative complications occurred in 20 patients (38%), including five Clavien grade 3+. There were eight POPFs and two patients died (pneumonia/sepsis). There was significant correlation between IFA and DFA1 (Pearson’s correlation: $R^2=0.713$; $p<0.001$) and DFA3 ($p<0.001$), and median IFA was higher in patients with POPF than patients without (1232.5 vs. 122; $p=0.0003$). IFA $>260$ U/l predicted POPF with sensitivity, specificity, PPV and NPV of 88%, 75%, 39% and 97%, respectively. The incidence of POPF was 43% in high risk (high aFRS/IFA) and 0% in low risk patients (low aFRS/IFA).

**Complications:**

![Figure 1. Scatter Plot Showing Logarithmic Distribution](image)

![Figure 2. ROC curve for Intraoperative Fluid Amylase (IFA) and DFA1>350](image)

![Figure 3. ROC curve for Intraoperative Fluid Amylase (IFA) and development of POPF](image)

- **Figure 1.** Scatter Plot Showing Logarithmic Distribution
- **Figure 2.** ROC curve for Intraoperative Fluid Amylase (IFA) and DFA1>350
- **Figure 3.** ROC curve for Intraoperative Fluid Amylase (IFA) and development of POPF

AUC of 0.921 with a 95%CI of 0.848 to 0.994, $p<0.001$

AUC of 0.905 with a 95%CI of 0.794 to 1.000, $p<0.001$

**Conclusions**

Intraoperative fluid amylase closely correlated with postoperative pancreatic fistula, and may be a useful adjunct to clinical risk scores to stratify patients during pancreatico-duodenectomy, allowing targeted intervention to reduce the clinical impact of pancreatic fistula. It is possible to detect fluid amylase adjacent to the completed pancreatic anastomosis in patients undergoing PD. Presence of IFA correlates with postoperative DFA and POPF.

IFA increases the accuracy of the alternate Fistula Risk Score in predicting POPF. Low risk patients with a low IFA may be suitable for a ‘no drain’ strategy, whilst patients with a high IFA may benefit from intraoperative mitigation strategies to reduce the incidence and/or severity of a postoperative pancreatic fistula.
A fast-track surgery programme leads to timelier treatment and higher resection rates in pancreatic cancer

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Background
Pancreatic cancer is currently the fourth most common cause of cancer-related mortality in the economically developed world and is set to become the second most common cause of cancer-related mortality within the next few years. NICE guidance makes a strong recommendation to offer up-front surgery to people with resectable pancreatic cancer, without preoperative biliary drainage, if sufficiently fit for surgery. The aim of this study was to perform a propensity-matched comparison of patients with pancreatic cancer undergoing surgery, with and without biliary stenting, to examine perioperative outcomes and to perform an intention to treat analysis to evaluate long-term survival between the two groups.

Methods
This was an observational study of a cohort of consecutive patients presenting with obstructive jaundice and undergoing pancreatoduodenectomy for pancreatic and peripancreatic malignant neoplasms between November 2015 and May 2019. Data related to patient and tumour characteristics, biliary drainage, surgery and histopathology were gathered and analysed from a prospectively maintained electronic database. Post-operative complications were defined and graded according to the definitions of the International Study Group on Pancreatic Surgery (ISGPS) and the Clavien-Dindo system. Data related to adjuvant treatment, disease recurrence and overall survival were also analysed.

Results
In this retrospective study of 216 consecutive operable patients, 70 followed the fast-track (FT) pathway and 146 had pre-operative biliary drainage (PBD). All 70 patients in the fast-track group and 122 out of 146 in the PBD group proceeded to surgery (100% and 83.6% respectively, p=0.001). Interval time from diagnostic CT scan to surgery and from MDT decision to treat to surgery was much shorter in the FT group (median range) 8 vs 43 days p<0.001 and 3 vs 36 days p<0.001 respectively) as was the overall time from diagnostic CT to adjuvant treatment (88 vs 121 days p<0.001). Postoperative outcomes including in-hospital stay, number and grading of complications, readmission rate and mortality rates were comparable in the two groups. There was no difference in survival between the two groups.

Conclusions
These data strengthen the existing evidence that, for a person with pancreatic cancer who is proceeding to surgery, the best approach is to avoid pre-operative biliary drainage. The optimal comparison to the neoadjuvant approach is upfront fast-track surgery without biliary drainage followed by adjuvant therapy.
A composite polymeric nanoparticle as a sensitiser for sonodynamic therapy (SDT)-based treatment of pancreatic cancer

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Background
Pancreatic cancer remains one of the most recalcitrant forms of cancer with poor prognosis and limited treatment options. SDT is a novel, targeted approach to the treatment of solid tumours. Based on the generation of cytotoxic reactive oxygen species (ROS) following the exposure of a sonosensitiser to ultrasound, the approach is designed to extracorporeally target less accessible lesions. Here we describe the production of a poly(lactic-co-glycolic acid) (PLGA), polyethyleneimine (PEI), Rose Bengal (RB) and indocyanine green (ICG) containing composite nanoparticles and describe their use in SDT-mediated treatment of pancreatic cancer using both in vitro and in vivo target models.

Methods
Nanoparticles were prepared using an oil in water emulsion and solvent diffusion-based approach. These were designated RB-ICGNP. In vitro SDT treatment consisted of exposing BxPC3 (human PDAC cells), T110029 (murine PDAC cells) or hPSC (immortalised human pancreatic stellate cells) to RB-ICGNP and subsequently treating with ultrasound for 30 s at a frequency of 1 MHz, a power density of 3.0 W/cm² (SATP) using a duty cycle of 50% at a pulse repetition frequency of 100 Hz. For in vivo studies, BxPC3 (xenograft) and T110029 (syngeneic) tumours were treated with a power density of 3.5 W/cm² ultrasound for 3.5 min.

Results
1. Of the three cell lines treated with RB-ICGNP-mediated SDT, the pancreatic stellate cell line was the most sensitive. This suggested that SDT may play a role in reducing tumour stroma.
2. By exploiting the ICG in the nanoparticles, realtime nIR fluorescence imaging of tumour-bearing animals following IV administration of RB-ICGNPs, demonstrated tumour uptake of nanoparticles.
3. Both human xenograft and syngeneic preclinical models of pancreatic cancer exhibited significant responses to RB-ICGNP-mediated SDT.
4. Histological staining of residual tumour tissues from SDT-treated animals with Sirius Red (connective tissue) demonstrated reduced stroma when compared with untreated tumours.

Conclusions
Using in vitro and in vivo (human xenograft and murine syngeneic) models of pancreatic cancer, RB-ICGNP composite nanoparticles may be employed as a sensitiser for SDT-based treatment of pancreatic cancer. Since pancreatic stellate cells were more sensitive to SDT, the latter may have an impact on tumour stroma. Staining of residual tumour tissues from SDT-treated animals for connective tissue (stroma) confirmed the latter. Since tumour stroma presents a significant challenge to treatment of pancreatic cancer and represents a negative prognostic marker, the impact delivered by SDT may be exploited to potentiate alternative therapeutic approaches.
Sonodynamic Therapy Complements PD-L1 Immune Checkpoint Inhibition in a Murine Model of Pancreatic Cancer

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Background

The emergence of immune checkpoint inhibitors (ICI’s) in the past decade has proven transformative in the area of immuno-oncology. The PD-1 / PD-L1 axis has been particularly well studied and monoclonal antibodies developed to block either the receptor (anti PD-1) or its associated ligand (anti PD-L1) can generate potent anti-tumour immunity in certain tumour models. However, many “immune cold” tumours remain unresponsive to ICI’s. Sonodynamic therapy (SDT) is a targeted anti-cancer treatment that uses ultrasound to activate a sensitiser with the resulting generation of reactive oxygen species (ROS) causing direct cell death. SDT has also been shown to stimulate the adaptive immune system in a pre-clinical cancer model. We investigate the ability of combining ICI and microbubble mediated SDT at controlling tumour growth in a bilateral pancreatic cancer model.

Methods

Preparation of O2MB-RB are shown below (scheme 1). Cytotoxicity of SDT and immunotherapy in-vivo are illustrated below (Figure 1). Figure 1 highlights that T110299 cells were subcutaneously implanted in the right and left dorsum of C57 mice. Group 1 received an IP injection of anti-mouse PD-L1 antibody (10mg/kg). After 2 hours, mice in this group received an IV injection of O2MB-RB suspension while receiving ultrasound applied to the right-hand-side (target) tumour. Group 2 received the same as Group 1 but no anti PD-L1 antibody; Group 3 received anti-PD-L1 antibody alone and Group 4 remained untreated. Flow cytometry analysis were carried out to investigate tumour infiltrating CD4+ and CD8+ T-lymphocytes.

Results

The results demonstrated a significant 287% decrease in tumour volume when compared to untreated animals 11 days following the initial treatment with SDT, which reduced further to 369% when SDT was combined with anti-PD-L1 ICI treatment. Analysis of residual tumour tissues remaining after treatment revealed increased levels of infiltrating CD4+ and CD8+ T-lymphocytes (respectively 4.65 and 3.16-fold more) in the off-target tumours of animals where the target tumour was treated with SDT and anti-PD-L1, when compared to untreated tumours. These results suggest that SDT treatment elicits an adaptive immune response that is potentiated by the anti-PD-L1 ICI in this particular model of pancreatic cancer.

Conclusions

In conclusion, microbubble mediated SDT treatment of a target tumour in a bilateral tumour model of pancreatic cancer, enables growth control at both the target and off-target tumours which is further enhanced when combined with anti-PD-L1 ICI treatment. Combining SDT with anti-PD-L1 ICI treatment, which is also well tolerated, could provide an attractive treatment option for pancreatic cancer, particularly for patients with advanced disease who may not be physically capable of undertaking a toxic chemotherapy regimen.
Background
Ultrasound targeted microbubble destruction (UTMD) has emerged as an effective strategy for the delivery of drug payloads to solid tumours. However, loading a single microbubble (MB) formulation with two drug payloads is challenging and often involves several manipulations post-MB preparation to enable attachment of drug payloads which can be cumbersome and generally results in low / inconsistent drug loading. Here we report a one-step synthesis of a gemcitabine-functionalised phospholipid and its subsequent incorporation into a stable MB formulation co-loaded with paclitaxel (PTX). The efficacy of the MB conjugate was determined in a Panc-1 spheroid model and ectopic BxPC-3 tumour model of pancreatic cancer.

Methods
Gemcitabine-modified phospholipid (Lipid-Gem MB) was prepared from 1,2-dibehenoyl-sn-glycero-3-phosphocholine (DBPC) through a transphosphatidylation reaction using gemcitabine (Gem) as the acceptor alcohol. Lipid-Gem MB and Lipid-Gem-PTX MB were prepared from Lipid-Gem MB and/or PTX using a standard thin-film hydration technique followed by sonication in the presence of PFB gas. In vitro efficacy of Lipid-Gem MB and Lipid-Gem-PTX MB were determined in Panc-1 spheroids using an MTT assay. The in vivo effectiveness was determined in BxPC-3 tumour bearing mice following IV administration of either Lipid-Gem MB or Lipid-Gem-PTX MB plus ultrasound (US). Free Gem, free Gem + PTX and untreated mice were used for comparative purposes.

Results
Spheroids treated with Lipid-Gem MB +US or Lipid-Gem-PTX MB +US were significantly reduced relative to spheroids treated with US alone (p =0.033 and p =0.0031 respectively) or with the respective MB formulation alone (i.e. no US) (p =0.0336 and p =0.0037 respectively). Furthermore, cell viability for spheroids treated with Lipid-Gem-PTX MB +US was significantly reduced compared with spheroids treated with Lipid-Gem MB +US (p =0.0077) (Figure a). Mice treated with Lipid-Gem MB +US or Lipid-Gem-PTX MB +US showed an average change in tumour volume of +7 ± 7% and -10 ± 10 % respectively compared with +45 ±10% and +30 ± 10% for free gem and free gem + PTX respectively (Figure b).

Conclusions
A Gem-modified lipid was successfully synthesised using a single step reaction and was subsequently incorporated into MBs containing PTX, eliminating the need for cumbersome drug conjugation methods. UTMD mediated treatment of Panc-1 spheroids and BxPC-3 tumours demonstrated the efficacy and tolerability of the formulations. Given that all components of this formulation are already clinically approved, UTMD using Lipid-Gem-PTX MB offers a promising alternative to existing treatments.
O-P06
Early postoperative differentiation between biochemical leak and clinically-relevant pancreatic fistula after pancreaticoduodenectomy: development of a predictive risk score

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Background
Several risk scores are available which predict pancreatic fistula after pancreaticoduodenectomy (PD), but do not differentiate between biochemical leak (BL) and clinically relevant pancreatic fistula (CR-POPF). The aim of this study was to identify factors that differentiate between BL and CR-POPF in the early postoperative period.

Methods
Consecutive patients diagnosed with BL and CR-POPF after PD were identified from a prospectively maintained database (2009-2019). Data were collected for demographics, intraoperative and laboratory parameters on the first five postoperative days (PODs), including drain fluid amylase (DFA), C-reactive protein (CRP) and albumin. Independent predictors of CR-POPF were identified using a multivariable binary logistic regression model, which was subsequently converted to a risk score.

Results
187 patients consisted of 99 BL and 88 CR-POPF. In those with CR-POPF, the leak became clinically relevant a median of 9 days after surgery; these patients had a significantly higher length of hospital stay than those with BL (median: 24 vs. 10 days, p<0.001). On multivariable analysis, male gender (p=0.002), higher DFA (p<0.001) or CRP (p<0.001) on POD3, lower albumin (p=0.028) on POD3 were all found to be independent predictors of CR-POPF. A risk score based on these factors returned an area under the ROC curve of 0.78.

Conclusions
In patients with a confirmed pancreatic fistula it may be possible to differentiate between BL and CR-POPF using early postoperative variables, particularly DFA, serum albumin and CRP. Early identification of CR-POPF may allow earlier intervention to improve clinical outcomes.
Optimising design of national collaborative studies in surgery: national availability of electronic data in the NHS

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Background
Clinical trials are constrained in part by cost and limited funding opportunities. Trainee-led collaborative, multi-centre research models have become increasingly popular, enabling clinicians to undertake impactful national and international practice-changing studies with limited funding. However, ensuring equitable and efficient data collection from participating centres requires understanding data accessibility. Here, we reflect upon our strategies in designing and delivering collaborative research (The RICOCHET Study). Specifically, we consider the availability of data sources for UK hospitals, to enable effective design of study case report forms to ensure study success.

Methods
RICOCHET was a National trainee-led audit of UK hospitals treating patients with pancreatic cancer. All registered hospitals were asked to complete a site-survey at point of registration. The site survey was completed by the lead consultant (surgeon or gastroenterologist) or the lead trainee at each site. The site-survey detailed hospital demographics, including size, availability of services and availability of patient data electronically. The survey was completed online via REDCap. Sites lacking full reporting were excluded from the analyses.

Results
98 UK sites registered for RICOCHET, and 94 completed the site-survey (26 specialist pancreatic sites; 68 non-specialist sites). 100% sites had electronic radiology reports. However, electronic ward-round notes were available at only 19% (5/26, 19.2% specialist vs. 13/68, 19.1% non-specialist; p=0.99). Furthermore, sources such as external letters were low (29%; 11/26 42.3% specialist vs. 16/68, 23.5% non-specialist; p=0.072). Although electronic interventional radiology reports were broadly available at 79% sites, this was significantly lower at non-specialist sites (49/68 72.1% vs. 25/26 96.2%; p=0.011).

Conclusions
Availability of electronic data is not consistent across sites managing pancreatic cancer patients. Significant disparity exists between specialist and non-specialist centres, highlighted by lack of availability of interventional radiology reports. To ensure success in trainee-led cohort studies we recommend designing concise case report forms that can be easily completed from electronic data sources. Until this report, there was no data available for the availability of electronic data across the NHS. This represents the most comprehensive report of such data sources, and will guide future study design of national studies at both specialist and non-specialist pancreatic centres in the UK.
O-P09
PACT-UK: PAncreatic Cancer reporting Template - a national pan-specialty collaborative consensus project to develop a standardised radiological reporting proforma for pancreatic cancer

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Background
In line with the NCRI framework, appropriate staging and classification of pancreatic cancer, with particular relevance to vascular involvement, is essential to ensure patients are offered all potential treatment options both at diagnosis and post-neoadjuvant therapy. This pan-specialty national collaborative consensus project, supported by PCUK, AUGIS, PSGBI, RCSEng, NCRI, RCR and BSGAR, aimed to develop a succinct radiological reporting template to allow a more consistent and standardized means of detailing all clinically-relevant aspects of pancreatic cancer, which, in addition to the aforementioned benefits, will allow more efficient MDT review, improved ability to audit national practice, and optimized clinical trial design.

Methods
In stage one, a core group of stakeholders from surgery, radiology and oncology was formed to establish current practice and determine the optimal data-set for a template. This included a blinded radiological validation study of established templates in use (Beth-Israel, PROTRACT and Glasgow proformas), and national survey of consultant surgeons on the PSGBI mailing list. Thereafter, consensus meetings led to the development of a provisional template. In stage two, representatives from surgery, radiology and oncology at all UK HPB units attended a consensus meeting to discuss and finalise the first official template draft, with subsequent trial utilisation in clinical practice.

Results
In stage one, the radiological assessment highlighted a significant variation in reporting of vascular involvement, with 100% concordance in only 30% of cases. Within the surgeon survey, amongst various tumour-related factors, most notably a significant majority preferred a specific range of degrees of vascular involvement, and specific information regarding tributary involvement and associated narrowing/occlusion/thrombosis. Both processes, and subsequent national consensus meetings in stage two, helped establish the ideal factors required in a template with respect to usability, clinical relevance, applicability and IT-factors, resulting in the generation of the PACT-UK proforma that will be presented at the congress.

Conclusions
This pan-specialty collaborative consensus project has successfully produced the first nationally-developed pancreatic cancer radiological reporting template. In stage three, the PACT-UK group aim to continue trialing the proforma nationally, with upcoming workshops facilitated by RCR/BSGAR to ensure buy-in from radiologists at all HPB units. Further representation from all units is welcomed, with the philosophy that template data-points can and will continue to evolve on the basis of ongoing feedback from consensus meetings, and following the development of more aggressive surgical techniques and novel neoadjuvant therapies. Plans for the use of PACT-UK within national audit and clinical trials is under-way.
Poster Presentations

Category: Bariatrics

P-B01
First Inventory of Access and Quality of Metabolic Surgery across Europe

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Background
Europe consists of 51 independent countries. Variation in healthcare regulations results in differing challenges faced by patients and professionals. The obesity pandemic has multiple health, economic and social implications. However, metabolic surgery is not universally accessible, with significant variations in its provision. This study aimed to gain insight into compliance with international guidelines; the accessibility and barriers to surgery; patient pathways and quality indicators of both metabolic and body contouring surgery after weight loss in different European countries.

Methods
This study was initiated during the European Obesity Academy (EOA). Expert representatives in the metabolic field from all 51 European countries were sent a novel, 37-item, electronic self-administered online questionnaire on their data and experiences from the previous year exploring accessibility to and quality indicators for metabolic surgery and body contouring surgery after weight loss. The survey tool was peer-reviewed by experienced researchers and piloted by fifteen experienced researchers with a spread of seniority and specialty. Content and face validity were ensured by peer-review and the piloting process. 45 completed responses were collected.

Results
68% of countries had eligibility criteria for metabolic surgery; 59% adhered to these. 46% had reimbursement criteria for metabolic surgery. 41% had eligibility criteria for plastic surgery and 31% reimbursement criteria. Average tariffs for a metabolic procedure varied (€800–€16000). MDTs were mandated in 78%, with team members varying significantly. Referral practices differed. In 45% metabolic surgery is performed by pure metabolic surgeons. 23% had a metabolic training program. Access to metabolic surgery was rated poor/very poor in 33%. 35% had a bariatric registry. 24% required a minimum procedure number for metabolic centres; varying from 25 to 200 procedures.

Conclusions
This is the first study to describe accessibility and quality data on metabolic and body contouring surgery from most European countries. There are myriad differences between European countries in terms of accessibility to metabolic surgery. Lack of funding, education and structure fuels this disparity. We hope this study will impact standardisation of access and quality indicators for metabolic and body contouring surgery across European countries, as well as be a springboard for further evaluation of international metabolic surgery practices.
P-B02
Does the length of alimentary limb make a significant difference in the weight loss in Roux en y gastric bypass patients?

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Background
Roux en Y gastric bypass (RYGB) surgery for morbid obesity is considered as gold standard, but there can be a difference in the length of alimentary and biliopancreatic limb to achieve optimum weight loss. Till now there is no agreed consensus on the ideal limb lengths and their effect on the weight loss. We would like to evaluate the change in the alimentary limb length on the weight loss after the gastric bypass surgery, as a short to medium term single center study.

Methods
A retrospective analysis from prospectively maintained database of 523 patients who underwent RYGB from 2012 till 2018 was done. Patient who had at least a follow up of 2 years(n=388) were included. At our center we use alimentary limb of 120 +/- 10 cm for Body Mass Index (BMI) < 40 kg/m² (group A) and 150 +/- 10 cm for the BMI >40 kg/m² (Group B). The biliopancreatic limb length varies from 50 to 70 cm and this does not change with BMI. The percentage excess weight (EWL) loss was measured and analyzed at 1st and 2nd year post operatively. We used paired t test to check for statistical significance.

Results
There were 172 patients in Group A and 216 in Group B. The number of females were 330 and males were 58. The average age was 44 years. The mean preoperative BMI for the 120 cm limb group was 37.1 kg/m² and that for 150 cm limb was 45.3 kg/m². The EWL for the group A at 1 year and 2 year post op was a Mean and standard deviation of 79.3% +/- 39.4% and 78.3% +/- 35.2% respectively and for group B was 58.8% +/- 26.6% and 58.6% +/- 23.2% respectively. The difference was statistically significant (p<0.001). The analysis and interpretation for metabolic syndrome is yet to be determined.

Conclusions
In our study, Increasing the alimentary limb length for higher BMI reduced EWL. This is consistent with few other publications regarding the same. This has resulted in a change in our practice namely keeping the length of alimentary limb constant and varying the BP limb length. We will be analyzing and presenting this data in future.
Gastric Band Tubing Causing Small Bowel Obstruction

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Background
Laparoscopically adjustable gastric bands (LAGB) have been widely employed as a means of weight loss in bariatric surgery over the past two decades. Although now largely superseded by other bariatric surgical techniques, complications from gastric bands continue to be encountered in surgical practice.
We report an unusual case of small bowel obstruction due to an internal hernia caused by gastric band tubing resulting in closed loop small bowel obstruction. This is not commonly encountered and emergency general surgeons need to have a high index of suspicion for this condition as a possible cause for small bowel obstruction.

Methods
A 40 year old male presented with abdominal pain, vomiting and failure to open bowels or pass flatus for nine days. Twelve years previously (2008) he had had Roux n Y gastric bypass (RYGB), followed by by laparoscopic gastric banding of the RYGB about two years later (2010) also in the private sector. He had a soft but distended abdomen, and empty rectum on rectal examination.
CT scan abdomen reported as:
Multiple loops of distended small bowel demonstrated. No air seen in rectum, indicative of small bowel obstruction. No pneumoperitoneum. There is dilatation of the mid and distal small bowel seen to an apparent transition point in the mid abdomen where a loop is noted associated with the tubing for the inflation device for the gastric band. This appears to be centred on the cause of obstruction and appears tied around the base of mesentery and may be creating a closed loop obstruction, by having created an internal hernia.
This patient had an internal hernia around loop of the gastric band tubing with resultant closed loop small bowel obstruction.
The patient underwent diagnostic laparoscopy with ileo-caecal resection and primary anastomosis. He made successful recovery. Deflated gastric band remains in-situ.

Results
While small bowel obstruction is most commonly due to adhesions in individuals who have had previous laparotomy, it is important to bear in mind other causes such as internal hernias particularly in cases of those with history of previous gastric banding or Roux n Y gastric bypass. Early intervention may be necessary to reduce the likelihood of bowel ischaemia and bowel resection. Laparoscopy is a useful tool in the management of small bowel obstruction. Keywords: gastric band, small bowel obstruction, closed loop, emergency surgery, laparoscopy

Conclusions
Acute small bowel obstruction due to the connecting tube of a gastric band. Federico Oppliger, M.D. Gonzalo Wiedmaier, M.D. Juan. Published April 07 2017. https://doi.org/10.1016/j.soard.2014.03.021
P-B04
Restarting bariatric surgery after the Covid-19 pandemic: a template for safe practice

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Background
Bariatric surgery virtually ceased with the advent of the Covid-19 pandemic and has been amongst the last sector of operative practice to restart. There have been understandable concerns about restarting bariatric surgery including the risks to patients of contracting Covid infection in the peri-operative period, potential de-skilling of surgeons and theatre teams and the appropriateness of directing scarce and limited resources to bariatric surgery when every surgical specialty is experiencing rapidly rising waiting times and ever lengthening waiting lists. This study describes the restart programme at our NHS bariatric unit and offers a template for safe commencement of complex benign surgeries in the current era.

Methods
In the months after the pandemic started, our Bariatric MDT reviewed every case on the waiting list and contacted each patient to explain the current waiting times and the importance of not gaining weight to be eligible for surgery when surgical practice resumed. Group education and Support Group sessions were moved from face-to-face appointments to online classrooms and regular input was sought from specialist dieticians, nurses and psychologists. The expected waiting times for patients was pro-actively submitted to the Executive Board of the Trust with details about >104-week waiting patients being clearly articulated.

Once approval was given to restart bariatric surgery, every patient was assessed and prioritised in terms of waiting time and clinical need. A bariatric theatre team was brought together and engaged in pre-operative training and a local refresher course on equipment and the planned surgeries. There was engagement with industry to provide on-the-ground support for the first lists to ensure proper and safe use of energy and stapling devices. Each list had two consultant surgeons assigned to it and just two cases per day were planned and patients were managed on an entirely green pathway within the NHS hospital.

Results
The bariatric restart programme commenced in May 2021; between May 2021 and August 2021, there have been 27 operations carried out (25 Roux-en-Y gastric bypass, 2 sleeve gastrectomy) and two cancellations on the day (both due to patient choice). Each operating list finished between two and three hours before the planned finish time. Formal debrief sessions after each list identified no problems with the operations of the equipment and none of the patients had any post-operative complications. Length of stay was between 1 to 2 days for the entire cohort.

Since the restart programme commenced, the requirement for dual consultant operating has ceased and the last 5 cases have been entirely training cases for the operating registrar, again without complication. Each list is now planned to increase to pre-pandemic levels of activity with four cases per list.

Conclusions
Restarting complex benign surgical practice is complicated and requires engagement with management, theatre and nursing colleagues to ensure that cases are not 'left behind'. It is important to reduce the risk of complications and of peri-operative covid-19 infection in bariatric patients and development of a pathway that all members of the theatre team have input in to meant that there were few problems or issues with either the planning of the lists or the running of the lists. Such an approach could be considered for restarting any high volume, complex benign surgical practice.
P-BN02
Experience in Transitioning From Laparoscopic to Robotic-Assisted ParaEsophageal Hernia Repair - A Single Centre Experience

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Background
Paraesophageal hernias (PEH) constitute only 5% of hiatal hernias. They may give rise to significant post-prandial symptoms, acute episodes of obstruction or gastric ischaemia and patient mortality. Surgical repair of symptomatic PEHs is the current standard of care. This study explores our centre’s experience with the introduction of Robotic Assisted PEH (RA-PEH) repair in comparison to our longer established technique of laparoscopic repair.

Methods
Retrospective review of all laparoscopic and robotic PEH repair using the DaVinci Xi between January 2017 and May 2020 by a single surgeon in 2 institutions. A total of 27 cases were included in our review. An analysis of patient demographics, operative time and approach, morbidity and mortality was performed.

Results
Sixteen patients underwent laparoscopic repairs and 11 underwent elective robotic repair. Fundoplication was performed in both groups while mesh repair was used in 18% of the laparoscopy group. Type IV hiatal hernia was found in 50% and 37% in the laparoscopy and RA-PEH groups, respectively. Mean operative time was 144 minutes in the laparoscopy group and 153 minutes for RA-PEH (p=0.07). Median length of stay was 2 days for both groups (p=0.18). Post-operative morbidity occurred in 37% and 9% in the laparoscopy and RA-PEH groups respectively (p=0.18). There was 1 case of acute post-operative recurrence and re-operation in the laparoscopy group.

Conclusions
Minimally invasive surgery is the standard of treatment in PEH repair. The robotic technique is a safe and effective approach when compared to the standard laparoscopic repair. It may have an advantage in reducing reliance on the necessity of having experienced assistance in the operating theatre without utilising more theatre time.
A systematic review of pre-operative low-calorie diets for laparoscopic cholecystectomy

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Background
Laparoscopic cholecystectomy is the fourth most common procedure in the UK. Increased liver adiposity, commonly encountered in obesity, anecdotally may increase technical difficulty and surgical risk. Pre-operative low-calorie diets are well-established in bariatric surgery to reduce liver bulk, thereby ameliorating difficulty and risk. Similar diets are often used before laparoscopic cholecystectomy, however, the supporting evidence base is unclear; we performed the first systematic review on their use in this context.

Methods
PubMed, Embase and Cochrane Central Register of Controlled Trials databases were searched in February 2021. We included English language clinical studies describing pre-operative low-calorie diet for laparoscopic cholecystectomy. Data were extracted for specifics of adherence to diet, weight change, operative time/difficulty, complications and length of stay. Study quality was qualified using Scottish Intercollegiate Guidelines Network criteria and Jadad score.

Results
One randomised controlled trial (RCT) and one prospective observational study were identified. Both utilised a pre-operative very low-calorie diet of < 800 kcal/day. Overall weight loss was greater in patients deemed compliant with the intervention. Both demonstrated tendency towards reduced operative difficulty with the intervention. Only the RCT found improvement in operative time.

Conclusions
Pre-operative very low-calorie diets (< 800 kcal/day for two weeks) may aid weight loss and reduce operative difficulty in laparoscopic cholecystectomy, although evidence supporting their continued use is limited. Further RCTs are warranted to fully evaluate their role in clinical and cost-effectiveness.
Evaluation of Outcomes of Anti-reflux Surgery in a District General Hospital

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Background
Gastro-oesophageal reflux disease (GORD) affects up to 20% of the Western population, and is usually associated with presence of hiatus hernia (HH). Proton pump inhibitors (PPI) are the mainstay treatment, but half of PPI users have persistent symptoms. Anti-reflux surgery in the form of fundoplication surgery with HH repair can be considered in patients unable to tolerate or unwilling to persevere with long term medical therapy and those with severe sequelae of reflux, such as those with Barrett esophagus or non-healing erosive esophagitis. We aim to evaluate the outcomes and factors relating to surgical success of anti-reflux surgery.

Methods
We identified patients who had HH repair and fundoplication surgery from our prospectively maintained theatre database over a eight year period. Retrospective data collection was performed, inclusive of patients’ pre-operative investigations, intraoperative findings and postoperative patient outcomes. Chi Square and Mann Whitney U test were used to calculate the statistical significance. 187 cases were analyzed, involving only 167 unique patients as 14 patients had 1 redo surgery and 2 patients had 2 redo surgeries.

Results
Male to female ratio was 2:3. Median age was 59 years and median BMI was 29.1. 85% of cases were performed laparoscopically, which had the shorter median length of stay at 2 days. Pre-operative assessment of HH size with barium swallow had the highest sensitivity (82%) and specificity (75%). Large to moderate HH are more prevalent in female patients. Rolling HH are more associated with dysphagia and vomiting whereas sliding HH with reflux symptoms. Rolling HH are more likely to be repaired with an open approach and more likely to require hiatal mesh repair compared to sliding HH.

Conclusions
In the 96% of patients followed up, we successfully achieved symptom control in 94% of them. Although we were unable to find specific patient or surgical factors contributing to symptom recurrence or redo surgeries, we were able to identify certain pre-operative tests which can predict the difficulty of surgery. Larger scale case series would allow us to predict patient cohort at a higher risk of unsuccessful anti-reflux surgery.
Solitary jejunal diverticulum: a rare unexpected cause of chronic pneumoperitoneum

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Background
Jejunal diverticula are rare acquired herniation of the mucosa and submucosa through the muscularis propria. They are asymptomatic in the majority of cases, however, they can present with non-specific abdominal symptoms and rarely complicate leading to acute abdomen. Perforation usually results in symptoms and signs of acute peritonitis and it is not an identifiable aetiology of chronic pneumoperitoneum. Computed tomography scan may identify intestinal wall oedema, air bubbles travelling through the mesentery, free intra-abdominal air and/or fluid. Radiological diagnosis requires high index of suspicion of such pathology. We report a case of an isolated jejunal diverticulum as a cause for aseptic chronic pneumoperitoneum.

Methods
A 77-year-old female was referred to the ambulatory emergency surgical unit (AESU) with a 4-month history of nonspecific abdominal pain, considerable weight loss, diarrhea, nausea and a few episodes of vomiting. Physical examination revealed no constitutional signs of sepsis and her abdomen was mildly distended but soft and nontender to palpation. Laboratory investigations were unremarkable. CT scan of her abdomen and pelvis on her first visit showed pneumoperitoneum with associated low volume ascites, which raised the possibility of sealed gastrointestinal perforation. In the absence of any clear signs of sepsis, a strategy of ambulatory, conservative management and follow up was chosen.

Four months after her initial presentation our patient presented with ongoing vague abdominal symptoms with weight loss and failure to thrive. A CT colonogram described pneumoperitoneum and larger volume of ascites is in comparison to the previous CT scan. There was an unusual pattern of mural gas in some loops of small bowel in the left side of the abdomen that suggested pneumatosis. MDT decided to proceed with diagnostic laparoscopy.

Results
Laparoscopy exploration revealed odorless pneumoperitoneum, moderate amount of non-turbid bile stained serous ascites and thin fibrinous covering. We identified a jejunal diverticulum associated with mesenteric air bubbles and moderately enlarged reactive feeling lymph nodes in the diverticular segment. A small bowel resection with a primary side-to-side anastomosis, washout of the abdomen and cholecystectomy were done through a Kocher’s subcostal incision. She made an uneventful post-operative recovery and was discharged home well on day 4. Histopathological examination of the resected specimens confirmed the presence of a ruptured isolated jejunal diverticulum with a breach in muscularis propria and chronic cholecystitis in the gallbladder.

Conclusions
In summary, our case report highlights the importance of being aware of the possibility of perforated jejunal diverticula as a possible source of chronic pneumoperitoneum causing chronic nonspecific abdominal pain, diarrhea and unexplained weight loss. The surgical option of segmental resection and primary anastomosis was beneficial in this patient. However, calculating the risk benefit ratio remains the mainstay of the management plan, which, as ever, should be tailored to each patient’s general condition and fitness with appropriate counselling and consent.
P-BN06
Percutaneous cholecystostomy rates are increased following COVID-19 induced disruption to elective surgical pathways

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Background
The COVID-19 pandemic has led to major service disruptions, including the cessation of elective laparoscopic cholecystectomies (LC), causing delays in managing symptomatic gallstones. We hypothesised that this would lead to an increased need for percutaneous cholecystostomy (PC) for acute cholecystitis.

Methods
We performed a retrospective cohort study in a single NHS trust. We included all patients who underwent either LC or PC during the periods of March 1st – August 31st over the years 2019 and 2020. Patient data was obtained from prospectively maintained patient electronic notes. Data are presented as median and interquartile ranges for continuous data and the percentages for categorical data and compared with Mann-Whitney U-test and Fisher’s exact tests respectively.

Results
We observed a substantial reduction in the number of LC performed in 2020 (n=99) compared to 2019 (n=198), whilst the number of PC performed in 2020 (n=35) was more than double that in 2019 (n=17) (Fig.1). This increase in numbers persisted even after our LC service was restarted. Comparing the patients who underwent PC in both years, there were no significant differences in age (2019: 68 (45-76) vs 2020: 72 (57-81), p=0.41), comorbidities (Charlson comorbidity index≥4: 10 (59%) vs 16 (46%), p=0.56), or in-hospital mortality (2019: 2 (12%) vs 2020: 3 (9%), p=0.99). As a proportion of all biliary interventions for cholelithiasis, PC increased from 8% (17/214) in 2019 to 26% (35/134) in 2020 (p<0.001).

Conclusions
These results show how the cessation of LC service was directly related to increased numbers of invasive ‘damage control’ procedures for acute cholecystitis, emphasising the importance of maintaining COVID-secure surgical pathways. The numbers of PC remained high even after the restart of LC service, consistent with a ‘COVID shadow’ resulting from interruptions to elective services that impacts patient care for a prolonged period.
P-BN07
Identifying gallstones in acute pancreatitis. Are we undermanaging our patients?

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Background
Acute pancreatitis (AP) is a common surgical presentation with a wide spectrum of severity and outcome. The most common cause of AP is gallstones, accounting for approximately 50% of cases, followed by alcohol excess. Reliable identification of gallstones is crucial as patients can be offered cholecystectomy to prevent recurrence. Current UK guidelines recommend a minimum of two negative ultrasounds to rule out gallstones. The aim of this study was to assess the pickup rate of gallstones on ultrasound for patients admitted with AP and audit our compliance with UK guidelines.

Methods
All patients admitted with acute pancreatitis between the start of January 2019 to the end of December 2020 were retrospectively analysed. All patients with a known pre-existing cause for pancreatitis such as alcohol excess, chronic pancreatitis, CBD stricture and pancreatic mass were excluded. Electronic records were examined to identify subsequent imaging investigations and final diagnosis. Particular interest was given to whether gallstones were identified, and adherence to UK guidelines.

Results
206 patients were identified following the exclusion criteria. 189 underwent an ultrasound on admission, 111 were positive for gallstones. Of the negative ultrasounds (78), 15 underwent a further USS (4 positive), 29 underwent an MRCP (12 positive), 15 had a CT (3 positive) and 3 had an ERCP (3 positive). This left 16 with an unknown aetiology after 1 ultrasound and did not undergo further imaging and therefore did not comply with the current guidelines. Of the 11 patients who had 2 negative ultrasounds 5 had further imaging and all were negative for gallstones.

Conclusions
In conclusion Gallstone pancreatitis is a common acute surgical presentation of which morbidity and mortality can be significant. Following our retrospective assessment, we deem secondary imaging in the form of USS or MRCP to be necessary in the investigation of acute pancreatitis due to the high pickup rate. Compliance with current guidelines aids diagnostics and ensures appropriate and timely management of this condition leading to improved patient care.
Management of isolated splenic vein thrombosis: Risks and benefits of Anticoagulation

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Background
Isolated splenic vein thrombosis (iSVT) is a common complication of pancreatic disease. Whilst patients remain asymptomatic, there is a risk of sinistral portal hypertension and subsequent bleeding from gastric varices if recanalization does not occur. There is a wide variation of iSVT treatment, even within single centres. We report outcomes of iSVT from tertiary referral hepatobiliary and pancreatic (HPB) units including the impact of anticoagulation on recanalization rates and subsequent variceal bleeding risk.

Methods
A retrospective cohort study including all patients diagnosed with iSVT on CT scan abdomen and pelvis between 2011 and 2019 from two institutions. Patients with both SVT and portal vein thrombosis at diagnosis, and isolated splenic vein thrombosis secondary to malignancy were excluded. The outcomes of anticoagulation, recanalization rates, risk of bleeding, and progression to portal vein thrombosis were examined.

Results
Ninety-eight patients with iSVT were included; of which thirty-nine patients received anticoagulation (40%). The most common cause of iSVT was acute pancreatitis n=88 (90%). The recanalization rate in the anticoagulation group was 46% vs 15% in patients receiving no anticoagulation (p=0.0008, OR = 4.7, 95% CI 1.775 to 11.72). Upper abdominal vascular collaterals (demonstrated on CT scan angiography) were significantly less among patients who received anticoagulation treatment (p = 0.03, OR = 0.4, 95% CI 0.1736 to 0.9288). The overall rate of upper GI variceal related bleeding was 3% (n=3/98) and it was independent of anticoagulation treatment. Two of the patients received therapeutic anticoagulation.

Conclusions
The current data support that therapeutic anticoagulation is associated with a statistically significant increase in recanalization rates of the splenic vein; with a subsequent reduction in radiological left-sided portal hypertension. However, all patients had a very low risk of variceal bleeding regardless of anticoagulation. The findings from this retrospective study should merit further investigation in large-scale randomized clinical trials.
Seasonal Variation of Presentation of Perforated Peptic Ulcer Disease: An Overview of Patient Demographics, Management and Outcomes in Northern Ireland

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Background
Perforated peptic ulcer disease is one of the most common causes of acute peritonitis. It carries significant mortality and morbidity. Several previous studies have reported a seasonal variation in presentation of patients with perforated ulcers. Here we present this study from a Northern Irish perspective on perforated peptic ulcers.

Methods
A retrospective cohort study was conducted on perforated peptic ulcer patients who presented to Altnagelvin Area Hospital emergency department between 2015 to 2020. Data on patient demographics, clinical presentation, investigations, management and outcomes were collected. Primary outcome was to investigate if seasonality was associated with incidence of perforated peptic ulcers. Follow-up data was also collected. Seasons were defined as per UK Met Office.

Results
Results: A total of 50 patients presented with perforated PUD. Male:female ratio was approximately 3:2. Peaks were noted in spring and winter. April was the most common month for presentation followed by December. Smoking was the most common risk factor followed by alcohol abuse. 14 patients (28%) were either very frail or had contained perforations and were conservatively managed. 3 deaths were noted (6%). 13 patients (26%) required ICU admission at some stage in their management.

Conclusions
Slight seasonal variation was noted in presentation of perforated peptic ulcers in our study with more common incidence in winter and spring months. The month of April was noted to have the peak incidence of the disease in our study.
Patient Reported Outcomes of Phasix™ ST Mesh for Laparoscopic Hiatal Hernia Repair

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Background
Laparoscopic hiatal hernia repair continues to suffer from high recurrence rates, which has prompted the use of mesh reinforcement by some surgeons. Use of mesh however remains controversial due to its association with complications such as erosion, fibrosis and oesophageal stenosis. Biosynthetic Poly-4-Hydroxybutyrate Phasix™ ST mesh is an emerging technology which combines the durability of synthetic mesh with the remodelling characteristics of biologic mesh and includes an anti-adhesion hydrogel barrier. There is a paucity of patient reported outcome data for Phasix™ ST mesh. This study evaluates early patient reported outcomes following laparoscopic hiatal hernia repair with Phasix™ ST mesh.

Methods
Adult patients undergoing laparoscopic hiatal hernia repair with Phasix™ ST mesh between July 2020 to June 2021 at our institution were identified. Prospective data, including demographic data and complication rates, was collected from electronic and paper medical records. The 12-item Short Form Survey (SF-12) was administered to assess quality of life pre-operatively and post-operatively with a minimum 30-day follow-up.

Results
Fourteen patients (12 female, one male) were included with a median age of 66 years (range 52-79). There were no intraoperative complications, mesh-related complications, re-operation, re-admission, or recurrence at a median follow-up of 4 months (IQR 4.0). Median physical health component (PHC) score was 32.7 (IQR 6.2) at baseline and increased to 41.6 (IQR 13.7) post-operatively. Median difference in PHC score was +11.4 (IQR 10.7). Median mental health component (MHC) score was 39.8 (IQR 12.5) at baseline and increased to 57.4 (IQR 8.2) post-operatively. Mean difference in MHC score was +17.7 (IQR 15.9).

Conclusions
To our knowledge, this is the first report of outcomes on the use of Phasix™ ST mesh for laparoscopic hiatal hernia repair in the United Kingdom. Our study found that it is associated with improvements in both physical and mental quality of life in the short-term post-operative follow-up, although there is some variation in the degree of improvement reported.
IMPACT OF COVID-19 ON UGI (UPPER GASTROINTESTINAL) TRACT STENTING AND DILATATION SERVICES-PRIORITISE, KEEP SCOPING AND TRAINING

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Background
The COVID-19 pandemic profoundly affected endoscopy services including therapeutic gastroscopy across the UK. The BSG (British Society of Gastroenterology) issued guidance for managing endoscopy services safely throughout this period. At the beginning of the pandemic in March 2020, a symptom-based questionnaire was used to screen patients for COVID-19 prior to their endoscopic procedures in our hospital (COVID-19 swabs were only carried out if patients presented with COVID-19 symptoms). From 18 May 2020 onwards, in addition to the above approach, all patients attending endoscopic procedures underwent a SARS-CoV-2 nasopharyngeal swab 1-3 days prior to the procedure. We describe our experience of UGI stenting and dilatation during the initial wave of COVID-19 pandemic in the UK.

Aims
To assess the impact of COVID-19 pandemic on technical and clinical success of luminal dilatation and stenting in the UGI tract and ascertain the risk of procedure related complications.

Methods
A retrospective audit of a prospectively maintained endoscopy database was carried out between 18th March and 31st July. All patients were followed for 30 days. Full PPE were used.

Results
42 procedures [31 were oesophageal dilatation (21 peptic stricture, 9 radiotherapy stricture, 1 achalasia), 8 oesophageal stent insertion (6 for primary oesophageal cancer, 1 metastatic cancer and 1 secondary to external compression from lung cancer) and 3 pyloric dilatation all benign] were carried out-mean age 65 years, 64.3% males, 81% of procedures were carried out as outpatients. All procedures were performed under fluoroscopy. 41/42(97.6%) patients had a confirmed histology prior to their procedure – one patient who underwent oesophageal dilatation had a peptic stricture on endoscopy (no biopsy or imaging). 39/42(92.9%) patients had undergone CT scan and/or barium swallow prior to their first procedure. All procedures were technically and clinically successful (100%). There were no procedure related complications or mortality. There were no COVID positive swabs in the 30-day post procedure period during the entire study period. Trainees were present in 21/42 (50%) of the procedures. None of the endoscopists who were involved with these procedures were diagnosed with COVID-19 during this period. One of the nursing staff, who regularly assisted in the fluoroscopy room, was involved in a non-fluoroscopic endoscopic procedure in a COVID-19 patient (not known at the time of the procedure) and subsequently tested positive.

Conclusions
Our study confirms that a high quality stenting and dilatation service of the upper gastrointestinal tract together with specialist registrar training can be delivered safely and effectively during the COVID-19 pandemic in appropriately prioritised symptomatic patients.
How has the COVID pandemic affected outcomes in Elective Laparoscopic Cholecystectomy? An observational study in a UK Upper GI Surgical Unit

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Background
COVID-19 has a significant impact on elective surgery for benign disease. When routine services resumed in April 2021, surgeons were faced with higher number of complicated cases. The aim of this study is to examine the effect of COVID-19 related delays on the outcomes of patients undergoing elective laparoscopic cholecystectomy (LC) in an upper gastrointestinal unit in the UK.

Methods
Data were collected retrospectively on consecutive patients undergoing elective LC between 1/3/19 to 1/5/19 (Pre-COVID) and 1/4/21 to 1/6/21 (resumption of elective operating following COVID). The indications for surgery, intraoperative details, postoperative complications, length of stay (LoS) and 30-day readmission were compared between the two cohorts. We divided indications for surgery as inflammatory (acute cholecystitis, gallstone pancreatitis, CBD stone with cholangitis) vs non-inflammatory (biliary colic, gallbladder polyps, CBD stone without cholangitis). Data were analysed using the Mann-Whitney U-test and Chi-square or Fisher’s exact test. A p value of <0.05 was used for statistical significance.

Results
159 patients were analysed, 106 in Pre-COVID vs 53 in Post-COVID. Both cohorts had similar age, gender, ASA-grade, BMI. 68 (64.2%) of the pre-COVID cohort were operated for a non-inflammatory pathology compared to 19 (35.8%) of the post-COVID cohort ($p<0.001$). Less patients had total cholecystectomy (subtotal and failed surgery) in the post-COVID cohort [49 (92.5%) vs 159 (100%) $p=0.01$]. There was no difference in the operating time, conversion to open surgery, the need for drains, and no difference in the Clavien-Dindo grade complications. Two patients in pre-COVID cohort (1.8%) required re-operation for bile-leak and bowel injury and two in the post COVID cohort (3.7%) for bleeding and CBD-injury. There was no difference in day case discharge or 30-day readmission rate.

Conclusions
Surgery in the post-COVID cohort was associated with a higher incidence of inflammatory biliary disease, subtotal cholecystectomy and procedure abandoned. Although the numbers in our study are small they highlight the need for enhanced preoperative assessment in elective biliary surgery as the NHS emerges from the acute phase of the pandemic.
P-BN14
Differences in rate of complications between emergency and elective laparoscopic cholecystectomy at district general hospital

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Background
Current NICE guidelines recommend healthy low risk patients who present with acute biliary disease should be offered laparoscopic cholecystectomy on the same index admission. The increased complexity of the acute operations may impact on the operative complication rates; hence the aim of this study is to evaluate and compare the operative complication rates between elective and emergency laparoscopic cholecystectomies and additionally to assess the difference in surgical techniques comparing complete cholecystectomy versus subtotal versus open procedures.

Methods
Retrospectively, data was collected from emergency and elective Laparoscopic Cholecystectomies completed in the period 01/01/2021-01/06/2021 at the Queen Elizabeth Hospital Gateshead. The data set was gathered from an electronic theatre database and the individual cases were sub-analyzed further by delving into the electronic patient records database. Statistical analysis done by using Excel 2010.

Results
The average age of both groups was 50 years. There wasn’t a statistical significance on the rate of complication between the elective Vs emergency cholecystectomies (Elective 2%, Emergency 9% P=0.17). Out of 42 Elective procedures, 4 had Sub-total cholecystectomy Vs 3 out of 42 patients on the emergency group who had Subtotal cholecystectomy (9% Vs 7%), implying there was no significant difference noted between the two groups. Average hospital stays was 5.6 days for the acute presentation with biliary disease Vs 0.14 days on the planned elective group.
2% of the elective group were noted to have a surgical drain inserted during the operation; whilst the emergency cohort had a slightly higher rate at 5%.

Conclusions
Overall there was no significant difference noted between the surgical complications arising in emergency cholecystectomy compared to planned surgeries. In addition to this the data also suggests that there is negligible difference in the rates of sub-total cholecystectomies in both cohorts.
P-BN15
Outcomes following surgical repair of giant paraoesophageal hernia of over 200 cases with long-term follow up: a 20-year experience

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Background
Symptomatic giant paraoesophageal hernia (PEH) can often be troublesome and may require surgical intervention. It commonly presents with dyspnoea, post-prandial pain, vomiting and dysphagia but rarely strangulation. In a good proportion of patients, iron deficiency anaemia may also be present. Patients are often elderly and may have co-morbidities and hence there may be a reluctance to refer and to offer surgery. This long-term study offers an insight to the outcomes following this complex surgery in a relatively elderly cohort of patients.

Methods
A retrospective analysis of prospectively collected data of patients who underwent surgery for symptomatic PEH from January 2001- June 2021 was performed. Clinical presentation, management, post-operative clinical outcomes, radiographic evaluation, pre and post-operative haemoglobin levels, respiratory function ( Forced Vital Capacity (FVC), Forced Expiratory Volume in 1 Second (FEV1)) as well as quality-of-life (QoL) with SF-36 questioners (including general health, physical, emotional and social components) were assessed.

Results
202 patients (122 females) with median age 68 years (36-88) underwent PEH-surgery. The commonest symptom Eighty-one presented with dyspnoea (41%). Ninety-five (47%) were ASA III, 119 (59%) had microcytic anaemia. 142 (70%) had a fundoplication during PEHR. Hospital-stay was significantly lower in laparoscopic group

<table>
<thead>
<tr>
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<th>Laparoscopic (176)</th>
<th>Open (108)</th>
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<tbody>
<tr>
<td>Hospital stay in days</td>
<td>4(1-16)</td>
<td>10(5-33)</td>
</tr>
</tbody>
</table>

Mortality: 1.8% (2/112).
Median follow-up: 10 years. Symptoms improved in 166 (82%) with respiratory function and anaemia. 42 (21%) had radiological recurrences but only nine (4.5%) clinical recurrence requiring surgery.

<table>
<thead>
<tr>
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<th>Haemoglobin (g/L)</th>
<th>FVC (L)</th>
<th>FEV1 (L)</th>
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<tbody>
<tr>
<td>Pre-op</td>
<td>96 (61-123)</td>
<td>1.72 (0.97-3.26)</td>
<td>1.48 (0.61-2.32)</td>
</tr>
<tr>
<td>Post-op</td>
<td>129 (98-138)</td>
<td>2.29 (1.34-4.47)</td>
<td>2.26 (1.71-3.49)</td>
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Conclusions
Laparoscopic repair of giant paraoesophageal hernia is safe with good outcomes in all age groups with improvement in symptoms, quality of life, respiratory function and associated anaemia.
Gallbladder agenesis in a gentleman presenting with biliary sepsis: a case report and review of literature

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Background
Gallbladder agenesis (GBA) is a well-recognised, yet rare embryological malformation, that is thought to stem from a failure of the gallbladder and cystic duct to bud from the common bile duct in the 5th week of gestation. The anomaly has an estimated incidence of 10-65 per 100,000 and is often an incidental finding. A quarter of those affected are symptomatic, often presenting in a similar manner to cholecystitis or choledocholithiasis. There is a lack of awareness and guidance on its investigation and management, making GBA a diagnostic challenge, which often leads to unnecessary high-risk surgical exploration.

Methods
A 64-year-old man presented with right upper quadrant abdominal pain, fevers, jaundice and persistent vomiting. On examination he was confused, visibly jaundiced and septic with deranged liver function tests. An initial ultrasound scan of the abdomen revealed dilated common bile ducts, with no evidence of choledocholithiasis, however, a gallbladder could not be identified. Magnetic resonance cholangiopancreatography confirmed a ‘post-cholecystectomy’ picture, despite no history of abdominal surgery. This led us to the diagnosis of gallbladder agenesis.

Results
There are no dedicated guidelines regarding the investigation and management of GBA. Efforts have been made to stratify the diagnostic imaging of GBA. Malde et al suggest that if the gallbladder is not visualised on USS, the next most appropriate investigations in order of accuracy are MRCP, CT and ERCP, respectively. Interestingly, they further suggest that if results of imaging remain inconclusive, they should be repeated again once the acute phase of the illness or symptoms have resolved. Inadvertently, this suggestion was applied in our case, as the patient underwent a repeat MRCP following the resolution of his acute symptoms. In our case, MRCP allowed an effective final diagnosis, avoiding unnecessary investigations and exploratory surgery. It also provided a detailed anatomical picture, excluding the possibility of an ectopic gallbladder.

Conclusions
The present case accentuates the importance of non-invasive imaging such as MRCP in appropriately diagnosing this phenomenon and avoiding unnecessary operative exploration.
Laparoscopic subtotal cholecystectomy is a safe and effective treatment for gallstone disease

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Background
Laparoscopic cholecystectomy is the gold standard treatment of gallstones in fit patients with symptomatic gallbladder disease. If the critical view of safety cannot be achieved intra-operatively, there are few options, one of which is laparoscopic subtotal cholecystectomy. This study aims to ascertain the outcomes of subtotal cholecystectomy.

Methods
Retrospective review of all patients who underwent laparoscopic subtotal cholecystectomy by a single surgeon over a 5 year period.

Results
37 consecutive patients who underwent subtotal cholecystectomy were included in this study; seventeen of which were males (49%); the median age was 69, and 18 were emergencies (49%). The most common reasons for conversion to laparoscopic subtotal cholecystectomy were adhesions (57%) and fibrotic Calot’s triangle (22%). One patient required ERCP and biliary stenting for ongoing bile leak and another returned to theatre for post operative bleeding during index admission. 6 patients (16%) required further hospital admissions for gallstone disease (1 for biliary colic, two for cholecystitis and three for CBD stones). 3 patients required ERCP. None required further gallbladder surgery.

Conclusions
Laparoscopic subtotal cholecystectomy is a safe and effective alternative to total cholecystectomy when the critical view of safety cannot be achieved. In our experience, only a small proportion of patients have recurrent biliary problems.
Cholecystectomy following ERCP: A retrospective audit from a single centre

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Background
15% of the adult population are estimated to have gallstones (GS) and managing GS related disease can represent a significant challenge to surgical and endoscopic services alike. One particular challenge is the management of bile duct calculi (BDC), and treatment can vary according to the unit/institution. NICE has published guidelines (CG188) on the management of GS disease with the recommendation that bile duct clearance and cholecystectomy be offered for symptomatic and asymptomatic BDC. This retrospective audit was performed to determine compliance of a single centre with respect to offering cholecystectomy following ERCP for BDC.

Methods
A retrospective audit was performed for the year 2018 at a single centre utilising the trust ERCP database. The audit was analysed against NICE guideline CG188 and specifically whether patients treated with ERCP for BDC were then treated with cholecystectomy or had a documented justification as to why cholecystectomy was declined. 2018 was chosen so that at least a 2-year period of follow-up could be analysed. As well as the trust ERCP database, the trust electronic documentation record and paper notes were consulted to determine compliance with the guideline.

Results
149 ERCPs were performed on 121 patients at this centre in 2018. Of these, 82 patients were included as 39 had an ERCP for malignant disease or had already had a cholecystectomy. Of those 82, 51 (62%) had an ERCP as an emergency while 31 (38%) had an elective procedure. The median age was 65, 54% being male and 46% female. 45 (55%) had a cholecystectomy following ERCP, 29 as an emergency, and 16 electively. Of those 37 who did not have a cholecystectomy, 20 (54%) had no recorded documentation to justify a decision not to proceed to cholecystectomy.

Conclusions
GS disease has the potential to cause significant morbidity. If an ERCP has been performed for BDC, NICE recommends that cholecystectomy should be offered to mitigate further GS related complications. Patients may of course decline an operation, or a joint decision made not to pursue operative management due to identified surgical risks. This audit demonstrated that 54% of patients at this institution who did not have a cholecystectomy following ERCP had no documented reason why cholecystectomy was declined. Robust follow-up and documentation measures have since been put in place and a follow-up audit is being performed to monitor improvement.
An evaluation of the accuracy of sonography for the measurements of gallbladder polyps across 3 UK hospital trusts: should the surveillance guidelines be revised?

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Background
Transabdominal ultrasound scan (USS) is recommended for surveillance of gallbladder polyps (GBP), this is to stratify risk for premalignant potential. European Society of Gastrointestinal and Abdominal Radiology make recommendations based on increases of as small 2mm during sequential USS surveillance. Our aim is to determine the accuracy of USS in diagnosis and measurement of GBP.

Methods
Measurement data for all GBPs were gathered for three hospital trusts across a 12 year period and retrospectively reviewed. USS findings (diagnosis of GBP and GBP size) were compared with histological diagnosis and measurements, when both reports were available, in those patients who had undergone cholecystectomy at the time of data collection.

Results
For the first two hospital trusts, 778 USS were reviewed which identified patients with GBP. 78 patients had undergone cholecystectomy at time of data collection. Only 17/78 of patients had histological evidence of GBP. Of those without GBP, 37/61 had gallstones.

For the third hospital trust, 41 GBP histological reports were identified, 20 could be directly compared with USS. Collectively 29 USS reports were directly compared with GBP histology reports. Only, 31% had results which were in agreement to within 1mm. The mean measurement discrepancy between both modalities was 5.41mm.

Conclusions
USS does not provide an accurate diagnosis of GBP, it is likely that USS misdiagnoses gallstones as GBP. Moreover, when comparing USS measurements with histological data, there is 31% accuracy of measurement to within 1mm in this cohort. Current guidelines recommend cholecystectomy if there is an interval change of 2mm or more; this data shows a measurement error of more than this.
P-BN21
Diagnostic accuracy of transabdominal ultrasound for assessing gallbladder polyps

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Background
Gallbladder polyps are common findings on transabdominal ultrasound (TAUS) and their implications are not entirely clear. Current guidelines advise monitoring with serial TAUS and to offer laparoscopic cholecystectomy if criteria are met to minimise risk of malignant transformation. TAUS is easily accessible and useful at identifying gallbladder polyps, however, has limitations when differentiating between pseudopolyps and true gallbladder polyps with malignant potential. This study looks at a district general hospital’s outcomes for patients undergoing laparoscopic cholecystectomy for gallbladder polyps.

Methods
This retrospective study identified patients who had polyps identified on TAUS and subsequently undergone laparoscopic cholecystectomy from 2011 to 2021. We identified patients using hospital coding and subsequently assessed their pre-operative imaging and clinic letters to ensure gallbladder polyps were the reason for cholecystectomy. The size of polyp on TAUS was noted and pathology reports were assessed to determine if polyps had been correctly identified on TAUS and if these were true or pseudopolyps. Clinic letters were assessed to determine if patients were symptomatic pre-operatively.

Results
66 patients were identified as having polyps pre-operatively. The size of polyp ranged from 2-19mm with a mean of 7.4mm. 39 (59%) patients were symptomatic pre-operatively. TAUS findings correlated with pathology findings of polyps in 45 (68%) patients. Of the 21 patients with no polyps on pathology: 11 had gallstones, 9 had chronic cholecystitis and 1 normal gallbladder. Of the polyps identified 44 were pseudopolyps and only 1 was a true adenoma – 39 cholesterol polyps, 3 inflammatory polyps and 2 adenomyomatosis. There was no evidence of dysplasia on the adenoma, it measured 5mm on TAUS and the patient was symptomatic.

Conclusions
This study highlights the limitations of TAUS in correctly identifying true polyps. The 41% of asymptomatic patients all had benign findings on pathology and likely had no benefit from surgery. Whilst TAUS is a useful method of identifying potential polyps these findings would suggest that other methods of identifying true polyps should be sought to minimise patients undergoing unnecessary surgery.
The use of virtual clinics in gallbladder polyp surveillance

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Background
Gallbladder polyps are common findings on ultrasound with a prevalence between 0.3-9.5%. Their significance is not clear but are theorised to have potential risk of transformation into gallbladder malignancy which have poor prognosis if not caught early. Current guidelines recommend surveillance of polyps and that laparoscopic cholecystectomy should be offered if certain criteria are met. Most patients are asymptomatic and regular reviews in clinic is time consuming for patients and adds to strain on services. This study looks at the use of virtual clinics in gallbladder polyp surveillance.

Methods
Since January 2019 patients identified with gallbladder polyps have been added to virtual clinic. Each patient is added to a database which is maintained by one upper GI surgeon. Current guidelines are followed: laparoscopic cholecystectomy is offered if polyps are greater than 1cm, there is an increase greater than 2mm between scans, and in high-risk groups or in symptomatic patients. All other patients are offered interval scans as per guidelines and a template letter is generated informing patients of their scan results and date of their follow up scan.

Results
Since January 2019, 70 patients have been identified to have gallbladder polyps. Of these 48 patients so far have benefitted from involvement from follow up in virtual clinic to date, this has resulted in 88 clinic appointments being saved. 12 patients have undergone laparoscopic cholecystectomy due to increase in size of their gallbladder polyps or secondary to symptoms. 7 patients have been lost to follow up, 2 discharged due to the gallbladder polyps disappearing and the other 49 remain under surveillance in the virtual clinic.

Conclusions
Long term polyp surveillance can be time consuming for both the patient and clinician. This model of a virtual clinic maintains clear communication with patients about their scan findings, the risks associated and plans for future scans. This is an efficient method of monitoring these patients that has good compliance and identifies patients appropriate for surgery.
Cholecystectomy in Octogenarians – Is there a benevolent bias?

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Background
Cholecystectomy is one of the most commonly performed general surgical operations in the UK. Around 50,000 patients undergo cholecystectomy every year. Recently a meta-analysis has raised concerns regarding the increased risk of performing cholecystectomy in octogenarians. Therefore, a study was organised to assess the safety and outcomes of octogenarians undergoing cholecystectomy compared to patients aged 65-79.

Methods
This is a retrospective observational study of a prospective database of all cholecystectomies performed from January’15 to December’20, including patients aged≥65 (elective and emergency). Adjunct cholecystectomies and age<65 were excluded. Patients were divided into OCG (age>80) and UE (age 65-79) groups. The primary outcome was ‘30day mortality’ (TDM). Secondary outcomes were graded ‘post-operative complications’ (POC) based on ‘Clavien-Dindo Classification’ (CDC), Length of Stay (LoS) and the total number of ‘Intensive care unit’(ICU) admissions. The categorical and continuous variables were assessed using Chi-square and Mann-Whitney U’ test, respectively. A p<0.05 was considered statistically significant.

Results
587 patients were included in this cohort. Majority of the patients were in UE (87.2%,n=512 vs OCG-12.8%,n=75).

There was one TDM noted in each group (UE-0.2%,n=1 vs OCG-1.3%,n=1; p=0.11). Intervention requiring grade-3 CDC were significantly common in OCG (OCG-18.6%,n=14 vs UE-6.8%,n=35; p=0.00054). However, grade-2 CDC complications were significantly common in UE (UE-16.6%,n=85 vs OCG-2.7%,n=2; p=0.0015). Number of intensive care stay was similar between the groups (UE-16.6%,n=85 vs OCG-2.7%,n=2; p=0.0015). Number of intensive postoperative recovery (p=0.91) and grade-4 CDS (p=0.77) were comparable between the studied groups. Median LoS was 1-day in both groups with no statistical difference, p=0.078.

Conclusions
This study demonstrates that cholecystectomy could be safely offered to a selective group of fit and well octogenarians. Octogenarians who had more complications requiring intervention may be due to factors comprising comorbidities and delayed presentation. However, the TDM and LoS of octogenarians were comparable to the control group. Therefore, age should not be considered as a solitary defining criterion in patient selection for cholecystectomy. Nevertheless, the retrospective nature of this study and skewed patient distribution are the limitations of the study.
Quality assessment of online patient information on upper gastrointestinal endoscopy using the Modified Ensuring Quality Information for Patients (EQIP) tool

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Background
Online resources are rapidly becoming patients’ primary source of healthcare information due to the Internet’s ease of access. The availability of high-quality online information is paramount to improving patient education and clinical outcomes. Upper gastrointestinal (UGI) endoscopy is the gold standard investigation for UGI symptoms, yet little is known regarding the quality of patient oriented websites. This study aims to analyse the quality of online patient information on UGI endoscopy using the modified Ensuring Quality Information for Patients (EQIP) tool.

Methods
A systematic review was conducted using 10 search terms. The top 100 websites for each term identified using Google search were assessed using the modified EQIP tool (score 0-36). Sub-analysis was performed on high-scoring websites. Websites for medical professional use or containing video and marketing content were excluded.

Results
378 websites were eligible for analysis. The median modified EQIP score for UGI endoscopy was 18/36 (IQR 14-21). Median EQIP scores for the content, identification and structure domains were 8/18, 1/6 and 9/12, respectively. Websites produced by government health departments and NHS hospitals had a higher modified EQIP score (p=0.007). Complication rates were included in only 20.4% of websites. High-scoring websites were significantly more likely to provide balanced information on risks and benefits (94.6% vs. 34.4%; p <0.001).

Conclusions
The current quality of online patient information on UGI endoscopy is limited, with minimal information available on risks of the procedure, potentially hindering patients’ ability to make informed healthcare decisions. There is an immediate need for high-quality online resources to improve patient education.
P-BN25
Redo-Antireflux surgery long term quality of life retrospective study

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Background
Gastro-oesophageal reflux disease (GORD) can have a significant effect on patients quality of life, especially in severe cases. Laparoscopic Antireflux surgery is the most common approach which offers promising long-term outcomes. However, Failure of antireflux procedures are reported in 5% to 10% of the patients who might require a redo-antireflux surgery (Redo-ARS). This study aims to assess the long-term outcomes of Redo-Antireflux surgeries regarding symptoms control and patient satisfaction.

Methods
Retrospective study for patients who underwent Redo-ARS with a single consultant in the south of England. Follow up was done using The GORD Health-Related Quality-of-Life (GORD-HRQL) scale and patients reported their scores before and after the redo-surgery. Exclusion criteria included follow up less than one year and failure of contacting the patient.

Results
All patients who underwent Redo-ARS between 2009-2019 were enlisted and 18 -out of the identified 22- were included in the study. Overall, There was a significant decrease in heartburn severity after the redo operation with a median reported severity of 4.5 preoperatively which decreased to 2 after the operation with a P value of 0.00062. This was observed in assessment of heartburn symptoms severity during sleep, laying flat, standing and after meals which all showed improvement after the operation with P values <0.005. There was no statistically significant improvement of dysphagia, odynophagia or bloating. The median follow up was 5 years.

Conclusions
Redo laparoscopic antireflux operations are technically challenging, however, significant heartburn symptoms control is feasible. Further evaluation of types of surgeries and patient selection can guide decisions regarding further management and guidelines.
P-BN26
The effect of cholecystectomy on unplanned admissions following endoscopic sphincterotomy and bile duct stone removal

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Background
Choledocholithiasis is common, with patients usually treated with ERCP and subsequent cholecystectomy to remove the presumed source of common bile duct (CBD) stones. However, previous investigations into the management of patients following ERCP have focussed on recurrent CBD stones, negating the risks of cholecystectomy.

Methods
Patients undergoing ERCP and CBD clearance for choledocholithiasis at St James’s University Hospital January 2015 – December 2018 were included. Patients were divided into those who received cholecystectomy and those managed non-operatively. Readmissions, operative morbidity, mortality and treatment costs were investigated.

Results
844 patients received ERCP and CBD clearance with 3.9 years follow up. 209 patients underwent cholecystectomy with 15% requiring complex surgery. 373 patients were non-operatively managed. Unplanned readmissions occurred in 15% following ERCP, mostly within two years. There was no difference in readmissions between the two groups. Accounting for the entire patient pathway, non-operative management was less expensive.

Conclusions
The majority of patients do not require readmission following ERCP for CBD stones and cholecystectomy did not reduce the risk of readmission. Few patients have recurrent CBD stones, but difficult biliary surgery is frequently required. Routine cholecystectomy following ERCP needs to be re-evaluated and a more stratified approach to future risk developed.
Novel technique for safe and efficient cannulation of the cystic and common bile duct

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Background
Concomitant stones in the common bile duct (CBD) at the time of laparoscopic cholecystectomy (LC) are present in up to 15% of patients. In conjunction with intra-operative cholangiogram (IOC), transcystic common bile duct exploration (TCBDE) enables diagnosis and management of ductal stones in a single stage procedure. However, cannulation of the cystic duct (CD) and CBD can be challenging. With repeated attempts at cannulation, there is increased risk of iatrogenic injury by creating a false passage or perforating the duct. We propose a novel technique for the safe cannulation of the CD and CBD.

Methods
Once critical view of safety is achieved, a clip is placed distally in the CD and opened with scissors. A flexible tip 80cm guidewire is then preloaded into 5-French ureteric catheter. The complex is then passed into the introducer through the lateral port. A grasper placed at Hartmann’s pouch is used to retract the gallbladder and straighting the CD. Only the guidewire is advanced out of the catheter, traversing the CD and CBD. Once safely advanced, the catheter can then be slid over the guidewire and the guidewire can be removed. IOC and TCBDE can then be performed if indicated.

Results
This technique was performed on 18 patients who failed CD cannulation during elective and emergency LC for symptomatic gallstone disease in a single center performed by the same surgical team. Median age was 46 years and there was 15 females. A total of 34 cannulations were attempted (in 18 patients) which 100% success rate. There was no added time required for the technique. In majority of cases it decreased the operative time due to quick intubation of CBD. None of the cases required conversion to open surgery.

Conclusions
The novel technique described for cannulation of the cystic duct uses a Seldinger ‘like’ approach. This is a safe an effective strategy for cannulation of the CD, making the skills more accessible and more time efficient. This should encourage more surgeons to perform IOC and TCBDE where indicated.
P-BN28
The Consistency of Operative Safety Markers and the Critical View of Safety During Laparoscopic Cholecystectomy: A Pilot Study

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Background
Safe laparoscopic cholecystectomy (LC) depends on surgeon's experience, operative difficulty, utilisation of traditional safety markers, adapting the dissection technique and, where possible, displaying the critical view of safety (CVS) to confirm cystic pedicle structures prior to division. The Safe Cholecystectomy Multi-Society Practice Guidelines and State of the Art Consensus Conference on Prevention of Bile Duct Injury During Cholecystectomy identified no direct comparative evidence to support the CVS over other methods of anatomic identification. The aim of this study, therefore, was to examine the consistency of safety markers guiding the dissection and to determine the value of displaying the CVS.

Methods
A pilot study was conducted, reviewing video recordings of 241 LCs (144 retrospective and 97 prospective). The consistency of the Rouvier Sulcus (RS), the cystic lymph node (CLN), identification of the common bile duct (CBD) and duodenum and a new marker; the "cystic duct fold" (CDF), the peritoneal fold stretching between the retracted Hartman's Pouch and the CBD guiding the dissection at its distal end over the gallbladder neck, was documented. Data on the safety marker used to commence dissection, gallbladder condition, the LC difficulty grade, the selected technique and whether the CVS was achieved was recorded and analysed.

Results
Although the CBD and duodenum were visualised in 77%, the CDF was identifiable in 56% (CLN in 52.3%, RS in 50.2%) and the most consistently used to commence dissection in 51.4% (CLN 17.4%, CBD in 11.6% and RS in 6.6%). 12.8% required access to the infundibulum using sub-serosal or trans-vesical dissection (41% had acute cholecystitis, empyema or gangrenous gallbladders). Infundibular dissection was used in 88%. CVS was achievable in 56.8%. The CDF dropped form 87% in difficulty grades 1 and 2 to 16.5% in grades 4 and 5 with the CLN used in 21% of these difficult LCs.

Conclusions
A new safety marker, the CDF is proposed, being more reliable and safer on account of starting the dissection away from the CBD and potentially aberrant ducts, contrary to the line of RS. The CLN is more reliable in difficult LC, especially with acute inflammation. Infundibular dissection remains the default approach to "target identification" required to display the CVS. The true value of the CVS, as an end product of the process of dissection, lies in "target confirmation" before dividing any structures and in clearing the cystic plate to avoid injury to Couinaud Types C, F and hepato-cystic ducts.
P-BN29
Laparoscopic cholecystectomy during the era of a Covid-19 pandemic; a cohort study

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Background
The Covid-19 era has created a lot of uncertainty for management of common emergency and elective surgical conditions such as acute cholecystitis and other gallstone disease related emergency admissions. At our centre we continued to provide early operative intervention for patients presenting with biliary disease and acute cholecystitis throughout the Covid-19 era during both the 1st and the 2nd waves, despite a significant local surge in Covid-19 hospital admissions impacting on the available resources. Here we present the outcomes of our experience of managing such patients during the Covid-19 pandemic of 2020 of both 1st and 2nd waves.

Methods
A retrospective observational study was performed on all patients presenting with acute cholecystitis and biliary disease who underwent elective and emergency surgical intervention at UHNM (University Hospital of North Midlands) during the second wave of the Covid pandemic (2nd CW) between 14/10/2020 and 14/01/2021). These were then compared with patients who presented in the first Covid wave (1st CW) of 1/03/2020 – 30/06/2020, and a control group pre-covid (CG) 1/03/2019 – 30/06/2019. Patients were identified using ICD-10 codes K80 (Cholelithiasis) and K81 (Cholecystitis) and OPCS codes.J18.1 – J18.5. Primary endpoints were length of stay, 30 day readmission rates, mortality and morbidity.

Results
A total of 146 patients were identified who underwent laparoscopic cholecystectomy during the study time period (2nd CW). In comparison to 104 patients during the first covid wave cohort (1st CW) and the control group (CG) of 217 patients in the preceding non covid year. Length of stay (LOS) was significantly lower in the 2nd CW cohort in comparison to both the previous 1st CW cohort and the CG cohort (p<0.0001), with readmissions also being statistically lower (5% vs 15% and 12% respectively p=0.027). There was no statistical difference in outcomes for post-operative complications as per Clavien-Dindo classification.

Conclusions
Overall our study demonstrates that the recommended good practice of early surgical intervention in both emergency and elective gallstone disease can continue during the pandemic periods without any significant impact on patient care & outcomes. Also during this period length of stay was significantly shorted and lower 30 day readmission rates which are likely to be multifactorial but where lessons could be potentially learnt.
P-BN30
Retroperitoneal biloma: a case report of spontaneous retroperitoneal bile leak and collection

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Background
Retroperitoneal biloma is a rare complication of gallstone disease. Only a handful of cases have been reported in the literature with various mechanisms postulated. Here, we report a case of spontaneous retroperitoneal biloma arising from gallbladder perforation.

Methods
An 87-year-old female patient presented with right upper quadrant pain in the context of known gallstone disease. Inflammatory markers and liver function tests were deranged. Cross sectional imaging found acute cholecystitis and a gallbladder neck perforation with an impacted 2cm proximal common bile duct (CBD) stone. A cholecystostomy was placed and she improved clinically. However, inflammatory markers remained high, and a subsequent computed tomography (CT) found a large collection in the retroperitoneum.

Results
The retroperitoneal collection measured 14cm x 7cm, and there had been evidence on prior CT scans of retroperitoneal inflammation. It was urgently drained under ultrasound guidance and found to contain bilious content. Subsequent endoscopic retrograde cholangiopancreatography (ERCP) was unable to retrieve the CBD stone, but left stents either side of the stone. The patient clinically and biochemically improved. She was discharged and had an elective ERCP, which successfully retrieved the stone, with a plan for urgent elective laparoscopic cholecystectomy.

Conclusions
Here, we report an interesting case of retroperitoneal biloma successfully managed with ultrasound-guided drainage. Perforation of the distal CBD can result in retroperitoneal bile leak, but the proximal CBD stone in this case would have likely prevented passage of bile. A more likely cause is adhesion of the gallbladder neck to the posterior parietal peritoneum due to chronic inflammation, with subsequent perforation and release of bile into the retroperitoneum. This has previously been described in the literature. Regardless of mechanism, knowledge of the potential for this rare complication is important for anticipating and appropriately managing complications of gallbladder perforation.
P-BN31
Surveillance for Gallbladder polyps at a NHS District General Hospital – a retrospective analysis

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Background
Gallbladder polyps are encountered in 5% of ultrasound scans and continue to remain a dilemma in terms of management. Very few polyps progress to cancer. However, most cancerous polyps are usually found at an advanced stage. It is therefore important to identify the premalignant polyps. There is a lack of national consensus in UK for surveillance of gallbladder polyps. Many trusts in the UK either adopt the European guidelines or formulate local protocols. We aim to present our findings based on our local surveillance policy existent during the study period with a view to recommending new local guidelines.

Methods
A search from our radiology database being coded to gallbladder polyp identified patients. We identified 431 patients from 2017 – 2019 who had a total of 1014 scans. The data was collected from local hospital IT databases in terms of variables such as number of scans, polyp size, number of polyps, progression to surgery or discharge from surveillance and histology. The data was analysed on excel platform.

Results
Patient demographics revealed an incidence of 54% in females (males 46%) with an average age of 59.7 years. Pain was the dominant symptom prompting the first scan (48%). An average of 2.3 scans were performed per patient. 45% of the polyps were less than 5mm. Overall, 22% polyps demonstrated interval growth. Only 15% of polyps less than 5mm demonstrated interval growth and none required cholecystectomy. 6% patients proceeded to surgery mainly for symptoms (46%) compared to polyp progression (1.5%). No malignancy was identified in this study. 43% of patients with polyp diagnosis in primary care had no identified surveillance plan.

Conclusions
Our study demonstrates a low incidence of polyp progression. We would recommend stopping annual surveillance after 2 years from the index scan for multiple small (<5mm) polyps with little or no progression but continue with annual surveillance for polyps greater than 5mm. We would recommend reserving cholecystectomy for symptomatic polyps and polyps greater than 10mm. There is wide variation in surveillance practice particularly in primary care. We would recommend sharing the guideline widely with primary care for optimal surveillance.
Should a three-port technique be the gold standard for laparoscopic cholecystectomy?

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Background
The four-port technique is currently considered the gold standard technique for laparoscopic cholecystectomy. A three-port technique has been described but there is no consensus over the safety profile and efficacy of this technique compared to the four-port technique.

Methods
A comprehensive systematic review and meta-analysis comparing the three-port technique to the standard four-port technique in laparoscopic cholecystectomy for benign diseases of the gallbladder was performed. Two authors independently conducted an electronic database search of CENTRAL, MEDLINE, EMBASE, CINAHL, WHO ICTRP and ClinicalTrials.gov. For each outcome, we calculated the risk ratio (RR), mean difference (MD) or standardised mean difference (SMD) with 95% confidence intervals.

Results
Eighteen trials were included which randomised 2085 participants. Length of hospital stay and postoperative analgesia requirement favoured the three-port group [(MD -0.29, 95% CI -0.43 – -0.16, p < 0.0001) and (SMD -0.68, 95% CI -1.03 – -0.33, p = 0.0001) respectively]. There were no differences in length of procedure and success rate between the two groups [(MD 0.90, 95% CI -3.78 – 5.58, p = 0.71) and (RR 0.99, 95% CI 0.97 – 1.01, p = 0.17) respectively]. There were no differences in the rate of any measured adverse events. There were no mortalities in either group. The GRADE quality of evidence was low.

Conclusions
The three-port technique for laparoscopic cholecystectomy can be chosen by experienced surgeons who perform it regularly. However, the decision to use three ports should not be at the expense of safe dissection.
P-BN34
A single centre study of outcomes for Hiatal Surgery during the Covid-19 pandemic

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Background
Covid-19 has had a significant adverse impact on our ability to maintain provision of surgical interventions for a range of conditions, due to the diversion of resources to care for Covid related emergency admissions. Furthermore, there is clear evidence demonstrating how covid-19 infection in the peri-operative period is associated with dramatically increased rates of morbidity for patients. It has therefore become incumbent on healthcare providers to create peri-operative care pathways which can facilitate delivery of surgical care in a Covid safe environment.

Methods
In response to the Covid-19 pandemic our institution implemented a ‘Covid-lite’ pathway in order to allow the admission for patients for surgical procedures on the basis of urgent need. This included patients requiring surgery benign upper GI conditions. Patients underwent pre-operative PCR Covid testing, and asked to isolate from time of swab until admission for surgery. Post-operative operative care was provided on the elective surgical ward which is all single rooms, and was maintained as a Covid free environment. We conducted a review of outcomes for all patients undergoing hiatal procedures between January 2020 – April 2021. Surgeries included were Para-Oesophageal Hernia Repair (POH), Anti-reflux Surgery (ARS) & surgery for achalasia (LCM). The primary outcome measure was the rate of Covid-19 infection in the peri-operative period. Measurements were also taken of length of stay, and any significant morbidity.

Results
Hiatal surgery was performed on 42 patients in this time period (28 female, 14 male). The median age was 73 years. Three patients underwent elective ARS and 39 had repair of POH. All ARS procedures were performed laparoscopically. For those having POH repair, 31 cases were elective admissions. 30/31 cases had laparoscopic procedures, with 50% of emergency cases also treated laparoscopically. All elective patients were managed via the

The median length of stay for elective cases was 2 days vs. 14.5 for emergencies (p=0.001). Zero patients returned positive Covid-19 tests pre-operatively or during their inpatient stay. Two patients were re-admitted within 30 days, although neither were related to covid-19.

Conclusions
These results indicate that it is possible to safely maintain the provision of hiatal surgery in the Covid-19 era for both elective and emergency cases. The use of a dedicated pathway demonstrates our ability to minimise risk of peri-operative Covid-19 infection and any associated morbidity or mortality. Although there has been a significant attempt prioritise surgery for patients with cancer during the Covid-19 pandemic, these results provide a strong case that it possible to provide safe and timely interventions for other necessary surgical interventions with appropriate risk reducing measures.
Trends in Management of Gall Bladder Polyps Over 10 Years

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Background
Gall Bladder (GB) polyps are abnormal growths on the inner lining that project into the lumen of the GB. They are a rare incidental radiological finding, with a prevalence ranging from 0.3% to 9.5%. The majority of these turn out to be pseudopolyps, however, correct follow up and management is essential to ensure that true polyps, which may be malignant or have malignant potential, are not missed.

We hypothesised that a lack of familiarity and poor understanding of the significance of GB polyps, along with the fact that they are frequently noted as an incidental finding by non-surgical specialties, has led to variable management of GB polyps. In order to investigate this, we carried out a retrospective analysis of the management of GB polyps at our large district general hospital over the last 10 years.

Methods
Patients were identified for this retrospective ten-year cohort study from our database by identifying all patients coded under the ‘International Statistical Classification of Diseases and Related Health Problems (ICD 10) code K82.8, other specified diseases of gall bladder’. Patients with other diagnoses, such as gall bladder dysfunction, were excluded after review of electronic patient record (EPR) (Sunrise, Allscripts). These records facilitated review of emergency attendances, clinic letters, investigations, and histological results for those diagnosed with a gall bladder polyp. Analysis was performed using Microsoft Excel.

Results
A total of 154 GB polyps were identified, of which general surgeons diagnosed 63% and 74% went on to have further management. 11% of patients in our cohort proceeded straight to laparoscopic cholecystectomy, 33% underwent planned surveillance, 20% had unplanned scans and 12% were either followed up with the GP or referred back to clinic. A further 26% were discharged. In total, 35% of patients ultimately had a laparoscopic cholecystectomy and the average time from diagnosis to operation was 19 months. There was a strong negative correlation (-0.72) in reduction in time to operation over the 10-year study period. We also identified a decline in patients being followed up over time (-0.14) and in patients receiving no further management post diagnosis (-0.19).

Conclusions
Management of GB polyps has historically been and continues to be very variable, however, over our 10-year study period we have identified a trend towards operating earlier, with more patients being listed for surgery straight from diagnosis, and more having a shorter period of surveillance. In our cohort there has been no change in number of patients who have further planned surveillance imaging after diagnosis or in numbers of patients discharged with no further investigation or management. We postulate that this variability in management may be due to the fact that GB polyps are often identified as an incidental finding by non-surgical specialists, together with a general lack of awareness of current guidelines and a poor understanding of the pathophysiology.
Audit of the Management of Gall Bladder (GB) Polyps according to European Joint Guidelines (EJG), 2017

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Background
Gall Bladder (GB) polyps are abnormal growths of the inner lining that project into the lumen. They are a rare incidental radiological finding, with prevalence ranging from 0.3% to 9.5%. The majority of these frequently turn out to be pseudopolyps, however, correct follow up and management is essential as to ensure that true polyps, which may be malignant or have malignant potential, are not missed. EJG on the subject, published in 2017, tried to address controversial issues including which patients require cholecystectomy, which patients require follow up and how frequently this should be. We carried out an audit assessing adherence of our center’s management of GB polyps to the EJGs.

Methods
Patients were identified for this retrospective ten year cohort study by identifying patients listed under ‘International Statistical Classification of Diseases and Related Health Problems (ICD 10) code K 82.8, other specified diseases of gall bladder’ on our database. Patients with other diagnoses, such as gall bladder dysfunction were excluded after review of electronic patient record (EPR) (Sunrise, Allscripts). EPRs facilitated review of emergency attendances, clinic letters, investigations and histological results for those diagnosed with a gall bladder polyp. Analysis was performed with Microsoft Excel.

Results
Since publication of the guidelines, 71 patients were diagnosed with a polyp. Of these, 73% were diagnosed by general surgeons and only 36% were managed according to the guidelines. We did, however, identify a strong positive trend (0.9) in improved adherence to guidelines over time. We found that guidance was more likely to be followed if the polyp was >10mm versus smaller (p <0.01). 18% of patients (50% of those adherent to guidelines) were booked straight for laparoscopic cholecystectomy but there was a much poorer adherence to guidance concerning surveillance of polyps. There was no statistically significant difference (p=0.32) in adherence to guidance when comparing management by surgeons versus non-surgeons.

Conclusions
Adherence to EJG’s overall is poor in our cohort. The adherence has improved over time, and at 3 years post introduction is 62% compared to an average of 35%. The guidance is also best followed when laparoscopic cholecystectomy is indicated straight from diagnosis compared to patients who meet the criteria for surveillance. Initial diagnosis by a non-surgical specialty does not affect adherence to guidance. Better local education amongst junior surgical grades about GB polyps, as well as increased awareness of the EJG’s may improve adherence to guidance. Further research into risk stratification and the optimal follow up of GB polyps may make surveillance guidance easier to follow and further improve compliance.
Patient Outcomes Following Laparoscopic Cholecystectomy after a Diagnosis of Gall Bladder (GB) Polyp over 10 Years

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Background
Gall Bladder (GB) polyps are elevations of the GB wall that project into the lumen. They are a rare incidental radiological finding with prevalence of 0.3% to 9.5%. Although the majority of these may be pseudopolyps correct follow up and management is essential to ensure that true polyps, which may be malignant or have malignant potential, are not missed. We conducted a retrospective study assessing patient factors that may predispose to the finding of true polyps. Patient outcomes including histological findings as well as ongoing symptoms and further investigations or emergency attendances were also assessed.

Methods
Patients were identified for this retrospective ten year cohort study using International Statistical Classification of Diseases and Related Health Problems (ICD 10) code K 82.8, other specified diseases of gall bladder. Patients with other diagnoses such as gall bladder dysfunction were excluded after review of electronic patient record (EPR) (Sunrise, Allscripts). EPR allowed for review of emergency attendances, clinic letters, investigations and histological results for those diagnosed with a gall bladder polyp. Analysis was performed with Microsoft Excel.

Results
35% patients had a laparoscopic cholecystectomy and the average wait time for surgery was 19 months but only 11% of patients were found to have true GB polyps on histology. Other histological findings included chronic cholecystitis (96%), cholesterolsis (33%) and stones 35%. Only 12% of those booked straight to laparoscopic cholecystectomy represented post operatively compared to 37% of those operated on after a period of surveillance. Patients booked straight for laparoscopic cholecystectomy, or diagnosed with polyps >10mm in size, were statistically more likely to have a true GB polyp (P<0.05), however, gender, ethnicity, and whether an isolated polyp or multiple were diagnosed made no statistical difference to detection of a true polyp (P>0.05).

Conclusions
From this series of patients true polyps are most likely to be identified if it is larger than 10mm at diagnosis and operated on straight away. 96% of all patients, however, displayed histological features of chronic cholecystitis. This suggests that proceeding to laparoscopic cholecystectomy straight from diagnosis of a GB polyp can be justified. Only 1patient in our cohort returned normal GB histology. Following diagnosis of a GB polyp, the option of operation versus surveillance should be discussed with individual patients and decisions based on assessment of risks and benefits should be made. Further research will help identify those with a predisposition to high-risk true polyps.
The perils of MRCP requesting and early associations of data quality and likelihood of a diagnostic result

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Background
MRCP (Magnetic resonance cholangiopancreatography) is used most to assess the biliary tree for stones or strictures. Recently, MRCP availability has increased, and it is extensively used to detect of common bile duct (CBD)stones although very frequently no stones are seen. Indeed, the currently recruiting sunflower RCT aims to determine the clinical and cost effectiveness of expectant management versus MRCP in patients undergoing laparoscopic cholecystectomy at low or moderate risk of common bile duct stones. However, it is critical when requesting an investigation that adequate information is provided. This work aimed, to describe the adequacy of information provided and correlate this with the MRCP result. We hypothesised that the less information that was provided the more common a normal result would be.

Methods
For a three month period (January 2021 to April 2021) all MRCP requests to detect the presence of a CBD stone were reviewed and data obtained from the Radiology CRIS (CDN Radiology Information System, CDN, Sydney, Aus.). The requesting information was compared to three pre-defined criteria (CBD diameter, presence of gallstones and LFT details) that were agreed as the optimal information that a reporting radiologist would require. The number of key pieces of information for each request and whether the request identified a CBD stone were identified. The proportion of MRCPs detecting a CBD stone was calculated according to the number of key pieces of information provided.

Results
56 patients were identified, of which 16 (29%) patients had CBD stones. In 24/56 (43%) patients the presence of gallstones on a previous ultrasound was provided, 14/56 (25%) of patients had information about LFTs including bilirubin and a trend in LFTs was not stated for any patient (0/56; 0%). The rate of stone detection was calculated by the number of pieces of information provided. The rate was 71% (5/7) when all 3 pieces of data were provided, 31% (2/13) when two piece of information were provided, 30% (8/27) when a single piece of information was provided, and only 11% (1/11) when none of the specified data were provided.

Conclusions
It is uncommon for adequate clinical information to be provided in MRCP requests and in 16% of request no key information was provided. The LFT results were frequently omitted and the trend in LFTs never stated. The more key data provided in the request saw a higher proportion of MRCPs where a CBD stone was identified. We recommend that maximal clinical information is mandated for MRCP request perhaps using mandatory fields on electronic requesting systems and that these systems are also used to facilitate recruitment to clinical trials such the Sunflower RCT.
Fundoplication following lung transplant: A retrospective cohort analysis

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Background
Gastroesophageal reflux disease (GORD) in patients receiving a lung transplant has been associated with worsened graft function and decreased survival. This analysis aimed to identify whether fundoplication following lung transplant can improve graft function and overall survival.

Methods
Patients undergoing lung transplantation between January 1993 and January 2020 were included. Data on oesophageal pH, manometry testing, post-transplant lung function testing and overall survival were collected. Cox-regression testing was used to analyse associations between oesophageal manometry and pH testing, fundoplication and overall survival.

Results
Of 345 patients who underwent a lung transplant, 20 patients also received fundoplication. 84 patients received oesophageal pH and manometry testing. Abnormal manometry was recorded in 41 patients. Average Demeester score was 28.45 for patients not receiving fundoplication and 37.28 for those receiving fundoplication. Average pre-operative reflux time was 8.6% for those not receiving fundoplication and 10.3% for those receiving fundoplication. Of 20 fundoplications, 4 were carried out within 1 year of transplant and 12 within 2 years. 1 patient had a post-operative complication following fundoplication. 13 of 20 patients had a positive response to fundoplication, defined as a less than 10% decrease in FEV1 lung function at 2 years. Receiving fundoplication was associated with better overall survival (p=0.024) as was total reflux time <7% (p=0.21).

Conclusions
Fundoplication is a safe operation after lung transplant with good outcomes. Fundoplication was associated with better overall survival on cox-regression analysis.
Does performing percutaneous cholecystostomy in patients at risk of sepsis have better outcomes than patients in sepsis?

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Background
Gallstone related diseases account for almost one-third of acute surgical admissions with presentation varying from biliary colic to sepsis. There were various studies evaluating the role of ‘percutaneous cholecystostomy’ (PC) as part of the management in acute cholecystitis under ‘radiological guidance’ (RG). However, limited literature is conducted to evaluate patients’ outcomes based on the indication and optimal timing of cholecystostomy. Therefore, this study was set up to assess the difference in clinical outcome between the patients undergoing cholecystectomy with overt sepsis (OS) and impending sepsis (IS).

Methods
A retrospective observational study was conducted using a prospective database on patients who underwent PC under RG between 03/2014-03/2021. NICE’s sepsis risk stratification tool was used to divide patients into OS and IS groups. OS group included patients with 1 or >1 high-risk criteria. IS group included patients with 2 or >2 moderate to high-risk criteria. The primary outcomes are 30-day mortality and the ‘length of stay’ (LoS) and secondary outcome include post-procedural ‘bile leak’ (BL). Continuous and categorical variables were analysed using Mann-Whitney U and Chi-squared tests respectively. A p-value of <0.05 was considered to be statistically significant.

Results
Some 27 patients were included. The median age was 80 (range 61-90). The majority of the patients (77.78%, n=21) were unfit for surgery, with a Charlson Comorbidity Index ranging of 3 to 12. The median length of hospital stay of the OS and IS groups were 17 and 15 days respectively (p=0.47). There was no significant difference in bile leak (IS-1/20 vs OS-0/7; p=0.56) and drain accidents (IS-8/20 vs OS-1/7; p=0.35). Overall two patients in the IS group underwent an uncomplicated interval cholecystectomy. The 30-day mortality rate was significantly higher in OS (IS 0/20 vs OS-4/7; p=0.00039).

Conclusions
Percutaneous cholecystostomy is generally safe to be performed irrespective of patients’ co-morbidities and has no significant long-term complications associated with mortality. Early cholecystostomy before overt sepsis results in a reduced 30-day mortality rate and better outcome. Further clinical studies may be required to determine specific patient groups who would benefit from percutaneous cholecystostomy.
P-BN42
Percutaneous cholecystostomy - A practice review

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Background
Percutaneous cholecystostomy (PC) is performed occasionally in a highly selected group of patients with variable outcomes. The World Society of Emergency Surgery (WSES) updated guidelines(2020) has recommended PC as a treatment modality in patients admitted with ‘acute calculous cholecystitis’(ACC) with who are not fit for surgery, including septic patients and those who show no improvement on conservative management within 48 hours. An audit was organised to review our patient selection for PC in the last 5 years in comparison to the latest WSES recommendations.

Methods
A retrospective observational study was conducted using a prospectively collected hospital database on patients who underwent PC between March 2016 and March 2021 in a teaching hospital. The patient cohort who underwent PC were compared and analysed against the set WSES guidelines.

Results
Some 23 patients were included. The median age was 82 years (range-61-90), with 13 females (56.5%) and 10 males (43.5%).19/23(82.6%) patients were at risk of sepsis on presentation, with two or more amber flag symptoms, whereas 4/23(17.4%) patients presented with confirmed sepsis. 19/23 (82.6%) were deemed unfit for surgery against 4/23 who were deemed fit based on the surgeons assessment. Patients unfit for surgery were treated with antibiotics following a diagnosis of ACC. The median time for patients to undergo PC from admission was 4 days. The 30-day mortality rate was 13 % (n=3/23).

Conclusions
The study has demonstrated that our current practice for managing patients admitted with ACC and performing PC are mostly in line with the WSES guidelines. Considering individuals presentation and the surgeons clinical judgement into account, the practice was also likely impacted by COVID-19 the global pandemic. Further clinical studies may be required to determine specific patient groups who would benefit from PC.
Giant Hiatus Hernia Repair Significantly Improves Quality of Life

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Background
Giant hiatus hernias (GHH), defined as more than 30% of the stomach herniating into the chest cavity accounts for 5%-10% of all hiatus hernias.
GHH repair is undertaken electively in symptomatic patients, to prevent complications such as volvulus of the stomach with resultant mortality. Advances in laparoscopy and perioperative care have reduced the risk of operation, and improvement in quality of life (QoL) has become an important outcome measure. “Quality of Life in Reflux and Dyspepsia” (QOLRAD) questionnaire is a disease specific validated tool used to assess QoL.
We present our prospective data assessing change in QoL following GHH repair.

Methods
Symptomatic patients undergoing elective repair of GHH, by a single surgical team, between January 2010 and June 2021 were identified from a prospectively kept database. Demographic data and operative details were recorded from patient notes.

From 2015 onwards the QOLRAD questionnaire was introduced. Patients who underwent GHH repair completed the questionnaire pre-operatively and then at 6 weeks, 6 months, 1 year and 2 years post-operatively. Patients, who were not operated on, completed the questionnaire at 6 month intervals over 2 years.
Mann-Whitney U test was used to compare QOLRAD scores between hernia size, type and symptomatology.

Results
Sixty-eight patients underwent GHH repair from 2010 to 2014. Statistically significant (p<0.001) improvement in QoL was only seen in patients with ‘heartburn’ symptoms.

Thirty patients were included in the post 2015 group. Statistically significant improvement in all QOLRAD domains was observed as demonstrated in the table below.

<table>
<thead>
<tr>
<th></th>
<th>PRE-Operation</th>
<th>6 WEEKS</th>
<th>6 MONTHS</th>
<th>1 YEARS</th>
<th>2 YEARS</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotional distress</td>
<td>3.4</td>
<td>6.4</td>
<td>6.0</td>
<td>6.4</td>
<td>6.1</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Sleep disturbance</td>
<td>3.5</td>
<td>6.3</td>
<td>6.2</td>
<td>6.3</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Food and drink problems</td>
<td>3.0</td>
<td>5.8</td>
<td>5.8</td>
<td>6.1</td>
<td>5.8</td>
<td></td>
</tr>
<tr>
<td>Physical/social functioning</td>
<td>3.7</td>
<td>6.3</td>
<td>6.3</td>
<td>6.2</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>Vitality</td>
<td>3.4</td>
<td>5.8</td>
<td>6.2</td>
<td>6.3</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>QOLRAD total</td>
<td>3.4</td>
<td>6.2</td>
<td>6.1</td>
<td>6.3</td>
<td>6.0</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions
GHH repair is a safe operation in symptomatic patients that results in an improvement in QoL across all QOLRAD domains and may prevent deterioration in QoL.
P-BN44
The impact of the COVID-19 pandemic on waiting lists for laparoscopic cholecystectomy and its effect on patient care and outcomes

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Background
It has been widely reported that the COVID-19 pandemic has had a detrimental impact on waiting lists for elective surgery in the NHS. Delays in laparoscopic cholecystectomy (LC) are likely to prolong suffering for symptomatic patients and risk increasing complications for patients which may then require emergency care and intervention. In this study we aim to quantify the impact of the COVID-19 pandemic on elective waiting lists and to assess what implications this might have on patient care and outcomes.

Methods
Electronic health records were retrospectively interrogated for patients undergoing LC in both March 2019 (prior to the COVID-19 pandemic) and March 2021. The following data was captured: age, gender, elective vs emergency operation, laparoscopic vs open, total vs subtotal cholecystectomy, use of drains, length of stay/daycase rates, the number of emergency presentations prior to operation and the number of days between being listed for surgery and their operation. The results were analysed using SPSS Statistics (IBM, New York).

Results
111 patients were included in the study (25 male and 86 female). Of these, 60 had their LC in 2019, and 51 in 2021. The age and gender distribution of the patients in both time periods were similar. The median number of days on the waiting list was significantly higher ($P < 0.001$) for patients in 2021 at 379.5 days, compared with 153 days in 2019. There was a significant increase in the number of emergency presentations prior to LC in 2021 ($P = 0.025$) with an average of 0.7 presentations per patient compared with 0.45 in 2019. Additionally, there was a significant increase in the number of emergency LC performed in 2021 ($P = 0.002$), with 15 performed compared with 4 in 2019, representing 29.4% and 6.7% of all LC respectively. There was no significant change in rates of conversion to open, drains or subtotal cholecystectomy. There was no significant difference in daycase rates for elective patients in either period (55% vs 58%).

Conclusions
Whilst there has been no change in the operative outcomes for patients undergoing LC, there has been a stark increase in the length of time patients are on a waiting list prior to undergoing elective LC. This has resulted in a significant increase in the number of emergency presentations and the number of emergency LC performed. This study demonstrates the wider impact of increasing waiting list times beyond the prolonged suffering of symptomatic patients. A significant reduction in waiting list times would be beneficial to both patients and healthcare providers, with the aim of reducing the number of emergency presentations. A reduction in these would have a positive impact on acute services and on the associated cost implications.
The Impact of Covid-19 on Benign Upper GI Operations in England During 2020

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Background
Since the cancellation of elective surgery in early 2020 due to the threat of Covid-19, surgical provisions in England have continued to be affected by the Covid-19 pandemic. Elective surgery makes up the majority of surgical procedures performed in England and therefore cancelled operation lists and increased demand for ITU beds has had a significant impact upon the surgical services delivered to patients throughout 2020. The following research looks at the impact of Covid-19 on benign upper GI surgery in England and reviews the relationship between Covid-19 deaths and operations performed throughout England and analyses the data at a regional level.

Methods
Data relating to operation numbers was taken from The Surgical Workload Outcomes Audit (SWORD) database. The SWORD database was interrogated for the years 2017 – 2020. A mean number of operations was calculated using the 2017-2019 data and compared to data from 2020. Operations performed and other demographic data was analysed regionally and compared to Covid-19 deaths throughout England. Covid-19 data was obtained from the national government dashboards.

Results
The results show that there is a correlation with increasing Covid deaths and lower rates of elective surgery. Furthermore, elective surgery was worse hit than emergency surgery with a slower recovery overall. Cholecystectomies were reduced by a total of 20817 (31.4%) for the year 2020 with a greater reduction seen in elective operations (35.6%). However, similar reductions were seen in both laparoscopic (31.4%) and open (37.5%) Similarly, bile duct explorations and elective splenectomy were reduced by 34.4% and 23.4% respectively. Comparatively, both paraumbilical and inguinal hernias also saw reductions of greater than 40% in 2020 when compared to the mean of the previous 3 years. Regional variances were seen between operation numbers performed and Covid-19 rates, however the overall trend remained the same for national level data.

Conclusions
Overall, the Covid-19 pandemic has had a significant impact on operations, particularly on those deemed as benign and ‘less urgent’. Whilst a global impact across all benign operations was seen, greater reductions were seen in elective operations compared to emergency operations. Hernia operations and bile duct exploration saw greater overall reductions compared to cholecystectomies and splenectomies, which suggests that whilst operation numbers were reduced, efforts were made to prioritise operations with greater clinical need throughout the pandemic. On analysis of the data in relation to Covid-19 rates and deaths, variation was seen across the regions in the UK, however overall the trend remained the same. Centres and regions worse hit by Covid-19 performed less operations during 2020. However, further qualitative research to investigate why certain centres maintained higher levels of performance during the pandemic would be beneficial for planning for future waves and future pandemics.
Risk Factors for Anastomotic Stricture after Hepaticojejunostomy for Bile Duct Injury – A Systematic Review and Meta-Analysis

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2College of Medical and Dental Sciences, University of Birmingham, Birmingham, United Kingdom

Background
After major bile duct injury (BDI), hepaticojejunostomy (HJ) is usually required. This can lead to good long-term patency but anastomotic stricture unfortunately remains common cause of long-term morbidity after major BDI. Although risk factors for adverse outcomes of BDI repair are reasonably well understood, there is a need to assimilate high level evidence to establish risk factors specifically for development of anastomotic stricture after HJ for BDI.

Methods
This was a systematic review of studies reporting rate of anastomotic stricture after HJ for BDI was performed according to PRISMA guidelines. Where possible, meta-analyses were then performed to establish risk factors for anastomotic stricture after HJ for BDI.

Results
The meta-analyses performed included five factors with a total of 2,155 patients from 17 studies. An increased rate of anastomotic stricture after HJ for BDI was shown amongst patients with concomitant vascular injury (OR 4.96; 95%CI 1.92-12.86; p=0.001), post-repair bile leak (OR: 8.03; 95%CI 2.04-31.71; p=0.003) and repair by non-specialist surgeon (OR 11.29; 95%CI 5.21-24.47; p<0.0001). Level of injury according to Strasberg Grade did not significantly affect the rate of anastomotic stricture (OR: 0.97; 95%CI 0.45-2.10; p=0.93). Due to heterogeneity of reporting it was not possible to perform meta-analysis for impact of timing of repair on anastomotic stricture rate.

Table 1 – Meta-analysis of risk factors for anastomotic stricture after hepaticojejunostomy for bile duct injury

<table>
<thead>
<tr>
<th>Groups</th>
<th>N Stud.</th>
<th>N Pat.</th>
<th>I²</th>
<th>Odds Ratio (95% CI)</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injury factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strasberg E3-5</td>
<td>5</td>
<td>644</td>
<td>4%</td>
<td>0.97 (0.45-2.10)</td>
<td>0.93</td>
</tr>
<tr>
<td>Vascular injury</td>
<td>7</td>
<td>380</td>
<td>0%</td>
<td>4.96 (1.92-12.86)</td>
<td>0.001</td>
</tr>
<tr>
<td>Post-repair bile leak</td>
<td>3</td>
<td>192</td>
<td>54%</td>
<td>8.03 (2.04-31.71)</td>
<td>0.003</td>
</tr>
<tr>
<td>Repair factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Previous repair attempt</td>
<td>4</td>
<td>800</td>
<td>46%</td>
<td>2.68 (0.81-8.86)</td>
<td>0.11</td>
</tr>
<tr>
<td>Non-specialist repair</td>
<td>2</td>
<td>186</td>
<td>0%</td>
<td>11.29 (5.21-24.47)</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Conclusions
Repair by a non-specialist surgeon was the only modifiable risk factor revealed by this meta-analysis and systematic review, which demonstrates the importance of broad awareness of these data. That said, knowledge of these risk factors permits evidence-based risk stratification of follow-up as well as better informed consent and understanding of prognosis for patients who have experienced major BDI and require HJ.
Acute cholecystectomy in elderly - Age is not a limit

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Royal Shrewsbury Hospital, Shrewsbury, United Kingdom

Background
Acute or hot cholecystectomy (AC) has been established as a safe and efficacious modality of managing acute biliary pathology. However, it has been performed with caution in the elderly (defined by the world health organisation as patients over the age of 65). The NICE guidance in this area does not preclude this practice on elderly patients. Our acute cholecystectomy service treats patients of all ages according to performance status and fitness for surgery rather than age we audited our results in this age group.

Methods
All patients over the age of 65 who underwent acute cholecystectomy in the dedicated emergency cholecystectomy lists were audited from the period starting 31st December 2019 to 31st June 2021. Patient demographics, co-morbidities and surgical factors were recorded. The primary outcomes measure was in hospital stay and re-admission, secondary outcome were complications and perioperative mortality.

Results
41 elderly patients underwent AC during the audit period, (male 18: female 23). Majority of patients had acute cholecystitis 30(73%). The median inpatient stay following surgery was 2 days(range 2-5 days) and the median admission to surgery time was 6 days (range 5-12 days). Only 3(7%) patients had a subtotal cholecystectomy. There was only 3 complications from surgery which were all between a clavien-dindo score of 2 and 3. There were 3 readmission in the immediate post-operative period. There was one 30-day mortality which was from necrotising pancreatitis as a result of ERCP and not from the operation.

Conclusions
Acute cholecystectomy in this age group appears to be safe and effective way to treat acute biliary pathology and compares similarly to the outcomes in the younger groups.
Utilising spatial geometry to obtain the ideal needle mount for laparoscopic intracorporeal suturing

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¹Ninewells Hospital and Medical School, Dundee, United Kingdom. ²University of Dundee, Dundee, United Kingdom

Background
Intracorporeal suturing is an essential component of any advanced laparoscopic procedure like fundoplication, bypass surgery or common bile duct exploration. Obtaining the appropriate needle mount during suturing can be challenging. Spatial geometry defines points in three-dimensional space. Ergonomics in laparoscopic surgery identifies a manipulation angle of 60° to target as being optimal. This knowledge, in combination with the principles of light reflection can be used to understand needle orientation in laparoscopic suturing.

Methods
An experiment was designed on a laparoscopic trainer with three participants. Using the principles of spatial geometry and light reflection, four different points were identified on an angle chart and labelled for a right-hand dominant participant as; centre, right off-centre (5.5cm), right lateral (10 cm) and left off-centre (5.5cm). Each participant was instructed to mount the needle at the defined points using light reflection on the needle shaft as a reference guide. Three readings were taken for each position. Mounted angle was defined as the angle between the shaft of needle holder and long axis of the needle. This was measured using a special application and an average value determined for each position.

Results

<table>
<thead>
<tr>
<th>ANGLE MEASUREMENT (degrees)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOUNTED ANGLE</td>
<td></td>
</tr>
<tr>
<td>Centre</td>
<td></td>
</tr>
<tr>
<td>Participant 1 116 101 110 114</td>
<td>112</td>
</tr>
<tr>
<td>Participant 2 110 115 118 120</td>
<td></td>
</tr>
<tr>
<td>Participant 3 102 117 119 107</td>
<td></td>
</tr>
<tr>
<td>Right off centre</td>
<td></td>
</tr>
<tr>
<td>Participant 1 92 97 92 102</td>
<td>101</td>
</tr>
<tr>
<td>Participant 2 106 95 112 102</td>
<td></td>
</tr>
<tr>
<td>Participant 3 111 102 94 98</td>
<td></td>
</tr>
<tr>
<td>Right lateral</td>
<td></td>
</tr>
<tr>
<td>Participant 1 84.5 97 85 77</td>
<td>88.8</td>
</tr>
<tr>
<td>Participant 2 92 91.37 93.4 84</td>
<td></td>
</tr>
<tr>
<td>Participant 3 97 95 89 78</td>
<td></td>
</tr>
<tr>
<td>Left off centre</td>
<td></td>
</tr>
<tr>
<td>Participant 1 119 120 128 121</td>
<td></td>
</tr>
<tr>
<td>Participant 2 133.2 126 134 132</td>
<td></td>
</tr>
<tr>
<td>Participant 3 129 134 101 129</td>
<td></td>
</tr>
</tbody>
</table>

The average values for the mounted angle measurements for each spatial position were: Centre(112°), Right off centre(101°), Right lateral (88.8°) and Left off centre (124.6°).

Conclusions
This study describes a novel and reproducible technique to obtain an ideal needle mount. For a needle mount greater than 100° either the centre position or the left off-centre position should be considered.
The predictive role of white cell and platelet count for infective complications following splenectomy

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Background
Temporary elevation of white cell count (WCC) and platelets are commonly observed after splenectomy and can therefore make it difficult for the surgeon to distinguish a normal physiological response from potential infection. Clinicians are often misled by elevated post-operative WCC after splenectomy, resulting in delayed discharges and prolonged unnecessary hospital stays for patients. The aim of this study was to establish what constitutes a normal rise in WCC and platelets after splenectomy.

Methods
All 127 patients who had undergone a splenectomy between July 2016 and January 2021 were identified from a search of our centre’s hospital episode statistics data. WCC and platelet count on post-operative days one to seven as well as at least one long-term follow-up result count were identified from electronic hospital records. Hospital records were searched for data on pre-operative steroid administration and peri-operative infections. These cohort data were retrospectively analysed in SPSS using stepwise logistic regression, correlation analysis, and T-tests, as well as descriptive statistics.

Results
86 (68%) patients underwent an elective splenectomy and 41 (32%) an emergency splenectomy. 35 (27.6%) patients developed infections post-operatively, while 92 (72.4%) did not. Logistic regression suggested that a raised WCC (above 17.5x10^9/L) at day 3 post-op was a significant predictor of infection (p<0.001): average WCC at day 3 for patients with infection was 20.00x10^9/L (SD = 6.23x10^9/L) compared to 14.86x10^9/L (SD = 4.01x10^9/L) for those without. Infective outcomes were not influenced by whether the surgery was emergency or elective. Overall, average WCCs were 9.63x10^9/L pre-operatively and 15.07x10^9/L long-term post-operatively. Even in the absence of infection, splenectomy led to a long-term rise in WCC of 3.8x10^9/L from baseline, to an average of 13.0x10^9/L: a T-test on the 56 patients without infection and with both pre-op and long-term WCCs showed a mean rise of 3.76x10^9/L, p<0.0001).
Platelet count was not correlated with infection, though platelet counts rose from a mean of 261x10^9/L (SD = 103.4x10^9/L) pre-operatively to 581x10^9/L (SD = 236.3x10^9/L) at 7-day and 619x10^9/L (SD = 293.5x10^9/L) at long-term follow up across all patients – an average increase of 357x10^9/L, which did not significantly differ between patients with and without infective complications.

Conclusions
A rise in WCC and platelet count is normal post-splenectomy. A rise in WCC>17.5x10^9/L on day 3 post-splenectomy is strongly correlated with infection (regardless of trauma or platelet count). Long-term follow up suggests that while much of the WCC increase is transient, WCC remains higher than pre-operatively, as does platelet count, in post-splenectomy patients. A raised WCC or platelet count without signs of infection should not preclude timely discharge in otherwise well patients.
Transcystic CBD Exploration: The First-Line Treatment of CBD Stone - A Single Centre 12-month Review of Practice

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Ulster Hospital, Belfast, United Kingdom

Background
In the UK around 15% of the population will have gallstones and as such biliary pathology makes up a significant proportion of emergency and elective general surgical practice. Within this 10% will have choledocholithiasis; the management of which remains widely varied.

A single-stage laparoscopic cholecystectomy with transcystic common bile duct exploration has been shown to be a safe and efficient option avoiding a choledochotomy and risks associated with ERCP. The aim of this study was a 12-month review of data following the adoption of this approach; assuming that laparoscopic transcystic CBD exploration was the ideal treatment for CBD stones.

Methods
This was a retrospective, single-centre, observational study. All patients who underwent a laparoscopic transcystic CBD exploration from June 2020 to June 2021 were included both in the elective and emergency setting. Patient demographics were varied with ages ranging from 15 to 76 and ASA classification of 1 -3, showing a significant proportion with comorbidities.

Data collection was done through a review of a contemporaneous operative database and a follow-up morbidity period of 30 days was cross-referenced with electronic healthcare records.

The primary outcome studied was CBD stone clearance. With secondary outcomes measures including complications, length of stay and the role of preoperative imaging versus intraoperative cholangiogram.

Results
A total of 49 patients were included within the study, of which 61% were emergency. The primary outcome of CBD stone clearance was achieved in all elective patients with one emergency patient requiring ERCP for a retained fragment at day 8.

There were no other complications in the remaining 48 patients, making the 30-day morbidity 2% upon review of electronic care records. One patient was converted to open due to concern with regards to potential CBD injury but this was demonstrated not to be the case. The median duration of hospital admission was 3 days with a range from 0-15, with the median stay for elective cases being 1 day.

Finally, 39 patients underwent intraoperative cholangiograms prior to duct exploration as a means of identifying CBD calculi and delineating anatomy. Those 10 that did not; all had an MRCP within 30 days of surgery demonstrating CBD calculi and as such proceeded straight to CBD exploration.

Conclusions
Laparoscopic cholecystectomy and transcystic CBD exploration, with adequate training and exposure, is a viable and safe first-line approach for all cases of choledocholithiasis both in the elective and emergency setting; demonstrating advantages by avoiding additional procedures thereby reducing costs, inpatient bed days and a risk of further complications and being truly minimally invasive.

The principal findings of this study were that the transcystic CBD exploration route can achieve successful CBD stone clearance rates in close to 98 per cent of patients with a low morbidity rate, and a short median length of hospital stay. This study of course has several potential limitations; given it was a retrospective single-centre observational study there is likely a degree of selection bias and although follow up was complete in all patients to 30 days via electronic care record it was not routine practice to offer face to face follow up given the low incidence of delayed complications. On the basis of this review, the transcystic approach has become the primary strategy for patients with common bile duct stones within this unit.
Subtotal cholecystectomy: risk factors and patient outcomes

James Lucocq, David Hamilton, John Scollay, Pradeep Patil
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Background
A subtotal cholecystectomy (SC) is indicated when a total cholecystectomy (TC) cannot be achieved without the risk of causing significant harm, the most feared complication being a bile duct injury. The aims of the present study were to identify patients at risk of SC, to compare the peri- and post-operative course between SC and TC and to compare outcomes between fenestrated and reconstituting subtypes.

Methods
All planned laparoscopic cholecystectomies across three surgical units over a population of 493,000 between 2015 and 2019 were considered. Data were collected retrospectively using electronic databases and included pre-operative, operative and post-operative data over a 100-day follow-up period. Variables associated with SC were identified using multivariate logistic regression. Outcomes following SC were compared with TC using univariate analysis, specifically chi-squared and Mann-Whitney U tests. The subtype of SC was documented and outcomes were compared between groups.

Results
The rate of SC was 3.4% (94/2768). Variables positively associated with SC included male sex (OR-2.33;p<0.001), age≥60 (OR-1.79;p=0.009), ≥2 previous admissions (OR-1.76;p=0.043), ≥3 previous admissions (OR-3.10;p=0.003), emergency cholecystectomy (OR-2.01;p=0.002); cholecystitis (OR-4.92;p<0.001) and pre-operative ERCP (OR-2.23;p<0.002). Patients with SC versus TC were more likely to suffer intra-operative complications (RR-13.1;p<0.001), post-operative complication (RR-6.7;p<0.001), require post-operative imaging/intervention (RR-4.0;p<0.001) and be re-admitted (RR-4.2; p<0.001). The rate of bile duct injury was 0% in SC patients. The rate of post-operative bile leak was higher where the cystic duct was left open versus closed (RR-2.9;p=0.03) and in fenestrating SC versus reconstituting SC (35.7% versus 0%;p=0.002). Drain duration was reduced in reconstituting SC (p<0.001).

Conclusions
The risk of SC can be explained by a number of patient specific factors and the risk should be emphasized in these patients during the consent process and should influence surgical decision making. The morbidity following a subtotal cholecystectomy is markedly higher than that of a total cholecystectomy but can be performed without significant risk of bile duct injury. Reconstituting SC and closure of the cystic duct reduces rates of post-operative bile leaks and duration of drains.
Background
Gastro-oesophageal reflux disease (GORD) affects approximately 10%-20% of adults in Western Countries. Surgery is indicated following failed medical therapy. This is recommended when GORD symptoms have a significant impact on the quality of life (QOL). A long term follow up is critical to authenticate outcomes following anti-reflux/hiatal hernia repair surgery. Objective information must be linked to the patient’s perception of the disease and the impact on the QOL. Our survey aims assess the long term patient’s satisfaction and the impact on QOL following standard Nissen’s and Lind’s fundoplication for GORD.

Methods
A single surgeon’s prospective database of laparoscopic and or open hiatus hernia repair and fundoplication with patient’s demographics since 2014 in a district general hospital was analyzed. These patients were contacted virtually between June and July 2021. Verbal consent was obtained, the patients were asked to answer questions from the GERD HRQL (AUGIS modified for use in National Hiatal Surgery Registry) for Hiatus Hernia (HH) or Gastro-oesophageal reflux disease (GORD) or both to assess postoperative symptoms relief, complications, and overall quality of life. The scoring scale was divided into two categories; no symptoms or mild–moderate symptom improvement and those with significant symptoms.

Results
Of the 93 patients, 85 (91.4%) underwent primary laparoscopic repair with 91 cases performed as elective procedure. 68 patients (73%) underwent a Lind wrap, 24 (26%) had a floppy Nissen’s and one was a dor procedure. Three patients with unrelated death were excluded from the analysis. We had 67 responders (74.4%), 56 answered the GORD questionnaire and 66 responded to the HH questionnaire.
84% patients with GORD and 85% of patients with HH had significant symptom improvement. 61% and 55% suffered from significant gas bloat symptoms in each group. As for dysphagia; 77% had no - mild dysphagia and 23% had significant dysphagia and this was 79% and 21% in HH group.

| GORD Questionnaire – Responses – 56, on medication – 19 (34%) |
|---------------------------------|---|---|
| Asymptomatic | Mild | Significant |
| Heartburn | 31 (55%) | 16 (26%) | 9 (16%) |
| Dysphagia | 30 (54%) | 13 (23%) | 13 (23%) |
| Gas bloat | 13 (23%) | 9 (16%) | 34 (61%) |

| HH questionnaire – Responses – 66, on medication – 21 (32%) |
|---------------------------------|---|---|
| Heartburn | 40 (61%) | 16 (24%) | 10 (15%) |
| Nausea | 57 (86%) | 6 (9%) | 3 (5%) |
| Dysphagia | 39 (59%) | 13 (20%) | 14 (21%) |
| Gas bloat | 20 (30%) | 10 (15%) | 36 (55%) |

<table>
<thead>
<tr>
<th>Over all quality of life improvement</th>
<th>Significant</th>
<th>Some improvement</th>
<th>Worse or stayed same</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>48 (73%)</td>
<td>11 (17%)</td>
<td>7 (10%)</td>
</tr>
</tbody>
</table>

Conclusions
Overall patients satisfaction and improvement in quality of life was 90%. Half of our patient experienced gas bloat syndrome, which had little effect on their quality of life. 20% had long term dysphagia and one third of the patients seem to continue to use PPI despite expressing a satisfactory clinical improvement. It appears that patient’s long term improvement on the quality of life was satisfactory from both Nissen’s and Lind procedure.
Background
Laparoscopic cholecystectomy (LC) for a ‘difficult gallbladder’ can incur increased risk of biliary complications. In these challenging conditions where anatomical delineation (commonly through the critical view of safety) is unachievable, it is important to recognise when to proceed and when to consider a bail-out strategy. Subtotal cholecystectomy (SC), cholecystostomy insertion, conversion to open or abandoning the procedure are accepted solutions. In this study we review the outcomes of patients who underwent LC following previous intervention.

Methods
We retrospectively reviewed patients who underwent LC under a single surgeon between January 2009 to July 2020 following a previous intervention with LC, SC or cholecystostomy tube insertion. Data was collected with regards to demographics, clinical presentation, intraoperative details, imaging, conversion to open, length of hospital stay and complications.

Results
40 patients with previous intervention underwent LC. Previous intervention included abandoned LC in 24(60%), on-table cholecystostomy in 8 (20%) and SC in 8 (20%), with 5(13%) converted to open. Reasons for referral included adhesions, intrahepatic gallbladder, possible malignancy, empyema and abnormal anatomy. Laparoscopic approach attempted in 39/40 (98%), conversion to open in 25%. Reasons for conversion included cholecystoduodenal fistula, and suspected malignancy. Median hospital stay was 4 days (1 – 22). Morbidity was seen in 2(4%) with no biliary complications. Completion of treatment, from previous intervention to definitive LC was 9 months (1-48).

Conclusions
In patients with previously attempted cholecystectomy, LC is feasible and can be performed with low morbidity. When faced with a difficult gallbladder intra-operatively, aborting the procedure and re-attempting at a later date, locally or referral to a specialist Unit, should be considered.
The outcomes after a Laparoscopic subtotal cholecystectomy

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Background
Laparoscopic subtotal cholecystectomy (LSC) is a recognised option when the “critical view” cannot be safely delineated. It carries a high morbidity rate as there are increased frequencies of a bile leak occurring however reducing the risk of bile duct injury. LSC can be further divided into fenestrating or reconstituting cholecystectomy, the later entails closing the remnant. The literature state reconstituting cholecystectomy reduced rate of bile leak. We reviewed our cases to analyse the complication rates of LSC and there outcomes.

Methods
A retrospective review of patients who underwent a laparoscopic subtotal cholecystectomy (LSC) using electronic records between January 2015 to March 2021. A total of 160 patients, with a mean age of 65, 51% male and 49% female.

Results
76% of LSC were performed as an emergency. Mean operation length was 96min and the mean blood loss 92ml. Complications occurred in 50% of patients.

<table>
<thead>
<tr>
<th>Complication</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>bile leak</td>
<td>37.5%</td>
</tr>
<tr>
<td>collection</td>
<td>6.3%</td>
</tr>
<tr>
<td>Conversion to open</td>
<td>1.9%</td>
</tr>
<tr>
<td>pancreatitis</td>
<td>1.3%</td>
</tr>
<tr>
<td>AKI</td>
<td>1.3%</td>
</tr>
<tr>
<td>CBDI</td>
<td>0.6%</td>
</tr>
<tr>
<td>Duodenal injury/fistula</td>
<td>0.6%</td>
</tr>
<tr>
<td>wound dehiscence</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Subtotal technique</th>
<th>Bile leak</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sutured</td>
<td>14.4%</td>
</tr>
<tr>
<td>endoloop</td>
<td>13.1%</td>
</tr>
<tr>
<td>left open</td>
<td>66.9%</td>
</tr>
<tr>
<td>clip</td>
<td>0.6%</td>
</tr>
<tr>
<td>hemolok</td>
<td>0.6%</td>
</tr>
<tr>
<td>staple</td>
<td>0.6%</td>
</tr>
<tr>
<td>drain in lumen</td>
<td>1.9%</td>
</tr>
<tr>
<td>posterior wall left</td>
<td>0.6%</td>
</tr>
<tr>
<td>partially sutured</td>
<td>0.6%</td>
</tr>
<tr>
<td>suture and endoloop</td>
<td>0.6%</td>
</tr>
</tbody>
</table>

Post operatively 22% underwent an ERCP and the re-operation rate was 9%.

<table>
<thead>
<tr>
<th>Bile leak management</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ERCP</td>
<td>35</td>
<td>58%</td>
</tr>
<tr>
<td>Resolved spontaneous</td>
<td>20</td>
<td>33%</td>
</tr>
<tr>
<td>theatre</td>
<td>5</td>
<td>8%</td>
</tr>
</tbody>
</table>

The mean length of stay was 8 days.

Conclusions
Based on our results LSC carry a high rate of bile leak with the majority requiring intervention in the form of ERCP or laparoscopy and wash out. A reconstituting cholecystectomy, closing with an endoloop of suture seems to slightly reduce the rate of bile leak. LSC are only performed when managing a difficult gallbladder with a dense/ inflamed Calot’s triangle. There were no mortalities associated with a LSC.
Results of the ARROW survey of anti-reflux practice in the UK

The ARROW collaboration
AUGIS, London, United Kingdom

Background
Gastro-oesophageal reflux disease (GORD) affects 10-20% of the population. Lifestyle modifications and medications such as proton pump inhibitors are generally well tolerated, however a variety of surgical and endoscopic interventions may be more suitable for well selected patients. Despite national guidelines and evidence from trials there is lack of consensus regarding the best approach to antireflux surgery (ARS).

We designed a national audit (ARROW) to describe variation in UK clinical practice of ARS and adherence to clinical guidelines. Our audit was designed in two phases. First, a survey of national practice; Second, a prospective audit of adherence to available guidelines.

Methods
Survey questions were iteratively developed by the ARROW steering committee and an online tool was developed to gather survey responses and contact details for the audit phase. The final questionnaire consisted of 90 fields per surgeon and 57 fields per institution. Participants were enlisted through AUGIS, social media, personal contacts and the ROUX group of upper GI surgical trainees. The online tool was piloted in three centres. The protocol for the study was peer reviewed and published in Diseases of The Esophagus in January 2021.

Results
Survey responses were received from 151 surgeons at 57 institutions with a median of 40 cases annually and 4 surgeons/institution. Surgeons perform a median of 12(range 0-75) NHS cases and 6(range 0-75) private cases. 150/151 NHS surgeons perform some form of fundoplication for ARS, 4 surgeons perform LINX™, 4 STRETTA™ and 49 roux-en-y bypass for GORD. Fundoplication procedures performed in the UK include Nissen (111/151), Watson (39/151), Toupet (72/151) and Dor (61/151). 104 surgeons adjust the wrap performed according to clinical symptoms, manometry or both. 20/57 centres had no access to a benign MDT to discuss ARS.

Conclusions
ARS in the UK lacks standardised approaches that can be reliably compared and therefore improved most surgeons perform less than 20 cases a year. Our survey revealed differences in which investigations are considered mandatory, which procedures are available to whom and with what variations, and available resources to facilitate shared decision making for patients with GORD and ARS surgeons. Our audit phase (begun in April 2021) will establish current practice, compliance with clinical guidelines and inform improvement projects and randomised trials in the future.
P-BN56
Anti-Reflux Surgery in the end-stage of the pandemic: Early results of the ARROW audit

The ARROW collaboration
AUGIS, London, United Kingdom

Background
Gastro-oesophageal reflux disease (GORD) affects 10-20% of the population. Lifestyle modifications and medications such as proton pump inhibitors are generally well tolerated, however a variety of surgical and endoscopic interventions may be more suitable for well selected patients. Despite national guidelines and evidence from trials there is lack of consensus regarding the best approach to antireflux surgery (ARS).

We designed a national audit (ARROW) to describe variation in UK clinical practice of ARS and adherence to clinical guidelines. Our audit was designed in two phases. First, a survey of national practice; Second, a prospective audit of compliance with available guidelines.

Methods
International guidelines and consensus statements were collated and reviewed by the ARROW steering committee. Sources included NICE, ICARUS and BSG guidelines and AUGIS commissioning guidelines. Definitions were adopted from the Montreal consensus statements and the Chicago Classification of Esophageal Motility Disorders. Audit fields were then iteratively developed by the steering committee and an online tool was developed to prospectively collect pseudo-anonymised patient data.

Participants were enlisted through AUGIS, social media, personal contacts and the ROUX group of upper GI trainees. The online tool was piloted in three centres. The protocol was published in Diseases of The Esophagus in January 2021.

Results
Of 240 registered patients on 25th August 2021, 171 had complete data. Median age was 57 (range 19-83), 60.2% were females. 156 (91.2%) had OGD performed prior to surgery. 105 (61.4%) had manometry and 97 (56.7%) had 24-hour pH studies performed. 91 DeMeester scores were recorded, median score 38 (IQR 24-70). Median days from referral to surgery was 471, (range 1 to 1374). 167 patients (93.3%) underwent some variant of fundoplication. The most common wrap was a posterior 360° (44%) followed by a posterior 270°(27%) and anterior 180°(23%). 2 patients returned to theatre, 1 for recurrent hernia and 1 for ischaemia.

Conclusions
In keeping with all non-cancer elective work in the UK, ARS is recovering from the effects of the COVID pandemic, and this is reflected in long delays between referral and surgery. Compliance with established guidelines and consensus opinions has similarly been affected as access to diagnostic services has been impeded. Variation persists in the interventions offered to individuals and long-term outcomes monitoring to compare interventions is beyond the scope of this audit. Complication rates are very small with only 2 returns to theatre, 9 patients experiencing any short-term complication and only 24 delayed discharges.
The impact of COVID-19 pandemic on management of patients with acute uncomplicated gallstone pancreatitis

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Background
Current British Society of Gastroenterology guidelines suggest that patients presenting with acute uncomplicated gallstone pancreatitis should ideally undergo laparoscopic cholecystectomy during the index admission or within two weeks of discharge from hospital. COVID-19 pandemic had a significant impact on the delivery of elective and semi-elective surgical services in the National Health Service (NHS) due to limited availability of theatre resources. The aim of this study was to evaluate compliance with the BSG guidelines during the COVID-19 pandemic and the impact of the newly introduced ‘Hot’ lists at our centre.

Methods
Patients admitted with first presentation of acute uncomplicated gallstone pancreatitis between 01/03/19 and 25/02/21 were identified from electronic records. Pregnancy and lack of fitness for surgery were the exclusion criteria. Patients admitted between 01/03/19 and 31/12/19 were defined as the pre-COVID cohort. Those admitted between 23/03/20 and 25/02/21 formed the COVID cohort and had access to urgent gallbladder lists. Baseline characteristics, choice of imaging and timing of laparoscopic cholecystectomy were compared between the two cohorts using STATA software. Continuous variables were compared with Mann Whitney test and categorical variables were compared with Pearson’s Chi-Squared test.

Results
53 patients were identified in the total cohort with 27 being hospitalised prior to COVID-19 outbreak and 26 presenting after the national lockdown. Baseline characteristics did not differ significantly between the two groups. Biliary imaging pathway was similar between the two cohorts and importantly there appeared to be no delays in radiological tests during the lockdown. The overall proportion of patients undergoing cholecystectomies remained similar between the two groups and percentage of patients having it during the index admission did not differ. However, patients undergoing cholecystectomy post discharge had a significantly shorter waiting time during the lockdown (p=0.021) as they were prioritised on the ‘Hot lists’ created to meet the demands of reduced planned theatre service.

Conclusions
During the 2020 COVID pandemic our service for patients with uncomplicated gallstone pancreatitis continued to be delivered. Despite clinical pressures, there were no notable delays in biliary imaging. The introduction of the urgent operating lists has significantly reduced the time to laparoscopic cholecystectomy following admission for patients with acute uncomplicated gallstone pancreatitis during this period.
Danger is there, do we want to know about it? Routine intra operative cholangiography highlights dangerous biliary anatomy for safer cholecystectomy

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Background
Normal biliary anatomy is uncommon. Different classification for biliary anatomy has been described, with Huang Types A4 & A5 of great interest for laparoscopic cholecystectomy (LC) due to the proximity of aberrant bile duct to Cystic duct (CD). These types of dangerous anatomy might contribute to bile duct injury. This study aims to analyse the prevalence of dangerous biliary anatomy.

Methods
Prospectively collected data for all patients who underwent laparoscopic cholecystectomy was analysed. All LC were performed by single surgeon or under his direct supervision, between 01/07/2020 and 20/08/2021. Index admission and single session management of cholelithiasis disease with routine Laparoscopic cholecystectomy + intra operative cholangiography (IOC) +/- LCBD exploration were standard practice.

Results
Laparoscopic cholecystectomy was performed in 137 patients. Mean age was 56y (17-84). 62% were females. 66% of Laparoscopic cholecystectomies were emergency.
IOC was performed in 92% of cases. Abnormal biliary anatomy was found in 54% : Huang A1 - 48%, A2 - 29%, A3 - 12%, A4 - 9.7% and A5 - 0.7%.
Dangerous anatomy (A4 and A5) was found in 10.5%, 78 % were females. Female with dangerous anatomy were younger than males 49 y, 60y respectively. Nassar difficulty grading for dangerous anatomy was as follows: G2 28%, G3 42% and G3 28%
Abnormal cholangiogram was found in 48%, due to filling defect in 58%, no contrast flow into duodenum in 4%, Cystic duct stone in 4%, and short CD in 8%. CBD stones were treated using transcystic approach in 92% of cases. No intra-operative or post operative complications were recorded for patients with dangerous anatomy.

Conclusions
This study demonstrates that dangerous biliary anatomy, that could lead to bile duct injury is relatively common, occurring in 10.7% of LCs. Routine intra-operative cholangiography highlights these high-risk variations in biliary anatomy and may prevent inadvertent bile duct injury in such cases.
Predicting post-operative length of stay following laparoscopic cholecystectomy: derivation and validation of a pre-operative risk score

James Lucocq, John Scollay, Pradeep Patil
Ninewells Hospital, Dundee, United Kingdom

Background
To predict the post-operative length of stay following laparoscopic cholecystectomy (LC) will help guide the utilisation of resources, particularly the allocation of day surgery beds. Prolonged post-operative stay (PPS) is associated with morbidity and the acknowledgement of pre-operative factors predisposing to morbidity and PPS will influence surgical decision-making. The aim of the present study was to determine pre-operative factors associated with PPS and both derive and validate a risk score to predict the risk of PPS following LC.

Methods
Patients who underwent emergency and elective LC between January 2015 and December 2019 across three surgical centres were included. Pre-operative, operative and post-operative data were collected retrospectively from multiple databases using a deterministic records-linkage methodology. The cohort was randomly divided into a derivation and validation cohort, by a 3:1 ratio, respectively. The derivation cohort was used to create a risk score for PPS (≥3 days post-operatively) using multivariate logistic regression. The risk score was then applied to the smaller set or ‘validation cohort’ for internal validation purposes and the predictive accuracy was assessed using a ROC curve.

Results
The rate of PPS was 10.6% (294/2768). PPS was associated with intra-operative complication (RR-17.0;p<0.001), bail-out procedures (RR-47.1;p<0.001) post-operative complications (RR-11.9;p<0.001), re-admission (RR-2.4;p<0.001) and post-operative imaging/intervention (RR6.5;p<0.001). Variables associated with PPS included ag ≥60 (OR-1.56;p=0.011), male sex (OR-1.47;p=0.022), ASA 2 (OR-1.63;p=0.019, ASA≥3 (OR-3.27;p<0.001), 2 hospital admissions (OR-1.56;p=0.046), ≥3 hospital admissions (OR-2.11;p=0.024), cholecystitis (OR-3.19;p<0.001), pre-operative ERCP (OR-3.49;p<0.001) and cholecystostomy (OR-2.77;p=0.025) and emergency LC (OR-5.20;p<0.001). The AUC (area under curve) for the derivation and validation cohorts were 0.83 and 0.81 respectively. The risks of PPS in low-risk (0-5), medium-risk (5.5-10) and high-risk (>10) groups were 3.3%, 14.9% and 45.1%, respectively.

Conclusions
The rate of PPS following LC is significant and strongly associated with peri- and post-operative morbidity. Our model concludes that multiple pre-operative patient factors can predict the likelihood of prolonged post-operative stay. A patient’s risk score could be used to assess the risk of morbidity. Pragmatic patient selection in accordance with the above model could help surgical centres improve the allocation of beds between tertiary centres and day-surgery units.
Optimal timing of laparoscopic cholecystectomy for admitted acute cholecystitis patients

James Lucocq, John Scollay, Pradeep Patil
Ninewells hospital, Dundee, United Kingdom

Background
The Tokyo 2018 guidelines support emergency laparoscopic cholecystectomy (ELC) for acute cholecystitis (AC) over delayed laparoscopic cholecystectomy (DLC) for mild cholecystitis, substantiated by a lower total length of stay. The supporting studies are limited by small sample sizes, and clinically relevant findings may have been missed. The aims of the present paper were firstly, to compare the peri- and post-operative course following emergency and delayed LC for AC.

Methods
All patients who underwent ELC and DLC for AC following hospital admission between January 2015 and December 2019 were included in the study. Pre-operative, operative and post-operative data over a 100-day follow-up period were collected retrospectively from multiple databases using a deterministic records-linkage methodology. Patients were splint into groups based on previous admissions and outcomes were compared between ELC and DLC. Multivariate logistic regression models were then used on the entire cohort to adjust for other variables and to determine the impact of ELC versus DLC. Complications of the category Clavien-Dindo ≥2 were considered.

Results
In the group with no previous admissions (n=630), DLC patients had lower rates of intra-/post-operative complications (8.0%vs.17.9%;p<0.001), lower rates of re-admission (6.6%vs.12.2%;p=0.04) and longer total length of stay (6dvs.5d;p=0.03). In patients with previous admissions (n=181), DLC had lower rates of intra-/post-operative complications (14.1%vs.25.5%;p=0.06) but there was no significant difference in length of stay (13dvs.12d;p=0.81). The ELC group had a significantly lower admission CRP, ASA and age (p<0.001). In the multivariate logistic regression models, ELC was positively associated with subtotal/conversion to open (OR,1.94;p=0.01), drain insertion (OR,2.54;p<0.001), bile leak (OR,2.38;p<0.001), post-operative imaging (OR,1.83;p=0.01), longer post-operative stay (OR,7.26;p<0.001) and readmission (OR-1.9;p=0.01).

Conclusions
DLC, once the period of active inflammation has settled, offers superior post-operative outcomes, including lower rates of complication, re-admission and post-operative length of stay; however is associated with longer total length of stay. DLC is only advised where the risk of re-admission is minimised (i.e surgery six weeks following the episode) and relies on the management of surgical waiting lists.
Predictive factors for subtotal cholecystectomy in delayed elective cholecystectomy after acute biliary presentation

Husam Ebied1,2, Andrew Refalo1, Hedda Widlund3, Annabelle white1
1Guy’s and St Thomas’ NHS Foundation Trust., London, United Kingdom. 2Ain Shams University, cairo, Egypt

Background
Laparoscopic cholecystectomy is introduced as a treatment option for symptomatic gall bladder disease in 1987 and it is now the gold standard treatment for symptomatic gall bladder disease.

The rate of conversion from laparoscopic to open ranges between 5 and 10%. The step of paramount importance in cholecystectomy is the clear identification of the cystic duct and artery, which in some situations can be difficult especially in presence of dense adhesions or severely inflamed gall bladder, increasing the risk for common bile duct (CBD) injury.

The traditional response to encountering a difficult laparoscopic cholecystectomy procedure is to perform conversion to an open procedure but the open conversion has its drawbacks;

The subtotal cholecystectomy has been shown to reduce the need for conversion to an open procedure, thus reducing complications associated with the open cholecystectomy. Studies have also shown that this procedure decreases the bile duct injury rate. Subtotal cholecystectomy rates increased nationally over the past decade.

The aim of our study is to identify factors which could predict the need for a subtotal cholecystectomy in the acute biliary admission group having delayed elective Laparoscopic cholecystectomy, hence proper planning in terms on theatre timing, expertise and patients consenting

Methods
We conducted a retrospective analysis of patients who had delayed elective laparoscopic subtotal cholecystectomy after admission with Acute Biliary disease and managed conservatively in a tertiary London hospital, between 01/03/2019-29/02/2020.

We collected data for all patients whose primary diagnosis was either Acute Cholecystitis, Cholelithiasis, Ascending Cholangitis, Choledocholithiasis and Gallstone Pancreatitis, and analysed these in terms of patient demographics, duration of index admission, laboratory and radiological results during the acute admission and need to intervention during the acute phase either as a drain (cholecystostomy) or ERCP during initial management.

Data were collected from electronic patient records, regarding age, gender, indication for surgery, operative notes, preoperative gall bladder wall thickness on US scan, laboratory results during acute admission. BMI, other interventions such as endoscopic retrograde cholangiopancreatography (ERCP) and cholecystostomy.

Odds ratios were calculated to assess the risk of patients having a subtotal cholecystectomy.

Results
243 patients presented between 01/03/19-29/02/2020 which acute biliary pathology – 95 Male and 148 Female, 230 patients had delayed elective laparoscopic cholecystectomy at least 6 weeks post-acute admission.

Of 230 laparoscopic cholecystectomies, 22 (9.56%) cases had a subtotal cholecystectomy

13(59.9%) patients were male patients, median age 72
54.5%) had BMI more than 30

No open conversion.

The indication for cholecystectomy in the subtotal group was as follows:

Acute cholecystitis 12 (54.54%), Ascending cholangitis 4 (18.18%), Choledocholithiasis 3 (13.63%), gall stone pancreatitis 1 (4.5%), Cholelithiasis 2 (9.09%) The subtotal cholecystectomy group had Gall bladder wall thickness during index admission documented 4 (18.18%) patients had Gall bladder wall thickness less than 4 or equal 4 mm, 18 (81.81%) patients had Gall bladder wall thickness more 4 mm.

Odds ratios were calculated to assess the correlation between several characteristics and the likelihood of having a subtotal cholecystectomy in the delayed elective cholecystectomy,
we concluded that Older age, male sex, BMI more than 30, previous ERCP, thickened GB wall on ultrasound scan more than 4 mm, WCC > 15000 during acute admission, all increased the likelihood of having a subtotal cholecystectomy.

**Conclusions**

Older age, male sex, BMI more than 30, previous ERCP, thickened GB wall on ultrasound scan more than 4 mm, WCC > 15000 during acute admission all increased the likelihood of having a subtotal cholecystectomy. We recommend all these information should be documented during planning for laparoscopic cholecystectomy to allow proper theatre time planning and patient consenting for the possibility of having a subtotal cholecystectomy.
Requirement of preoperative group and save testing prior to cholecystectomy: A systematic review

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Background
Group and save (G&S) testing is usually performed prior to cholecystectomy. However, there are no standard national or international guidelines regarding the routine use of preoperative G&S testing for patients undergoing emergency laparoscopy.

Methods
We evaluated the available literature on the necessity of G&S prior to cholecystectomy to determine whether this was required preoperatively. Studies from January 1980 to May 2021 assessing the requirement of G&S were retrieved from MEDLINE and EMBASE databases. Number of patients, co-morbidities, operation performed, number of patients that underwent preoperative G&S testing, perioperative transfusion rates and financial costs were extracted.

Results
We initially screened 194 studies of which 11 retrospective studies reported on cholecystectomy. A total of 177,692/474,485 (37.4%) patients underwent preoperative G&S testing with a perioperative transfusion rate of 2.07% (9803/474,485 patients, range 0.0% to 1.6%). The main preoperative risk factors, where recorded, associated with perioperative blood transfusion identified include cardiovascular co-morbidity (16/45, 35%), coagulopathy (13/45 patients, 28%), anaemia (9/45 patients, 20%) and haematological malignancy (6/45, 13%). All 11 studies concluded that routine G&S is not warranted.

Conclusions
The current evidence, though limited, suggests that G&S is not necessarily required for all patients undergoing cholecystectomy. Preoperative testing should be performed in selected cases, for example in septic coagulopathy, anaemia and haematological malignancy. There is no evidence to suggest that routine G&S screening benefits patient outcomes. Having a targeted G&S approach would reduce delays in elective and emergency lists, reduce the burden on the blood transfusion service and have financial implications.
Cholecystectomy after gall stone pancreatitis

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Background
According to the UK guidelines for the management of acute pancreatitis commissioned by the British Society of Gastroenterology,
All patients presenting with gallstone pancreatitis should be considered for cholecystectomy when they are well enough to undergo surgery. In cases of mild biliary pancreatitis, cholecystectomy should ideally be performed during the index admission or within 2 weeks of discharge as interval cholecystectomy is associated with a significant risk of readmission for recurrent biliary events.
In cases of severe gallstone pancreatitis, cholecystectomy may need to be delayed until collections have improved, unless the patient is well enough for surgery and the gallbladder is some distance from the collection

Methods
Methods:
- Retrospective study
- Patients presenting to Mid Yorkshire Hospitals NHS trust between 1/1/2019 till 31/12/2019
- Definition of severity dictated by the Revised Atlanta Criteria

Inclusion Criteria
- Adult > 16 years old
- Clinical diagnosis of pancreatitis
- Evidence of gall stones

Exclusion Criteria
- Pediatric patients
- Non-gall stone pancreatitis

Results
80 patients were collected during the study period, 96% of them were classified as mild pancreatitis
Cholecystectomy rate
Total percentage of cholecystectomies performed for mild gall stone pancreatitis during index admission or within 2 weeks from discharge: 37%
Percentage of early cholecystectomies for eligible patients (i.e. after ruling out unfit patients, patients declining treatment, previous cholecystectomy, etc): 54%
Re-admission rate
Re-admission rate for early cholecystectomy patients: 7.4%
Re-admission rate for delayed cholecystectomy patients: 20.7%

Conclusions
- Relatively low compliance with early cholecystectomy for mild pancreatitis
- Higher re-admission rate for patients not offered lap chole during the 1st 2 weeks of index admission
- The study recommends dedicating 1-2 expedited lists per week for gall stone pancreatitis cholecystectomy
P-EGS02
Impact of delayed elective laparoscopic cholecystectomy on incidence and complications from gallstone ileus

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1South Tyneside District Hospital, South Shields, United Kingdom. 2James Cook University Hospital, Middlesbrough, United Kingdom

Background
The negative impact of the COVID-19 pandemic on the provision of elective surgery in the UK has been profound. Per the latest National figures, a total of 4.59 million patients are awaiting an elective operation (1). In our Trust, emergency operations and cancer service took precedence as we worked to minimize risks of COVID-19 while providing life-saving procedures. Subsequently, our ‘hot gallbladder’ operating list was put on hold for a period of 18 months. In our Trust, the current waiting time for an elective laparoscopic cholecystectomy is 52 weeks for symptomatic gallstone disease. Gallstone ileus is a well-recognized but rare complication of gallstones (2) and needs operative treatment. We performed this study to investigate the impact of delayed cholecystectomy on the incidence of gallstone ileus and the morbidity and mortality associated with this.

Methods
Retrospective study reviewing all acute admissions with gallstone ileus for 4 years from 2016 to 2020. Total number of patients was 19. Data collated from patient’s notes to include demographics and co-morbidities, operative notes, theatre records, and WebICE

Results
Demographically, there was significant female preponderance (M : F : 1 : 18). Mean age of patients was 76.7 years. 17/19 patients underwent laparotomy as the primary operation (89%) and 1 (5%) had a laparoscopic procedure. 1 patient (5%) was managed conservatively. All patients had a CT scan as pre-operative imaging. 7 (34%) also had USS and 4 (20%) had MRCP. Mean length of stay in hospital was 13 days. 3 (15%) patients required re-admission to hospital for surgical and medical complications within 30 days. 3 (15%) patients returned to theatre for a second laparotomy within the index admission for recurrence of gallstone ileus. 8 (40%) patients had post-operative complications. There were 2 (10%) mortalities. 9 (45%) patients had gallstone related complications preceding their index presentation; majority (66%) which was calculous cholecystitis. The mean time between diagnosis of gallstone disease and emergency laparotomy for gallstone ileus was 38 months.

Conclusions
Gallstone ileus can be a life-threatening complication of gallstone disease and needs prompt recognition and treatment. Patients with known gallstones with symptoms of bowel obstruction should have a CT scan at time of presentation. Surgery is the mainstay treatment following resuscitation and concurrent conservative management. Early elective laparoscopic cholecystectomy can prevent mortality and morbidity from emergency laparotomy for gallstone ileus.
Curious Case of Life Threatening Gastrointestinal Bleed

VIBHA SINGH
Maulana Azad Medical College, New Delhi, India

Background
Gastrointestinal stromal tumors are mesenchymal in origin, being derived from the interstitial cells of Cajal. These can be found anywhere in the gastrointestinal tract and are commonly found in the stomach followed by the small bowel. Gastrointestinal stromal tumors are usually asymptomatic and are often found incidentally. Chronic bleeding is one of the most common presentation. Gastrointestinal stromal tumors presenting with massive gastrointestinal haemorrhage and mimicking arteriovenous malformation on radiology are rare with only few cases reported.

Methods
Herein we present such a case of a 45-year-old gentleman with massive gastro intestinal bleeding. At presentation, patient was in congestive heart failure due to severe anaemia with a hemoglobin of 2.9g/dL. CECT Angiography localised the bleed to be from a jejunal mass lesion with radiological features consistent with those of arteriovenous malformation. Patient underwent laparoscopy assisted resection and anastomosis.

Results
Histopathology examination revealed a low risk jejunal gastrointestinal stromal tumor with no evidence of arteriovenous malformation. The mass was removed completely and the patient was discharged on 5th post-operative day. Patient was followed up in the out-patient department and was found to be doing well.

Conclusions
Gastrointestinal stromal tumors though relatively uncommon should be kept as important differentials for acute torrential gastrointestinal bleeding. It is highlighted that a presentation of gastrointestinal stromal tumors similar to that of arteriovenous malformations on cross sectional imaging should be kept in mind. The present case is reported in hope of expanding the knowledge of a rare occurrence, its aetiology, clinical impact and treatment.
Assessment of Malnutrition in emergency laparotomy patients. A QIP highlighting simple measures can improve early recognition and optimisation of high-risk patients

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Background
Early recognition of high-risk malnourished patients is important for optimisation of nutritional status leading to better outcomes. The accurate recording of malnutrition universal screening tool (MUST) results is vital in this regard. This quality improvement project (QIP) aimed to review the quality of nutritional assessment of emergency laparotomy patients against the National Institute for Health and Care Excellence (NICE) guidelines and outline area of improvement.

Methods
The QIP was conducted at Royal Oldham Hospital in 2019-2020 over a seven-month period. Fifty random patients were included in the first audit cycle over a 4-month period, followed by implementation of recommended changes and a re-audit of 30 patients over a 2-month period. The initial MUST scores which were calculated and documented by nursing staff were identified as the nursing staff MUST score (NSMS). To assess the accuracy of NSMS, we developed a MUST rescoring method which was performed by a senior member of the medical team and was identified as the medical team MUST rescore (MTMR).

Results
The initial audit showed a significant difference between NSMS and MTMR scores. According to MTMR, 23 patients (46%) had an inaccurate MUST score assessment by the nursing staff. A multidisciplinary approach using a standard online calculator were recommended. The second phase of the QIP showed an obvious improvement in the accuracy of MUST assessment. Our interventions improved the accuracy rate of MUST scores significantly (27, 54% vs 29, 96.6%, P = 0.00005).

Conclusions
A multidisciplinary team approach and online calculator are useful in improving the accuracy of MUST assessment in emergency laparotomy patients. This helped early involvement of the dietitian leading to improvement in morbidity and mortality.
Assessment of acute cholecystitis management during COVID-19 pandemic in comparison to the CholeQuic approach: A single centre experience

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Background
Acute cholecystitis is an emergency condition, typically arising from gall bladder stones and often leading to unplanned surgical admissions to hospital. In the UK, gall stone disease accounts for approximately one third of all unplanned general surgical admissions. According to the The Royal College of Surgeons’ Commissioning guidance, early management of acute cholecystitis in particular is the key to prevent further development of more serious complications that can lead to mortality (up to 10%). Therefore, urgent admission to secondary care and laparoscopic cholecystectomy are recommended once diagnosis is confirmed. Conservative management is not recommended as gallbladder inflammation often persists despite medical therapy which can lead to further attacks and risk of developing gall bladder perforation (mortality in 30% of cases). Early laparoscopic cholecystectomy is also associated with reduced hospital costs and earlier recovery. During the first wave of COVID-19, the guidelines changed in order to limit the admission rates to free up spaces for possible COVID-19 infected patients. Crisis approach entailed conservative management with pain relief, antibiotics plus or minus cholecystostomy. However, reviews of this approach have not been widely published to assess the results and in turn planning our future management approach in case of other COVID-19 surge.

Methods
Our study included all the patients diagnosed with acute cholecystitis who needed surgical intervention in one medical Centre in the UK. The time table of the study is divided into 3 periods the pre-COVID era from 16/12/2019 to 15/03/2020 (group I), then during the first lock down era from 16/03/2020 to 30/06/2020 (group II) and, finally after the ease of the lock down from 01/07/2020 to 02/09/2020 (group III). Pre- and post-lockdown time periods the CholeQuIC approach was followed while during the lockdown era, patients were initially treated conservatively followed by surgical management in case of failure to improve. Laparoscopic cholecystectomy was performed, however, in difficult cases conversion to open surgery occurred.

The primary outcome was to compare and perform analysis of the three distinctive periods regarding, delayed presentation, the degree of operative difficulty, which was quantified by analysing the operative time, blood loss, rate of drain insertion and rate of conversion into open surgery. Furthermore, a review of unfavourable intra-operative findings such as extensive adhesion to surrounding organs, hydrops, empyema, gangrene, and/or perforation of the gallbladder was done. The post-operative results were also analysed, according to the length of hospital stay, and the rate of post-operative complications.

Results
Operative difficulty
The mean operative time before the lockdown was 71.6 minutes while it was 81.0 and 78.0 minutes during and post COVID respectively. In terms of conversion to open, the rate reached 10.5% during the lockdown, while the figures were 4.9% and 3.13% during the pre and after lockdown respectively. Moreover, intra peritoneal drains were used in more than one quarter of the patients (28.9%) during the lockdown era compared to 11.5% and 12.5% pre and post the lockdown respectively. Considerable blood loss occurred in 10.5%.

Intra-operative findings
During the lockdown, 28.9% exhibited extensive adhesions between the gall bladder and surrounding structures. This level is almost three times the percentage during the pre and post-lockdown time periods (8.2% and 9.4% respectively). As for gangrenous cholecystitis, it was 18.4% during the lockdown, 6.6% before and 6.3% after the lockdown respectively.

Post-operative results
Before the lockdown the average LOS was 2.9 days which increased to 8.9 days during the lockdown, followed by a decrease to 2.4 days following the ease of lockdown. The lockdown era depicted the highest rate of post-operative complications (bile leakage 7.9%, missed stones 5.3% and duodenal injury 2.6%).

**Conclusions**
During crisis periods tough measures and decisions are made to deal with the situation, however, these decisions can lead to grave consequences on the medical staff and most importantly on patients. As shown in this study and supported by the previous studies, conservative management of acute cholecystitis led to serious complications as many patients were re-admitted for emergency surgery as a result of failure of the non-surgical approach. Moreover, delayed emergency surgery was associated with increased operative difficulties and higher percentage of serious intra and post-operative complications. All this led to longer hospital stay which can prove the failure of this approach. Unfortunately in our Unit, whilst closely studying acute gall bladder disease, we have found that the conservative approach appears to have back-fired and did the exact opposite. Therefore, we believe that there is nil to support conservative treatment of acute cholecystitis in our Unit. We believe that the evidence as displayed suggests that rapid surgery provides best outcome for individual patients and our system, perhaps especially when under strain for other reasons.
Evaluating the impact of COVID-19 on the trend of emergency laparoscopic cholecystectomy

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Background
Since the spread of the new SARS-CoV2 coronavirus in March 2020 to the UK, contradictory recommendations on the practice of laparoscopic cholecystectomies fuelled some debates among surgeons. The British Intercollegiate General Surgery Guidance recommended laparoscopic cholecystectomy as the treatment of choice for acute cholecystitis during the COVID-19 pandemic. Contradictorily, the Royal College of Surgeons of England warned about the unknown risk of viral infection and the release of pressurised gas from laparoscopic surgery. The audit aimed to identify the differences in surgical care before and during the pandemic to study their impact on patients.

Methods
Retrospective patient data was obtained from September 2019 to September 2020 to include data six months before the pandemic and six months during the pandemic. The data obtained had the patient hospital number, fitness for cholecystectomy, decision made regarding surgery, date of admission and date of surgery.

Results
178 patients before COVID-19 and 242 patients during COVID-19 were admitted with gallstone disease. Before COVID-19, 60.67% (n=108) patients were fit and consenting for surgery. Of these patients, 60.19% (n=65) were discharged for surgery later and 39.81% (n=43) had inpatient emergency surgery. During COVID-19, 71.49% (n=173) patients were fit and consenting for surgery. However, 87.86% (n=152) were discharged for surgery and only 12.14% (n=21) had inpatient surgery. The average time from admission to surgery increased from 8 days to 51 days during COVID-19. Although majority of inpatient surgeries were performed within eight days, the percentage performed was fewer during COVID-19.

Conclusions
The COVID-19 pandemic significantly affected emergency laparoscopic cholecystectomies performed in the hospital with a substantial increase in the average time taken from admission to surgery. More emergency laparoscopic cholecystectomies should be included in the weekly elective lists, design for dedicated emergency cholecystectomy lists and increase utilisation of the CEPOD theatres along with staff availability are required to achieve the emergency cholecystectomy service as guided by the Royal Colleges.
Two years of Acute Biliary Admissions at a tertiary care centre over the Covid-19 pandemic: a closed loop audit with implementation of an acute referral system

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Background
AUGIS recommends patients diagnosed with acute cholecystitis and gallstone pancreatitis to receive a laparoscopy cholecystectomy on the index admission, ideally within 72 hours of presentation. Early laparoscopic cholecystectomy is associated with better patient outcomes and reduced readmission rates. During the Covid-19 pandemic emergency surgery, if possible was avoided. These patients are referred for an elective cholecystectomy, however waiting times can be lengthy with readmissions common prior to surgery.

Methods
We performed a closed loop audit on acute biliary admissions to a central London tertiary care centre. We assessed waiting times to laparoscopic cholecystectomy for patients fit for surgery as well as readmissions prior to surgery. The data was collated over a one-year period (01/03/2019 to 29/02/2020), analysed and presented to the senior biliary surgery team. A dedicated e-referral system for patients who did not receive a laparoscopic cholecystectomy on index admission was implemented. Post intervention admissions were re-audited over a second year (01/03/2020-30/01/2021) and re-analysed to assess the effect of the intervention.

Results
A total of 111 patients with acute cholecystitis, 52 with gallstone pancreatitis, 34 with biliary colic, 36 with choledocholithiasis and 10 with ascending cholangitis, were included. Prior to implementation of our referral system average waiting time to laparoscopic cholecystectomy was 98.2 weeks, reduced to 47.7 weeks post referral system implementation. Reduction in waiting times resulted in readmission rates reduced by: 23.3% in Choledocholithiasis; 17.4% in Biliary Colic; 16.7% in Ascending Cholangitis; 12.8% in Acute Cholecystitis and 8.3% in Gallstone pancreatitis.

Conclusions
Admissions with acute biliary colic compose a substantial workload. The COVID-19 pandemic has resulted in a preference for elective versus emergency laparoscopic cholecystectomy. However, delay in surgery results in a readmission burden on emergency surgery departments and worse patient outcomes hence laparoscopic cholecystectomy should be performed as soon as possible following initial admission. This audit demonstrates that a dedicated biliary referral system reduced waiting time which translates to a reduction in admission rates. The importance of this referral system is magnified in the recovery phase of the pandemic where we continue to recover waiting times.
P-EGS08
What is the Best Risk Prediction Model for Oesophageal Perforation?

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Background
Oesophageal perforation is a challenging surgical condition associated with high mortality and morbidity. There is a lack of consensus regarding the optimal treatment strategy, when and whom to operate on. Treatment options include primary repair, t-tube repair, emergency oesophagectomy, endoscopic therapy, and palliation. Whilst many risk prediction models exist, the only specific score to predict mortality in oesophageal perforations is the Pittsburgh Severity Score (PSS). However, there is limited evidence on its validity and even less literature to predict short and long-term morbidity in these patients.

Methods
We compared and validated commonly used risk prediction models, including the PSS, the National Emergency Laparotomy Audit score (NELA score), the Portsmouth Physiological and Operatic Severity Score for the enumeration of Mortality (P-POSSUM), and the Surgical Outcome Risk Tool (SORT) using a dataset of 83 patients ranging from 2009 to 2021. The power to predict mortality and morbidity was assessed using the comprehensive complication index (CCI). The CCI was calculated using complications for both operative and non-operative cohorts.

Results
Of the scores assessed, NELA showed the most robust predictive value for in-hospital mortality, 30-day mortality, and 90 mortality (AUROC 0.812, 0.8602, 0.8302, respectively). The PSS also showed significant predictive value for in-hospital mortality, 30-day mortality, and 90 mortality (AUROC 0.792, 0.856, 0.813 respectively). Furthermore, NELA had the strongest correlation between score and CCI (r, 0.644 p<0.001).

Conclusions
Despite not being validated for oesophageal pathology, NELA appears to be the optimum scoring model to predict mortality and morbidity for this patient population. This is the first study to compare the efficacy of different risk prediction models in oesophageal perforations and could be used to inform shared decision making and peri-operative outcomes. Further large-scale validation of risk prediction tools is required to corroborate these findings.
The Introduction of an Ambulatory Surgical Pathway

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Background
Since the publication of the Emergency General Surgery Commissioning Guide by ASGBI in 2014, there has been a drive to develop ambulatory pathways for acute surgical patients, saving inpatient stays and reducing the risk of hospital-acquired infections. Many units, like ours, had a large workload increased by seeing next day returns as well as acute presentations. In October 2020 an Institute of Emergency General Surgery was formed who developed an ambulatory pathway to ameliorate some of these issues and provide a point of contact for primary care referrals, for one the busiest emergency general surgical takes in the UK.

Methods
A retrospective analysis was undertaken to identify all acute referrals to general surgery over a 14-day period in February 2019 prior to (Pre-ASC) and 2021 after (Post-ASC) the introduction of an Ambulatory Surgical Clinic (ASC). All patient episodes were reviewed, and descriptive statistics on overall attendance to the surgical assessment unit (SAU), admissions to inpatient wards and referrals to ASC were analysed. Patients presenting to the acute urology take were used as a control to compare the number patients attending the surgical assessment unit both before and during the COVID-19 pandemic.

Results
830 patients presented over the 28-day study period (426 pre-ACS vs 404 post-ACS; 5% reduction), totalling 992 patient encounters including planned returns (525 vs 467; 11% reduction). After the introduction of the ASC total attendance to SAU was reduced by 42% (525 vs 306); next day return attendances were reduced by 87% (99 vs 13) and attendances from primary care were reduced by 68% (208 vs 67). The proportion of patients admitted was similar (46% vs 50%).
146 patients attended the ASC, and 15 patients received telephone advice alone.
The control group saw attendance increase by 25% (178 vs 223).

Conclusions
The results clearly show that the introduction of the ASC has decreased attendance to SAU, freeing clinicians to dedicate more time to those acutely unwell. The similar proportion of admissions after the introduction of the ASC suggests that the ambulatory pathway correctly identifies those who are well enough to be managed as outpatients. The increased attendance in the control group suggests that the data were not the results of a decrease in referrals due to COVID-19. The results shared here should encourage other large units to consider developing ambulatory pathways.
Background
The incidence of acute gastrointestinal bleed in Malaysia is approximately 72 per 100000, as the incidence in patients who had mechanical ventilation is 2.6%. Coffee ground vomitus is one of the presentations of upper gastrointestinal bleed, and the decision for upper gastrointestinal endoscopy in a critically ill patient with such presentation would be a dilemma as endoscopy might lead to several complications such as endotracheal tube dislodgement, transient bacteremia, cardiopulmonary event, and perforation. We studied the clinicopathology of patients who were referred to our unit with coffee ground vomitus in a critically ill condition, as it would help us further in determining the severity and outcome of the patients.

Methods
This was a retrospective cross-sectional study from 59 patients in the critical unit in Hospital Melaka who were referred to the surgical department for coffee ground vomitus and underwent esophagogastroduodenoscopy. The study was conducted from November 2020 till July 2021.

Results
The median age of the patient was 73 years old and the mean body mass index was 25.6. The primary diagnosis of patients in the critical care was Acute Coronary Syndrome 18%, Sepsis 17%, and cerebrovascular accidents 10%. The mean systolic blood pressure was 126 and the mean pulse rate was 94. The mean hemoglobin level upon admission was 10.7 and 9.07 upon referral. Other laboratory parameters that were analyzed were urea, INR, platelet, and lactate. 51% had history of taking antiplatelet or anticoagulants. 92% of patients underwent urgent OGDS (within 24 hours of referral), and 30% of them had findings of high-risk ulcers (Forrest 1b, 2a, and 2b) which need urgent intervention.

Conclusions
The data from the study would be beneficial in providing evidence for further clinical research in our center on identifying the factors that will predict the outcome of OGDS towards the patient either for endoscopic intervention or diagnostic endoscopy only.
The Theatre Training Checklist: A Toolkit to Revive Post Pandemic Operative Training

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Background
The COVID-19 pandemic has had a significant negative impact on operative surgical training, with trainee logbook numbers reduced by more than 50% compared to 2019. The operating theatre is expensive, costing approximately £1200 per hour to run. It is a crucial learning environment for many different trainees: anaesthetists, surgeons, operation department practitioners and surgical first assistants. For individuals to achieve their training requirements, the operating theatre as a training environment must be shared between all trainees. This requires excellent teamwork and leadership. The recovery phase of the COVID-19 pandemic is a unique opportunity to adopt novel training strategies.

Methods
The Theatre Training Checklist is a simple framework that aims to facilitate awareness, understanding, coordination and cooperation of training for all members of the team (Figure 1). It is a practical strategy that can be adopted in any setting. Usually, trainers discuss informally with their trainees about their individual \textit{Skills, Experience, Expectations} and what is \textit{Achievable} in a planned theatre list (SEEA). However, there currently is limited opportunity to discuss this between different disciplines and the wider team. This tool aims to refine communication, optimize training, manage expectations and ensure equity across the board. The checklist has been introduced and trialed locally.

Results
The checklist is completed at the start of the list during the theatre brief. It identifies all trainees and their specific needs within the operating theatre session to the whole team. An agreed strategy is developed on how to achieve identified training goals (figure 2). Sometimes it may not be possible to allow a trainee to perform a particular procedure. However, other opportunities for training in theatre exist, such as: patient positioning, choice of equipment, types of techniques, discussions around consenting and complications etc. Feedback undertaken from the multiprofessional team after local trialing of the checklist has been positive.

Conclusions
The Theatre Training Checklist aims to create dialogue and shared understanding of training needs among all parties within the operating theatre. The Theatre Training Checklist Toolkit is available for use and consists of the checklist tool and an instructional video. The Theatre Training checklist is being piloted in some centers and we hope to have the opportunity to present some early findings at AUGIS 2021.
P-EGS12
An observational study investigating the differences the COVID-19 Pandemic had on admissions, methods of injury in a tertiary trauma centre in a major UK City

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Background
During March 2020 the country was plunged into a nationwide lockdown. Despite this, there remained a steady stream of trauma admissions. COVID changed a lot about how many medical specialties worked and we wanted to explore the effects on our patient population, and compare it to the experience of other hospitals

Methods
We analysed existing data on admissions to the Emergency Department that were referred to the trauma service between the 12th of March to the 24th of May; encompassing the lockdown and the two weeks either side. This data was compared to that of the year beforehand. We compared ages, sexes, mortality, methods of injury, and disposition.

Results
Admissions fell, 193, compared to 271 (~3:1 M:F). Both cohorts featured more younger people, but there was a drop-off in the number of older folk post-COVID; 6 of 9 centiles of the over 60s showed a fall in admissions of at least 14%. Those admitted to the Major Trauma service (ISS 9+) remained the same. Regarding the methods of injury, the most common presentations remained road traffic accidents, stabbings and falls <1m, contributing to 71 and 72% total admissions before and after COVID respectively. However, there were fewer patients falling from heights of >2m (OR 0.5), and fewer recorded assaults (OR 4.0). Penetrating injuries were separated into "stabbings" and "others". There was a significant increase in non-stabbing penetrating injuries (OR 4.6), a majority of which were self-inflicted. The rate of self harm during the lockdown showed a similar increase, from featuring in 8% of total presentations to 15% of admissions (OR 1.87). The hospital restructured considerably between the sample dates such that dispositions are not possible to compare meaningfully. Rates of patients sent straight home from the ED were similar (OR 1.0).

Conclusions
Overall, the lockdown had a moderate impact on patient numbers and demography. The data implies that the measures did small amounts to deter people from the roads and from interacting with each other in assaults and stabbings. Older people were less likely to present traumatically. The isolation may have led to a masking of mental health issues leading to a significant increase in self harm, which may present opportunities for restructuring of services in any the event of further major lockdowns.
These conclusions are limited by the data, and next steps would include gathering more detailed mortality data.
Risk Factors of Bleeding Gastroduodenal Ulcer Among Patient Undergo Emergency Upper Endoscopy in Hospital Melaka

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Background
Bleeding gastroduodenal ulcer has been one of the leading causes of admission in surgical or gastroenterology departments all over the world, requiring immediate intervention with high associated mortality exceeding 10%. We analyzed few important risk factors that lead to this potentially ill condition.

Methods
Data from a number of 548 patients who underwent emergency upper endoscopy were collected retrospectively from June 2020 till June 2021 in Hospital Melaka.

Results
From our data collection of emergency upper endoscopy performed, 111 patients had findings of high-risk ulcer (Forrest Ia, Ib, 2a and 2b). From these 111 patients, the most common presentation was low hemoglobin value (<10g/dL), with 43.6%. Presentation of melena encountered the second most common symptom (26.3%), while fresh per rectal bleeding counts the less common symptom (1%). Forrest Ib ulcer showed the commonest diagnosis found during endoscopy (45.5%), followed by Forrest Ila ulcer (34.5%), Forrest Ilb ulcer (16.4%), and Forrest Ia ulcer (3.6%). There were 27 participants who undergo repetitive endoscopy. For Helicobacter Pylori infection, there were 367 patients (66.7%) underwent the test during endoscopy, which showed 187 patients detected (51%) with H.Pylori positive. We identify other risk factors which lead to this fatal condition such as, patient’s comorbidities including liver disease, renal disease and their medications, blood investigations including hemoglobin level, platelet count, total white cell count, total bilirubin, Alanine Transaminase (ALT), serum urea and creatinine.

Conclusions
It is a must to identify important risk factors for bleeding gastroduodenal ulcers to prevent morbidity and mortality, and to initiate emergency intervention medically and surgically. From this study, it was a great move for us to make further research on how these risk factors affecting our management of patients.
From Gallstone Disease to Cholecystectomy: An audit looking at the waiting times for cholecystectomy in a small District General Hospital

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Background
Gallstone-related disease accounts for a third of emergency general surgery admissions and referrals. The average waiting time for acute gallstone presentations to laparoscopic cholecystectomy is about 7 days in England. This audit aims to identify emergency admissions and compare local management to the Association of Upper Gastrointestinal Surgery of Great Britain and Ireland (AUGIS) guidelines standards with a focus on waiting times for laparoscopic cholecystectomy (LC). Where AUGIS standards were not met, number of re-admissions and complications were identified. A cost analysis was also completed looking at the overall costs of delayed treatment.

Methods
We identified all patients admitted as an emergency between September 2019 and September 2020 with gallstone-related pathology. Patients not referred to the surgical team, with negative Ultrasound Scans (USS) or known HPB malignancy were excluded. The patients were divided into a pre-COVID-19 and during COVID-19 category (respectively before and after March 2020), to identify whether the cancellation to non-urgent elective surgery (due to COVID-19) had caused further delays or complications. Each patient’s management was compared to AUGIS guidelines depending on their diagnosis at presentation (biliary colic, cholecystitis, cholangitis, gallstone-related pancreatitis), focusing on the timing between presentation and LC.

Results
A total of 99 patients were identified. Of the patients presenting with biliary colic (n=9 pre-COVID, n=5 during COVID), none underwent LC within 72 hours from presentation as recommended by AUGIS. Of the patients presenting with cholecystitis (n=20 pre-COVID and n=16 during COVID), none had LC within the recommended 72 hours. 5 patients in each COVID group had LC, with a significantly longer waiting time compared to the pre-COVID group. Re-admissions and complications were similar for the cholecystitis patients in both COVID groups. In the gallstone-related pancreatitis group, only 1 patient underwent LC within the recommended 2 weeks.

Conclusions
This audit showed that locally we are failing to meet AUGIS guidelines for LC within 72 hrs, 2 weeks or 6 weeks both pre and during COVID. This has caused re-admissions of patients with cholecystitis, pancreatitis and perforated gallbladders. Factors that cause delay are limited access to USS, limited staff and theatre availability. To improve outcomes, it is necessary to implement a hot gallbladder service with dedicated theatre slots. A change in the overall perception of LC is also needed: this is should be considered an emergency operation as its delay has a significant negative impact on patients’ outcomes.
Gastric pneumatosis in an elderly patient with recurrence of gastric volvulus

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Background
Gastric pneumatosis (GP), defined as the presence of air in the gastric wall, is a rare CT finding. It is associated with a spectrum of conditions which can range from benign and self-limiting to severe with high mortality rate. A gastric volvulus occurs with a rotation of 180 degrees or more of the stomach around its longitudinal or transverse axis. It is a rare event, and can culminate in obstruction, strangulation, ischaemia and necrosis. We present a case of gastric pneumatosis in a patient suffering with hiatus hernia and a history of recurrent gastric volvulus.

Methods
An 83-year-old man presented with a history of vomiting and abdominal pain. His background included a known hiatus hernia with previous episodes of gastric volvulus. A computer tomography (CT) showed a gastric volvulus with air in the gastric wall, in the intrahepatic biliary tree and porta hepatis. Conservative management was pursued with IV PPI and antibiotics, keeping the patient nil by mouth. He improved clinically and a repeat CT scan showed regression of the gastric pneumatosis, with resorption of gas in the porta hepatis and regression of the pneumobilia. He was discharged home 12 days after his initial presentation.

Results
Gastric pneumatosis (GP) is described as a rare finding that can occur in conditions such as gastric emphysema (GE) and emphysematous gastritis (EG). GE is described as a more benign condition, usually self-limiting which can be managed conservatively in most cases and rarely requires surgical interventions. EG is a more severe condition with a high mortality rate, and more aggressive treatment is advocated. The diagnostic process can be challenging but literature shows lactate, the presence of metabolic acidosis and peritonitis can help differentiating between the two clinical entities and choosing the appropriate management plan.

Conclusions
This case described a patient presenting with a gastric volvulus with the presence of gastric pneumatosis, pneumobilia and portal venous gas. These findings were diagnosed as gastric ischaemia secondary to volvulus. In this case the patient made a good recovery after being managed conservatively. GP is a rare CT entity which can be found in the presence of GE or EG. Differentiating between the two can be a challenging process, aided by clinical examination as well as blood test results. Achieving the right diagnosis is key as radical surgical intervention is not always needed to guarantee a good outcome.
P-EGS16
Lemmel Syndrome due to Duodenal Diverticulitis, an Infrequent Cause of Biliary Obstruction

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Background
Lemmel syndrome, first described in 1934, is the presence of biliary obstruction as a consequence of duodenal diverticula. The precise aetiology remains uncertain. Multiple causative theories have been proposed. These include mechanical bilio-pancreatic duct occlusion, functional disruption of the sphincter of Oddi and alteration of the course of the distal biliary and pancreatic ducts. We present a case of biliary obstruction caused by diverticulitis of a solitary duodenal diverticulum.

Methods
A 71-year-old woman with no co-morbidities presented with early satiety, cachexia and upper abdominal pain. An epigastric mass was palpable, alkaline phosphatase was 247 iu/L, alanine transaminase 124iu/L, bilirubin 4umol/L and C-reactive protein 68mg/L. Computed tomography (CT) of the abdomen and pelvis revealed obstructed biliary tree with D2 duodenal diverticulitis. Magnetic resonance cholangiopancreatography (MRCP) displayed a causative enterolith. Treatment with antibiotics was initiated and the patient commenced on liquid diet. Liver function tests and inflammatory markers normalised. After a seven day admission patient was discharged and oral intake normalised. Interval MRCP revealed resolution of obstruction and inflammation.

Results
Duodenal diverticula occur in 1-20% of individuals. Complications are symptoms are uncommon. Diverticulitis is a rare complication. Malignancy and cholelithiasis should be excluded in diagnostic workup. The mainstay of therapy for duodenal diverticulitis is conservative. CT and MRCP are effective diagnostic tools. Diverticulectomy carries substantial risk of morbidity and mortality. Endoscopic sphincterotomy or lavage have a role in relief of biliary obstruction when present. Comparative prospective studies of management do not exist and retrospective enquiry is sparse. Management is thereby best determined clinically on a case by case basis. Surgery is reserved for failed conservative and medical therapy.

Conclusions
Duodenal diverticulitis should be considered in patients with unexplained upper abdominal pain and elevated inflammatory markers. In combination with obstructive jaundice, suspicions should be raised for acute inflammation causing obstruction to the biliary tree. Cross sectional imaging is useful in determining the diagnosis. Antibiotics and conservative therapy are prudent first line management in the absence of perforation. Where these measures are inadequate endoscopic and operative strategies may be employed but have no robust evidence basis.
Evaluation of Different Surgical Risk Prediction Models in Predicting Morbidity and Mortality in Emergency Giant Hiatus and Diaphragmatic Hernia Repairs

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Background
Emergency presentation of giant hiatus and diaphragmatic hernias are associated with significant morbidity and mortality, and predicting perioperative risks can be difficult. There are several preoperative risk evaluation models used commonly in emergency general surgery. Not only can they help clinicians stratify risk, but they can also be valuable tools to outline surgical risks to patients and families. This study aimed to evaluate the suitability of different risk prediction models when predicting morbidity and mortality in emergency giant hiatus and diaphragmatic hernia repairs.

Methods
This was a retrospective cohort study of all emergency hiatus and diaphragmatic hernia repairs at a tertiary upper gastrointestinal centre from 2010 to 2021. The outcomes were compared to the predicted mortality and morbidity of different risk prediction models. The mortality models SORT (Surgical Outcome Risk Tool), NELA (National Emergency Laparotomy Audit) and ACS-NSQIP (American College of Surgeons National Surgical Quality Improvement Programme) were compared using the area under the curve (AUC). Morbidity was evaluated by calculating the comprehensive complication index (CCI). CCI was compared to P-POSSUM (Portsmouth – Physiological and Operative Severity Score) and ACS-NSQIP predicted morbidity using Spearman correlation.

Results
108 patients were included in the analysis. 49.1% were female, and 50.9% were male. The median age was 69 (IQR 59-78). The 30-day mortality rate was 6.93%. ACS-NSQIP had the highest predictive power for mortality (AUC = 0.845), in comparison to NELA (AUC=0.809) and SORT (AUC = 0.740). Both ACS-NSQIP and P-POSSUM showed moderate correlation to CCI (rho = 0.489, p<0.001 and 0.446, p<0.001 respectively).

Conclusions
ACS-NSQIP is a better predictor of both mortality and morbidity in emergency giant hiatus and diaphragmatic hernia repairs when compared to NELA, P-POSSUM and SORT. ACS-NSQIP may have a role in pre-assessment and consenting of emergency giant hiatus and diaphragmatic hernia repairs. Multi-centre prospective studies could be used to validate these findings.
The outcomes of upper gastrointestinal bleeds with unsuccessful endoscopy in a district hospital with no interventional radiology

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Background
Acute upper gastrointestinal bleeding (UGIB) is a common emergency estimated to occur in 80 to 150 out of 100,000 people each year. First line management is endoscopy and pharmacological but those who fail this can pose a challenge. Current NICE guidelines recommend repeat endoscopy to patients who re-bleed, those unstable consider interventional radiology (IR) or emergency surgery. The estimated mortality rate is approximately 10%. This study was conducted to review our current surgical outcomes and whether referral for IR is appropriate and could reduce mortality.

Methods
Retrospective study of 11 patients who underwent surgery for refractory non-variceal UGIB between November 2015 and March 2021 with a mean age of 61. Data was collected from the electronic records.

Results
All patients underwent an emergency laparotomy, 82% had an ASA of 4 the remainder ASA 3, a mean NELA mortality of 31.1% and a mean Blatchford 11.1. The initial OGD was performed on the day of admission in 54% of patients. 45% during initial OGD became hemodynamically unstable and transferred to theatre, one patient re-bleed 3 days after and taken to theatre the remainder (45%) re-bleed and had a 2nd OGD. 2 patients unstable during OGD went to theatre, 3 re-bleed within 24hrs 1 within 48hrs and taken to theatre. Mortality rate was 27%, complication rate 45%, mean LOS 24.6.

Conclusions
These findings highlight the high rate of morbidity and mortality associated with surgical treatment for UGIB. A small number of cases occurred over 7 years requiring surgical intervention, 45% had two OGD’s and 9% went on to have a 3rd. Was there a window of opportunity to use IR if it were available. Recent studies have shown that transcatheter arterial embolization is safer than surgical intervention in the high risk patient population and has a lower 30-d mortality rate.
Complete oesophageal transection during thyroidectomy; Successful management of anastomotic leak using endoluminal vacuum therapy (EVT) following failed primary repair

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Background
Perforation of the cervical oesophagus is an extremely rare but recognised complication of thyroidectomy. As with all oesophageal perforations management depends on timing of diagnosis in relation to the timing of injury, the size of the oesophageal wall defect, extent of extraluminal contamination, and how unwell the patient is with respect to sepsis. We report a case of complete transection of the cervical oesophagus during total thyroidectomy and its subsequent management.

Methods
A previously well 32-year-old female had a complete cervical oesophageal transection during total thyroidectomy and neck dissection for papillary carcinoma of thyroid. This was recognised by her ENT surgeon who repaired the oesophagus primarily. Subsequently, she developed sepsis with cellulitis of her anterior chest wall. Cross-sectional imaging demonstrated a leak at the site of the cervical oesophageal repair. Gastroscopy confirmed a 50% dehiscence of the oesophageal anastomosis. Control and management of her oesophageal leak was achieved with EVT delivered using an ad-hoc endoluminal vacuum device (EVD) constructed from open cell foam sutured around the distal end of a nasogastric tube.

Results
The patient was managed in the intensive care unit (ICU) with appropriate organ support and antimicrobial cover. A surgical jejunostomy was placed to facilitate enteral feeding. EVT was delivered using the ad-hoc EVD which was placed endoscopically and situated intraluminally across the anastomotic leak site. Continuous negative pressure (125 mmHg) was applied. Six EVD changes were required to heal the leak. Her total length of stay was 41 days, of which 38 days were in ICU. There were no periprocedural complications related to using the EVD or EVT, although the patient subsequently developed an oesophageal stricture which required endoscopic dilatation.

Conclusions
Accidental complete transection of the cervical oesophagus is extremely rare. This case highlights the importance of a multidisciplinary team approach for managing such cases. EVT is an emerging treatment option for upper gastrointestinal (UGI) leaks and is reported to be safe and effective for leaks from a wide range of causes throughout the UGI tract. Successful resolution of the oesophageal leak in this unusual case demonstrates the utility of EVT in difficult clinical situations which may otherwise pose a formidable management challenge using traditional treatment strategies.
Safe emergency laparoscopic cholecystectomy in the first 12 months of the Covid-19 pandemic

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Background
The World Health Organisation declared a global pandemic on the 11\textsuperscript{th} March 2020 regarding the COVID-19 infection. This has had a dramatic impact on both acute and elective hospital services that will take a considerable time to recover from. Initial emergency intercollegiate surgical guidance released in March 2020 raised concern regarding laparoscopic surgery and advised to pursue alternative non-surgical or radiological treatment options for the safety of patients and theatre teams. The aim of this study was to assess the safety of emergency laparoscopic cholecystectomy (ELC) for patients presenting to our centre with acute gallstone pathology during the pandemic.

Methods
Retrospective analysis of all cholecystectomies undertaken in the department during the first year of the pandemic from 11\textsuperscript{th} March 2020 to 11\textsuperscript{th} March 2021. This period encapsulated two recognised peaks of the pandemic in the United Kingdom. Demographic data, elective/emergency, operative time, postop ITU admissions due to COVID and COVID related mortality was collected. Operative numbers and times were compared with historical data (HD) from the previous five years over the same time frame.

Results
399 laparoscopic cholecystectomies were performed during the first year of the pandemic which was less than the previous five-year average of 570 cholecystectomies per annum (30\% reduction). 247 (61.9\%) were performed as an emergency on patients presenting with acute gallstone pathology compared to 35\% (HD) performed acutely on average historically. Average age was 56 yrs (16-88 range). Average operative time for ELC during the pandemic was 69 minutes compared to 78 minutes HD (NS). No patients were admitted to ITU with post-operative Covid infections and there were no 30 day post-operative deaths.

Conclusions
We performed more ELC’s in the first year of the pandemic compared to the previous five-year average as we were conscious of the inevitable long waiting lists, we would certainly be faced with in the coming months. The Covid-19 pandemic was a global healthcare crisis and one the NHS had never encountered before. At the time there was no high-quality evidence on the safety of laparoscopy on patients presenting acutely. This study adds to the growing body of evidence that with consistent preoperative testing, PPE and appropriate patient flow pathways that emergency laparoscopic cholecystectomies are safe to perform in the current climate.
**P-EGS21**

**The impact of COVID-19 on operative difficulty and outcomes of laparoscopic cholecystectomy**

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**Background**  
The COVID-19 pandemic resulted in substantial delays to surgery among patients with symptomatic gallstones due to cessation of elective surgical procedures. As this exposed patients to a longer period of time during which complications from gallstones could develop, we hypothesised that the operative difficulty and complication rate of laparoscopic cholecystectomy (LC) increased following the first wave of the pandemic.

**Methods**  
This was a retrospective cohort study of patients receiving emergency or elective LC at a single NHS trust comprising three sites. We included patients undergoing surgery in the pre-pandemic period (July-September 2019) and after resumption of elective surgical services following the first wave of the pandemic (July-September 2020). We compared data on operative duration, length of hospital stay, complications (bile leak, bile duct injury and mortality) and need for subtotal cholecystectomy. Categorical data are reported as n(%) and were compared with Fisher’s exact test. Continuous data are reported as median with interquartile range and compared with Mann-Whitney U Test.

**Results**  
220 patients were included; 106 in the pre-pandemic group and 114 in the pandemic group. There were no significant differences in median operative times between the pre-pandemic (91 (71-121 minutes) and post-first wave (86 (69-114) minutes) groups (p=0.48). The proportion of prolonged operations (over two hours) was similar in the pre-pandemic and pandemic groups (50% versus 46%, respectively, p=0.59). Median length of hospital stay was 0 days for both groups (pre-pandemic 0 (0-1) days; pandemic 0 (0-1) days, p=0.42)). There were no significant differences in the rates of bile leak, bile duct injury, mortality, or the conversion to subtotal cholecystectomy.

**Conclusions**  
Interruption of elective surgery following the first wave of the COVID-19 pandemic did not result in a discernible change in the technical difficulty or complication rate of LC at our centre. Longer term studies are required to assess the effect of prolonged delays to surgery and the impact of subsequent waves of the pandemic.

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Background
Emergency cholecystectomy is recommended for all acute admissions with symptomatic gall stones. The Royal College of Surgeons and AUGIS on 25th March 2020 recommended that all laparoscopic procedures should be avoided during the COVID-19 pandemic with the view to minimise the risk of virus transmission from aerosol-generating procedures. This retrospective study compares the outcomes of patients undergoing emergency cholecystectomy during the COVID-19 period with the pre-COVID-19 period.

Methods
All patients who underwent emergency cholecystectomy (EC) from March 2019 to March 2021 were included. ‘Pre-COVID-19’ period was defined as 25th March 2019 to 24th March 2020, whereas the ‘COVID-19’ period was from 25th March 2020 to 24th March 2021. Mortality was considered as the primary outcome. Secondary outcomes include the 30-day postoperative complications based on the Calvien-Dindo classification (CDC) and the length of stay (LOS). Mortality and postoperative complications were assessed using the Chi-squared test, whilst LOS was studied using the Mann-Whitney U test. A p-value of <0.05 was considered statistically significant.

Results
A total of 143 patients underwent EC during the 24-month study period (75 patients pre-COVID-19 and 68 patients during COVID-19). The 30-day mortality was nil. 9 patients; 12% in pre-COVID-19 period and 11 patients; 16% in COVID-19 period underwent conversion to open cholecystectomy (p=0.47). 18 patients; 24% from pre-COVID-19 and 19 patients; 27.9% from COVID-19 periods developed postoperative complications (p=0.59). Grade-2 CDC complications were seen in 12 patients; 17.6% during COVID-19 period and 5 patients; 6.7% in pre-COVID-19 period (p=0.0043). However, grade-3,4 CDC complications requiring intervention (p=0.39), and ICU-admission (p=0.62) were comparable in both periods. 1 patient developed COVID-19 infection but made a full recovery. Mean LOS was 6-days in both periods, with no statistical difference (p=0.28).

Conclusions
This study demonstrated no significant difference in patient outcomes who underwent emergency cholecystectomy during the COVID-19 pandemic compared to the pre-COVID-19 period. Emergency cholecystectomy should be offered to all surgically fit patients with symptomatic gall stones.
Efficacy of Percutaneous Cholecystostomy and Timing of Tube Removal: An Observational Study from a busy District General Hospital

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Background
Percutaneous cholecystostomy (PC) has traditionally been reserved for high-risk patients with cholecystitis who are unfit for surgical intervention, or as a temporizing measure for septic biliary patients to relieve sepsis and symptoms. However, there are currently no guidelines regarding the timing of tube removal following PC. The aim of this study is to evaluate the timing of tube removal following resolving inflammation and patency of biliary ducts, and its associated risks.

Methods
Patient notes and imaging reports were retrospectively reviewed from those who underwent percutaneous cholecystostomy from January 2015-Dec 2020. Data collected included demographic details, symptom presentation, requirement of ITU admissions, details of cholecystostomy, post-operative complications from the tube, outcomes following PC, and mortality rates within 30 days of the procedure. Patients were graded by their severity of their cholecystitis according to the 2018 Tokyo Guidelines, and these were correlated with morbidity and mortality outcomes within 1 year of the procedure.

Results
There were 55 females and 65 males, with a mean age of 75.2 years (range 45-96 years). Approximately 45% of patients were diabetic and had comorbidities. On presentation, 54% (65/120) patients had elevated inflammatory markers (WCC/CRP), and 20% of patients had associated deranged liver function tests. Majority of patients had moderate or severe acute cholecystitis, with over 25% (31/120) of patients presenting with sepsis, and 6 required admission to intensive care. The median time from diagnosis of acute cholecystitis to percutaneous cholecystostomy was 8.5 days (range 1-64 days). Tube removal was performed after a median time of 31 days (range 1-142 days). Morbidity rate was observed to be 8-10%, comprising of complications such as tube displacement, leakage around the drain, bleeding and liver abscesses. Only 18.3% (22/120) of patients were deemed to be fit for further surgical intervention, of which 13 of those underwent a cholecystectomy thereafter. Unsurprisingly, 38% of these patients had recurrent biliary symptoms, and a 30% mortality rate.

Conclusions
Percutaneous cholecystostomy is a safe option in high-risk surgical patients for symptom relief, and is a crucial step in temporizing and de-escalating sepsis. However, this study suggests that timing of cholecystostomy removal is variable, and is associated with high morbidity. Consideration needs to be given to shorten the time to tube removal, to minimise risks, if certain criteria are met to ensure safety and efficacy.
Surgical case series of incarcerated diaphragmatic hernias following oesophagectomy for oesophageal cancer. Single centre experience

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Background
Incarcerated post-oesophagectomy diaphragmatic hernia (IPODH) is a recognised surgical emergency and potentially hazardous event. Information regarding the natural course for this emergency and guidelines regarding the management were not described clearly in literature. This case series aim to review patients who presented as emergency with IPODH.

Methods
This observation study is conducted at Salford Royal Hospital that has one of the largest oesophago-gastric unit in United Kingdom. A 7-year period (April 2013 - April 2020) retrospective data collection is performed using prospectively maintained database. We reviewed the presentation and management course for all patients who presented as emergency with IPODH.

Results
We identified 341 patients who underwent oesophagectomies over the seven-year period. Seven patients (2%) developed IPODH which required emergency surgery. All these patients underwent 2 stage oesophagectomies. Out of these, 5 patients had laparoscopic assisted procedure (hybrid), 1 patient had minimally invasive procedure and another patient had open operation. Mean time interval from esophagectomy to the acute incarcerated hernia presentation was 23 months. Only 1 patient developed acute diaphragmatic hernia on day 4 post-oesophagectomy. The incarcerated hernia contents were reported as small bowels (4 patients), gastric conduit (2 patients) and colon (1 patient). Dealing with these acute emergency cases can be difficult as the hernia contents are threatened. Therefore, most of these patients underwent emergency laparotomy, only 1 patient had laparoscopic procedure to repair the incarcerated hernia. Collagen mesh used to repair the defect only in 2 patients, whereas the rest of the patients had the defect repaired with primary sutures only.

Conclusions
Minimally invasive techniques were associated with a higher incidence of post-oesophagectomy diaphragmatic hernia compared with open techniques. These hernias can lead to a significant and serious risk when they present with incarceration. The risk of the acute manifestation and significant post-repair morbidity support long-term surveillance for post-oesophagectomy diaphragmatic hernia and elective surgical treatment. Laparoscopic repair of non-complicated diaphragmatic hernia is feasible and effective in high-volume centres.
P-EGS25
Boerhaave’s Syndrome Secondary to Symptomatic COVID-19 Infection

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Background
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19), has infected over 140 million people worldwide (1). COVID-19 symptoms primarily involve the respiratory system. However, recent data suggests that gastrointestinal symptoms occur in 11-61% of cases (2, 3). Boerhaave’s syndrome is a rare and dangerous disorder of the gastrointestinal tract, associated with a mortality rate of up to 50% (4). It most commonly occurs due to a lack of coordination between upper and lower oesophageal sphincters during forceful emesis, leading to an abrupt rise in intra-oesophageal pressures which leads to a transmural tear (5). Less commonly, a tear can be secondary to prolonged coughing (6). The majority of tears occur in the distal posterolateral third of the oesophagus and have an average length of 2.2 cm (7). Risk factors include males, excess alcohol or food consumption (6). We present a case of Boerhaave’s syndrome secondary to prolonged coughing, from COVID-19 infection. The tear was 8 cm in length in the mid anterior oesophagus. The patient survived a major operation and prolonged intensive care stay. Meloy et al. (8) published one case of oesophageal rupture in symptomatic COVID-19 – unfortunately the patient passed away before intervention.

Methods
A 75-year-old Caucasian female was day seven of COVID-19 infection and had been coping in the community with a continuous dry cough and mild shortness of breath. She presented to Accident and Emergency in the late afternoon when her cough developed into unremitting retching, vomiting, a global headache and epigastric pain disproportionate to presentation. No associated haematemesis or change in bowel habit. Past medical history was significant for hypertension, hypothyroidism, depression and anxiety. Previous surgical history included an open appendicectomy, cholecystectomy and resection of a melanoma. She was previously independent, consumed alcohol socially, a non-smoker and compliant with her regular medications. A CT chest with contrast demonstrated distal oesophageal rupture transversely with pneumomediastinum and extensive surgical emphysema in the neck and secondary bilateral pleural effusions, consistent with Boerhaave’s syndrome. The patient was taken to theatre the next morning for an oesophagogastro-duodenoscopy (OGD), right posterolateral thoracotomy and primary repair of the oesophageal perforation. On endoscopy, an 8cm defect in the anterior oesophagus starting at the T4 vertebral level was identified and was repaired using tunnelled permanent mesh. During the surgery, mediastinitis was noted and washed out. The antimicrobial therapy was altered post-operatively to intravenous tazocin and fluconazole.

Results
The management of this patient was a huge multidisciplinary team achievement. She spent forty-six days recovering in ICU, intubated, ventilated and sedated with noradrenaline vasopressor support. The patient developed a severe acute kidney injury, requiring haemofiltration. The mediastinal fluid culture grew Enterococcus faecalis, sensitive to vancomycin and antibiotic therapy was adjusted accordingly. The patient’s recovery was burdened by seizures, whilst being weaned off sedation, and episodes of bradycardia and asystole, most of which were self-resolving except one requiring thirty seconds of cardio-pulmonary resuscitation. After chest drain removal, the patient redeveloped a right sided loculated pleural effusion so a further drain was inserted. A gastrografin contrast swallow study performed thirty-five days post-operatively demonstrated no evidence of contrast leak although some tracheobronchial aspiration. She was later stepped down to the ward and recovered very well. However, a component of post-ICU delirium and low mood was persistent. The patient had a repeat water-soluble contrast study on day 77 which demonstrated a contained anastomotic leak, managed conservatively. She was deemed medically ready for discharge at day 110. She was readmitted due to dysphagia secondary to a stricture at the site of mesh repair. OGD was performed and a stent was inserted. Conclusions: COVID-19 infection may lead to an abnormal presentation of Boerhaave’s syndrome, with oesophageal tears being secondary to coughing, longer and more proximal. Peri-operative morbidity in COVID patients is elevated and clinicians should consider the short and long term implications of this to provide a holistic approach to care. Clinicians should maintain an awareness of the diversity of COVID-associated complications whilst ensuring that they do not succumb to the diagnostic overshadowing that becomes commonplace during a pandemic.
P-EGS26
Outcomes of Surgical Treatment for Perforated Peptic Ulcer in a non-Upper Gastrointestinal Surgery Centre

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Background
Perforated peptic ulcer (PPU) remains a common surgical emergency worldwide requiring surgical intervention. Although commonly performed, morbidity and mortality rate remained high. This study aimed to analyze the factors that contribute to the outcome of PPU surgery in a non-upper gastrointestinal surgery center in Malaysia.

Methods
Data were collected by retrospective review of all PPU surgeries done throughout the year 2020, looking into various preoperative, intraoperative, and postoperative details.

Results
In this study, we have a total of 24 PPU patients underwent surgery resulted in 7 (29.2%) deaths. Majority of our subjects were elderly (median age 65 years, IQR 48.5 – 73.0) with 4 (16%) being of ASA (American Society of Anesthesiologist) category 3 - 4. The most common cause of death was uncontrolled systemic infection in 4 patients (57.1%), followed by 2 (28.6%) fatal arrhythmia and 1 (14.3%) massive upper gastrointestinal bleed. Our analysis found that size of perforation ≥ 30mm (OR=0.18, 95%CI 0.08 - 0.44), and postoperative complications (OR=12.5, 95%CI 1.6 – 97.6) were significantly associated with a higher postoperative death. Low serum albumin level (mean 34.3 ± 9.1g/L), negative base excess level (mean -3.28 ± 4.89), and prolonged interval between admission and commencement of surgery (median 750 mins, IQR 258 – 2218) were all significantly associated with increased mortality post PPU surgeries.

Conclusions
This study highlighted to us various perioperative factors which could potentially be modifiable thus necessary measures can be taken in the future to ensure a better operative outcome of PPU surgery.
Outcomes of disorders of the gallbladder, biliary tract, and pancreas during COVID pandemic

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Background
Biliary disorders make up a significant proportion of the acute general surgical workload. Effective management allows definitive treatment with relief of symptoms and reduced impact to patients due to recurrent admissions and complications. During the first COVID-19 wave and lockdown there were reduced surgical presentations to hospital and patients presented later. Surgical services were forced to implement different practices including more conservative/non operative management potentially increasing the possibility of recurrent presentations and greater complications in biliary-pancreatic presentations.

Methods
We performed a retrospective audit of patients presenting to our unit with ICD 10 codes: K80; Cholelithiasis, K81; Cholecystitis and K85; Acute pancreatitis. We used the period of the first wave of the COVID pandemic March – August 2020(COVID) and compared this to the same period in 2019(pre-COVID). On note review those with inaccurate coding were excluded. Patient demographics, admission details, investigations, surgical management, operative details, and post-operative complications were recorded. The primary outcomes were change in operative management, representation, and post-operative complications. χ2 test was used to test for significance of categorical variables.

Results

<table>
<thead>
<tr>
<th></th>
<th>Pre-COVID</th>
<th>COVID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital presentations</td>
<td>409</td>
<td>456</td>
</tr>
<tr>
<td>Unique patients</td>
<td>376</td>
<td>331</td>
</tr>
<tr>
<td>No. of patients with repeat presentations in study period [repeat presentations]</td>
<td>38*(10%) [35]</td>
<td>77 (24%) [135]</td>
</tr>
<tr>
<td>p&lt;0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age†</td>
<td>59.7 (57.7-61.6)</td>
<td>58.6 (56.8-60.4)</td>
</tr>
<tr>
<td>Length of stay†</td>
<td>3.1 (2.5-3.8)</td>
<td>2.5 (1.9-3)</td>
</tr>
<tr>
<td>Presentations of Cholecystitis who had index procedure [no. of presentations]</td>
<td>110 (36%) [305]</td>
<td>50 (15%) [326]</td>
</tr>
<tr>
<td>Definitive management of gallstone pancreatitis [no. of presentations]</td>
<td>42 (81%) [52]</td>
<td>34 (53%) [64]</td>
</tr>
<tr>
<td>Adverse operative findings</td>
<td>50 (22%) [52]</td>
<td>60 (36%) [64]</td>
</tr>
<tr>
<td>Post-operative complications</td>
<td>33 (15%) [33]</td>
<td>39 (23%) [39]</td>
</tr>
</tbody>
</table>

†values displayed are mean (95% c.i.).
*3 patients crossed study groups

Conclusions
The two groups were demographically similar with equal spread of primary diagnoses however there were significant differences in outcomes. Patients presenting with cholecystitis and gallstone pancreatitis had significantly reduced rates of definitive management. The increase in adverse operative findings is likely secondary to patients presenting later and initial conservative management. The increase in complications for the COVID cohort correlates with the increase in adverse findings/operative complexity. Conservative management with the aim of reducing COVID exposure inadvertently resulted in increased risk to patients with increased presentations/admissions. Despite this risk there were no COVID cases in our cohort.
Management of obstructive jaundice secondary to gall stones in an ambulatory setting

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Background
Our data from Leeds shows a 30% increase in patient attendance to the Surgical Assessment Unit (SAU) across a 5 year period, putting unprecedented demands on the acute surgical service. A new Ambulatory Surgical Centre (ASC) was established for the advancement of ambulatory care pathways that would ensure that acute patients are seen promptly and kept safe with monitoring in an appropriate setting without needing admission to the hospital bed base. Gallstone related disease accounts for a third of patient attendance to the emergency surgical services. We present our experience with an ambulatory pathway to manage patients with obstructive jaundice caused by gall stones, and propose a protocol driven pathway.

Methods
The ASC operates an acute, consultant led clinic, with access to urgent blood tests and dedicated USS, CT and MRI imaging capacity, and offers a direct referral service from Primary Care Networks (PCNs) through the Primary Care Access Line (PCAL). Patients referred with clinical jaundice or RUQ/Epigastric pain are investigated for derangement in their liver function, and assessed for the presence and severity of Acute Cholangitis (AC), according to the 2018 Tokyo Guidelines. Patients without evidence of cholangitis, or with AC Grade I are planned for management in the ambulatory setting, including investigations, monitoring and endoscopic/surgical intervention. Outcome data was collected retrospectively from PCAL data source, spanning from Oct 2020 till July 2021.

Results
A total of 98 patients were referred to the acute surgical service during this period. Out of these, 47% had Grade II (n=35) or Grade III (n=17) AC. 48% were suitable for ambulatory management, with no evidence of AC(n=5) or Grade I AC(n=43). 20% patients were found to have a cause other than gall stone disease. 55% have undergone intervention (33 Laparoscopic cholecystectomies, 22 ERCP) while 12 are on the waiting list for surgery.

Conclusions
Our protocol offers a safe, comprehensive and timely pathway for the management of patients with gall stone related obstructed jaundice in an ambulatory setting. This has helped reduce the demand on hospital beds for surgical patients.
Is an ambulatory emergency general surgery management pathway of biliary disease more cost effective than a traditional approach? A matched case series study

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Background
Patients presenting with biliary colic with or without deranged liver function tests (LFT’s) requiring surgery have traditionally been managed as inpatients or on an elective basis. Emergency surgery has previously been associated with higher costs in comparison to outpatient, elective management.

Methods
Thirteen patients presenting as an emergency with a diagnosis of cholecystitis, with or without deranged LFTs, who underwent different patient pathways resulting in laparoscopic cholecystectomy were identified randomly over 1 month period. They were then matched into groups to compare elective, inpatient and ambulatory care pathway management for patients with similar demographics and clinical picture. The costs of each patient’s journey, from acute presentation to discharge following laparoscopic cholecystectomy was calculated in conjunction with the patient level information costing team (PLICS).

Results
Three matched groups of patients were identified: 50-60M, 65-75F with normal LFTs, 60F with obstructive LFT’s. Each patient underwent an ultrasound scan of the upper abdomen, laparoscopic cholecystectomy with additional investigations dependent on the group and clinical picture. In each group, when elective, emergency inpatient or ambulatory care pathways were compared there was a consistent cost difference. The order from most expensive to cheapest was: inpatient management, elective management, ambulatory care.

The difference in costs was primarily linked with emergency department assessment and inpatient bed stays with cost saving of up to £5000 in one group when comparing inpatient stay to ambulatory emergency care management

Conclusions
The use of an ambulatory emergency general surgical pathway for patients with a variety of biliary colic presentations including those with deranged LFT’s is economically comparable and potentially advantageous to more traditional and established patient management pathway options in a number of patient demographics across age, gender and pathology. An ambulatory care pathway, when developed and used correctly can provide significant cost savings to a wide range of patients.
Audit of the management of patients presenting with gallstone pancreatitis during the COVID-19 pandemic

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Background
In the UK around 50% of cases of pancreatitis are caused by gallstones. BSG guidelines recommend ERCP is undertaken within 72h of onset of pain and patients should undergo definitive treatment with cholecystectomy if fit enough during the index admission or within two weeks of discharge to avoid the risk of potentially fatal recurrent pancreatitis. A national audit in 2015 showed that 34.2% of patients receive definitive treatment. During the first COVID-19 wave our surgical service was forced to modify practice including more conservative/non operative management potentially increasing the possibility of recurrent pancreatitis and thus complications.

Methods
We performed a retrospective audit of patients presenting to our unit with gallstone pancreatitis during the first wave of the COVID-19 pandemic from March to August 2020 (COVID) and compared this to the same period in 2019 (pre-COVID). Patients were filtered from a larger dataset of all admissions with an ICD-10 coding of any biliary disease. Patient demographics, admission details, investigations, surgical management and post-operative complications were recorded. This was then audited against the standards in the BSG guidelines for the management of pancreatitis.

Results

<table>
<thead>
<tr>
<th></th>
<th>Pre-COVID</th>
<th>COVID</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentations with GS pancreatitis</td>
<td>52</td>
<td>64</td>
</tr>
<tr>
<td>Unique patients</td>
<td>50</td>
<td>56</td>
</tr>
<tr>
<td>No. of repeat presentations in study period</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Median age (years)</td>
<td>65</td>
<td>69</td>
</tr>
<tr>
<td>Median length of stay</td>
<td>4</td>
<td>4.5</td>
</tr>
<tr>
<td>ERCP [ERCP &lt; 72 hours]</td>
<td>5 [220%]</td>
<td>11 [654%]</td>
</tr>
<tr>
<td>Average time to ERCP (days)</td>
<td>3.8</td>
<td>3.5</td>
</tr>
<tr>
<td>Cholecystectomy</td>
<td>37 (74%)</td>
<td>32 (57%)</td>
</tr>
<tr>
<td>Hot procedures &lt; 2 weeks [CT1]</td>
<td>30 (60%)</td>
<td>17 (30%) (p=0.002^†)</td>
</tr>
<tr>
<td>BSG guidance fulfilled</td>
<td>33 (77%)</td>
<td>27 (47%) (p=0.001^†)</td>
</tr>
<tr>
<td>Complications</td>
<td>3</td>
<td>7</td>
</tr>
</tbody>
</table>

* Patients with severe pancreatitis and those unfit for intervention excluded
† \( \chi^2 \) test

Conclusions
There were significant differences in the management of the groups. Most significantly in the number of hot procedures and number of patients receiving definitive treatment, a consequence of the conservative approach during COVID. Our pre-COVID results are similar to our previous audit in 2016; 76% received definitive treatment. Those that didn’t have definitive treatment were generally due to frailty/co-morbidities. Majority of ERCP delays were due to weekend effect. Of the 40 patients who didn’t receive definitive treatment 16 have represented with biliary flares/pancreatitis in the year following the study period highlighting the importance of definitive treatment.
P-EUS01
Pancreatic metastases from Renal Cell Cancer; endosonographic features and outcomes of a rare clinical entity

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Background
The pancreas is a rare site for metastatic deposits in the absence of disseminated metastatic disease. They can be difficult to differentiate from primary pancreatic malignancy based on the clinical history and radiological features alone. Renal cell cancer (RCC) is the most common source. We describe their endosonographic characteristics and clinical outcomes.

Methods
Patients undergoing EUS- FNB with a positive diagnosis of pancreatic metastatic disease from RCC from 2017 to 2019 were retrospectively identified. Recorded variables included patient demographics, endosonographic features and patient outcomes.

Results
Five patients were identified. Mean age was 63 (range 53-72 years old). Mean time from diagnosis of the primary RCC to diagnosis of pancreatic metastasis was 12.75 years (range 6-18 years). All had resection of the primary lesion. Mean diameter on EUS was 37.80mm (range 15mm to 100mm). The lesions were homogenous, well-circumscribed, hypoechoic and hypervascular. Tissue acquisition was performed using a 22G FNB needle. Two underwent surgical resection of the metastasis, one of which had recurrence at the surgical bed after 26 months. One had disseminated malignancy at the time of diagnosis. One passed away prior to surgical resection.

Conclusions
Pancreatic metastasis from renal cell cancer have characteristic endosonographic features and can present many years after initial diagnosis and resection. EUS-FNB has a central role in confirming this diagnosis.
The value of Endoscopic Ultrasound (EUS) in the investigative pathway of Acute Idiopathic Pancreatitis (AIP)

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Background
The British Society of Gastroenterology (BSG) guidelines on the management of acute idiopathic pancreatitis (AIP) state the incidence of idiopathic cases to be no more than 30%. However, before a firm diagnosis of AIP is made, Endoscopic Ultrasound (EUS) may be used to determine occult causes. This approach may help prevent recurrent attacks which may evolve into chronic pancreatitis.

Methods
Retrospective analysis over a one-year period of cases of AIP in a tertiary referral center was performed to see the incidence of AIP and the role of EUS. Patients with an identifiable cause for pancreatitis were excluded, leaving only those who had received a diagnosis of AIP and the diagnostic value of EUS was examined.

Results
Of the 101 patients diagnosed with AIP, 19% (n=19) underwent an EUS successfully. 79% (n=15) had no underlying cause of pancreatitis identified on EUS. In the remaining 21% of cases (n=4), microlithiasis, ductal stones, and pus requiring drainage were common findings. Of these patients, only 1 was referred for surgery. In the patient group with negative findings on EUS, 4% were unaffected, 2% were referred for surgery, 2% died and 7% had recurrent episodes of pancreatitis.

Conclusions
The results of this study show that EUS is a valuable modality in patients with suspected AIP, with a positive diagnostic rate of 21%. Therefore, we propose EUS needs to be included in the investigative pathway of all suspected AIP. Although EUS is a relatively scarce resource, further research is required to establish guidelines for the investigation of suspected AIP.
P-EUS03
Risk prediction in patients undergoing Endoscopic Necrosectomy for infected pancreatic necrosis

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Background
Laparotomy for the treatment of patients with infected pancreatic necrosis is associated with high rates of morbidity (~95%) and mortality (~50%); this has driven the development of minimally invasive alternatives for the treatment of such cases. Endoscopic Transgastric Necrosectomy (ETN) is an accepted method for debriding infected necrosis in these challenging cases. The National Emergency Laparotomy Audit (NELA) and P-POSSUM scoring systems are well-validated risk stratification tools used nationally for patients undergoing emergency laparotomy. This work aims to determine whether patients undergoing ETN for infected pancreatic necrosis can be risk stratified accurately using both the NELA and P-POSSUM scoring systems.

Methods
A prospective database of all patients in a single UK centre undergoing ETN from 2011 to 2021 for infected pancreatic necrosis has been maintained. All patients initially underwent an EUS guided stent placement to create a cystgastrostomy before subsequent transgastric necrosectomy. Patient demographics, timing of procedures and short-term post procedural outcomes were recorded. The NELA and P-POSSUM score was calculated at the time of the endoscopic cystgastrostomy. Demographic data were descriptively summarized and ROC analysis was performed to assess the diagnostic accuracy of both the P-POSSUM and NELA score. Data are presented as median (range)

Results
Sixty-nine patients underwent ETN between 2011 and 2021 with a median age of 54 years (15-86). Twenty-nine patients (42%) required ITU admission during their admission. The actual mortality was 10.1% (7), which was slightly higher than the median of the NELA predicted mortality- (6.7%) but half the median of the P-POSSUM predicted mortality- (21.1%). Median overall predicted mortality for ETN using P-POSSUM was 21.1% (2.6-85.7%) and with NELA was 6.7% (0.4-34.3%). The median P-POSSUM score of the patients who died was 33.2% (6.9-52.4%) compared to the median NELA score which was 17.2% (0.8-34.3%). The area under the receiver operating characteristics curve (AUROC) was similar for both the NELA (0.82, SE=0.13) and P-POSSUM (0.75, SE=0.1).

Conclusions
Endoscopic Transgastric Necrosectomy is a safe alternative to emergency laparotomy for the debridement of infected pancreatic necrosis. Both the NELA and P-POSSUM scoring systems can effectively stratify those patients at highest risk, however where P-POSSUM scoring may overestimate mortality NELA scoring may underestimate the severity of illness and mortality associated with the disease.
Newly detected liver nodules with a history of colorectal cancer: are they metastasis?

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Background
The diagnosis of newly detected liver nodules in patients with colorectal cancer (CRC) is crucial for determining prognosis and treatment. Accurate identification of benign nodules can help avoid unnecessary therapy. The aim of our study was to retrospectively review CRC patients who underwent liver resection for newly detected liver nodules in our institution.

Methods
We went over all patients with a history of CRC, who underwent liver resection from January 2012 to December 2019 in our institution. We specifically focused on nodules pathologically confirmed benign. Clinicopathological characteristics of these patients were collected.

Results
From 2012 to 2019, a total of 2632 CRC patients received liver resection for liver nodules, among which 2584 cases were proved to be malignant, and 48 cases were benign. Among these 48 cases, 24 were pathologically confirmed as focal nodular hyperplasia (FNH), 10 were inflammatory lesions, 9 were peliosis, and 5 were hemangioma. At least one pre-operative imaging examination (MRI, US, or PET-CT) indicated CRLM, while no one underwent gadoxetic acid-enhanced MRI. The median size of nodule was 2.0 cm (range, 0.4-8.0 cm). For therapy, ten patients received laparoscopic surgery, and 38 patients received open surgery; ten patients received chemotherapy after discovery of liver nodules.

Conclusions
Newly detected liver nodules with a history of colorectal cancer could be benign. Gadoxetic acid-enhanced MRI should be considered especially for indeterminate liver nodules that would be mimicker of colorectal cancer liver metastasis.
Machine learning to evaluate liver reserve function based on venous blood biochemistry

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Background
The accurate and comprehensive evaluation of liver reserve function is crucial for daily follow-up and medical treatment of patients with liver disease. However, existing techniques are too complex and costly for universal implementation. To develop a convenient, reliable method to evaluate liver reserve function based on eight biochemical indicators measured from venous blood.

Methods
Blood test results (albumin (Alb), total bilirubin (TBIL), prothrombin time (PT), international normalized ratio (INR), total cholesterol (TC), cholinesterase (ChE), aspartate amino transferase (AST), and alanine transaminase (ALT)) were collected retrospectively from 660 patients treated at the first hospital of Lanzhou University from 2016 to 2018. As the reference standard for liver reserve function, indocyanine green (ICG) clearance test results were also collected from the same patients at the same times. The patient data were processed and analyzed to construct a machine learning model, eXtreme Gradient Boosting (XGBoost), and a generalized linear model (GLM) to predict liver reserve function based on the eight biochemical indicators.

Results
Results showed that the predicted XGBoost values were closely correlated with the actual ICG 15-minute retention rates (R = 0.969, R² = 0.939), while the GLM values had a relatively low correlation (R = 0.566, R² = 0.320). These findings indicate that the developed model can be used to evaluate liver reserve function with comparable performance to the ICG clearance test. Furthermore, the XGBoost model exhibited superior prediction compared with the GLM. Hence, the XGBoost model developed using machine learning can be utilized to evaluate liver reserve function from eight biochemical indicators that are closely related to liver function, commonly used clinically, and easier to obtain than ICG clearance measures.

Conclusions
The results predicted by the XGBoost model were highly accurate when compared with the results of the actual ICG test, demonstrating the strong practical clinical value of the model.
The efficacy and safety of controlled low central venous pressure for liver resection: a systematic review and meta-analysis

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Background
Partial hepatectomy is an effective treatment for benign and malignant liver diseases. However, intraoperative bleeding is one of the major factors affecting the outcome of hepatectomy. Currently, the most commonly used method of hepatic blood flow occlusion in clinical practice is Pringle method, but this method has a great impact on liver function and can cause hepatic ischemia-reperfusion injury. Studies have shown that blood loss volume during hepatectomy is related to central venous pressure (CVP). Intraoperative control of central venous pressure (LCVP) is increasingly popular in hepatectomy, but its effectiveness and safety remain controversial.

Methods
The main result of the analysis was to reduce the blood loss and blood infusion. Secondary outcomes included operative time, fluid infusion, urine volume, ALT, TBIL, BUN, CR, postoperative complication rates and length of hospital stay. Statistical analysis was performed using RevMan 5.3 software (Cochrane Collaboration, Oxford, England). The results of all studies were measured by mean ± standard deviation. If there is significant heterogeneity between the results (P < 0.05), a random-effects model is used. A fixed-effect model was used when there was no significant heterogeneity (P > 0.05). Heterogeneity was assessed using the Cochrane χ² test.

Results
In total, 10 studies, involving 324 patients undergoing liver resection with controlled low central venous pressure, were identified. Meta-analysis showed that blood loss in the LCVP group was significantly less than that in the control group (P = 0.0002). Blood transfusion in the LCVP group was also significantly less than that in the control group (P = 0.0006). There was no difference between LCVP group and control group in operation time (P = 0.17), fluid infusion (P = 0.46), urinary volume (P = 0.38), ALT (P = 0.23), TBIL (P = 0.86), BUN (P = 0.67), CR (P = 0.59), postoperative complication rates (P = 0.01) and hospital stay (P = 0.26).

Conclusions
Compared with the control, controlled low central venous pressure showed comparable efficacy and safety for the treatment during liver resection.
Temporal changes in prevalence and associated risk factors for gallbladder dysplasia and adenocarcinoma in patients undergoing cholecystectomy. A UK hospital-based observational study

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Background
A metaplasia-dysplasia–carcinoma sequence is the most plausible carcinogenic pathway for gallbladder cancer. Although the incidence of gallbladder carcinoma is increasing, little is known about its precancerous lesions. The aim of this study was to determine temporal changes in the prevalence of low-grade dysplasia (LGD), high-grade dysplasia (HGD) and gallbladder adenocarcinoma and associated risk factors.

Methods
We retrospectively identified consecutive patients who underwent cholecystectomy between January 2011 and March 2020. Patients were grouped according to histology: no dysplasia; LGD; HGD; and adenocarcinoma. Fitted linear models estimated temporal trends in prevalence and mean age for all histological outcomes. Logistic regression estimated associated risk factors.

Results
A total of 5 835 patients were included in the analysis. The prevalence of LGD was 1.47%, HGD 0.17% and adenocarcinoma 0.19%. Prevalence for all diseases increased over time, and mean age at diagnoses decreased over time. In a multivariate logistic regression model, with no dysplasia as the reference group, female sex increased the odds of LGD (OR 4.57, 95% CI 3.07-10.10, p=<0.0001). BMI was not associated with disease risk.

Conclusions
Our data suggests the prevalence of precancerous gallbladder lesions are increasing in younger patients. Although a risk factor for cholelithiasis, BMI was not associated with disease progression. If occurring in a dysplasia-carcinoma sequence, mean age of diagnoses suggests a progression period of 20 years. Further research is required to explain both the significant sex disparity and potential environmental risk factors for gallbladder dysplasia.
P-L05
Enterohepatic migration of ingested fishbone resulting in hepatic abscess- Case report and review of literature

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Background
Ingestion of foreign bodies is common, particularly in children. In adults, most foreign body ingestions are related to food bolus or bone. The majority present with pharyngeal symptoms. Most foreign bodies exit the gastrointestinal tract without complication. However, around 1% result in perforation. Patients may have a delayed presentation with nonspecific symptoms and pose a diagnostic dilemma. We report a rare case of silent migration of a fishbone into the liver and a review of the literature.

Methods
We present the case of a 56 year old man who presented with a liver abscess second to an ingested fishbone. We conducted a PUBMED search and reviewed the published data over a period of thirty years. We identified 52 similar cases and compared the presentation, site of perforation and location of the fish bone. We observed the different approaches in presentation and management of such patients.

Results
A 56-year-old man presented to his local hospital with dull epigastric pain and raised inflammatory markers. CT scan revealed a 4 cm abscess in the left lobe of the liver, with a linear radio-dense body within. The patient was given antibiotics and the abscess was aspirated. The patient was transferred to our Hepatopancreatobiliary unit for further management. Laparoscopy was performed. The left lateral segment of the liver was adherent to the gastric antrum. The hepato-gastric fistula was disconnected. The fishbone was retrieved from the liver. The abscess was drained and wash out performed. The patient was discharged the following day.

Conclusions
Left lobe liver abscess should raise suspicion of foreign body. Although antibiotic treatment may be effective in the short term, there is no long-term data regarding recurrence. We believe that laparoscopic drainage of the abscess and extraction of the foreign body offer control of the source of sepsis and reduces the risk of recurrence.
Establishing minimum datasets and disease specific forms for cancer patients in multidisciplinary team meetings

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Background
Multidisciplinary team (MDT) meetings aim to ensure standardised access to cancer pathways and treatment. It is thus important that minimum datasets are established and provided to the MDT clinicians to facilitate thorough discussion and encourage shared decision making. To determine the effectiveness of pre-established minimum dataset proformas for periampullary tumours, hepatocellular carcinoma (HCC), colorectal cancer with liver metastases (CRLM) and hilar cholangiocarcinoma in cancer MDT meetings.

Methods
Cancer specific minimum dataset forms were developed by consultants to be implemented in MDTs for the four types of hepatobiliary pancreatic cancers: HCC, periampullary cancer, hilar cholangiocarcinoma and CRLM. 189 MDT reports and 184 referral letters were analysed from three weekly MDT meetings to determine the outcomes reported against those outlined in the proformas. The proformas were then implemented by consultants leading the weekly MDT meetings for three consecutive weeks. 128 MDT reports and 126 referral letters were re-audited from these MDT meetings to determine if there was a change in the outcomes reported.

Results
In this quality improvement project, 21.25% (11/52) of outcomes in MDT and 19.23% (10/52) of outcomes in the referral letters had a statistically significant difference in the reporting of outcomes from Cycle 1 to Cycle 2 across all four cancers. Greater changes in reporting were observed for outcomes that may carry higher prognostic value, such as tumour size and vascular invasion. Despite the notable difference in reporting seen for datasets consisting of smaller cohorts, the change was not statistically significant due to the insufficient statistical power proving the need for trialling such proformas in a wider population.

Conclusions
The minimum dataset proformas were associated with a limited gain in compliance with data reporting. Further work, with particular focus on user acceptability and attitudes is required to improve use of minimum dataset proformas in MDT.
Nematode infection mimicking Liver metastasis from previous Melanoma

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Background
Malignant melanoma is known to metastasise to the liver. In the absence of any other disease spread it is prudent to resect these lesions. This case highlights how certain pathology can masquerade as liver metastases. Here we present a case of a gentleman previously diagnosed with malignant melanoma in 2016. He had previous liver resection for metastatic disease in 2017. Surveillance MRI picked up what was assumed to be a further metastatic deposit in the right lobe of the liver. Patient underwent resection, and subsequent histological analysis has shown this to be a worm cast from a parasitic infection.

Methods
Review of the current literature reveals just one previous case of nematode infection masquerading as liver metastasis making this a very unusual and rare finding at operation. We have undertaken review of patients imaging and histopathological specimens as well as seeking expert opinion from the infectious diseases centre in London

Results
Images were reviewed in HPB MDT and the suggestion was that this was a new malignant lesion in right lobe of liver. At time of operation the lesion had slightly odd appearance on USS. Specimen was sent for histological analysis and this showed no features to suggest malignant melanoma. On further examination there appeared to be a collection of hyalinised structures suspicious for parasitic infection. The specimen was sent to Guys for further evaluation. This confirmed that this was likely a helminth nematode resulting in a necrotic liver nodule

Conclusions
This presentation is highly unusual and review of the literature demonstrates only 1 previous case to date. The differential for liver lesions is broad and nematode infection should be included. However on a background of previous liver metastases it would not be high on the differential list. It is important that we consider this in future and ensure to clarify risk factors for nematode infection, none of which this patient had. Highlights that despite advancement in imaging it is still only after surgical resection we can be sure of the aetiology.
P-L08
Novel surgical technique for the management of biliary-enteric anastomotic strictures

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Background
This study presents an invented surgical technique for dealing with biliary-enteric anastomotic strictures with the potential to replace currently used methods in certain cases.

Methods
In this retrospective study, a novel surgical technique was introduced in the management of eight patients with bilioenteric strictures between January 2016 and May 2018.

Results
Our new technique was associated with a 100% success rate where patency of anastomosis was achieved in all patients along the 28 month follow-up period. Only two of the patients developed a complication including wound-site infection, and cholangitis at the 17th month follow-up. None of the patients developed intrahepatic biliary dilation or stricture recurrence.

Conclusions
This novel surgical approach may reduce recurrent medical and radiological interventions and the need for anastomosis revision. It may also lessen the rate of complications. However, larger scale studies are needed to confirm such findings.
Pyogenic Liver Abscess: a Retrospective Study of Patients Presenting to a UK Tertiary Liver Centre

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Background
Pyogenic liver abscess (PLA) carries a significant mortality of between 2-12%. The incidence is higher in East Asia than in Western countries, and recent data looking at PLA in western populations is limited. Increasingly, we find that PLA is primary in the liver rather than from a secondary source, even in the western world. The aim of this retrospective study is to analyse data on presentation and outcomes of PLA at a UK tertiary liver centre.

Methods
Data was collected on patients diagnosed with a PLA and treated at the University Hospital of Wales, Cardiff between December 2010 and December 2020. Patients were identified by searching the Cardiff Liver Unit surgical database and Radiology database using the search term “liver abscess”. Patients with an abscess secondary to gallbladder perforation into the liver were excluded. Data was gathered using the available electronic health records, including comorbidities, mode of presentation, cause of PLA, microbiology, treatment received (surgical, radiological drainage, or antibiotic therapy), and outcomes.

Results
There were 86 patients with a median age of 69 (16-91), Male:Female ratio was 2:1. Main symptoms were abdominal pain and fever; 61.6% (n=53). Treatment was surgical in 49% (n=42), US guided drainage in 21% (n=18) and antibiotics only in 30% (n=26). Mortality was 9.3% (n=8), with a median age of 76, significantly higher than survivors (p=0.012). In this group, Male:Female ratio was 7:1; proportion with >2 co-morbidities was 62%, compared with 39% of survivors; and there was a greater delay in diagnosis (average 4 days versus 2 days in survivors), although these factors were not statistically significant.

Conclusions
PLA is a serious infection that can lead to mortality. Forty percent of patients can present with non-specific symptoms and early imaging in this group is essential for diagnosis. In our cohort, significant number of patients were treated with surgery compared to the literature, with good outcomes. Although the numbers are small to be statistically significant, delayed diagnosis, multiple comorbidities, and male gender confer an increased risk of mortality, as does advanced age. We conclude that early diagnosis and referral to a Liver centre for opinion or management is essential for optimal outcomes.
**P-L10**

**Individualized Enhanced recovery after surgery improves postoperative outcomes in hepatocellular carcinoma patients**

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**Background**

Hepatocellular carcinoma (HCC) patients often undergo curative liver resection to treat this form of cancer. Hepatectomy is, however, a form of major surgery associated with many significant risks including prolonged hospitalization, high costs, impaired physiological function, and high postoperative complication rates. Enhanced recovery after surgery (ERAS) is a multidisciplinary approach that seeks to expedite postoperative recovery in patients undergoing major surgeries in order to lower postoperative complication rates. This study was thus designed to assess the efficacy and safety of individualized ERAS approaches in patients undergoing hepatectomy.

**Methods**

In total, we retrospectively analyzed data from 90 HCC patients that underwent hepatectomy between October 2018 and August 2019. All patients met the study enrollment criteria and provided written informed consent to participate. All studies were approved by the Hospital Research Ethics Committee and were consistent with the Declaration of Helsinki. Patients were randomly divided into two groups (n=45 each) based on the employed perioperative treatment strategies: a conventional treatment group and an ERAS treatment group. Key outcomes were then compared between groups, including postoperative pain scores, duration of postoperative hospitalization, medical costs, and rates of readmission.

**Results**

ERAS treatment was associated with lower postoperative pain scores at 24, 48, and 72 h post-treatment (P<0.05), with a shorter postoperative hospitalization duration (8.16 days vs. 10.49 days; P<0.004), and with lower medical costs (P<0.004) as compared to traditional treatment. No significant differences in complication rates (P>0.05) or readmission rates (P>0.557) were observed between these groups.

**Conclusions**

Individualized ERAS improves patient postoperative recovery more effectively than traditional treatment in patients undergoing hepatectomy.
Comparison of clinical efficacy between LAPS and ALPPS in the Treatment of Hepatitis B Virus-related Hepatocellular Carcinoma

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²Department of Diagnostic Radiology, the First Affiliated Hospital, Sun Yat-sen University, Guangzhou, China

Background
The aim of the study is to compare the safety and efficacy of modified ALPPS (laparoscopic microwave ablation and portal vein ligation for staged hepatectomy, LAPS) and classical associating liver partition and portal vein ligation for staged hepatectomy (ALPPS) in the treatment of hepatitis B virus (HBV)-related hepatocellular carcinoma (HCC).

Methods
Clinical data of patients with HBV-related HCC who underwent LAPS or ALPPS surgery in our institute from April 2013 to October 2020 were retrospectively analyzed.

Results
31 patients with HBV-related HCC were retrospectively collected in this study (LAPS = 8, ALPPS = 23). 7 patients with LAPS and 19 patients with ALPPS proceeded to resection (resection rate: 87.5% vs. 82.6%, P > 0.05). The hypertrophy rate of future liver remnant (FLR) caused by ALPPS was higher than that of LAPS (24.3 vs. 11.7 mL/d, P = 0.024). Compared with the ALPPS, LAPS was associated with less blood loss (300ml vs. 40ml, P < 0.001) during stage 1, lower comprehensive complication index (CCI) after stage 1 (8.7 vs. 0, P = 0.023) and lower total CCI (20.9 vs 0, P = 0.018) for two stages. Two years’ recurrence-free survival rate and over survival rate for ALPPS and LAPS were 17.3%, 34.3% (P = 0.105), and 28.9%, 100.0% (P = 0.011) respectively.

Conclusions
Compared with ALPPS, LAPS can reduce the occurrence of complications in patients with HBV-related HCC and improve patients’ prognoses.
P-L12
Exploring Pathological Signatures for Predicting Recurrence of Early-stage Hepatocellular Carcinoma Based on Deep Learning

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Background
Early-stage hepatocellular carcinoma (HCC) is the ideal indication for liver resection. High recurrence rate limits the radical possibility. Current clinicopathological determinants are insufficient to reliably evaluate the recurrence risk after surgery. To address this global issue, we aimed to use deep learning to explore novel pathological signatures based on histological slides for predicting early-stage HCC recurrence and to evaluate the relationship between histological features and multi-omics information.

Methods
576 pathological images collected from 547 patients with BCLC stage 0-A HCC who underwent hepatectomy from 2006 to 2015 were randomly divided into the training cohort and validation cohort. The external validation cohort was composed of 147 TNM I patients from TCGA database. Weakly supervised convolutional neural networks were used to identify six classes of HCC tissues. Pathological signatures were extracted and two novel risk scores were constructed by LASSO Cox to predict recurrence. The forecast performance of the scores and patients' prognosis were evaluated. The relationship between histological score (HS) and immune infiltrating cells was estimated by clustering analysis.

Results
The classification accuracy of HCC tissue was 94.17%. The C-indexes of histological score in the training, validation and TCGA cohorts were 0.804, 0.739 and 0.708, respectively. Multivariate analysis showed that microvascular invasion (HR= 1.46, 95% CI: 1.09-1.95) and HS (HR= 4.05, 95% CI: 3.40-4.84) were independent risk factors for recurrence-free survival. Patients in HS high-risk group had elevated alpha fetoprotein, worse tumor differentiation and higher proportion of microvascular invasion. HS was positively correlated with the expression of CD14 in adjacent normal liver tissue (P= 0.013), and negatively correlated with the expression of CD8 in tumor (P < 0.001).

Conclusions
This study established and validated two novel risk scores based on the histological slides using deep learning. HS performed well in recurrence prediction for early-stage HCC patients and indication of important clinicopathological features.
Proposed sampling methodology for improved accuracy of hepatic burden assessment in neuroendocrine tumours

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Background
Hepatic burden is a significant confounder in the assessment of impact of primary tumour resection in metastatic small bowel neuroendocrine tumours (SI-NET). For SI-NET metastatic hepatic burden >10% disease replacement or >5 hepatic metastases are known prognostic markers, though nomograms and scores do not adequately account for this. Most trials do not adequately account for hepatic burden when assessing the survival difference between SI-NET primary tumour resection and no resection. We propose a sampling methodology to more accurately assess metastatic liver burden in SI-NET and correlate with delayed resection vs. upfront primary tumour resection at a specialist NET surgical unit.

Methods
Patients referred for metastatic SI-NET between January 2003 and February 2020 were identified from a prospective dataset. The earliest CT scan after diagnosis was used. The axial, coronal and sagittal slice position limits of the whole liver were recorded. These limits allowed equitable slice position of the liver, with 8 equally distributed axial, 4 equally distributed coronal and 4 equally distributed sagittal slices. Each slice was used to define the liver and metastatic area as assessed using liver CT windows. Liver burden was estimated as percentage total metastatic area summed from all 8 axial, 4 coronal and 4 sagittal slices.

Results
157 total patients were on the collated data base and 46 patients were identified with an appropriate CT. Liver burden was positively skewed. Liver burden was significantly higher for delayed resection vs. upfront resection in all planes of assessment (axial: 11.61% vs. 0.14%, p=0.003; coronal: 13.46% vs. 0.33%, p=0.006; sagittal: 10.46% vs. 0.16%, p=0.008). All planar assessments correlated well with one another (all Kendall’s tau ≥0.851, all p<0.001). Liver metastatic burden correlated with total liver volume (Kendall’s tau 0.549-0.573, all p<0.001).

Conclusions
Hepatic burden differs between resection groups in a small sample at our centre, highlighting the unmeasured confounders favouring primary tumour resection via positive bias. Therefore, hepatic burden needs quantifying in prospective studies that assess primary tumour resection in SI-NET. This is to ensure comparable groups after randomisation. Our method provides an assessment of this metastatic SI-NET liver burden.
Ex-vivo normothermic perfusion of an abattoir-derived porcine hepatic segment as a model for scientific research

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Background
The human immune response to bacterial and viral pathogens has been the focus of intense research, but details on the earliest phases of infection remain unclear. Better knowledge regarding the response of immune cells in the liver is important for the treatment of severe bacterial disease. Ex vivo perfusion which mimics physiological conditions of the liver may provide useful models for this research. An ex vivo model which perfuses hepatic segments would allow translational research on a physiological and reliable model in the scarce resource of human organs. Here we describe the extra-corporeal perfusion of a porcine hepatic segment.

Methods
Whole porcine livers were retrieved from animals slaughtered according to UK laws for food production and connected to a normothermic extracorporeal perfusion circuit. Constant perfusion via the hepatic artery and portal vein with heparinized autologous blood was established. Sodium bicarbonate, epoprostanol sodium and calcium chloride were also added to the perfusate to regulate acid-base status and reduce vasospasm. Functionality was assessed by monitoring blood-gases, perfusion pressures and flow rate. A segmental ex-vivo liver resection was performed to leave hepatic segment IV in circuit and isolated segment IV perfusion was maintained for one hour.

Results
Portal venous pressure was maintained between 8-16mmHg and hepatic arterial pressure between 80-90mmHg. Metabolic acidosis resolved with addition of sodium bicarbonate to the circuit with a pH of 7.42 after segmental perfusion for 1 hour. The lactate increased over the course of the perfusion to 20mmol/L after 1 hour of perfusion, however glucose levels were found to improve with the addition of sodium bicarbonate to the circuit.

Conclusions
Isolated segmental perfusion via ex-vivo resection of porcine hepatic segments is technically challenging. Ischaemic-reperfusion injury coupled with progressive metabolic acidosis may limit model viability. However, addition of sodium bicarbonate to the perfusate aids reduction of glucose levels and improves acidosis. Successful perfusion of a porcine hepatic segment provides the potential for segmental perfusion of human hepatic segments such as those resected during hemi-hepatectomies (HRA approved; REC 21/PR/0287). This is an important milestone leading to the creation of a model to study the early changes in human liver tissue for example during infection.
P-L15
Fluorescence guided laparoscopic resection of Colorectal Liver Metastases: Same day administration of indocyanine green with use of SPY- Colour Segmented Fluorescence imaging to identify tumours intraoperatively

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Background
Near-infrared fluorescent (NIRF) imaging using indocyanine green (ICG) has various applications in minimally invasive surgery. There are a number of techniques in timing and dose administration. Visually different fluorescent enhancement patterns correlate with different pathologies to aid identification of lesions intra-operatively. The aim of this study is to present our experience with utilisation of Colour Segmented Fluorescence ICG mode in laparoscopic liver surgery for colorectal liver metastases.

Methods
We present a single surgeon (SA) experience with the use of laparoscopic fluorescence guided imaging surgery (L-FGIS). Between November 2020 and July 2021, L-FGIS was used in seven patients with suspected CRLM. ICG was administered intravenously at a dose of 0.2 to 0.3 mg/kg IV 2-3 hours prior to liver surgery. Through use of the SPY Colour Segmented Fluorescence (CSF) imaging mode, the image is scaled as to NIRF fluorescence intensity to allow for the clear identification of the CRLM intra-operatively.

Results
A total of seven patients (Four males) with median age of 74.3 years (range: 30.5 - 86) underwent L-FGIS during the study period. Two out of seven patients underwent re-do liver surgery. The median size of the tumour was 27mm (range: 10-65mm) and median number of tumours were one (range: 1-2). To visualise the tumour and to avoid interference of green background liver, ICG camera was switched to CSF mode. All lesions had signet ring appearance under CSF mode (see figure 1). Except in one patient (necrotic lesion), the histology of resected specimen contained a well to moderately differentiated colorectal adenocarcinoma metastasis. R0 resection was achieved in all patients and median clearance of the tumour was 3mm (range 0.4-10mm).

Figure 1 A: Laparoscopic image of a metastatic lesion in segment 6. 1B: Signet ring appearance of the same tumour under ICG fluorescence CSF mode.

Conclusions
In our limited experience ICG administered at least 2-3 hours prior to surgery can identify superficially located colorectal metastases, provided ICG camera is switched to CSF mode. Superficially located lesions are easily identifiable under CSF mode. CSF mode helped us to identify the lesions and to mark the resection margin. The use of ICG is an important advancement in CRLM surgery and further research is needed to optimise image interpretation and correlate with clinical resection outcomes.
The Impact of Covid-19 on the Management of Primary and Metastatic Liver Cancers; A Single Centre Experience

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Background
The Covid-19 pandemic has impacted on all aspects of health care. Surgical specialties have been affected by the impact on theatre time and space, staff re-deployments, reduced ICU capacity for non-Covid patients, and in some cases this has had a significant impact on wait time for surgery and overall surgical capacity. In our tertiary referral HPB unit, the service has been relocated to two different sites throughout the pandemic. We aimed to assess the impact of this on patients undergoing liver resection

Methods
We examined patient data for all patients undergoing liver resection in the 15 month period prior to the introduction of national lockdown, and compared this with all patients who have undergone liver resection since. We looked at total number of cases, ICU admission rates (planned vs unplanned), length of stay, case mix, histology, rates of laparoscopic vs open surgery, and length of time from completing neoadjuvant chemotherapy to surgery. Data were obtained from electronic care records and patient notes.

Results
The overall number of cases was similar (84 pre-covid vs 86 since) and basic patient demographics were unaffected. Median length of stay was the same for both groups (7 days). Colorectal metastases were the underlying pathology in the majority of cases (56/84 pre Covid, 56/86 post). Numbers of laparoscopic and laparoscopic converted to open cases were reduced in the post-Covid era, 12 prior versus four since. The median time from completion of neoadjuvant chemotherapy to surgery was also affected, increasing from 46 to 62 days.

Conclusions
These data show some differences in patient care in the pre and post-Covid eras, in particular a lower rate of laparoscopic surgery and longer period of time between neo-adjuvant treatment and surgery. Longer follow up is required to see if these trends persist and their effect on long term survival and recurrence rates. However, despite the strains on the system there were similar numbers of patients pre and post Covid, indicating that patients are still presenting and being treated. This showed that staff responded well to the pressures of Covid, and trainee experience would have been similar.
Post-liver transplant inferior vena cava stenosis in a large volume UK centre

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Background
Inferior vena cava stenosis (IVCS) is a rare complication of liver transplantation with a reported incidence rate of 3%. Limited clinical consensus exists on the management of IVCS. We report the management and outcomes of patients with IVCS at our transplant centre.

Methods
Relevant data were collected from adult patients who underwent liver transplantation at our centre between October 2014 and August 2020. These included demographics, investigation and management details with regards to IVCS. Values presented as % of total and median with interquartile range (IQR).

Results
A total of 636 liver transplants were performed during the study period, of which 48 (7.6%) patients were investigated for possible IVCS. Of those, 14 (2.2% of total) were found to have IVCS, 85.7% (n=12) were female. Only 2/14 were re-transplants and pre-transplant portal vein thrombus was present in 3 cases (21.4%). 10 livers (71.4%) were DBD donors. Normothermic machine perfusion was used in 4/14 patients. All 14 recipients found to have IVCS had an implantation using a modified piggyback cavocavostomy technique. The IVCS was identified at a median of 25.5 days (19.7-30.8 days) following transplantation within the suprahepatic IVC in 92.9% (n=13). Hemi-azygos collateralisation was seen in 4 cases (28.6%). 8 of the 14 recipients underwent intervention for IVCS, 6 patients were managed with balloon venoplasty, 1 patient required an IVC stent and 1 was managed surgically. Six of the recipients with IVCS died, 4 of whom had an intervention for their stenosis and 3 of these were within 90 days of their transplant. Pressures measured at the anastomotic stricture were higher in those who succumbed (median of 21 Vs 12.5 mmHg; p=.017).

Conclusions
At our centre, cava-replacement technique was not associated with IVCS. Patients with more significant strictures (as evidenced by higher pressures at the anastomotic stenosis) may have an increased mortality risk.
A patient education video to support the management of post-gastrectomy / oesophagectomy syndromes

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Background
Oesophagectomy and gastrectomy result in profound and life-long changes in eating behaviour and appetite, and significant post-prandial symptoms. Despite decades of research, and recent advantages in the understanding of gut physiology, medical approaches to post-resectional patient care remain limited. The mainstay of treatment is patient education. Using clinical and lab-based studies, we investigated the effects of altered gut hormone secretion in patients after surgery for oesophageal and gastric cancer. We then produced a partially animated patient information video to better equip our patients to manage their altered alimentation.

Methods
The scientific background to the video was previously presented at AUGIS, and published. Studies included examination of eating behaviour, post-prandial symptoms, glucose homeostasis, gut hormone profiles and intestinal transcriptomic / peptidomic changes in a cohort of patients after oesophagectomy and gastrectomy. The movie storyboard and script were written by a team of surgeons, dietitians, patient representatives, clinical scientists and communications specialists. The goal was to communicate the physiological basis of altered eating in post-operative patients and appropriate nutritional strategies.

Results
The video is now freely available on Vimeo at: https://vimeo.com/356892336
It is in routine use for pre- and post-operative patient education.

Conclusions
Multimedia patient education is a useful tool to help manage the late effects of upper GI cancer treatment.
P-O02
Management Experiences of Post-gastrectomy Severe Alkaline Reflux Oesophagitis

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Background
Alkaline reflux oesophagitis is a recognized complication of procedures that compromise the lower oesophageal sphincter (LES), including gastrectomy. Incidence of reflux is dependent on the reconstructive procedure with Roux-en-Y esophagojejunostomy commonly accepted as the optimal method. The authors report their experience of 6 patients who underwent remedial intervention for severe alkaline reflux esophagitis following gastric surgery.

Methods
A retrospective review of 6 patients who had underwent a previous gastric procedure and developed symptoms of gastroesophageal reflux disease, over a 6-year period (2014-2020). Reflux symptoms were diagnosed by clinical history, radiology, endoscopy and esophageal manometry prior to proceeding to surgical reflux control. Post-operative outcomes following anti-reflux surgery were assessed by means of serial outpatient assessments and endoscopy.

Results
Six patients were included in this report, 4 males and 2 females with an average age of 73 years (range 58-91). Primary diagnoses encompassed; 4 gastric adenocarcinomas, 1 gastric neuroendocrine tumour and 1 patient with debilitating gastric antral vascular ectasia (GAVE) syndrome. Four patients underwent total gastrectomy and 2 subtotal gastrectomy with Roux-en-Y reconstruction. Onset of post-operative reflux symptoms ranged from 2-weeks to 3-years. Failing medical management, all patients underwent jejunojejunal anastomosis and Roux limb length revision with surgical jejunostomy. At follow up 5 patients had some degree of symptom resolution; 3 complete resolution, 2 initial resolution and 1 with unresolved symptoms.

Conclusions
Severe alkaline reflux oesophagitis is a recognized complication of gastric procedures compromising the LES. The authors report our experience of managing this complication following gastrectomy with jejunojejunal anastomosis and Roux limb length revision, with a majority of patients having improvement in if not complete resolution of reflux symptoms.
The Management of Gallbladder Polyps at a Single Trust: Are we compliant with European Guidelines?

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Background
Gallbladder polyps affect approximately 5% of the global population, with rates highest in those of Indian descent. 10% of polyps will have malignant potential based on their size or rapid growth rate, which are associated with a poor 5-year survival once advanced of less than 25%. As gallbladder polyps are common but gallbladder cancer is rare, it is a diagnostic challenge to determine which polyps are likely to be malignant. Adherence to guidelines regarding radiological follow up and definitive treatment, in the form of a cholecystectomy, is therefore vital.

Methods
Retrospective data collection and analysis was completed for all patients who had a biliary ultrasound between December 2013 and December 2016 to enable 5-year follow up, and a snapshot of 47 patients selected at random. Patients having a gallbladder “polyp” documented on their scan report were eligible for inclusion and adherence to European Society of Gastrointestinal and Abdominal Radiology (ESGAR) guidelines was assessed.

Results
Within the cohort there was a mean age of 56 years, with a male:female ratio of 17:30. All patients included were Caucasian, with 41 reporting “biliary symptoms” as the indication for the primary ultrasound. 26 patients were not followed up in adherence to guidelines, with 50% due to the sonographer reporting follow-up was not indicated on initial scan, 5 having unchanged polyp size and 2 discharged by the responsible consultant. Of the 21 who were followed up according to guidelines, 20 had a cholecystectomy within 5 years, with none of these patients having cancer detected on histology.

Conclusions
Over 50% of patients within our cohort were not followed up according to the ESGAR guidelines. Although no patients in the study were found to have malignant polyps, the sample size is relatively small and limited to low-risk groups. We aim to expand this audit both locally and regionally, raise awareness of the importance of surveillance across the multi-disciplinary team, and produce local guidance for the outpatient setting.
The effect of a pre- and post-operative exercise programme versus standard care on physical fitness of patients with oesophageal and gastric cancer undergoing neoadjuvant treatment prior to surgery (The PERIOP-OG Trial): A Randomised controlled trial

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Background
Neoadjuvant cancer treatment (NCT) reduces physical fitness prior to surgery. Lower levels of fitness pre-operatively are associated with increased risk of post-operative morbidity and prolonged recovery. Exercise prehabilitation can optimise fitness for surgery. There is a paucity of evidence regarding the role of community-based exercise programmes during oncological treatment of oesophagogastric malignancies. The aim of the PERIOP-OG trial was to investigate the effect of a community-based exercise prehabilitation programme on physical fitness and other clinical outcomes in patients undergoing NCT and surgical resection for oesophagogastric malignancies.

Methods
Between March 2019 and December 2020, patients with oesophagogastric cancers requiring NCT and surgery were recruited to a multi-centre randomised controlled trial that compared an exercise prehabilitation group to a usual care control group. The exercise programme commenced following cancer diagnosis. All participants undertook assessments at baseline, end of NCT and pre-surgery. The primary endpoint was improvement in cardiorespiratory fitness, measured by the 6-min walk test (6MWT), from baseline to pre-surgery. Secondary endpoints included upper and lower body strength tests (grip strength and 10-sec sit to stand), EQ-5D-5L Health Questionnaire (EQ-5D-5L), Functional Assessment of Cancer Therapy (FACT-E) Questionnaire and Surgical Fear Questionnaire (SFQ).

Results
Seventy-one patients were randomised (exercise n=36, control n=35). Baseline characteristics between groups were comparable: mean age (p=0.87) and sex (p=0.24). The difference-in-difference (DID) for the exercise prehabilitation showed a significant improvement in 6MWT pre-surgery compared to the usual care group from baseline to pre-surgery: mean (standard deviation) 522 m (17.4) to 582 m (20.1) vs. 498 m (18.2) to 506 m (28.7), p=0.050. There was no significant DID in grip strength p=0.770, 10-sec sit to stand (p=0.100), EQ-5D-5L (p=0.311), FACT-E (p=0.105) or SFQ (p=0.350).

Conclusions
The PERIOP-OG trial demonstrates that a community-based exercise prehabilitation programme initiated at diagnosis, continued during NCT and up to the time of surgery, significantly improves cardiorespiratory fitness. This community exercise prehabilitation model is feasible and sustainable and may provide a standardised framework for the prescription of exercise in oesophagogastric cancer patients.
Deconstructing Operations to Improve Recording of Surgical Training Experience

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Background
A new outcomes-based curriculum is soon to be implemented for UK surgical trainees. Performance will be evaluated against the standard expected of a new consultant. Accurate recording of operative experience and performance will therefore be crucial to demonstrate achievement of this standard. The current eLogbook system for recording surgical experience has many benefits including simplicity and accessibility, but may misrepresent actual experience because most operations are considered as a whole; unlike some colorectal operations, involvement in steps within many upper gastrointestinal (UGI) operations cannot be recorded.

Methods
Impact on training by the COVID-19 pandemic led to discussion and identification of cultural and logistical barriers to accurate recording of experience. To address these, a modification to enhance the current eLogbook system was developed by trainees and trainers at a university teaching hospital. An existing typology was used to deconstruct common UGI operations into their component steps, which can be recorded at this more detailed level.

Results
The modified deconstructed logbook concept is described using a worked example, which can be applied to any operation. We also describe the integration of a component-based training discussion into the surgical team brief and debrief; this complements the deconstructed logbook by promoting a training culture.

Conclusions
Using the described techniques, trainees of all levels can comprehensively and accurately describe their surgical experience. Senior trainees will benefit from recording complex operations which they are not expected to complete in their entirety, whilst less experienced trainees will benefit from the ability to record their involvement in more basic parts of operations. The suggested approach will reduce misrepresentation of experience, encourage proactive planning of training opportunities, and reduce the impact of crises such as pandemics on surgical training.
P-O06
A scoring system to support surgical decision-making for cardial submucosal tumors

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Background
Submucosal tunneling endoscopic resection (STER) and non-tunneling techniques are two alternative options for the treatment of cardial submucosal tumors (SMTs). We aimed to establish a regression model and develop a simple scoring system to help clinicians make surgical decisions for cardial submucosal tumors.

Methods
A total of 246 patients who suffered cardial SMTs and received endoscopic resection were included in this study. All of them were randomized into the training cohort (n=147) or internal validation cohort (n=99). Then, the scoring system was proposed based on multivariate logistic regression analysis in the training cohort and assessed in the validation cohort.

Results
Of 246 patients, 97 were treated with STER, and the others with non-tunneling endoscopic resection. In the training stage, four factors were weighted with points based on the β coefficient from the regression model, including irregular morphology (-2 points), ulcer (2 points), the direction of the gastroscope (-2 points for reversing direction and 1 point for entering direction), and originating from the muscularis propria (-2 points). The patients were categorized into low-score (<4), medium-score (4-3) and high-score (>3) groups, and those with low scores were more likely to be treated with STER. Our score model performed satisfying discriminatory power in internal validation (Areas under the receiver-operator characteristic curve (AUC), 0.829; 95% confidence interval (CI), 0.694-0.964) and goodness-of-fit in the Hosmer-Lemeshow test (P = .4721).

Conclusions
This scoring system could provide clinicians the references for making decisions about the treatment of cardial submucosal tumors.
Endoscopic submucosal dissection for giant esophageal lipomatous tumors

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Background
Thoracotomy is the foremost choice of giant esophageal lipomatous tumors in previous studies, but it is highly traumatic and possibly diminishes the quality of patients’ life. To minimize such impacts, a minimally invasive method without loss of curability is desirable for giant lipomatous tumors of the esophagus. With recent progress in endoscopic techniques and devices, endoscopic submucosal dissection (ESD) has been successfully used to remove esophageal or gastric submucosal tumors (SMTs).

Methods
Objective: To evaluate the clinical impact of ESD for giant esophageal lipomatous tumors.
Design: Single-center, retrospective study.
Setting: Academic medical center.
Patients: Six patients with six giant lipomatous tumors of the esophagus between February 2013 and December 2020.
Interventions: ESD.
Main Outcome Measurements: Procedure duration, en bloc resection rate, complications, local recurrence, and distant metastases.

Results
Endoscopic en bloc resections of esophageal lipomatous tumors were successfully performed in all patients, with a mean duration of 56.5 ± 26.0 min. All en bloc resection lesions showed both lateral and deep tumor-free margins. The average maximum diameter of the esophageal lipomatous tumors was 171.7 ± 66.2 mm. No complications such as bleeding and perforations happened during hospitalization with 4.0 ± 1.6 days. Besides, local recurrence and distant metastasis have not occurred during the follow-up period.

Conclusions
ESD was a safe and effective way to dissect giant lipomatous tumors of the esophagus thoroughly.
**P-O08**

**Effect of socioeconomic deprivation on clinical characteristics and outcomes of patients undergoing an emergency appendectomy**

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**Background**
Appendicectomy is one of the commonest emergency general surgical operations performed. Previous studies have shown that socioeconomic status (SES) impact outcomes in a number of diseases. Currently, there is no study analysing the impact of SES on the outcome of appendectomy. Our aim was to compare the clinical characteristics and outcomes of adults having an emergency appendectomy between deprived and less deprived SES groups.

**Methods**
A multicentre retrospective observational study of all adult patients who had an emergency appendectomy across four hospitals (two district general and two tertiary care hospitals) between August 2018 and November 2020 was performed. Patients were identified through pathology records. Data was extracted from electronic records for demographics, pre-operative (peak) blood results, pre and post-operative imaging, operative details and the clinical outcomes. Patient’s residential address was used to calculate Scottish Index of Multiple Deprivation (SIMD). The patients were grouped by SIMD into a more deprived SES group (SIMD 1-5) and a less deprived SES group (SIMD 6-10) and results compared.

**Results**
A total of 1,105 patients (57.5% male) were included. Median age was lower in the more deprived group (35 vs 40 years, p<0.001). The less deprived group were more likely to be fitter: ASA-1 grade 51.6% vs 43.5%, p=0.008. There were fewer appendectomies in most deprived decile compared to the least deprived decile (5.2 vs 11.3 per 10,000 population per year, p<0.001). There was no difference in inflammatory markers, pre-operative imaging, surgical approach, severity of appendicitis and the median length of stay (3 days). However, there were more surgical site infection in the more deprived group (3.4% vs 0.9%, p=0.006).

**Conclusions**
This study demonstrates that SES does impact on the age of presentation and incidence of appendectomy. Surgical site infection were seen more frequently in the more deprived patients undergoing emergency appendectomy. This may be a reflection of the underlying comorbidities.
P-009
Development of a non face-to-face pre-operative assessment pathway for laparoscopic cholecystectomy

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Background
The Covid-19 pandemic has led to markedly reduced capacity in almost all areas of normal face-to-face activity in our hospitals. Prior to the pandemic, the standard pre-operative pathway for all patients included an initial appointment in the outpatient clinic and formal examination before recommending surgery. With the reality of limited clinic capacity, our unit developed a non face-to-face assessment pathway alongside a parallel green operating area in our local Independent Sector (IS) hospitals for laparoscopic cholecystectomy. This study describes and methodology and outcomes of this approach

Methods
A non face-to-face (telephone) proforma for all new referrals for consideration of laparoscopic cholecystectomy was prepared in April 2020 with the first operations carried out in June 2020. All consultations were carried out by consultant surgeons and included thorough history, careful documentation of previous surgery and duration of symptoms and, where appropriate, patients were told to send images of their abdominal wall if they were unable to describe their scars. The first stage of the consent process was completed at initial appointment and all patients were sent written information about surgery. Patients who had BMI<40, uncomplicated biliary disease (biliary colic, mild cholecystitis, ERCP for CBD stones) and ASA of 1/2 were deemed suitable for surgery in the IS and sent across accordingly.
A telephone pre-assessment was completed by the hospital and patients were sent blood tests forms in the post, as well as a Covid test to be completed at home followed by a period of self isolation before surgery.
All patients were examined on the day of surgery by the operating surgeon and formal consent taken on the day.
Primary outcomes that were recorded were cancellation on the day, transfer to the NHS hospital after surgery and complications.

Results
From June 2020 to December 2020, when the contract with the IS changed, 218 patients attended the IS hospitals for planned elective laparoscopic cholecystectomy. Four patients (2%) did not have surgery (one cancelled as inappropriate for the Independent Sector, two patients whose Covid swab result was not complete and one patient who no longer wished to have surgery). Three patients required transfer to the NHS hospital for post-operative care (drains inserted after unanticipated difficult surgery).
All patients were given details of the surgical SDEC unit at the NHS hospital to allow ease of admission in the event of any problems or complications. 28 patients (13%) attended SDEC within 30 days after surgery; most had blood tests and clinical assessment alone. One patient (<1%) required re-laparoscopy for abdominal pain three days after their initial surgery (washout alone) and 5 patients developed umbilical wound infections after surgery (antibiotics alone).
Two patients were found to have CBD stones on MRCP.
The waiting time from initial assessment to surgery for patients on this pathway was less than 18 weeks for 168 patients though patients who were not suitable for the Independent Sector have had waiting times that are considerably longer.

Conclusions
These results demonstrate that it is possible to plan surgery for laparoscopic cholecystectomy without a face-to-face appointment at all which has considerable implications for resource allocation in the future; indeed, this approach has been continued within our unit even as clinic capacity has increased and been rolled out to patients with inguinal or para-umbilical hernia. Use of a green site away from the acute NHS hospital allowed elective surgery for non-urgent pathology to continue with acceptable waiting times even during the worst of the Covid-19 pandemic though patients who were not suitable have had markedly worse experiences and waiting times.
Background
Mortality and morbidity (M&M) meetings in surgery are an important quality assurance process. These meetings contribute to learning, education and improvements in patient care. In order to achieve these outcomes effectively, M&M meeting require robust structure and process including accurate documentation of complications. Our hepatopancreatico-biliary (HPB) unit conducts and records weekly M&M meetings based on consultant reported complications. However as there was no standardized documentation method of complications there was possible under-reporting. This realisation acted as a basis to investigate the robustness of our current reporting methodology of surgical complications and recommend changes in practice to achieve quality improvement.

Methods
Patients were selected retrospectively (May 20 - Sep 20) from M&M recording excel sheet which is maintained through our weekly meetings. Patient undergoing major HPB cancer resections were included. Day case procedures were excluded.
Complications reported on excel sheet were compared against any additional mis-reported complications through review of online discharge letters, discharge summaries & investigations.
The primary aim of this quality improvement project was to identify mis-reported complications. The secondary aims were to compare any change in Comprehensive complication Index (CCI) following addition of mis-reported complications.

Results
Total number of patients included in the study were n=46. Postoperative surgical complications were recorded for n=27 patients. 19 patients were identified to have unreported complications. Total number of unreported complications were 34. This amounted to average unreported complication per case at 1.78. Average CCI score was 14.4 before inclusion of unreported complications. There was a significant rise in average CCI score to 35.8; an increase of 21.6 CCI score after inclusion of unreported complications.

Conclusions
Unreported complications following major HPB cancer resection impact the quality of learning and education process in M&M meetings. It is essential to make complications reporting a robust process to prevent mis-reporting. We recommended use of Clavein-Dindo complications grading form as part of surgical clerking. This would help real time recording of surgical complications during postoperative journey of patients, help capture even minor complications. It would also be recommended to get these forms countersigned by responsible consultants before discharge of patients.
Surgical Ambulatory Care: Reducing surgical admissions whilst maintaining patient satisfaction. Experiences over a four year period

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Background
The tri-association document; The future of Emergency General Surgery (2015) has a number of key recommendations for the provision of emergency general surgical care. Key recommendations include for senior surgeons to triage referrals and to utilise a “hot clinic” model.

Prior to 2016 in the authors’ hospital, all General Practitioner/community referrals were formally admitted to General Surgery. A consultant led ambulatory clinic with dedicated Advanced Nurse Practitioner support was instituted in October 2016. It offers preliminary assessment, phlebotomy and priority access to routine imaging modalities. The clinic is located in a tertiary hospital serving a population of 500,000.

Methods
A retrospective audit of prospectively collected referral and outcome lists for the Surgical Ambulatory clinic was conducted for the time periods of October 2016 to June 2021. The two primary outcomes were defined as admission to the General Surgical ward and discharge to the community/non-general surgical specialty.

Secondary outcomes for patient satisfaction were measured by randomly distributing over a six week period a patient satisfaction survey. The survey was designed in accordance with trust guidance, was anonymous and would cover multiple lead Consultant encounters as a cohort.

Results
In total, 9069 patients presented to the surgical ambulatory clinic over a period of 44 months. 2347 (26%) were admitted to the General Surgical ward whilst 6717 (74%) were discharged directly from the clinic.

71% of survey responders rated their experiences of the ambulatory clinic as “Excellent”, 19% “Very Good”, 0.5% “Good” and 0.5% “Poor.”

Conclusions
The introduction of an ambulatory care model has demonstrated a marked reduction in surgical admissions whilst remaining favourable to the patient populace. This has a direct impact on overall bed occupancy rates.

In the age of COVID-19, efforts must be made to reduce the number of potential inpatient interactions to protect those most at risk. A reduced admission and bed occupancy rate will contribute to the reduction of this risk.
Atraumatic Splenic Rupture Secondary to Concurrent Cytomegalovirus and Epstein Barr Virus Infection

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Background
Infectious Mononucleosis (IM) is a common viral illness among adolescents and young adults. While most cases are self-limiting, a small number of patient can develop life threatening complications, such as atraumatic splenic rupture (ASR). This is a rare but serious sequelae, and the commonest cause of associated mortality. While Epstein Barr Virus is commonly associated with IM, concurrent infection of cytomegalovirus (CMV) and EBV is rarely reported. Both infections are associated with splenomegaly, however this is usually mild and very rarely results in ASR.

Methods
We present the case of an immunocompetent nineteen year old male who underwent emergency splenectomy for ASR secondary to concurrent EBV and CMV infection. He presented to the Emergency Department with a five hour history of severe, sudden onset left upper quadrant pain preceded by coughing fit. He reported a one year history of incidental splenomegaly and recent positive monospot test in community. Computerised tomography (CT) of abdomen and pelvis confirmed splenic rupture with large haemo-peritoneum and large sub-capsular haematoma. He was haemodynamically unstable and underwent laparotomy and splenectomy.

Results
Intraoperative findings included two litres of intraperitoneal blood and large spleen with sub-capsular haematoma; approximately seventeen centimetre diameter and weighed nine hundred and seventy grams. Pathology showed features of non-specific lymphoid hyperplasia. Serum virology confirmed high levels of CMV on polymerase chain reaction with low levels of EBV detected. Virology screening was incidentally repeated post discharge and at this time was consistent acute EBV infection. No alternative cause for splenic rupture or pre-existing splenomegaly has been identified.

Conclusions
The serology results in this case confirm acute CMV infection with most likely concurrent EBV infection. While we cannot confidently identify which virus caused splenic rupture in this case, ASR is a life threatening condition and an important differential in patients presenting with sudden onset LUQ pain and shock. Splenectomy remains the treatment of choice in haemodynamically unstable patients.
Spontaneous Splenic Rupture as first presentation of Chronic Myeloid Leukaemia

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Background
Although rare, spontaneous splenic rupture (SSR) is a potentially life threatening condition and most commonly associated with infection and malignancy. Haematological malignancies are an important differential diagnosis and among these chronic myeloid leukaemia (CML) has one of the highest associations with SSR.

Methods
This case report follows a previously fit and healthy thirty-three year old gentleman who presented to accident and emergency with one day history of sudden onset, severe, left upper quadrant pain. CT of the abdomen and pelvis including an arterial phase, confirmed splenic rupture with moderate volume haemo-peritoneum, but no active bleeding. White cell count (WCC) was 225.8 x10^9/l and blood film confirmed suspicion of haematological malignancy. The patient was haemodynamically stable and therefore transferred to the surgical high dependency unit for observation and conservative management. He was commenced on hydroxycarbamide on the advice of haematology.

Results
Genetic screening detected BCR-ABL1 and Philadelphia chromosome; this along with bone marrow aspirate confirmed diagnosis of CML. His WCC decreased with hydroxycarbamide therapy. He made good clinical progress and was discharged home with haematology follow up. Hydroxycarbamide has since been stopped and he has been initiated on Imatinib therapy. His WCC has returned to normal and he has remained well with no further complications.

Conclusions
SSR is an extremely rare first presentation of CML. Given its associated morbidity and mortality, it should remain an important differential diagnosis in patients presenting acutely to the General Surgeon with abdominal pain and shock, especially in those with a known underlying haematological malignancy.
The predictive role of pre-operative liver function tests in outcomes following emergency appendicectomy

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Background
Acute appendicitis remains one of the most common diagnoses in emergency general surgery, with recent evidence from the COMMA trial confirming that appendicectomy is the cornerstone of definitive management in most patients. With a wide range of severity and of patient physiology, complications are a burden to patients and the health service. We hypothesised that liver function tests have predictive value for complications following emergency appendicectomy.

Methods
A multicentre retrospective observational study was carried out across 4 hospitals (2 teaching centres and 2 district general hospitals) for adult patients who underwent emergency appendectomy between August 2018 and November 2020. Patients were identified through pathology records and data was extracted from electronic case records for patient demographics, pre-operative routine laboratory results, operative details, and clinical outcomes. Peak perioperative liver function parameters were analysed using unpaired two-way T-tests, Pearson’s correlation coefficient, ANOVA and multivariate regression to determine their relationship with conversion to open surgery, superficial and deep surgical site infection (SSI), length of stay (LOS) and 30-day re-admission rates.

Results
Of 1131 patients included, 57.4% were male, 80.5% were laparoscopic, with 7.3% converted to open, 10.8% performed open, and 1.5% by laparotomy. Mean LOS was 3.81 (SD4.0) days, 6.3% readmission rate, with 2.3% superficial SSI and 5.0% deep SSI.
ALP was higher in patients with superficial SSI (p<0.001). Lower ALT was associated with wound dehiscence (p<0.001). Bilirubin, AST and ALT were lower in patients with chest infections (p<0.001). ALP correlated with increased LOS (p<0.001).
On multivariable regression, ALP was associated with superficial SSI (p<0.001), and LOS (p<0.001). ROC curve analysis demonstrated AUC of 0.655 for ALP and superficial SSI.

Conclusions
Emergency appendicectomy is completed laparoscopically in more than 80% of patients and complication rates are acceptable. Routine liver function tests were associated with important clinical outcomes including superficial SSI, wound dehiscence, chest infection, LOS and readmission rate. Patients who had superficial SSI, wound dehiscence, chest infection and readmission with 30 days had lower transaminase levels compared with those with uncomplicated recovery.
"Knife to Skin" time: The invariable variable

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Background
The Covid-19 pandemic has affected all aspects of healthcare globally. Theatre utilisation assumes a substantial proportion of hospital resources, creating a streamlined pathway increases efficiency and productivity. With concerns regarding aerosol generating procedures, viral transmission to healthcare workers in theatre and patient pathways through the hospitals the covid-19 pandemic has added another dimension to the theatre pathway. The aim of this study was to quantify the impact of Covid-19 on the “knife to skin” (KTS) time and compare it to previous historical data (HD).

Methods
Retrospective analysis of real time theatre data was analysed for the first 12 months of the pandemic from 11th March 2020 to 11th March 2021. To try and minimise variability between different specialities and operations we picked one operation to study: Laparoscopic cholecystectomy (LC). Historical data was also gathered from the same time frame over the last 5 years (2015-2020) for comparison. Data collected included emergency or elective, time sent for patient, anaesthetic start time, knife to skin time and duration of operation. Comparison of means were analysed by One-way ANOVA tests and Student’s T-Test.

Results
399 laparoscopic cholecystectomies were performed during the first year of the pandemic. KTS time was calculated as operation start time minus time sent for patient. Average time during the pandemic for emergency LC KTS was 56 minutes and 35 minutes for elective LC. Comparison of these times to HD revealed no statistical difference (Emergency LC 56 mins vs 58 mins p>0.05, Elective LC 35 mins vs 35 mins p>0.05). The anaesthetic time for emergency LC during the pandemic vs HD was 10 mins vs 14 mins (p<0.05), no statistical difference was found in the elective group, 16mins vs 14mins (p>0.05)

Conclusions
The Covid-19 pandemic has had no detectable effect on Knife to skin time as compared to our previous historical data. It seems the extra Covid 19 precautions involving PPE, pathways etc. have not affected theatre efficiency or utilisation. In fact, there was very little variance in KTS time over the six years studied (2015-2021) with very consistent levels for both elective and emergency procedures. The shorter anaesthetic time for emergency LC during the pandemic needs to be further investigated but one hypothesis is the unconscious or conscious decision to decrease the amount of preoxygenation to minimise aerosolisation.
A framework for reporting modifications in robotic surgery: a systematic review and case study in robotic cholecystectomy

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Background
Surgical innovations, such as robotic surgery, are critical to advancing surgical care. Innovation in the absence of supporting frameworks and effective evaluation risks patient safety and may hinder efficient innovation. The adoption of robotic surgery across the United Kingdom has increased dramatically over the past decade. Its use in upper gastrointestinal surgery remains innovative and continues to evolve. In the early stages of innovation, procedures tend to be modified or refined. Modifications to procedures could be beneficial, ineffective or harmful. There is currently limited understanding of modifications, and no standardized way to report or share modifications. Ineffective reporting of modifications could prevent shared learning in evolving innovative surgical procedures. Furthermore, the National Institute for Health and Care Excellence (NICE) requires ‘major modifications’ to procedures or technologies to potentially undergo re-evaluation to establish safety and efficacy, yet classifications for types of modifications are lacking. This study aimed to examine current reporting of modifications in robotic surgery through a systematic review and qualitative case study in robotic cholecystectomy. The findings were used to develop a conceptual framework for reporting modifications in robotic surgery.

Methods
A systematic review was performed to identify studies on robotic cholecystectomy. Comprehensive search strategies were developed with a specialist librarian. The OVID SP version of MEDLINE and Cochrane Controlled Trials Register were searched using keywords for i) robotics and ii) cholecystectomy. Searches were limited to human studies published in the English language, up to and including April 2021. Abstracts and conference reports were excluded. Titles and abstracts of records were screened for eligibility by two reviewers with a clinical background. References of retrieved articles were manually searched to identify potentially relevant further studies. All published primary research studies reporting on robotic cholecystectomy for any indication, except biliary malignancy, were eligible for inclusion. Full-text articles were retrieved and examined for details of reporting modifications. Any data on modifications were extracted verbatim using a standardized proforma. A broad working definition of ‘modification’ was developed by the study team for the purposes of this study. Characteristics of published studies were summarized with descriptive statistics. A qualitative grounded-theory approach was taken for data analysis. Thematic analysis of the extracted data was undertaken to inductively generate themes and make comparisons across studies. Themes were organized into a conceptual framework for reporting modifications in robotic cholecystectomy.

Results
A total of 2,048 records were identified in total. After de-duplication of results, titles and abstracts of 1,499 records were screened, of which 1,185 were excluded. The remaining 314 records were assessed for eligibility by reviewing full-text articles, of which 219 were excluded. A total of 95 articles reporting robotic cholecystectomy were included in the analysis. The majority of studies were single-centre (n=86, 90.5%); most were from North America (n=43, 45.3%). Comparative studies (n=47, 49.5%) and case series (n=40, 42.1%) accounted for over 90% of all study types. Of the 95 studies, half (n=48, 51%) contained data pertaining to modifications, many of which were case series (n=27, 56.3%). Thematic analysis generated four overarching themes: ‘Descriptions of Modifications’, ‘Rationale for Modifications’, ‘Planned or Unplanned Modifications’ and ‘Outcomes of Modifications.’ These themes informed a conceptual framework for reporting modifications.

Conclusions: The current reporting and sharing of modifications in robotic cholecystectomy are unstandardised and inconsistent. Findings from this study have informed a proposed framework to support a more systematic approach to reporting and sharing modifications in robotic cholecystectomy. Further work is now needed to evaluate the acceptability of such a framework to surgeon innovators and its generalisability to other robotic procedures.
P-O17
The Royal Stoke Green Pathway: a method to undertake safe UGI surgery during the COVID pandemic

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Background
During the first wave of the COVID pandemic surgical services we paralysed globally, with cancellation of an estimated 28-million operations during the first 12 weeks. Worryingly, surgical patient with COVID were reported to have unacceptably high peri-operative mortality, approaching 25%. However, there was an urgent clinical need to progress with category 1 and 2 operations, to prevent disease progression and avoidable morbidity and mortality from non-COVID pathologies. During the second and subsequent waves of the pandemic it was vital to protect patients from peri-operative COVID whilst undertaking urgent surgery safely.

Methods
Our centre developed a ring-fenced 'Green Pathway' for category 1 and 2 patients requiring surgery. Patients were treated in physically separate area of the hospital, with no interaction between COVID and non-COVID patients, healthcare staff or facilities. Patients self-isolated for 14-days prior to admission, and had pre- and peri-operative COVID RT-PCR tests. We assessed outcomes for patients immediately prior to the introduction of the Green Pathway (1/10/2020) and following implementation (31/12/2020) to assess safety. Textbook outcomes for panreatoduodenectomy were compared to assess safety and quality. Other data suggests that UGI surgery couldn’t continue in other hospitals from December 2020.

Results
There were 47 admissions to surgical HDU following category 1 and 2 upper GI operations during the study; 31 pre-pathway (PP) implementation, and 16 green pathway (GP) patients. Median age 66-years (43-78 range) PP vs 65-years (range 42-74) GP, median ASA 3 vs 2. Median HDU length of stay (LOS) 5-days vs 7-days, and median hospital LOS 11.5-days vs 9-days for PP vs GP respectively. There were 6 cases of peri-operative COVID in PP cohort, and 1 in GP (contract following discharge). There was no mortality within either cohort. For the subgroup of patients undergoing PD: 10 patients PP, 6 patients GP, textbook outcomes were achieved in 90% vs 67% PP vs GP.

Conclusions
The implementation of the Green Pathway at our institution enabled continuation of surgery for patients with category 1 and 2 operations during the COVID pandemic with a significant reduction in peri-operative COVID infection, no mortality and no increase in length of stay. The TO rate was lower with the GP (not statistically significant), but our 4-year institution TO rate is 70.3%, comparing favourably to other studies. This pathway has enabled safe continuation of urgent surgery during the pandemic and could be a model for adoption in other centres especially if there is resurgence of COVID cases during the coming winter.
P-O18
Pancreatic Enzyme Replacement Therapy in Upper GI Surgery- A Retrospective Audit

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Background
Pancreatic enzyme insufficiency (PEI) appears to be under recognised and under treated in upper GI surgery due to limited clinical data regarding the prevalence of PEI after gastric surgery, therefore potentially leading to malnutrition in an already vulnerable patient group. This retrospective audit looked at a total of 197 resections in a two year time period and aimed to determine what type of upper GI surgery pancreatic enzyme replacement therapy (PERT) was used in, if use of PERT improved malabsorption symptoms and/or nutritional markers (weight and grip strength) and finally if there was a consistent PERT dosage that was prescribed with good effect.

Methods
Retrospective audit recorded all patients that had undergone a total gastrectomy, subtotal gastrectomy, oesophagectomy, colonic interposition, palliative bypass and GIST resections between 2018-2019 that were undertaken in a regional centre for upper GI cancer surgery. Through means of patient electronic records it was recorded which of these patients started on PERT and if there was any improvement in their symptoms. Nutritional markers were recorded at specific intervals and the final dosage of PERT used with good effect.

Results
66.6% of total gastrectomies were commenced on PERT with 68.1% reporting an improvement in symptoms and 27.2% reporting some improvement. 34.7% of subtotal gastrectomies were commenced on PERT and 100% of these patients experienced symptomatic relief. 22.4% of oesophagectomies were commenced on PERT with 68% reporting an improvement in symptoms and 9% some improvement. 33% of the colonic interpositions were commenced on PERT with 100% of patients reporting an improvement with symptoms. PEI was not identified in palliative bypass or GIST surgery.

No significant improvement in weight was seen 9-12 months post-operatively in patients who began Creon 0-3 months after their operation, with a p-value of 0.19. Not enough grip strength data was available to analyse. The average final PERT dosage in patients that reported some improvement to improvement in symptoms was 50,000 – 75,000 units with every meal and snack.

Conclusions
More prevalent usage of PERT seen in total gastrectomy resections with good effect. This finding would benefit from further higher quality research to determine the mechanism behind this to support wider PERT usage in this patient group. In view of the overall positive outcomes in regards to symptom control across gastrectomies and oesophagectomies, albeit in small numbers, it should be a considered treatment and regularly screened for. In order to get a statistically significant result in regards to weight improvement when commenced on PERT a bigger sample size would be needed.
P-OGC01
Prevalence and treatment of nutritional deficiencies following Upper Gastrointestinal Surgery for Oesophageal or Gastric Cancer

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Background
Patients undergoing Upper Gastrointestinal (UGI) surgery for cancer are left nutritionally vulnerable due to alterations in digestion and absorption this is becoming increasingly evident as more patients are achieving five year survival.
Patients are more likely to endure nutritional deficiencies in particular B12, Iron, Vitamin D, Calcium, Zinc and folic acid.
Reduced absorption and inadequate dietary intake of calories, protein and micronutrients are the main contributing factors post operatively and longer term.
At 2 years post UGI resection the following nutritional deficiencies have been observed: 48% Iron, 42% B12, 40% Folic Acid, 34% Calcium, 33% Zinc, 24% Vitamin D.

Methods
Data was collected retrospectively from various systems on our Trusts Network.
The trusts reporting system was utilised for blood results.
Digital systems were used to confirm if any action had been taken and if this was appropriate. Additional digital systems were used to obtain clinic lists for the last 6 months.
The Data was collected and entered into an Excel spread sheet for comparison.
Chi squared testing was utilised to compare deficiency rate between different Upper GI surgeries.

Results
Chi squared statistical analysis of the nutritional deficiencies in the three main Cancer surgery types (Ivor Lewis / Total OG / Sub-total OG) found there was no statistical difference in prevalence of nutritional deficiency.
Comparison of deficiencies indicated that the main prevalence was or Zinc and Vitamin D pre and post operatively.

Conclusions
Nutritional deficiencies should be corrected pre operatively. Monitoring thereafter of nutritional vitamin and mineral status should be individually tailored to suit the patient.
All UGI patients should be commenced on a nutritionally complete vitamin and mineral supplement at the point of initial assessment in the UGI surgical clinic pre operatively.
The recommendation would be to commence Forceval vitamin and mineral supplement as this offers optimal trace element coverage.
Vitamin D deficiency pre operatively should have supplementation to maintain 25(OH)D levels greater than 50nmol/L and rechecked after 3 months. Zinc replacement should be monitored routinely.
The development of an evidence based algorithm for the provision of nutrition as part of an Enhanced Recover After Surgery (ERAS) pathway in patients undergoing elective Gastrectomy and Oesophagogastrectomy for cancer

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Background
Following a recent merger of UGI Cancer services, a consensus was needed for the ERAS pathway nutritional elements. ERAS is a way to maintain physiological function following surgery enabling post-operative recovery without adversely affecting morbidity or mortality. It is a coordinated pathway that enables consistent, evidence-based multi-modal care. Anaesthesia, nutrition, analgesia, surgical technique and physiotherapy are active and key components of enhanced recovery along with patient involvement and empowerment. ERAS in UGI revealed a significant reduction in LOS in most cases, by around 50% without increasing morbidity and mortality when compared to standard post-operative care.

Methods
Coupling the service redesign with the publication of guidelines in ERAS and Gastrectomy, it was decided to review the evidence base for ERAS and nutrition support specific to UGI Cancer surgery. In addition to this, aim to review the evidence for and against the use of immunonutrition (IN). Literature searches were conducted using CINAHL and PUBMED databases. The evidence was critiqued and a consensus reached. From this evidence review, an algorithm recommending the instigation of nutrition post Upper Gastrointestinal (UGI) surgery as part of an ERAS pathway was developed.

Results
An algorithm was produced standardising the nutritional care for patients undergoing elective UGI surgery in our centre, which formed part of the ERAS care pathway produced through the ERAS steering group. All patients were screened for risk of malnutrition at the start of their surgical care pathway and regularly throughout their journey, appropriate nutritional support will be provided by a specialist Dietitian to optimise the patient.

Conclusions
The evidence to support the use of IN is conflicting and is not currently recommended on this ERAS pathway. Nutritional intake in the form of Oral Nutritional Support (ONS) in subtotal gastrectomy can be commenced at Day 2. Nutritional intake in the form of ONS in Total Gastrectomy can be commenced at Day 4. Nutritional intake in the form of ONS in Oesophagogastrectomy can be commenced at Day 5. After ONS tolerated without clinical symptoms, patient can be progressed to Soups, Jellies, Ice creams for 24 hours then to an UGI specific soft menu pre discharge.
Pancreatic enzyme supplementation improves quality of life in patients following surgery for upper GI cancer

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Background
Unpleasant abdominal symptoms are common following surgery for upper gastrointestinal (UGI) cancer and may occur secondary to pancreatic exocrine insufficiency (EPI). This study investigated symptoms of EPI in patients following surgery and assessed the effect of pancreatic enzyme supplementation (PERT) on these symptoms and the effect of supplementation on quality of life.

Methods
Patients were assessed for symptoms of EPI using a novel questionnaire. Patients who reported two or more symptoms suggestive of EPI were prescribed PERT. Abdominal symptoms were reassessed following treatment. Quality of life (QoL) was studied using the SF-36 questionnaire before and after treatment. Faecal elastase was also measured in a patient subgroup.

Results
Fifty-six out of 57 patients (98%) reported at least two symptoms of EPI. Following PERT every patient reported fewer abdominal symptoms; median 5 symptoms before treatment reduced to two symptoms following treatment (p<0.0001; Wilcoxon rank). Reduced faecal elastase concentration was associated with more frequent abdominal symptoms; median 5 symptoms versus 3 symptoms (p = 0.043; Mann Whitney U test). PERT increased quality of life scores for every patient in each of the 5 principle health domains.

Conclusions
Symptoms of EPI are common among patients following UGI cancer surgery. PERT reduces unpleasant abdominal symptoms and this leads to significant improvements in quality of life across global health domains. PERT should be offered to all post-operative UGI cancer patients with symptoms suggestive of EPI.
Evaluation of post-operative surveillance strategies for oesophago-gastric cancers in the United Kingdom

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Background
Oesophago-gastric malignancies are associated with a high recurrence rate, yet there is a lack of evidence to inform guidelines for the standardisation and structure of post-operative surveillance after curatively intended treatment. This study aimed to capture the variation in post-operative surveillance strategies across the United Kingdom and Ireland, and enquire the opinions and beliefs around surveillance from practicing clinicians.

Methods
A web based survey consisting of forty questions was sent to surgeons or allied health professionals performing or involved in surgical care for oesophago-gastric cancers at high volume centers in the United Kingdom (UK). Respondents from each centre completed the survey on what best represented their centre. The first section of the survey evaluated the timing and components of follow-ups, and their variation between centres. The second section evaluated respondents perspective on how surveillance can be structured.

Results
Thirty five surgeons from 25 centers consisting 28 consultants, 6 senior trainees and 1 specialist nurse had completed the questionnaire. 45.7% of responders arranged clinical follow-up at 2-4 weeks. Twenty responders had a specific post-operative surveillance protocol for their patients. Of these, 31.4% had a standardised protocol for all patients, while 25.7% tailored it to patient needs. Patient preference, comorbidities and chance of recurrence were considered as major factors for necessitating more intense surveillance than currently practised.

Conclusions
There is a significant variation in how patients are monitored after surgery between centers in the UK. Randomised controlled trials are necessary to link surveillance strategies to both survival outcomes and quality of life of patients and to evaluate the prognostic value of different post-operative surveillance strategies.
The introduction of an Upper Gastrointestinal (UGI) specific menu can reduce the need for routine jejunostomy (JEJ) placement following UGI Cancer resection

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Background
Despite the fact that early oral feeding (EOF) after the surgical resection of oesophageal and gastric tumours is safe, and is associated with favourable early in-hospital outcomes, sooner return to physiological GI function and hospital discharge, there can still be some reluctance in establishing EOF. Concerns remain around risk of anastomotic leak, pneumonia, Naso-gastric tube (NGT) reinsertion, re-operation, readmissions and mortality. However, when utilising EOF, a reduction in length of stay, earlier removal of NGT and earlier initiation of soft diet can be observed. JEJ placement is beneficial however complications can arise and the optimal nutritional pathway remains debatable.

Methods
Patient satisfaction surveys were conducted amongst UGI Cancer patients following Cancer resection and analysed pre and post UGI menu development and staff training. Expert UGI Patient volunteers assisted in the UGI menu development through food tastings producing a new menu in collaboration with the catering department. The new menu was launched and an UGI snack box provided to the UGI Enhanced Recovery Unit (ERAS). Oral intake of Diet and Oral Nutritional Support was analysed for calorie and protein content post menu change, ward staff training and specialist UGI dietetic counselling. This was then compared with calculated minimum estimated nutritional requirements.

Results
Of the ten patients audited pre discharge:
- 4 exceed estimated calorie requirements
- Remaining 6 patients all achieved above 71% of their minimum nutritional requirements (71%, 98%, 91%, 94%, 74%, 78%).
- 7 patients exceeded protein requirements
- 2 patients both achieved 83% of protein requirements
Remaining 1 patient achieved 51% of protein requirements, below the aim of 60%. No patient audited required supplementary Enteral feeding via JEJ or Naso-jejunal tube

Patient satisfaction surveys were completed prior to catering staff training and menu revision, after the new menu was implemented. The results show a significant improvement in patient satisfaction following UGI menu implementation.

Conclusions
Specialist UGI RD support, UGI specific menu and Oral Nutritional Support can reduce the need for routine JEJ placement in favour of on an individual patient basis. Collaborative working between UGI Dietitians, Ward staff, Catering staff and Expert patients is required for UGI specific menu development to be effectual. This audit is limited to small numbers due to adapted operational procedures during the pandemic. This audit will be repeated on a larger scale to yield more meaningful data. Future audit will capture data on how many UGI patients went on to require enteral nutritional support with three months of discharge.
The effect of surgical complications on long-term prognosis following oesophagectomy for oesophageal cancer

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Background
Globally, oesophageal cancer incidence continues to increase. In recent years, surgical and oncological advancements have increased survival rates. Despite this, survival remains <50% at five-years for patients treated with curative oesophagectomy. Previous data has suggested post-operative complications may play a role in long-term increased mortality in oesophageal cancer patients. This study aimed to examine the effect of adverse in-hospital events following oesophagectomy on the long-term prognosis for oesophageal cancer, including assessing the effect of cumulative complication burden using data from a single high-volume academic unit in the UK.

Methods
Retrospective analysis of patients undergoing oesophagectomy for oesophageal adenocarcinoma or squamous cell carcinoma was performed to assess the relationship between in-hospital events and long-term survival. Analysis was limited to patients who survived to 90 days post-oesophagectomy (n=380). Complications were graded according to the Clavien-Dindo (CD) classification and the Comprehensive Complication Index (CCI). Survival was estimated using Kaplan Meier survival curves and multivariate cox-regression, adjusting for variables known to influence survival. The absolute magnitude of effect of complications on survival was assessed using the risk-adjusted population attributable fraction (PAF), which estimates the percentage improvement in survival if specified complications were removed.

Results
Complications occurred in 251 patients (66.1%). ≥CD3a complications (HR1.65, 95%CI 1.15-2.38, p<0.010) and unplanned critical care admissions (HR2.24, 95%CI 1.45-3.46, p<0.001) were independently associated with worse prognosis whereas pulmonary complications and anastomotic leak were not. A CCI >30 was the optimum cut-point for OS (HR1.94, 95%CI 1.36-2.78, p<0.001), and after weighting to remove confounding bias median survival was shorter with CCI>30 (28vs72 months, p<0.001). There was no difference in median survival when CCI>30 occurred from major or multiple minor complications (31 vs 21 months, p=0.096). The risk adjusted PAF for CCI>30 was 8.5% (95%CI 3.6-13.1%).

Conclusions
Long-term survival following oesophagoectomy for oesophageal cancer is significantly affected by major complications and unplanned critical care admissions. The cumulative effect of multiple post-operative minor complications is comparable to the effect of major complications on long-term survival from oesophageal cancer, and cause a substantial number of potentially preventable deaths, even in patients who survive to discharge.
The Role of Carbohydrate Loading on Lactate and Glucose Levels in Upper GI Cancer Surgery

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Background
Surgical stress is a significant factor in metabolic dysregulation in the perioperative setting. Its impact on insulin resistance is regarded as one of the most detrimental effects, contributing to post-operative complications and poor outcomes. Clinical markers of this include glucose and lactate levels, with hyperglycaemia and hyperlactataemia the predicted responses by the body. One way of minimising the impact of surgical stress is pre-operative carbohydrate loading, which in theory will provide more substrate for metabolism. Our aim was to investigate whether carbohydrate loading had any impact on lactate and glucose levels in patients undergoing upper gastrointestinal cancer resections.

Methods
A retrospective observational feasibility study was performed looking at 42 patients who had undergone either an oesophagectomy or gastrectomy. Patients were divided depending on whether they received pre-operative carbohydrate loading. Lactate and glucose levels both intra-operatively and post-operatively were collected. Mean difference was compared between the two groups at 4 hours intra-operatively, 2 hours post-operatively and 12 hours post-operatively using unpaired t tests, with significance at P<0.05. Variance between the two groups was analysed. Secondary outcomes included analysis based on type of operation, anastomotic leaks, and post-operative intravenous fluid use in the first 24 hours.

Results
There was no statistically significant difference in lactate levels between the two test groups at any time point. Mean difference at intra-operative 4 hours 0.0408mmol/L (+/- 0.2537, P = 0.8731); post-operative 2 hours 0.2697mmol/L (+/- 0.3008, P = 0.3754); post-operative 12 hours 0.2327mmol/L (+/- 0.3008, P = 0.3318). Glucose levels at the same time points were not significantly different: intra-operative 4 hours 0.068mmol/L (+/- 0.5322, P = 0.5746); post-operative 2 hours -0.2649mmol/L (+/- 0.4679, P = 0.5746); post-operative 12 hours 0.3773mmol/L (+/- 0.3629, P = 0.305). Secondary outcomes did not show any statistically significant differences between analysed groups.

Conclusions
Pre-operative carbohydrate loading does not seem to influence lactate or glucose levels in these patients either intra-operatively or post-operatively. The lack of significant differences between the two cohorts may be due to underpowering of the sample size, as this is a small feasibility study. We assume that carbohydrate loading would reduce insulin resistance and therefore lactate and glucose levels. However, could it be that carbohydrate loading is not having as much of an effect on patient metabolism as we think? A larger prospective study is recommended to investigate its impact on clinical biochemistry and patient outcomes.
Translational Insights from the Dual ErbB Inhibition in Oesophago-gastric Cancer (DEBIOC) Clinical Trial - A Bioinformatic Analysis

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Background
Oesophageal Adenocarcinoma (OAC) incidence in the Western-world has increased markedly over 30 years. 5-year survival rates for patients remains below 20% with dismal response to neo-adjuvant or perioperative chemotherapy for operable tumours. The Dual ErbB Inhibition in Oesophago-gastric Cancer (DEBIOC) clinical trial assessed efficacy of combined oxaliplatin and capecitabine (Xelox) with dual ErbB inhibitor AZD8931 in providing additional benefit to operable patients compared to Xelox alone. We utilised a bioinformatic approach combing Almac Clara-T Transcriptional Discovery software with unsupervised machine learning methods to unveil translational clinical potential and biological insights from DEBIOC patient biopsy and resection specimens.

Methods
Using microarrays of DEBIOC patient specimens with documented clinical observations, we combined unsupervised machine learning techniques with state-of-the-art Almac Clara-T software to assess transcriptional changes between treatment types regarding the 10 hallmarks of cancer, characterised by representative gene-expression signatures and scores. These methods were employed to identify possible mechanisms of treatment resistance, evaluate changes in the tumour-microenvironment and determine clinically significant molecular subgroups in OAC. Differential expression and pathway analytics were used to describe signalling dissimilarities between clusters from unsupervised analysis and phenotypes respective to hallmarks of cancer, with alignment of sensitivities to single-gene drug targets for subgroups of interest.

Results
Unsupervised clustering analysis of biopsy specimens, resulted in the identification of two robust subgroups pre-treatment in OAC, determined to be significantly associated with the prediction of Mandard Score (Tumour Regression Grade 1-5) post-treatment (fishers exact p <0.05). Differential expression analysis revealed distinguishing biology between subtypes and noted increased ErbB signalling in non-responding patients in addition to increased PI3K signalling, highlighting a potential mechanism of resistance to dual ErbB inhibition (nominal p-value <0.05, FDR p-value <0.2). Semi-supervised clustering revealed hallmark-specific-phenotypes associated with clinical observations including lymph node involvement, EGFR FISH classification, vascular invasion and progression events at BH adjusted p-values <0.05.

Conclusions
Our analysis has revealed translational insights into possible mechanisms of drug resistance as well as cancer hallmark-specific phenotypes significantly associated with clinico-pathological factors during the DEBIOC clinical trial. Continued analysis into resulting phenotypes and clusters combined with the alignment of single gene drug target sensitivities is anticipated to reveal novel molecular pathways driving phenotypic differences in an effort to further inform biological understanding and improve treatment response and survival outcomes in OAC patients.
Evaluating the Availability of Services for Cancer Patients Following Surgical Resection of Esophago-Gastric Tumours

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Background
Upper gastrointestinal (UGI) cancers account for 11% of cancers in the UK, with oesophago-gastric cancers having the highest incidence rate in males. Since publication of the NHS Cancer Plan in 2001, mortality rates of oesophago-gastric cancer patients following curative surgery have been decreasing, causing an increased demand for services, particularly during follow-up post-operatively. Current guidelines recommend that patients are treated by specialised multi-disciplinary teams, involving both cancer nurse specialists and diabeticians. However, the integration of these workers into patient care is still ongoing in UGI, with no national recommendations for trusts on the minimum requirements needed to run adequate services.

Methods
This was a retrospective observational study from October 2020 to April 2021. Cancer nurse specialists from all cancer trusts in England and Wales carrying out surgical resection of oesophago-gastric tumours were identified and contacted to complete a survey. The survey was divided into 4 main themes: the organisational setup of the trust, the follow-up of patients, the dietetic input and post-operative symptoms and survivorship.

Results
A total of 12 trusts out of 38 returned a completed survey. Differences were observed in the number of CNSs and UGI diabeticians available across trusts. 50% of responders felt that the number of CNSs at their trust was not adequate to run efficient services for patients. In 42% of cases, the CNS was solely responsible for long-term follow-up of patients, up to 5-years in the majority of trusts. 11 trusts routinely follow-up patients with a dietician, integrated into MDT clinics. 75% of trusts had an associated patient group that could provide additional support to patients.

Conclusions
Differences in the availabilities of services and staff for oesophago-gastric cancer patients are present across trusts in England, which can lead to inequalities in patient care. Further longitudinal studies are needed to evaluate the impact of these differences on patient surgical outcomes and mortality.
P-OGC10
Long-term survival is not affected by complications after oesophagectomy

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Background
Outcomes following oesophagectomy for oesophageal cancer continue to improve, but complications are common and can result in significant morbidity. Post-operative complications are known to impact upon peri-operative and short-term survival but the effect on long-term survival remains unclear. The aim of this study is to investigate the effect of post-operative complications on long-term survival following oesophagectomy.

Methods
A contemporaneously maintained database from a single centre was reviewed. All patients who underwent oesophagectomy between January 2010 and January 2019 were included. Patients were separated into three groups, those who experienced no or very minor complications (Clavien-Dindo 0 or 1), minor complications (Clavien-Dindo 2), and major complications (Clavien-Dindo 3-4). Those who died during the index hospital admission were excluded to correct for short-term mortality effects. Overall survival was analysed using Kaplan-Meier and log rank testing.

Results
Seven hundred and twenty-three patients underwent oesophagectomy during this time. Seventeen (2.4%) died during their index hospital stay, and were excluded from the survival analysis. The 30- and 90- day mortality was 1.1% (8/723) and 2.4% (17/723) respectively. There were 43.2% (305/706), 30.2% (213/706) and 26.6% (188/706) in the Clavien-Dindo 0-1, Clavien-Dindo 2, and Clavien-Dindo 3-4 group respectively.
Median survival across the three groups was equivalent (50, 57 and 51 months). Across all three groups, overall long-term survival rates were equivalent at 1 (87.5%, 84.9%, 83.5%), 5 (44.2%, 48.9%, 44.7%) and 10 years (36.7%, 36.0%, 36.7%) (p=0.730).

Conclusions
Long term survival is not affected by complications, irrespective of severity, following oesophagectomy.
Background
Vitamin B12 deficiency is a well described complication post gastrectomy. It is caused by the loss of parietal cell mass leading to megaloblastic anaemia and possible long term neurological symptoms. Treatment can be with standardised replacement regimens or to monitor B12 levels and replace as required. This study assesses patient understanding of and compliance with B12 supplementation guidelines post total and subtotal gastrectomy.

Methods
125 patients who underwent gastrectomy between 2010-2020 were available for study (86 total gastrectomies, 39 subtotal gastrectomies). Patient data was collected by review of the hospital electronic records and individual phone calls. Patients were asked standardised questions to elicit knowledge of the importance of B12 supplementation and compliance with supplementation.

Results
92% (79/86) of total gastrectomy patients reported compliance in regular parenteral B12 supplementation. Compliance was significantly lower for subtotal gastrectomies for checking and/or replacing their vitamin B12 at 53.8% (21/39) (p <0.001). 62.6% of patients stated that they knew it was important to supplement B12 post gastrectomy. 37.8% of participants could explain why this was important and 14.8% had any knowledge of the complications of vitamin B12 deficiency. Patients who were compliant with B12 supplementation had an improved understanding of why supplementation was important compared to those who did not.

Conclusions
Regular monitoring and supplementation of vitamin B12 levels is important post gastrectomy. This study demonstrates good compliance in those undergoing total gastrectomy. Patient understanding correlates with compliance, suggesting that patient education and knowledge reinforcement may be key to compliance with vitamin B12 supplementation.
Nasogastric tube drainage and pyloric intervention after oesophageal resection: UK practice variation and effect on outcomes

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Background
Over 1,500 patients with oesophageal cancer undergo a resection in the UK each year. At surgery, patients commonly have a nasogastric tube (NGT) placed and may undergo a pyloric intervention. There is conflicting evidence on the use of both NGTs and pyloric interventions during oesophageal resections. We performed a national survey of oesophageal centres and assessed practice variation.

Methods
An electronic survey was distributed to all resection centres in England, Wales and Scotland. Variations in practice regarding NGTs and pyloric intervention were assessed, and compared to nationally reported centre volumes and length-of-stay data

Results
Most centres (31/39, 79%) responded to the survey. All centres reported routine NGT use. The majority of centres (19/31, 61%) did not perform pyloric interventions. When used, surgical pyloroplasty was the most frequent strategy (8/31, 26%). Routine post-operative radiological assessment was utilised in 9/31 (29%) of centres. Criteria for NGT removal and dietary progression was highly variable, with every centre reporting different protocols. There were no significant differences in practice between high and low volume centres. There were also no trends seen when comparing centres above vs at-or-below the median length-of-stay. The majority (68%) of centres were willing to take part in a trial assessing NGT use and pyloric interventions.

Conclusions
Pyloric intervention use varies widely, with no clear link to outcomes. NGT use remains standard practice despite evidence for safe omission. Surgeons require and recognise the need for a trial to assess requirement for NGTs and pyloric intervention after oesophageal resection.
P-OGC13
Chest drainage after oesophageal resection: A systematic review

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Background
Modern enhanced recovery protocols discourage drain use due to negative impacts on patient comfort, mobility, and recovery, and lack of proven clinical benefit. After oesophagectomy, however, drains are still routinely placed. This review aimed to assess the evidence for, and how best to use chest drains after oesophageal surgery.

Methods
A systematic literature search was performed in Medline, Embase and Cochrane collaboration databases. Studies reporting outcomes for different types or uses of thoracic drainage, or outcomes related to drains after trans-thoracic oesophagectomy were included. Studies were collated into domains based on variations in number, position, type, removal criteria, diagnostic use and complications of drains. Methodological quality was assessed with Newcastle-Ottawa and Jadad scores.

Results
Among 434 potentially relevant studies, 27 studies met the inclusion criteria and these included 2564 patients. Studies that examined the number of drains showed pain reduction with a single drain compared to multiple drains (3 studies, n=103), and transhiatal placement compared to intercostal (6 studies, n=425). Amylase levels may aid diagnosis of anastomotic leak (9 studies, n=888). Narrow calibre Blake drains may effectively drain both air and fluid (2 studies, n=163). Drain removal criteria by daily drainage volumes of up to 300ml did not impact subsequent effusion rates (2 studies, n=130). Complications related directly to drains were reported by 3 studies (n=59).

Conclusions
Available evidence on the impact of thoracic drainage after oesophagectomy is limited, but has the potential to negatively affect outcomes. Further research is required to determine optimum drainage strategies.
**P-OGC14**

**Global Level of Harm Upper Gastrointestinal (GLEOHUG) – a multinational gastric cancer cross-sectional appraisal**

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**Background**

Gastric cancer (GC) is the 5th most common malignancy and remains one of the major causes of worldwide cancer-related deaths. COVID-19 pandemic has had a significant impact on the provision of cancer care. This study aims to overview the global standpoint of gastric cancer patients (GCP) during the first year of the pandemic.

**Methods**

The Upper Gastrointestinal Surgeons (TUGS), within its Global Level of Harm Project, designed an online cross-sectional survey to assess how gastric cancer patient’s management changed during the first year of the pandemic. The questionnaire included 33 questions about expertise, kind of health system, hospital organization and screening policies, personal protective equipment (PPE), change in patient’s characteristics, preoperative, operative and postoperative management of GCP.

**Results**

There were 209 participants from 178 centres & 50 countries. Results showed: most hospitals (88,18%) had restricted areas for COVID-19 patients; 53.58% of surgeons were redeployed; most frequent COVID-19 screening method was PCR (78,82%) & chest CT-scan (25,62%), and 55.98% lack full PPE. **Preoperative management:** 43.16% noted reduction in multidisciplinary teams (MDT) meetings; 28,42% increase in cT2 or higher GCP; 34,74% increase in metastatic (M1) GCP; 26,84% increase in patients receiving definitive palliative treatment; 23,68% note increase in frail patients; 50% increase in waiting list time; and 41,58% faced problems in the provision of oncological treatment. **Operative management:** 54,50% decrease in elective gastrectomies; 29,10% increase in urgent/semi-urgent gastrectomies; 37,04% decrease in the number of minimally-invasive gastrectomies (MIG); & 18,52% increase in the number of palliative surgeries. **Postoperative management:** 16,48% increase in the overall complication rate (OCR); 12,64% increase in the number of Clavien-Dindo 3 or higher complications; 8,13% increase in the leak rate; increase in pulmonary infections (26,79%) and bowel obstruction (2,39%); 44,51% note postoperative COVID-19; 15,38% increase in 30-days mortality; 23,08% mortality due to COVID-19 infection; 17,58% increase in the need for adjuvant treatment. Most patients were postoperatively assessed either through a face-to-face consultation or a hybrid approach.

**Conclusions**

COVID-19 pandemic has affected gastric cancer management by decreased frequency of MDT’s, higher clinical-stage migration and fuelled frailty. The pandemic increased waiting list time, the number of urgent and palliative surgeries, OCR, Clavien-Dindo 3 or higher complications, leak rate, and pulmonary infections. There was a noticeable high rate of postoperative COVID-19 infection and associated mortality. Further multicentric studies are warranted to affirm these findings.
Impact of postoperative systemic treatment on survival for oesophageal adenocarcinoma after preoperative chemotherapy and oesophagectomy

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Background
Perioperative chemotherapy is widely used in the treatment of oesophageal cancer with substantial survival benefit over surgery alone. However, the postoperative part of these regimens is given in less than half of cases, reflecting uncertainty about its benefit. This study estimates the effect of postoperative chemotherapy after surgery for oesophageal cancer using a large population-based dataset and modern statistical methods.

Methods
Patients with oesophageal adenocarcinoma diagnosed between 2012 and 2018 and underwent preoperative chemotherapy followed by surgery, were identified from a national level audit in England and Wales (National Oesophagogastric Cancer Audit). Postoperative therapy was defined as the receipt of at least one cycle of systemic chemotherapy within 90 days of surgery. The comparative effectiveness of postoperative chemotherapy compared to observation was estimated using inverse propensity treatment weighting (IPTW).

Results
The study included 2,814 patients, in whom postoperative therapy was given to 1,054 (37.5%). Patients who received postoperative therapy were younger, with a lower ASA grade and were less likely to have surgical complications of any type, including anastomotic leak (all p<0.001). Tumour characteristics were similar in both groups. Weighted median survival times for patients having no treatment or postoperative chemotherapy were 45.4 months and 57.5 months respectively. There was a life expectancy difference at five years of 2.9 months in favour of postoperative chemotherapy (95%CI 1.1–4.8 months, p<0.001) with a Hazard Ratio of 0.80 (95%CI 0.70-0.91, p<0.001).

Conclusions
Among patients with oesophageal adenocarcinoma treated with preoperative chemotherapy and surgery, improved overall survival was observed in those patients who received postoperative chemotherapy. Minimising surgical complications and improving patient fitness could increase the use of postoperative chemotherapy, leading to better outcomes for patients with oesophageal adenocarcinoma.
Minimally Invasive Oesophagectomy: Technique and learning curve over 10 years

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Background
The use of minimally invasive oesophagectomy (MIO) in the treatment of patients with oesophageal malignancy has developed since its first description by Cuschieri in 1992, although mainstream uptake of this technique has not been forthcoming. Oncological resection margins were not compromised in MIO, whilst complications and two-year mortality rates improved in MIO compared to open oesophagectomy. The advantages of MIO compared to open surgery include the speed of recovery, improved return to baseline quality of life, better physical function and less pain. We present our experience of MIO including operative technique, tips, and learning curve.

Methods
160 patients underwent MIO at Portsmouth Hospitals University NHS Trust between August 2010 and December 2019. After June 2016 there was a significant change in surgical technique and pathway as outlined below and this time point has been interrogated.
Primary outcomes were operative duration (minutes) and both 30-day and in-hospital mortality. Secondary outcomes were length of in hospital stay (days), ITU stay, conversion to open surgery and complications.
We undertake laparoscopic abdominal phase and thoracoscopic or robotic assisted thoracic phase oesophagectomy. Dual consultant operating is standard; and we work consistently with the same group of anaesthetists and theatre staff.

Results
82.5% of our 160 patients were male, median age was 67 years. Operative duration showed a steep learning curve over the first 10 cases followed by stabilisation to case 56 and then improvement. CUSUM analysis of the anastomotic leaks showed a change point at 53 cases - 30.8% vs 16.7% (p=0.05). 30-day mortality is 1.88% and median length of stay 12 days (IQR12.75). Complications of Clavien-Dindo ≥III occurred in 35% and “perfect” outcomes in 21.25%. Conversion to open in 5.6% of cases but only 1 in the last 100 patients.

Conclusions
There is a learning curve associated with the adoption of a new technique. MIO can be performed safely and cost effectively with equivalent oncological outcomes with the advantage of improved quality of life. Oesophageal cancer is still poorly understood and we therefore must spend more thought on how best to give our patients good quality disease free life. Our outcome data is within existing published data and our prospectively collected data is thorough and meticulous. Though some complications are inevitable, small changes lead to marginal gains and add up to better outcomes.
FEASIBILITY AND IMPACT OF A HOME-BASED PREHABILITATION PROGRAMME ON PATIENTS RECEIVING NEOADJUVANT TREATMENT FOR OESOPHAGO Gastric CANcer (THE CHEMOFIT STUDY)

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Background
Treatment for locally advanced oesophagogastric adenocarcinoma (OGA) involves neoadjuvant chemotherapy (NAC) which has a negative impact on patient fitness. Using ‘prehabilitation’ to increase activity levels and fitness may affect physiology, postoperative outcomes and improve patient wellbeing and quality of life. The aim of this study was to evaluate feasibility, acceptability and the impact of a home-based structured prehabilitation programme in OGA.

Methods
This feasibility study recruited consecutive patients to a pragmatic home-based prehabilitation during NAC. Participants completed daily walking sessions to a targeted step-count and daily strengthening exercises, under the weekly supervision of the research team. The primary outcomes assessed feasibility through recruitment rate, completion rate and individual compliance with each component of the intervention. Secondary outcomes included fitness derived from cardiopulmonary exercise testing (CPET).

Results
A total of 42/58(72\%) patients approached were recruited, 36/39(92\%) patients completed the programme. Median compliance with wearing a pedometer and recording step count was 97.8\%(IQR 93.2-100\%) and median engagement with telephone contacts was 100\%(IQR 93.1-100\%). Median compliance with 30-minutes aerobic exercise was 70.2\%(IQR 53.1-88.9\%) and for strength exercises 69.4\%(IQR 52.1-84.3\%). Nineteen patients had pre and post intervention CPET with no significant difference in anaerobic threshold (mean difference -0.5 ml.kg\(^{-1}\).min\(^{-1}\), 95\% CI -1.6 to +0.6, p=0.387) or VO\textsubscript{2}peak (mean difference -0.1 ml.kg\(^{-1}\).min\(^{-1}\), 95\% CI -1.6 to +1.4, p=0.883).

Conclusions
This study shows that ChemoFit is feasible, safe and achieved excellent patient compliance and engagement. Future utilisation of this home-based prehabilitation programme may improve preoperative fitness during NAC and impact post-operative outcomes.
P-OGC18
DOES CARDIOPULMONARY TESTING HELP PREDICT LONG-TERM SURVIVAL AFTER OESOPHAGECTOMY?

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Background
Oesophagectomy is associated with a high rate of morbidity and mortality. Preoperative cardiopulmonary fitness has been correlated with outcomes within major surgery. Variables derived from CPET have been associated with postoperative outcomes. It is unclear whether preoperative cardiorespiratory fitness of patients undergoing oesophagectomy is associated with long-term survival. The aim of this study was to evaluate whether any of the cardiopulmonary exercise testing (CPET) variables that are routinely derived in patients with oesophageal cancer may aid in predicting long-term survival after oesophagectomy.

Methods
Patients undergoing CPET followed by trans-thoracic oesophagectomy for oesophageal cancer with curative intent between January 2013 and January 2017 from single high-volume centre were retrospectively analysed. The relationship between predictive co-variables including CPET variables, and survival was studied with a Cox proportional hazard model. Receiver operation curve (ROC) analysis was conducted to find cut-off values for CPET variables predictive of 3-year survival.

Results
A total of 313 patients were analyzed. The ventilatory equivalent for carbon dioxide (VE/VCO2) at anaerobic threshold was the only CPET variable independently predictive of long-term survival in multivariable analysis (HR 1.049, 95% CI 1.011-1.088, p=0.011). Pathological stage III and IV disease was the other co-variable found to be independently predictive of survival. ROC analysis of the VE/VCO2 failed to demonstrate a predictive cut-off value of 3-year survival (AUC=0.564, 95% CI 0.499-0.629, p=0.056).

Conclusions
A high VE/VCO2 before oesophagectomy for malignant disease is an independent predictor of long-term survival and may be an important variable for consideration when counselling patients.
THE PREDICTIVE ROLE OF CARDIOPULMONARY EXERCISE TESTING IN GASTRIC CANCER SURGERY

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Background
The role of Cardiopulmonary Exercise Testing (CPET) prior to major surgery has been an area of growing interest over the last two decades. CPET offers an objective and composite measure of physiological functional reserve, and thus can be used to identify patients at highest risk of perioperative morbidity and mortality. Although the role of CPET has been investigated with respect to outcomes after oesophagectomy, no clear data exist into the predictive role of CPET specifically relating to gastric cancer surgery. The aim of this study was to identify CPET parameters predictive of adverse outcome in patients undergoing curative gastric resections.

Methods
Patients who underwent CPET followed by curative total or subtotal gastrectomy for gastric or junctional adenocarcinoma between January 2013 and December 2019 in a single high-volume centre were included in retrospective analysis. CPET variables were categorised as per cut-off values from other surgical populations (AT<11ml.min⁻¹.kg⁻¹, VO₂peak<15ml.min⁻¹.kg⁻¹, VE/VCO₂ at AT>34). Associations between these variables and postoperative outcomes were analysed using chi squared or Fisher’s exact test.

Results
There were 252 patients included in the study. Patients with VE/VCO₂>34 were more likely to return to the intensive care unit (ICU) (p=0.033) and had a higher chance of in-hospital mortality (p=0.012). AT<11ml.min⁻¹.kg⁻¹ or VO₂peak<15ml.min⁻¹.kg⁻¹ were not associated either with return to ICU (p=0.243, p=0.202) or with in-hospital mortality (p=1.000, p=1.000).

Conclusions
Although much has been published on the importance of CPET assessment prior to major abdominal surgery, there is a paucity of literature specifically looking at its role in patients with gastric cancer. Patients with ventilatory inefficiency (VE/VCO₂>34) are more likely to return to ICU or to die during hospital stay after total/subtotal gastrectomy for malignant disease. This information should play a more prominent role when assessing patients' fitness prior to surgery.
CAN PREHABILITATION PREVENT DEVELOPMENT OF SARCOPENIA DURING NEOADJUVANT CHEMOTHERAPY FOR OESOPHAGO GaSTRIC ADENOCARCINOMA?

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Background
Sarcopenia characterised as a loss of muscle mass and function is prevalent in cancer populations. It is known to occur in patients receiving neoadjuvant treatment and is associated with poorer outcomes. Thus, minimizing sarcopenia may lead to improved patient prognosis. It has been suggested that exercise can reverse and prevent sarcopenia. Little is known as to whether prehabilitation as an intervention to enhance patients’ functional capacity prior to surgery can lead to sarcopenia prevention.

Methods
Patients enrolled into a prospective prehabilitation study (ChemoFit) during neoadjuvant chemotherapy (NAC) for oesophagogastric adenocarcinoma (OGA) had their radiological sarcopenia measured before and after neoadjuvant chemotherapy (NAC). Radiological sarcopenia and lean body mass (LBM) were measured from computed tomography scans at the level of the L3 vertebra. ChemoFit patients were compared with an historical cohort (NO-PREHAB) which did not undergo prehabilitation and which had their radiological sarcopenia evaluated prospectively prior to and after NAC for OGA.

Results
Patients in the ChemoFit group were younger compared to the NO-PREHAB group (median age 70 vs 65, p=0.04). Otherwise there were no differences in gender, BMI, smoking status, comorbidities, tumour location and clinical stage of the disease. Radiological sarcopenia was present prior to NAC in 17/36 (47%) which increased to 26/36 (72%) after NAC amongst ChemoFit patients. Sarcopenia prior to NAC in the NO-PREHAB cohort was 12/28 (43%) which increased to 16/28 (57%) post NAC. Intergroup difference (p=0.291). Median (IQR) ΔLBM at two time points was in ChemoFit -2.6kg (-5.2;-0.6) and in NO-PREHAB -3.1kg (-4.7;-1.0) (p=0.730).

Conclusions
Radiological sarcopenia increased in both groups during NAC for OGA. Prehabilitation did not prevent this from happening. Other strategies must be explored in order to mitigate against sarcopenia.
P-OGC21
Patient perspectives on symptoms of importance and preferences for follow-up after major upper gastrointestinal cancer surgery

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Background
Long-lasting symptoms and reductions in quality of life are common after oesophago-gastric surgery. Post-operative follow-up has traditionally focussed on tumour recurrence and survival, but there is a growing need to also identify and treat functional sequelae to improve patients’ recovery.

Methods
An electronic survey was circulated via a British national charity for patients undergoing oesophago-gastric surgery and their families. Patients were asked about post-operative symptoms they deemed important to their quality of life, as well as satisfaction and preferences for post-operative follow-up. Differences between satisfied and dissatisfied patients with reference to follow-up were assessed.

Results
Among 362 respondents with a median follow-up of 58 months since surgery (range 3-412), 36 different symptoms were reported as being important to recovery and quality of life after surgery, with a median 13 symptoms per patient. Most (84%) respondents indicated satisfaction with follow-up. Unsatisfied patients were more likely to have received shorter follow-up than 5 years (27% among unsatisfied patient vs. 60% among satisfied patients, p<0.001) and were less likely to have seen a dietitian as part of routine follow-up (37% vs. 58%, p=0.005).

Conclusions
This patient survey highlights preferences with regard to follow-up after oesophago-gastrectomy. Longer follow-up and dietician involvement improved patient satisfaction. Patients reported being concerned by a large number of gastrointestinal and non-gastrointestinal symptoms, highlighting the need for multidisciplinary input and a consensus on how to manage the poly-symptomatic patient.
Incidence and relevance of clinically indeterminate non-regional lymph nodes in the treatment of oesophageal cancer

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Background
Metastatic involvement of non-regional supraclavicular or superior mediastinal lymph nodes in distal oesophageal cancer is rare, but has important implications for prognosis and management. The management of non-regional lymph nodes which appear indeterminate on CT and FDG PET-CT (subcentimetre nodes or those with preserved normal morphology, but increased FDG avidity) can present a diagnostic dilemma. This study investigates the incidence, work-up, and clinical significance of non-regional clinically indeterminate FDG avid lymph nodes.

Methods
A single centre retrospective review of all FDG PET-CT scans conducted over 5 years was conducted. Patients with mid- or distal oesophageal cancer with non-regional FDG avid nodes were identified. Subsequent work-up, management, and outcomes were retrieved from electronic health records.

Results
Reports for 1189 PET-CT scans were reviewed. A total of 79 patients met the inclusion criteria. Of these, 18 (23%) were deemed to have disease and performance status potentially amenable to radical surgery, and underwent further assessment. The indeterminate lymph nodes were successfully sampled via endobronchial ultrasound (EBUS) or ultrasound-guided fine needle aspiration (US-FNA) in 100% of cases. 15/18 (83.3%) of samples were benign and proceeded to surgery. Outcomes for patients who proceeded to surgery were similar to other cohorts. None had pathology suggesting false negative lymph node sampling.

Conclusions
EBUS and US-FNA are effective means of sampling clinically indeterminate non-regional lymph nodes, and can significantly impact prognosis, and management. Further investigations in this context are of value in this cohort and should be pursued.
Significance of neoadjuvant downstaging in gastric adenocarcinoma

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Background
Neoadjuvant chemotherapy is established in the treatment of gastric adenocarcinoma. Histopathological regression as a result of neoadjuvant treatment can potentially have important prognostic implications in gastric cancer. There is little data comparing the clinical outcomes of patients with gastric adenocarcinoma at the same pathological stage with and without neoadjuvant treatment. The aim of this study is to determine the impact of neoadjuvant chemotherapy upon the prognosis of patients being treated for gastric adenocarcinoma.

Methods
Consecutive patients with gastric cancer treated in a single, tertiary high-volume centre between 2007 and 2017 were evaluated. All patients with gastric adenocarcinoma were treated with either a subtotal or total gastrectomy with D2 lymphadenectomy. A stage-by-stage comparison of the extent of pathological downstaging was conducted for patients who received neoadjuvant treatment (ypTNM) and those that did not (pTNM). The pTNM and ypTNM stages were defined as per the TNM 8th Edition.

Results
Among 384 patients undergoing gastrectomy for gastric adenocarcinoma, 141 patients received neoadjuvant chemotherapy. Of them, 86 patients (58.1%) benefitted from a downstaging effect. Patients with downstaged disease had improved overall survival compared to patients who did not respond to neoadjuvant chemotherapy (NR vs 66 months, p<0.001). Downstaging by >3 stages was the strongest independent predictor of overall survival (hazard ratio: 0.17; 95% Confidence Interval (CI) 0.062-0.44). Overall survival was significantly better when a stage-by-stage comparison was performed between patients in the ypTNM and pTNM groups.

Conclusions
Pathological staging following neoadjuvant chemotherapy is a more accurate predictor of prognosis compared to pre-neoadjuvant chemotherapy clinical stage with downstaged patients benefitting from lower recurrence rates and improved overall survival. Patients downstaged due to neoadjuvant chemotherapy receipt can potentially have more favourable clinical outcomes compared to stage-matched patients who did not receive this.
Comparison of the histopathological regression after neoadjuvant FLOT versus ECX in resectable gastroesophageal adenocarcinoma

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Background

Neoadjuvant chemotherapy is a key component in the treatment of resectable oesophagogastric cancer (OGC). Histopathological tumour regression is associated with a prognostic benefit in OGC. There is increased usage of the FLOT regimen as part of neoadjuvant chemotherapy (NAC) for these tumours. The initial phase 2 trial demonstrated complete pathological response (pCR) in 15% for FLOT versus 6% for ECX but there is no data outside a trial setting. The aim of this study was to evaluate the differences in pCR and the extent of downstaging between patients receiving FLOT versus ECX in the neoadjuvant setting.

Methods

Consecutive patients treated for OGC in a single, high-volume UK centre between 2018 and 2021 were identified from a contemporaneously maintained database. Patients underwent 3 cycles of ECX or 4 cycles of FLOT as part of NAC. Histopathological tumour regression was assessed by the Mandard classification. A comparison of T- and N-stage migration between FLOT and ECX was performed. Major pCR was defined as TRG 1-2 based on the Mandard classification.

Results

The study included 162 patients. 6/84 (7.1%) patients receiving ECX and 5/78 (6.4%) patients receiving FLOT achieved a pCR (p=0.853). 11/84 (13.1%) patients in the ECX group and 12/78 (15.4%) patients in the FLOT group achieved a major pCR (p=0.677).

With regards to stage migration by T-stage, 36 (42.9%) patients were downstaged and 6 patients (7.1%) were upstaged with ECX. Amongst FLOT patients, 42 (53.8%) were downstaged and 8 (10.3%) upstaged (p=0.189). When comparing N-stage, 29 (34.5%) patients achieved downstaging and 28 (33.3%) were upstaged with ECX. 30 (38.5%) patients were downstaged and 20 (25.6%) were upstaged with FLOT (0.563).

Conclusions

There was no significant difference in pCR and stage migration rates between patients receiving neoadjuvant ECX and FLOT. pCR rates were lower than previously reported, and it is unclear if the difference in prognosis will translate comparable outcomes between patients receiving ECX versus FLOT.
Prognostic significance of extracapsular lymph node involvement after gastrectomy for gastric adenocarcinoma

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Background
Lymph node involvement is a key prognostic indicator in gastric adenocarcinoma. Little is known of the impact of extracapsular lymph node involvement (LNI) upon the prognosis of patients undergoing curative resection of gastric cancer. The aim of this study was to assess the incidence and prognostic significance of extracapsular LNI in patients undergoing a gastrectomy for gastric adenocarcinoma.

Methods
Consecutive patients who underwent a subtotal or total gastrectomy with curative intent for adenocarcinoma of the stomach or gastro-oesophageal junction in a single, high-volume U.K. centre between 2010 and 2018 were identified from contemporaneously maintained database. Patients with a pN0 status on final histology and those who died in-hospital were excluded from analysis. Factors associated with survival were studied with univariable and multivariable cox regression analysis. A p value of <0.05 was deemed significant.

Results
The study included 235 patients. A median (IQR) of 32 (24-43) lymph nodes were resected and median (IQR) 4 (1-9) lymph nodes were positive. Of them, extracapsular LNI was identified in 123 (52%) of patients. Factors associated with survival on univariable analysis were R1 resection (p=0.001), p/ypT stage (p<0.001), p/ypN stage (p<0.001) and extracapsular LNI (p=0.001). Median survival among patients who had extracapsular LNI was 19 months versus 49 months among patients who did not (p<0.001). Extracapsular LNI was not an independent predictor of survival on multivariable analysis (p=0.535).

Conclusions
Extracapsular LNI is associated with poor prognosis among patients undergoing a curative gastrectomy. However, it is not an independent predictor of survival among this patient population.
Learning curves in minimally invasive esophagectomy- a systematic review and evaluation of benchmarking parameters

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Background
Minimally invasive techniques are increasingly used in the treatment of esophageal cancer. The learning curve for minimally invasive oesophagectomy (MIO) is variable and can impact on patient outcomes. The aim of this study was to review the current evidence on learning curves in MIO and identify which parameters are used for benchmarking.

Methods
A search of the major reference databases (PubMed, Medline, Cochrane) was performed with no time limits up to February 2020. Results were screened in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Studies were included if an assessment of the learning curve was reported on, regardless of which (if any) statistical method was used.

Results
Twenty-nine studies comprising 3741 patients were included. Twenty-two studies reported on a combination of thoracoscopic, hybrid and total MIO, 6 studies reported robotic assisted MIO (RAMIE) alone and 1 study evaluated both RAMIE and thoracoscopic esophagectomies. Operating time was the most frequently used parameter to determine learning curve progression (23/39 studies), with number of resected lymph nodes, morbidity and blood loss also frequently used. Learning curves were found to plateau at 7-60 cases for thoracoscopic esophagectomy, 12-175 cases for total and thoracoscopic/hybrid esophagectomy and 9-85 cases for RAMIE.

Conclusions
Multiple parameters are employed to gauge MIO learning curve progression. However, there are no validated or approved sets of outcomes. Further work is required to determine the optimum parameters that should be utilised to ensure best patient outcomes and required length of proctoring.
Chyle Leak following Oesophagectomy: ‘A Retrospective 10-year Single-Site Experience of a Tertiary Centre.’

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Background
Chyle leak is a relatively uncommon but well-recognised complication following Oesophagectomy which carries significant morbidity and mortality if not treated actively. Evidence suggests the incidence rate of chyle leak post oesophagectomy can range from 0.4% to 21%. The aim of this study was to describe our experience in managing this complication.

Methods
This was a retrospective study, using the electronic database, to analyse our incidence of chyle leak in all patients who underwent elective oesophagectomy from April 2009 to December 2019 in a Tertiary Upper GI cancer centre. The diagnosis was confirmed by high persistent chest drain output, the colour of the fluid produced in the chest drain and its ‘content’ including fluid triglyceride levels and the presence of chylomicrons.

Results
Between 2009-2019, a total of 550 patients underwent Oesophagectomy. The median length of stay was 13 (Range 3 to 148) days. The median age was 63 years (45 to 82) with M:F 2:1. Chyle leak was identified in 24 patients (4.4%); Patients who were managed surgically were 83.3%(n=20) with a median LOS of 20 days (Range 11 to 148) and mortality of 5%(n=1). 16.7%(n=4) were managed conservatively with a median LOS of 31 days (Range 14 to 51) and mortality of 0%. All 24 patients with chyle leak had neoadjuvant chemotherapy as part of treatment with radical intent.

Conclusions
Low mortality rates with chyle leak can be achieved with a high index of suspicion and early surgical intervention. This is crucial in reducing the length of stay in hospital and morbidity. Conservative management is suitable in low volume chyle leak and cases clinically responding to medical management.
**P-OGC28**

**Totally minimally invasive Oesophagectomies (Robotic & Laparoscopic) are associated with an improved immediate post operative outcomes in comparison with open oesophagectomies; an upshot of a systematic review and metanalysis**

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**Background**

Radical oesophagectomy is the recognized standard curative surgery for operable oesophageal cancers. Postoperative morbidity and mortality are considerable following open oesophagectomy. Minimally invasive techniques (thoraco-laparoscopy and robotic surgery) has evolved as an alternative for open techniques. Oncological outcomes, tumor clearance, lymph node yield, anastomotic leak, in-hospital and 30-day mortality are comparable between open and MIS techniques in various studies. Short term benefits like pulmonary complications, post-op quality of life, operative time, blood loss, pain control have not been studied widely. This meta-analysis aims at evaluation of randomized trials that compare short term outcomes of totally minimally invasive versus open oesophagectomies.

**Methods**

Three articles were selected after a systematic search of the literature. Methodological quality was assessed by Jadad scoring. Cochrane Risk of Bias (RoB) assessment tool was applied to determine the impact of bias. Pulmonary infections, Health-related quality of life EORTC C30 score, blood loss, operating time, 10-day pain score was recorded. CASP tool questionnaire was applied to individual studies by two authors separately. A random-effects model used to determine the overall effect. Weighted mean difference (WMD) or standardized mean difference (SMD) with 95% CI is calculated for continuous variable and Odds ratio for dichotomous variables. Heterogeneity between studies was measured using the Chi-square test and I² test.

**Results**

A total of 338 patients have been included. All baseline characteristics are matched to eliminate bias. Review results showed a statistically significant lower rate of pulmonary infections in MIS oesophagectomy with odds ratio 3.63 (2.09, 6.31; p-value<0.00001). Postoperative QoL EORTC C30 was better in MIS group with SMD of 0.80 (0.57, 1.02; p-value<0.00001). Operating time was significantly longer in the MIS technique, SMD of 1.50 (1.20, 1.80; p-value <0.00001). The blood loss was significantly lower in the MIS group with SMD -1.74; p-value <0.00001. MIS had significantly lower pain scores compared to open surgeries with SMD of -0.39 (-0.66,-0.13; p-value 0.004)

**Conclusions**

The meta-analysis showed a significant difference in postoperative pulmonary infections and health-related quality of life, favoring totally minimally invasive surgeries for oesophagectomies done for resectable oesophageal cancers. Other outcomes like pain control, blood loss was also better in minimally invasive groups. These benefits could outweigh the longer operating time in minimally invasive surgeries. With time, after the steep learning curve is achieved, totally minimally invasive oesophagectomies will possibly be a better alternative to open surgeries in terms of short term postoperative outcomes.
Pathological response profiles of FLOT and ECX neoadjuvant chemotherapy in oesophageal adenocarcinoma

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Background
70% of patients undergoing neo-adjuvant ECX chemotherapy for adenocarcinoma of the oesophagus, show little to know response in their primary tumour (Mandard 4,5). However, among these patients, those who have a complete nodal response (cN+ to ypN0) have equivalent survival to those with Mandard 1,2,3 tumours. FLOT chemotherapy has shown a survival advantage to ECX, however, rates of primary tumour response and nodal response are yet to be the focus of published study.

Methods
Retrospective cohort study comparing patients undergoing ECX and FLOT neoadjuvant chemotherapy between 2014 and 2021. Pathological outcomes were examined including, Mandard tumour regression grade (1-5), complete nodal response (cN+ to ypN0), clinically node negative nodal progression (cN0 to ypN+).

Results
226 patients had data available for analysis (193 ECX and 33 FLOT). 27% (52/193) of patients receiving ECX showed a response in the primary tumour (Mandard 1,2,3) compared to 63% (21/33) with patients undergoing FLOT (p<0.001). Complete nodal response rates were 25% in ECX patients and 21% FLOT patients (p=0.556). Clinically node negative nodal upstaging (cN0 to pN+) was higher among FLOT patients 30% (13/33) than ECX patients 12% (24/193) (p<0.001).

Conclusions
FLOT chemotherapy confers improved primary tumour response. However, these findings were not echoed in locoregional nodal responses. Survival advantages with FLOT may result from improved responses in primary tumour and not improved systemic coverage. More data will be needed to explore this and over-come the confounding effect of staging inaccuracies. However, understanding systemic and loco-regional responses of different chemotherapy regimens will be needed to tailor future neoadjuvant treatment regimens.
High volume oesophagogastric resection in a small private hospital during COVID 19, April 2020- April 2021

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Background
Like other hospitals at the peak of the pandemic, our institution had limited elective critical care capacity. This study summarises the outcomes of patients undergoing oesophagogastric (OG) resection at our institution, treated as the result of the emergency national contract between the NHS and the independent sector hospitals.

Methods
Patients undergoing OG resection at our institution between April 2020 and April 2021 were included. Patients were managed through the multidisciplinary team and were treated according to standard ERAS pathways, involving critical care input. National OG Cancer Audit (NOGCA) metrics were collected and compared to pre-COVID data.

Results
81 patients underwent oesophagogastric resection in the private sector (60 oesophagectomies). Median length of stay was 9 days (9 pre-COVID). This included 21 patients who were repatriated to our main centre for ongoing management. 30-day mortality was 3.7% (1.8% pre-COVID), 90-day mortality 6.7% (4.2% pre-COVID). This included one patient who contracted COVID following discharge. 9 patients suffered an anastomotic leak, equating to a leak rate of 11% (7% pre-COVID). 22 resections were performed at our main centre (110-140 OG resection pre-COVID)

Conclusions
It is likely the private institution in this study represented one of the busiest oesophagogastric centres in the UK during COVID-19. A large cohort of patients underwent potentially curative surgery as a result of the emergency contract, who would have otherwise been placed on prolonged or palliative chemotherapy. 30 and 90-day mortality and anastomotic leak rates were higher than pre-pandemic levels, reinforcing the value of centralised tertiary OG resection services.
Robotic Upper GI Surgery: Is it Feasible, Safe and Can it Improve Patient Outcomes?

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Background
Robotic surgery has been increasingly applied in different specialties. The Rosemere Cancer Foundation funded the Da Vinci robot for Upper GI services at our tertiary Upper GI Cancer Centre which serves a population of approximately 1.5 million people. In 2017, two of our UGI surgeons performed the first robotic GIST excision in the UK successfully. The patient was discharged 5 days later after an uneventful recovery. We have subsequently performed increasingly complex benign and malignant Robotic UGI procedures. Our primary and secondary aims looked at the length of stay (LOS) in critical care and the complete hospital admission.

Methods
Two UGI Consultants observed cases in established centres in Netherlands and Germany. Following this, they undertook 60 hours of simulation practice, online modular training and 3 sessions of wet lab training. Their initial 10 resections were completed under proctorship. A database was designed collecting information from the notes, November 2017 till July 2021 prospectively. This database was compared against a retrospective database on the same outcomes for non robotic cases over the same time period, performed by the same surgeons. LOS was statistically assessed using Mann-Whitney U test.

Results
As of July 2021, we have completed 73 cases. These are 25 benign and 48 cancer cases. The M:F was 1.5:1 and the median age was 66 years (22-84 years). The primary and secondary outcomes are illustrated below.

<table>
<thead>
<tr>
<th>Surgery</th>
<th>LOS (Median &amp; Range)</th>
<th>Robotic</th>
<th>Non Robotic</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benign</td>
<td>ITU (days)</td>
<td>0 (0-7)</td>
<td>4 (0-23)</td>
<td>0.0044</td>
</tr>
<tr>
<td></td>
<td>Hospital (days)</td>
<td>2 (0-10)</td>
<td>4 (0-17)</td>
<td>0.38</td>
</tr>
<tr>
<td>Cancer</td>
<td>ITU (days)</td>
<td>2 (0-23)</td>
<td>5 (0-34)</td>
<td>0.0015</td>
</tr>
<tr>
<td></td>
<td>Hospital (days)</td>
<td>10 (0-71)</td>
<td>15 (7-102)</td>
<td>0.34</td>
</tr>
</tbody>
</table>

Conclusions
Robotic Upper GI surgery is safe and feasible with good short term outcomes. There is a reasonable learning curve and therefore a structured learning programme is needed before embarking. The main advantage from preliminary data suggests a reduction in the LOS in critical care. The cost-effectiveness in complex benign surgeries remains to be determined with increase volume of cases.
Copper-dependent cell death is a cancer specific vulnerability in oesophageal adenocarcinoma and provides the opportunity for future biomarker-stratified clinical trials

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Background
Oesophageal adenocarcinoma (OAC) is of increasing global concern due to increasing incidence, lack of effective treatments, and poor prognosis. Therapeutic target discovery and clinical trials have been hindered by the heterogeneity of the disease, dominance of large-scale genomic rearrangements, and lack of driver mutations. We have profiled small-molecule compounds using an innovative high content imaging assay in a panel of transformed and non-transformed oesophageal cell lines to identify OAC-specific cytotoxic compounds, new therapeutic targets, potential drug repurposing opportunities, and chemical starting points for the treatment of OAC.

Methods
We have comprehensively profiled 19,555 small-molecule compounds using an innovative high content assay to quantify 1000’s of subcellular imaging features to capture important phenotypes missed by standard approaches. Prioritised molecules then underwent functional, transcriptomic, and metabolomic characterisation across panels of oesophageal cell lines and patient-derived organoids for the identification of OAC-specific drug mechanisms.

Results
We identified 72 lead compounds as exhibiting OAC-specific cytotoxicity and characterised three of the most potent and selective compounds in depth, each of different proposed classes and chemical structures. Using several orthogonal methods we uncovered a unified mechanism of action and a targetable vulnerability in OAC involving copper-dependent cell death. Strikingly no phenotypic effects or changes in gene-expression were observed following treatment with these compounds in non-transformed oesophageal cell lines or normal gastric organoids providing support for this mechanism as a cancer-specific phenomenon.

Conclusions
We have applied high content imaging, transcriptomic and metabolomic analyses to reveal a unique vulnerability in OAC. We have defined a unified mechanism of OAC-specific copper-dependent cell death for the three highly potent compounds. Finally, through the integration of transcriptomic and metabolomics analyses we gained insight into drug sensitivity and provide the basis for a future biomarker-stratified clinical trial of these drugs in OAC.
Incidence, diagnosis and management of malabsorption following oesophagectomy: a systematic review

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Background
Survival following oesophagectomy for oesophageal cancer is increasing. This has resulted in increased focus on quality-of-life and improved survivorship. Weight loss and malnutrition occurs in 25-46% of patients after three years, with associated adverse gastrointestinal symptoms. Malabsorption syndrome is multifactorial and includes exocrine pancreatic insufficiency (EPI), small intestinal bacterial overgrowth (SIBO) and bile acid malabsorption (BAM), however there is little literature available in patients following oesophagectomy. The aim of this study was to evaluate the reported incidence and management of malabsorption syndromes post-oesophagectomy.

Methods
A systematic search of PubMed, EMBASE, MEDLINE, Scopus and the Cochrane Library evaluating incidence, diagnosis and management of malabsorption was performed for studies published until March 2021.

Results
Of 461 identified studies, seven studies (6/7 non-randomised observational studies) were included, with a combined population of 344 (range 7-87). Incidence of malabsorption syndromes including EPI, SIBO and BAM were 10.2-100%, 37.8-100% and 3.33-100% respectively. There was no consensus definition for EPI, SIBO or BAM; and there was variation in diagnostic methods. Diagnostic criteria varied from clinical (gastrointestinal symptoms or weight loss), or biochemical (faecal elastase, hydrogen breath test and Selenium-75-labelled synthetic bile acid measurements). Treatment modalities using pancreatic enzyme replacement, rifaximin and colesevelam showed improvement in symptoms and weight in all studies.

Conclusions
Malabsorption syndromes following oesophagectomy are likely to be severely underestimated. The resultant gastrointestinal symptoms have a negative effect on post-operative quality of life. Current literature suggests benefit with outlined therapies, however greater understanding of these conditions, their diagnosis, and management is required to further understand which patients will benefit from treatment.
P-OGC34
Pandemic paradigms: Early outcomes of radical chemoradiotherapy for patients with operable oesophageal and oesophago-gastric junctional adenocarcinoma

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Background
The peak waves of the COVID pandemic necessitated a paradigm shift in surgical management of patients with oesophageal adenocarcinoma due to both pressure on services and high mortality rates for those with COVID undergoing surgery. The Association of Upper GI Surgeons (AUGIS) guidance on treating Upper gastrointestinal cancers in the COVID era made suggestions to treat operable adenocarcinomas using definitive/consolidation chemoradiation (DCRT) over standard neo-adjuvant chemotherapy (NAC) and our unit altered practice accordingly for a cohort of patients. For affected patients we monitored and audited clinical outcomes and the initial results from this are presented here.

Methods
Patients with oesophageal or oesophago-gastric junctional (O/OGJ) adenocarcinoma with potentially curative disease where initial management was altered from a treatment path which would have included surgery (with or without neoadjuvant therapy) to DCRT discussed at our regional multidisciplinary team (MDT) meeting between 1st February-1st June 2020 were included. Patient demographics, investigations, treatment given and clinical outcomes were prospectively recorded.

Results
31 Patients with operable adenocarcinoma of O/OGJ had treatment altered to DCRT (mean age 65.4, [range 43 – 79]), 28 (90%) Male. 1 patient deteriorated prior to starting, leaving 30 who completed DCRT. Of these 4 patients had already had NAC prior to DCRT.
Follow up was for a median of 8 (range 4-8) months following start of treatment.
Post- vs pre-treatment FDG-PET imaging demonstrated a significant reduction in the mean maximum standardized uptake value (SUVmax) (p=0.003, Sign test), in all but 3 patients.
11 patients had DCRT alone, (all alive at the time of data collection), of whom 3 patients had no sign of tumour. 19 (56%) patients proceeded to salvage oesophagectomy at a median of 15(range 10-25) weeks after completion of DCRT. 42% of these patients had a complete pathological response to treatment. There was a 5% perioperative mortality rate for this group and 1 patient was found to be unresectable on the day of surgery.
At the time the data was reviewed overall survival of the entire cohort was 91%, 56% of whom had no sign of residual or recurrent disease.

Conclusions
A disease free survival of 56% compares poorly with the literature at the 3-month interval. The long-term follow-up of these patients will only be apparent in the coming months and years. This data does not support the use of this modality in the future and alternate treatment plans should be devised for future pandemics.
Does Adjuvant Chemotherapy Provide Additional Survival Benefit After Neoadjuvant Chemotherapy or Chemoradiotherapy and Esophagectomy for Esophageal Adenocarcinoma?

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Background
The evidence assessing the additional benefits of adjuvant chemotherapy (AC) following neoadjuvant therapy (NAT; i.e. chemotherapy or chemoradiotherapy) and esophagectomy for esophageal adenocarcinoma (EAC) are limited. This study aimed to determine whether AC improves long-term survival in patients receiving NAT and esophagectomy.

Methods
Patients receiving esophagectomy for EAC following NAT from 2004 - 2016 were identified from the National Cancer Data Base (NCDB). Patients with survival < 6 months were excluded to account for immortality bias. Propensity score matching (PSM) and Cox regression was performed to account for selection bias and analyze impact of AC on overall survival.

Results
Overall 12,972 (91%) did not receive AC and 1,255 (9%) received AC. After PSM there were 2,485 who received AC and 1,254 who did not. After matching, AC was associated with improved survival (median: 38.5 vs 32.3 months, p<0.001), which remained after multivariable adjustment (HR: 0.78, CI 95% : 0.71 - 0.87, p<0.001). On multivariable interaction analyses, this benefit persisted in subgroup analysis for nodal status: N0 (HR: 0.85, CI 95% : 0.69 - 0.96, p=0.039), N1 (HR: 0.66, CI 95% : 0.56 - 0.78, p<0.001), N2/3 (HR: 0.80, CI 95% : 0.66 - 0.97, p=0.024) and margin status: R0 (HR: 0.77, CI 95% : 0.69 - 0.86, p<0.001), R1 (HR: 0.60, CI 95% : 0.43 - 0.85, p=0.004). Further, patients with stable disease following NAT (HR: 0.60, CI 95% : 0.59 - 0.80, p<0.001) or downstaged (HR: 0.80, CI 95% : 0.68 - 0.95, p=0.009) disease had significant survival benefit after AC, but not patients with upstaged disease.

Conclusions
AC following NAT and esophagectomy is associated with improved survival, even in node-negative and margin-negative disease. NAT response appears crucial in identifying patients who will benefit maximally from AC, and thus future research must be focused on identifying tumors that respond to chemotherapy to maximize this prognostic benefit.
Staging Laparoscopy in Oesophago-gastric cancers; A highly selective approach and its impact on patient outcome during COVID 19

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Background
Staging laparoscopy is performed in all Oesophago-gastric cancer patients suitable for radical treatment with tumour staged ≥T2 prior to neoadjuvant chemotherapy. In response to COVID 19 pandemic, on 25th March 2020, the joint statement issued by the Royal College of Surgeons and AUGIS advised all laparoscopic procedures should be avoided due to the risk of virus transmission associated with aerosol-generating procedures. In accordance with the guidance, a more selective approach on who underwent a staging laparoscopy was followed. This audit explores its impact on patient outcome comparing data from pre COVID period with the COVID period.

Methods
Retrospective and prospective data was collected for 24 months on all OG cancer patients from 25th March 2019 to 24th March 2021. ‘Pre COVID’ period was defined as 25th March 2019 to 24th March 2020 and ‘COVID’ period was defined as 25th March 2020 to 24th March 2021. All patients with Oesophago-gastric cancer with MDT cancer staged ≥T2, suitable for neoadjuvant chemotherapy were included. Patients with tumour staged <T2 and or diagnosed with squamous cell carcinoma involving upper or middle third of oesophagus were excluded. Fishers Exact model using SPSS V24 was used to identify any statistically significant differences between the 2 groups.

Results
Pre-COVID Period: 80 patients underwent staging laparoscopy. Of these, 9 patients (11.6%) with tumour staged as ≥T3 were declined curative surgery due to advanced disease (n=2), metastatic disease (n=3) or both (n=4). In total, 40 patients underwent curative surgery and there were 0 open/close laparotomies.

COVID Period: Of the 79 patients suitable for staging laparoscopy, only 7 patients (8.7%) underwent laparoscopy. Of these, 3 patients (3.8%) with tumour staged as ≥T3 were declined curative surgery due to advanced disease (n=2) and metastatic disease (n=1). In total, 33 patients underwent curative surgery and only 1 patient had an open/close laparotomy due to a liver metastases. No statistically significant difference was found p=0.0913

Conclusions
Staging laparoscopy is a useful tool for accurate staging of Oesophago-gastric cancers. It helps avoid unnecessary open and close laparotomy due to advanced disease and also allows us to assess patient fitness to major surgery. During the pandemic, the number of staging laparoscopies performed declined significantly but with no statistically significant difference to patient outcome. Thus we conclude, the COVID 19 pandemic has enabled us to have a selective approach to performing staging laparoscopy in Oesophago-gastric patients with advanced disease staged ≥T3 only.
Lymphatic embolisation for chylous abdomen following oesophagectomy

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Background
A 78 year old man underwent an Ivor Lewis oesophagectomy (laparoscopic converted to open abdominal phase, right thoracotomy) for a T2 N2 (3/81) R0 Type II GOJ adenocarcinoma post FLOT neoadjuvant chemotherapy. He developed a chylosus abdomen requiring drainage radiologically. A percutaneous lymphatic embolisation was performed which showed a leak in the region of the cisterna chyli which was successfully treated.

Methods
A lymph node in each groin was cannulated under US guidance using spinal needles and an infusion of Lipiodol was started at a rate of 6ml/hr each side. Lymphatic opacification was monitored under fluoroscopy with contrast having reached the cisterna chyli within 30 minutes. Contrast was seen extravasating near cisterna chyli, confirming an injury at this site. A lumbar trunk lymphatic was cannulated with a Chiba needle and wire enabling positioning of a microcatheter as close to the point of injury as possible. Onyx liquid embolic was used to embolise the feeding lymphatic trunk.

Results
Post-procedural drain outputs demonstrated an immediate significant drop, with losses of only 300ml/24hr within 48 hours. Drain outputs continued to taper and the drains removed shortly after. The cisterna chyli is typically thought of as a retroperitoneal/para-aortic structure not prone to instrumentation during an ILGO. Despite reviewing the intra-operative footage, a definitive moment/point of injury remains unclear.

Conclusions
Conservative management of abdominal chyle leak including use of TPN and octreotide is often effective but in sustained large volume ascites(>1000mls/24hr) this is unlikely to succeed. Percutaneous lymphatic embolization can be offered as a treatment option for these patients.
The Impact of the COVID-19 Pandemic on Barrett’s Oesophagus and Oesophago-gastric Cancer

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Background
The COVID-19 pandemic has placed an inexorable strain on endoscopy services worldwide, affecting the diagnosis of oesophago-gastric (OG) cancer and Barrett’s oesophagus (BO). As coronavirus infection rates rose many professional bodies advised that all endoscopy, except emergency and essential procedures be stopped immediately. We sought to quantify the decline in OG cancer and BO diagnoses following implementation of British Society of Gastroenterology (BSG) guidance related to COVID-19 and the psychosocial effects on BO patients.

Methods
We examined OG cancer and BO diagnoses in Northern Ireland from March-September 2020 and compared them with the three-year average number of patients during the same time period (corresponding to weeks 10-37) between 2017-2019 by utilising Northern Ireland Cancer Registry (NICR) data. The psychosocial impact of COVID-19 was assessed using an online survey, which included validated WHOQOL-BREF and EQ-5D-5L quality of life measures, and was completed by 24 BO patients from April-May 2020.

Results
Between March and September 2020 in Northern Ireland, the proportion of OG cancer and BO diagnoses declined by 26.6% and 59.3%, respectively, compared to expected levels. In April, BO diagnoses fell by 95.5% but by September, whilst OG cancer rates had returned to baseline, BO cases remained suppressed by approximately 20%. We estimate that these declines in diagnosis represent 53 ‘missed’ OG cancer and 236 ‘missed’ BO diagnoses. In the online survey sample, BO patients reported consistently lower quality of life scores than population norms, and highlighted a number of concerns with regard to their health and care.

Conclusions
The COVID-19 pandemic has resulted in an abrupt decline in OG cancer and BO diagnoses and has profoundly impacted the wellbeing of BO patients. Our study represents the first report of the impact of COVID-19 on the diagnosis of BO. Strategies to mitigate the ongoing effects of the pandemic are urgently required to preserve the ability to rapidly detect and diagnose cancer and pre-malignant conditions.
P-OGC39
The smell of oesophageal adenocarcinoma: opportunities for tests and treatments

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Background
Exhaled breath analysis is a promising approach for oesophageal adenocarcinoma (OAC) early detection. The biomarkers of interest are low molecular weight metabolites including volatile aldehydes. In this translational study we investigated whether these metabolites originated from a tumoral source, and how this might impact the diagnosis and treatment of OAC patients.

Methods
The investigative strategy was directed by an unbiased informatics screen of metabolic reprogramming in OAC, and validated using complimentary gene expression assays (n = 638, including controls). Mass spectrometric methods were used to quantify corresponding metabolites and putative source compounds at a tissue level (n = 158), and also in exhaled breath for correlative purposes. Targeted in vitro experiments were performed to demonstrate the cause and effect of the proposed model of metabolic reprogramming in OAC.

Results
The unbiased screen and subsequent validation found that reduced aldehyde detoxification is an OAC hallmark. In vitro and in vivo this was associated with endogenous aldehyde accumulation. OAC tissue was generally enriched for volatile aldehydes, including the genotoxins formaldehyde, acetaldehyde, 4-hydroxy-2-nonenal and 2-butenal, and the exhaled biomarker decanal (all P < 0.0001). Decanal concentrations correlated with exhaled concentrations. Considering potential aldehyde sources, the OAC phospholipidome was characterised by desaturated and longer lipid acyls, and these spontaneously generated biomarker aldehyde species at ambient conditions. Enriched genotoxic aldehydes were detectable in base-pairing positions in DNA; this genotoxicity was therapeutically targetable with aldehyde scavengers in vitro.

Conclusions
These data support a model for enriched exhaled aldehydes based on increased production from an altered lipid phenotype, and reduced detoxification. Some aldehydes are non-reactive and thus support non-invasive detection. Others react with DNA and increase local genotoxicity; this process is druggable. These findings have implications for OAC early diagnosis and chemoprevention.
Enhanced recovery after oesophagectomy at Oxford University Hospitals: the benefit of having a discharge target

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Background
Enhanced recovery after surgery (ERAS) is a multimodal approach to decreasing morbidity and accelerating return-of-function after major surgery. However, the majority of patients undergoing oesophagectomy for cancer experience some kind of complication, which extends their admission and causes pathway deviation. Thus, the value of having a discharge target (Day 8 at our institution) could be challenged. In this study we reviewed our experience using this pathway, with a focus on: (i) whether length of stay and morbidity has improved since pathway implementation (ii) describing the medical and non-medical reasons for extended admission (iii) identifying pre-operative predictors of pathway deviation

Methods
A retrospective review of a prospectively maintained database was performed. Complications are recorded during routine clinical care using standardised definitions set out by the Esophageal Complications Consensus group, and are updated in the database at a weekly departmental meeting. Median and interquartile range were used for descriptors and differences tested with Mann-Whitney U test or Chi squared tests, using SPSS ver 26. Multivariable models were fitted to establish independent predictors of pathway deviation, using a binary logistic regression approach with bootstrapping.

Results
150 of 448 patients met the 8-day target. Patients treated since 2018 were significantly more likely meet their discharge date (OR 1.28, P = 0.041) compared to 2015-2017, and have less complications. Surgical quality was unchanged. Thirty-day mortality increased but was still low (0.9% vs 1.8%, P = 0.067). Aside from having a complication (OR 4.15, P < 0.001), independent predictor of delayed discharge was female sex (OR 2.6, P = 0.003), squamous cell cancer histology (OR 2.8, P = 0.014) and low socio-economic status (OR 1.33, P = 0.014), but not age, smoking, BMI, co-morbidities and other baseline variables.

Conclusions
Enhanced recovery after oesophagectomy provides clear goals for the patient and multi-disciplinary team, however the target is often not met owing to the frequent nature of post-operative complications. Nonetheless these targets provide a culture for accelerated recovery, with steady improvement in short-term outcomes over time. A number of specific patient-groups are more likely to have extended admissions independent of complications, which has implications for optimising prehabilitation services. Overall, these findings suggest that having a discharge target is valuable, even though it often is not met.
Survival after curative chemoradiotherapy or neoadjuvant therapy and surgery converges in higher-risk patients with oesophageal cancer

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Background
Both curative chemoradiotherapy (cCRT) and neoadjuvant chemoradiotherapy and surgery (nC(R)TS) can be considered as treatments for potentially curable oesophageal squamous cell carcinoma (OSCC). Whilst this equipoise does not exist in oesophageal adenocarcinoma (OAC), there are patients in whom treatment decisions are not straightforward, creating an overlapping group in which cCRT might be considered in preference to neoadjuvant chemotherapy or chemoradiotherapy and surgery (nC(R)TS). We aim to see how survival changes between unmatched and matched cohorts of patients with OAC and OSCC treated with cCRT or nC(R)TS, to reflect difficult multidisciplinary team treatment decisions.

Methods
Patients treated with nC(R)TS or cCRT for OSCC and OAC were identified on an intention-to-treat basis from April 2016 to April 2019, allowing a minimum 2-year follow up from diagnosis. Upper third tumours were excluded due to clear preference for cCRT. Preoperative variables were compared using descriptive statistics, with OSCC and OAC analysed separately. Significantly different variables were used to generate propensity scores. Cohorts were then matched and analysis repeated to assess cohort symmetry. Overall survival and 2-year survival were investigated using Kaplan-Meier survival curves and log-rank testing. Analysis was performed in R.

Results
60 and 231 patients with OSCC and OAC were treated with cCRT or nC(R)TS. In the unmatched analysis, nC(R)TS had superior overall and 2-year survival, however there were significant differences in age, Charlson comorbidity index and cancer stage in OSCC and OAC cohorts, and in tumour site for the OAC cohort. After propensity score matching, differences in overall and 2-year survival reduced, though no results reached significance (OSCC: nC(R)TS 2y survival 58% vs 51% and 54% in unmatched and matched cCRT cohorts, respectively; OAC: cCRT 2y survival 51% vs 60% and 56% in unmatched and matched nC(R)TS cohorts, respectively).

Conclusions
These data suggest that as patient and cancer related factors increase the difficulty of treatment decisions, the survival benefit of surgery reduces in both OSCC and OAC. These results underline the need for randomised controlled trials using current treatment and staging strategies, as there have been considerable advances since original comparisons of neoadjuvant and curative chemoradiotherapy. This study is limited by relatively short follow up and unpowered sample sizes, however the coded nature of the analysis provides a structure for regular review of outcomes in our unit using routinely collected data, and could be easily applied more widely.
Hiatus Hernia following Minimally Invasive Oesophagectomy - a Single Centre Experience

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Background
Hiatus hernia is an established complication following oesophagectomy, with a higher incidence when a minimally invasive approach (MIO) is undertaken. Literature reports the incidence post-MIO to be vary between 4.5% -26%. There is no clear consensus on the optimum operative management of this complication. The aim of this study was to establish the incidence of hiatus hernia post MIO (HiHO) at a single hospital site, identify predisposing factors, and evaluate subsequent surgical management of this complication.

Methods
Single-center data were retrospectively analysed of MIOs conducted consecutively between May 2018 and October 2020. A minimum follow-up period of 6 months was required for inclusion. HiHO was defined by radiological confirmation. Data collected included patient demographics, comorbidities, risk factors for hiatus hernia and patient’s post-operative course. Statistical analyses were performed using Fischer’s exact or independent t-test as appropriate.

Results
50 patients who underwent MIO were included; mean follow up of 1.92 years. 7 (14%) presented with HiHO. There was no significant difference in age or gender between patients with and without HiHO. HiHO patients had a significantly lower BMI (95% CI 1.083-8.271; P = 0.012) and were more likely to have underlying lung conditions (P= 0.029). A higher incidence of pre-existing hiatus hernia was present among the HiHO group (43% vs 21%). Of those developing HiHO, 6 (86%) were symptomatic requiring surgical reduction with crural repair of hiatus or colopexy; 2 had a recurrence of HiHO requiring subsequent colopexy.

Conclusions
This study represents the largest single centre analysis of hiatus hernia post minimally invasive oesophagectomy. Our results correlate with the literature, that there is a significant risk of hiatus hernia following minimally invasive oesophagectomy. This risk is increased among patients with pre-operative hiatus hernia, low BMI, and pre-existing lung conditions. Crural repair or colopexy are options for surgical management of HiHO. Colopexy may potentially prevent recurrence of HiHO. A larger study size and a consensus from experts in the field would be beneficial in guiding operative management of HiHO to improve patient outcomes.
Morbidity and unplanned hospital attendance among patients with oesophagogastric cancer treated with home enteral nutrition

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Background
Nutritional optimisation is an essential component of prehabilitation and enhanced recovery for patients with oesophageal and gastric cancer, but may be associated with increased burden of inpatient care. The aim of this study was to determine risk factors associated with complications and unplanned hospital attendance among patients treated with home enteral nutrition.

Methods
Consecutive patients with oesophageal or gastric cancer commencing home enteral nutrition from March 2020-June 2021 were prospectively studied. The primary outcome measure was the incidence of complications associated with home enteral feeding requiring unplanned hospital attendance. Univariable and multivariable linear and logistic regression were used to determine factors independently associated with enteral feeding associated morbidity and healthcare utilisation.

Results
70 patients were studied (27% pre neoadjuvant therapy, 63% postoperative; 19% gastrostomy, 81% jejunostomy). Tube complications requiring unplanned hospital attendance occurred in 33% of patients (25% gastrostomy, 38% jejunostomy, \( P=0.405 \)), most commonly dislodgement (15%), fixation problem (13%), and blockage (6%). Small bowel obstruction was rare (1.4%). Inpatient length of stay (LOS) following feeding tube placement and training was 5.1±2.4 days (gastrostomy: 5.5±2.7, jejunostomy: 4.4±1.9 days, \( P=0.074 \)). 17 unplanned hospital visits among nine patients (13.0%) occurred with a cumulative LOS of 71 inpatient days. On multivariable analysis patients undergoing neoadjuvant therapy were at the greatest risk of overall enteral feeding tube morbidity (OR19.34 [3.29–113.56], \( P=0.001 \)), dislodgement (OR19.09 [2.35-155.11], \( P=0.006 \)) and unplanned hospital attendance \( (P<0.001) \). Older patients were at increased risk of tube dislodgement (OR1.14 [1.02–1.28], \( P=0.024 \)) and unplanned hospital attendance \( (P=0.034) \).

Conclusions
Unplanned hospital attendance is common among patients undergoing supplemental home enteral nutrition during treatment for oesophagogastric cancer. Fixation problems and dislodgement account for the majority of presentations, and are more common among older patients and those undergoing neoadjuvant therapy. Pragmatic strategies to optimise tube fixation and minimise the need for unplanned hospital visits among patients receiving home enteral nutrition are urgently needed.
Multi-omic cohort study of Barrett’s oesophagus reveals structural variation and retrotransposon activity to occur early in cancer evolution

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Background
Barrett’s oesophagus (BE) is the main risk factor for the development of oesophageal adenocarcinoma (OAC), yet few patients ever go on to progress to cancer. The acquisition of events during the metaplasia-dysplasia-cancer sequence is poorly characterised. We present a large, unbiased, multi-omics analysis of a cross-sectional cohort of pre-cancer samples, with the aim of providing a comprehensive insight into the diversity and molecular changes driving the disease to cancer.

Methods
We generated and integrated the genomic (50x), transcriptomic and epigenomic (850K EPIC array) landscapes of snap-frozen endoscopic biopsies from 146 patients with a range of outcomes (27 long-standing non-dysplastic; 12 prior to progression to dysplasia; 14 low-grade; 25 high-grade; 21 intramucosal carcinoma; 47 cases of BE taken adjacent to OAC) and 642 person years of follow-up. All biopsies were reviewed independently by 3 pathologists and had associated annotation with detailed clinical information.

Results
The total number of structural variants (SV) captured the most variance between samples. Complex SVs and LINE-1 retrotransposon activity were observed even before dysplasia had developed and increased with progression. Increasing SV burden was associated with chromothripsis (12%, 18/146) and breakage-fusion bridges (BFBs; 8%, 13/146). In more than 50% of these, the BFBs were in chromosome 17, harbouring the oncogenes ERBB2 and CDK12, for which expression was significantly higher. With progression there was increased expression of genes related to cell-cycle checkpoint, DNA repair and chromosomal instability, and the epigenetic silencing of genes in WNT-signalling and cell-cycle pathways.

Conclusions
Genomic complexity occurs very early in the natural history of BE and increasing genomic instability appears to tip the balance towards cancer. This may inform the potential for progression to cancer beyond the clinically discernible phenotype. Efforts to better understand the triggers for chromosomal breakages and rearrangements that underly progression will aid clinical prediction and prevention strategies.
Could lymphatic, vascular or perineural invasion status improve clinical staging prior to oesophagectomy?

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Background
Unimodal treatment of oesophagogastric cancer (OGC) with surgery only is currently reserved for patients with early disease. Presence of vascular (VI), perineural (PNI) or lymphatic vessel invasion (LI) in pathological samples have been shown to be negative prognostic indicators of survival. These factors have been found to be associated with more advanced disease. Staging of OGC has limitations and in neoadjuvant naive populations it has been shown to be imperfect. It is unknown whether VI, PNI or LI could play any role during the staging process.

Methods
Patients with early disease (cT2 or less and cN0) who underwent unimodal treatment of their oesophageal or junctional cancer with oesophagectomy between 2010 and 2019 in a single centre were included in this study. The relationship between presence of LI, VI and PNI on pathological samples with incorrect staging/upstaging indicating locally advanced disease (defined as pT3+ or pN+) was studied using logistic regression model.

Results
There were 128 patients included. 26 patients (20%) were upstaged to pT3+ or pN+. LI, VI and PNI were present in 18%, 11% and 8% respectively. The presence of LI and clinical T stage were independently predictive of incorrect staging/upstaging in multivariable logistic regression analysis. LI (OR 12.5 95%CI 3.7-42.8, p<0.001) and cT2 (OR 5.9 95%CI 1.5-23.2, p=0.01).

Conclusions
These results indicate that the presence of LI from pathological samples is a strong independent prognostic factor of incorrect staging which would normally favour neoadjuvant treatment. The presence of LI suggests aggressive disease. Further studies should concentrate on the possibility of obtaining LI status from preoperative biopsies or endoscopic mucosal resection samples. This staging information could play an important role in deciding whether neoadjuvant therapy is indicated in patients staged as early disease.
**P-OGC46**

**Physiotherapy Regimens in Esophagectomy and Gastrectomy: a Systematic Review and Meta-analysis**

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**Background**

Esophageal and gastric cancer surgery are associated with considerable morbidity, specifically postoperative pulmonary complications (PPC), potentially accentuated by underlying challenges with malnutrition and cachexia affecting respiratory muscle mass. Physiotherapy regimens aim to increase the respiratory muscle strength and may prevent postoperative morbidity. This meta-analysis aims to assess the impact of physiotherapy regimens following esophagectomy or gastrectomy.

**Methods**

An electronic database search was performed in MEDLINE, EMBASE, CENTRAL, CINAHL and Pedro databases. A meta-analysis was performed to assess the impact of physiotherapy on the functional capacity, incidence of PPC and postoperative morbidity, in-hospital mortality rate, the Length of Hospital Stay (LOS) and the Health-Related Quality of Life (HRQoL).

**Results**

Seven RCTs and 7 cohort studies assessing prehabilitation totalling 960 patients, and 5 RCTs and 5 cohort studies assessing peri- or postoperative physiotherapy with 703 total patients, were included. Prehabilitation resulted in a lower incidence of postoperative pneumonia and morbidity (Clavien-Dindo score ≥II). No difference was observed in functional exercise capacity, and in-hospital mortality following prehabilitation. Meanwhile, peri- or postoperative rehabilitation resulted in a lower incidence of pneumonia, a shorter LOS and better HRQoL scores for dyspnea and physical functioning, while no differences were found for the QoL summary score, global health status, fatigue and pain scores.

**Conclusions**

Our meta-analysis shows that implementing an exercise intervention may be beneficial in both the preoperative and peri- or postoperative period. Further investigation is needed to understand the mechanism through which exercise interventions improve clinical outcomes and which subgroup of patients will gain the most benefit.
Anastomotic stricture after Ivor Lewis Oesophagectomy - An evaluation of incidence, risk factors and treatment

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Background
Anastomotic stricture is a recognised complication after oesophagectomy. It can impact the patient’s quality of life and may require recurrent dilatations. The aim of this study was to evaluate the frequency of benign strictures, contributing factors, and the long-term outcomes of management in patients undergoing oesophagectomy with thoracic anastomosis using a standardised circular stapler technique.

Methods
All patients who underwent a two-stage transthoracic oesophagectomy with curative intent between January 2010 and December 2019 at this single, high volume centre were included. All patients who underwent a stapled (circular) intrathoracic anastomosis using gastric conduits were included. Those with variations to anastomotic technique or those not having a transthoracic anastomosis were excluded to reduce heterogeneity. Patients who developed malignant anastomotic strictures and patients who died in hospital were excluded from the analysis. Benign stricture incidence, number of dilatations to resolve strictures, and refractory stricture rate were recorded and analysed.

Results
Overall, 705 patients were included with 192 (27.2%) developing benign strictures. Refractory strictures occurred in 38 patients (5.4%). One, two, and three dilatations were needed for resolution of symptoms in 46 (37.4%), 23 (18.7%), and 20 (16.3%) patients respectively. Multivariable analysis identified the occurrence of an anastomotic leak (OR 1.906, 95% CI 1.088-3.341, p=0.024) and circular stapler size <28mm (OR 1.462, 95% CI 1.033-2.070, p= 0.032) as independent predictors of stricture occurrence. Patients with anastomotic leaks were more likely to develop refractory strictures (13.1% vs. 4.7%, OR 3.089, 95% CI 1.349-7.077, p=0.008).

Conclusions
This study highlights that nearly 30% of patients having a circular stapled anastomosis will require dilatation after surgery for a benign anastomotic stricture. Although the majority will completely resolve after 2 dilatations, 5% will have longer-term problems with refractory strictures. Smaller circular stapler size and anastomotic leak have been identified as independent risk factors for developing a benign anastomotic stricture following oesophagectomy, and these patients should be monitored closely for symptomatology following surgery.
Definitive Chemoradiotherapy versus Neoadjuvant Chemoradiotherapy Followed by Radical Surgery for Locally Advanced Esophageal Squamous Cell Carcinoma: Systematic Review and Meta-analysis

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Background
Debate exists surrounding definitive chemoradiotherapy (dCRT) over neoadjuvant chemoradiotherapy and surgery (nCRTS) as a primary treatment for esophageal squamous cell carcinoma (ESCC) owing to the heterogeneity in the quality of current evidence. This study aimed to compare long-term survival of dCRT with nCRT for ESCC from high-quality studies.

Methods
This systematic review was performed according to PRISMA guidelines and eligible studies were identified through a search of PubMed, Scopus and Cochrane CENTRAL databases up to 23rd July 2021. Primary outcome was overall survival (OS) and secondary outcomes were disease-free survival (DFS) and recurrence rates. A meta-analysis was conducted using random-effects modelling to determine pooled adjusted multivariable hazard ratios (HRs).

Results
This review included ten high-quality studies including 14,092 patients, of which 30% received nCRT. Three studies were randomized controlled trials (RCT), six studies were single-center. dCRT and nCRT regimens were reported in six studies and surgical quality control were reported in two studies. Outcomes for OS and DFS were reported in eight and three studies, respectively. nCRT had significantly longer OS (HR: 0.68, CI95%: 0.54 - 0.87, p<0.001) and DFS (HR: 0.50, CI95%: 0.36 - 0.70, p<0.001) than dCRT.

Conclusions
nCRT followed by planned esophagectomy appears to remain the optimum curative treatment regime in patients with loco-regional ESCC. Thus, surgery remains an integral component of the management of patients with ESCC. As adjuvant and immunotherapy treatment regimens develop, ongoing prospective assessment of the role of radiotherapy in combination with modern treatment modalities should be studied.
P-OGC49
Reporting on Patient and Public Involvement in Oesophago-gastric Research Trials using the GRIPP 2 checklist

Aya Musbah, Arul Immanuel
Newcastle University Hospitals Trust, Newcastle, United Kingdom

Background
There is increasing evidence on the value of PPI reporting (patient public involvement) in all research. GRIPP2 (Guidance for Reporting Involvement of Patients and the Public) is the first international guidance for reporting of patient and public involvement in health and social care research. Associations with improved relevance and applicability may reduce research waste and target research funds more appropriately. The aim of this study was to review the reporting of PPI amongst all oesophago-gastric clinical trials undertaken between 2015 and 2021.

Methods
An electronic search in databases Medline, Embase and the Cochrane Library was conducted to identify all clinical trials pertaining to oesophagogastric cancer from 2015 to 2021 (with the exception of reviews, case reports and conference abstracts). Articles were scanned by two authors to identify if reporting of PPI had taken place.

Results
A total of 334 studies were found, of which 285 met the inclusion and exclusion criteria. Only 4 studies had reported on PPI. Two of which reported positive involvement and two reported negatively. None of the studies reported using the GRIPP 2 checklist and when reported by this study, none achieved all points on the GRIPP2 SF checklist. An analysis on the extent of PPI involvement in these studies was carried out.

Conclusions
PPI is poorly reported across oesophago-gastric research trials.
An Objective Evaluation of Youtube Videos on Oesophageal Cancer using the PEMAT Score

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Background
Studies in patient literature particularly regarding online video literature in all fields are few. Scoring systems for video materials such as the validated PEMAT(Patient Education Material Assessment Tool) have been used before to look at video patient literature. The aim of this study is to use the PEMAT tool to evaluate the quality of Youtube patient literature on oesophageal cancer and look at the inter rater reliability between lay and medical scorers.

Methods
A Youtube search was performed in April 2021 using the search terms “oesophageal cancer”, “esophageal cancer” “gullet cancer”. Characteristic data collected included language, ratings (thumbs up), type of video, country of origin and presence of advertising as well as intended audience. A PEMAT tool which is validated instrument to rate patient video material was used. A score of 70% is acceptable in the actionability and understandability domains. Cohen’s kappa coefficient was used to test inter-rater reliability between two lay person raters; and two medical raters.

Results

Seven sites were rated as understandable by the medical raters average and 13 were rated understandable by the lay raters average. Only two videos achieved best case scenario where both medical raters rated as understandable, rather than the average of both. Twelve videos were rated by both lay raters as understandable. Actionability rated poorer with only two videos rated as actionable on average by the medical raters and seven rated actionable by the lay raters on average.

Conclusions
Youtube videos on Oesophageal cancer score poorly in terms of actionability and understandability
A Review of Post-Oesophagectomy Benign Anastomotic Strictures

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Newcastle University Hospitals Trust, Newcastle, United Kingdom

Background
Benign anastomotic strictures (BAS) are a known risk of oesophageal resection, leading to significant post-operative morbidity and a reported incidence of BAS varies widely from 8.83% to 42.38%. This review aims to assess incidence, risk factors for development as well as treatment.

Methods
An electronic search using specific search terms using Medline, Embase and the Cochrane Library to identify all articles studying the development of BAS in adults post oesophagectomy was carried out. Inclusion criteria were patients who underwent any form of oesophagectomy for malignant disease (Ivor Lewis, McKeown, thoracoabdominal, transhiatal, minimally invasive); patients in study >18-year-old; study reported only benign anastomotic strictures and any study design with a minimum of 6 patients. Only articles published in the English language were included. Review articles, case reports and conference abstracts were all excluded.

Results
Seven studies reported on the incidence of BAS and an average of 34.1% was found. Cervical anastomosis, anastomotic leak development. Cardiovascular disease, diabetes and gastric conduit and smaller gun size in a stapled anastomosis were also found to be associated with BAS. Hypertension, neoadjuvant chemotherapy, transhiatal oesophagectomy or transthoracic were not found to be associated with BAS. The mainstay of management appears to be endoscopic balloon dilatation with adverse reported outcomes related to stent management.

Conclusions
BAS after oesophagectomy is common. Several risk factors have been identified and balloon dilatation appears to be the mainstay of treatment.
**Background**
Ongoing debate exists between neoadjuvant FLOT or CROSS for oesophageal cancers, especially adenocarcinoma (EAC). However, current evidence is limited to institutional series with mixed inclusion of oesophageal squamous cell carcinoma (ESCC). Therefore, and large, multicenter studies are limited. This study aimed in reporting pathologic outcomes comparing FLOT and CROSS.

**Methods**
Patients undergoing receiving neoadjuvant therapy (i.e. FLOT vs ECF/ECX vs. CROSS) curative resection for EAC were identified from the international Oesophagogastric Anastomosis Audit (OGAA) from April 2018 - December 2018. Primary outcome was pathologic complete response (pCR). Secondary outcomes include margin-negative resections, post-operative complications (i.e. anastomotic leaks, major complications) and 90-day mortality. Sensitivity analyses were performed in patients who had completed all cycles of planned neoadjuvant chemotherapy.

**Results**
This study included 1,030 patients with oesophageal cancers. In patients with EAC, 36% (n=368) received FLOT, 30% (n=312) received ECF/ECX and 34% (n=450) received CROSS. Patients receiving CROSS had significantly higher rates of pCR (18% vs 10% vs 4%, p<0.001) and margin-negative resections (93% vs 76% vs 69%, p<0.001) than patients receiving FLOT or CROSS, which remained in adjusted analysis. Patients receiving ECF/ECX had significantly higher rates of completion of all planned cycles than FLOT or CROSS (91% vs 87% vs 82%, p<0.001). Sensitivity analyses of patients with who completed all planned cycles demonstrated CROSS had significantly higher rates of pCR (19% vs 11% vs 4%, p<0.001) and margin-negative resections (92% vs 78% vs 70%, p<0.001) than patients receiving FLOT or ECF/ECX.

**Conclusions**
CROSS appears to achieve higher pCR and margin-negative rates than FLOT in EAC with comparable post-operative outcome profiles. This study provides real-world data in the absence of randomised controlled trials comparing these chemotherapy regimens. Future research should focus on long-term outcomes of FLOT in these patients and role of FLOT in ESCC patients.
Dashboarding for real-time analysis of oesophagogastric outcomes data

Oxford University Hospitals, Oxford, United Kingdom

Background
The typical paradigm for surgical service evaluation is intermittent audit based on perceived clinical need and mandated requirements. A better model would be monitoring patient outcomes automatically in real-time, with up-to-date cumulative frequencies of key surgical performance indicators such as surgical quality and morbidity, as changes in performance could be detected and reacted to at an earlier stage. This study aimed to develop a dashboarding technology to support real-time visualisation of prospectively maintained oesophagogastric cancer surgery data.

Methods
CODA is a bespoke databank (implemented in MS SQL Server, with HTML, C# and JavaScript) for oesophagogastric cancer care at our centre. We built on a custom dashboard interface for displaying this information in real-time, using Shiny for R and Tableau. We identified the key performance indicators (KPIs) to monitor in the dashboard, and defined benchmarks based on accepted standards, or our prevailing performance (based on 448 consecutive patients who underwent oesophagectomy between 2015 – 2020). The domains selected were surgical quality, length of stay, early mortality, and priority complications. Complications were defined according to the Esophagectomy Complications Consensus Group.

Results
For surgical quality, our benchmarks based on prevailing performance were (i) >90% >15 lymph node yield (ii) <2-5% longitudinal R1 (iii) <20-30% CRM R1. For length of stay, our benchmarks were (i) >33% meeting 8 day discharge target (ii) <15% missing target discharge without a medical complication (iii) <20% staying longer than two weeks. For 30 & 90 day mortality, our benchmarks were 2% and 4% respectively. For complications, two sets were identified: (i) common complications (occurring at >2 / year, monitored 2-yearly) (ii) impactful complications (>1 / year, >1 week median additional stay, monitored 5-yearly)

Conclusions
The CODA dashboard provides real-time appraisal of oesophagogastric cancer surgery practice, highlighting changes in performance and providing opportunity for early intervention. The platform can be used for personal, departmental or inter-institutional service evaluation. The KPIs will be extended to oesophagogastric cancer survival as the test set matures. The interface and wider benefits of CODA implementation are presented, together with the dissemination plan for use in other oesophagogastric centres.
P-OGC54
Economic cost utility analysis of stage directed oesophageal adenocarcinoma treatment

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Background
Oesophageal Cancer (OC) treatment levies substantial financial burden on Health Services and Best Supportive Care (BSC) outcomes are poor. Potentially Curative Surgery with or without Chemotherapy is offered to patients with locally advanced disease and this study aimed to examine treatment costs related to life-years gained in patients having potentially curative treatment (oesophagectomy) and those receiving Best Supportive Care (BSC).

Methods
Consecutive 179 patients diagnosed with potentially curative adenocarcinoma of the oesophagus between 2010 and 2017 were classified according to treatment modality by intention to treat (surgery vs. neoadjuvant/adjuvant chemotherapy). Cost calculations for one-year’s treatment from referral were made according to network diagnostic, staging, and treatment algorithms. Primary outcome was Overall Survival (OS).

Results
OC median survival after BSC is reported to be 3 months costing £4391 compared with Oesophagectomy median survival (all stages) of 44 months costing an average of £26,652 for one year’s treatment: BSC cost per QALY £92,448 compared with £12,207.20 for potentially curative surgery. Cost incurred for stage I OC was £25,153.09, stage II £26,795.17, stage III £28,781.81, and stage IV £28,592.64. Based on these values, the cost per Quality Adjusted Life Year (QALY) for stage I OC was £8,361, II £12,319, III £21,998 IV £35,011.

Conclusions
Potentially curative treatment that included oesophagectomy improved OS fifteen-fold compared with BSC and was cost effective at national thresholds of readiness to pay per QALY.
**P-OGC55**

Current treatment modalities and median survival for patients with gastric and oesophagogastric cancers with isolated peritoneal metastasis

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**Background**

Gastric cancer with peritoneal metastases carries a median survival of only 3-7 months without treatment. Meanwhile, cancers arising from the oesophago-gastric junction (OGJ) are rapidly increasing in incidence in the Western population and are also commonly associated with peritoneal metastases. In order to measure the efficacy of emerging modes of treatment for peritoneal disease, it is essential to describe the treatments patients currently receive and the impact of these on survival – data for which is poorly described in the literature and lacking in the UK setting.

**Methods**

This was a single hospital-based retrospective cohort study covering the period from March 2012 to January 2020 at a tertiary referral centre. 50 patients were identified from multidisciplinary team (MDT) meeting records receiving a diagnosis of gastric adenocarcinoma with isolated peritoneal disease. 31 patients were identified receiving a diagnosis of true (Siewert II or III) junctional adenocarcinoma with isolated peritoneal disease. We calculated median survival time for all patients and also by treatment modality.

**Results**

Mean age of patients with gastric adenocarcinoma and isolated peritoneal disease was 71 years (range 44-90). Overall median survival was 6.6 months (IQR 2.4-19.3). Median survival was 11.2 months (IQR 3.7-21.5) for patients receiving systemic chemotherapy (n=26) and 2.4 months (IQR 1.2-5.1) for patients receiving best supportive care alone (n=15).

Mean age of patients with junctional adenocarcinomas and isolated peritoneal disease was 70 years (range 37-89). Overall median survival was 7 months (IQR 3-19). Median survival was 10.5 months (IQR 6.5-20.5) for patients receiving systemic chemotherapy (n=20) and 3.5 months (IQR 2-6) for patients receiving best supportive care alone (n=6).

**Conclusions**

Our results demonstrate the poor prognosis of both gastric and oesophagogastric cancer patients with isolated peritoneal disease. Prognosis figures are comparable between the two cancer types. Findings are in line with previous studies performed outside the UK which have shown that available treatments extend survival by no more than 3-9 months, highlighting the desperate need for new treatment modalities.
Do patients presenting with obstructing oesophageal cancer have worse outcome?

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Background
Oesophageal cancer carries a poor prognosis. Despite the availability of urgent Upper GI endoscopy in the United Kingdom, a substantial proportion of patients with newly diagnosed oesophageal cancer present late with near total dysphagia and an obstructing tumour at the index endoscopy. There is little data analysing the effect of obstructing oesophageal cancer at presentation on overall prognosis. The aim of the study was to analyse if patients presenting with obstructing oesophageal cancer have a worse outcome.

Methods
A retrospective cohort study of all newly diagnosed oesophageal cancers (adenocarcinoma and squamous cell carcinoma) and high grade dysplasia registered in a single UK Regional Upper GI MDT between October 2019 and September 2020 was performed. Electronic records were interrogated and patients dichotomised into two groups based on if they were obstructed endoscopically or not on the index endoscopy and the results were compared. Median follow up was 7 months.

Results
243 patients (68 (28.0%) obstructed and 175 (72.0%) non-obstructed) with median age of 70 were identified. There were more females in the obstructed group (44.1% vs 25.7%, p=0.005). ECOG performance status was worse in the obstructed group: ECOG-0 (30.9% vs 50.3%, p=0.006). Adenocarcinoma was more common in non-obstructed group (69.1% vs 54.4%, p=0.031). More patients in the obstructed group had a T4 tumour (38.2% vs 18.9%, p=0.002), however, nodal and metastatic status were similar. Rates of curative intent treatment were similar. At median follow-up of 7 months (IQR 3-13), more patients in obstructed group were deceased (72.1% vs 49.7%, p=0.002).

Conclusions
Obstructing oesophageal cancer at presentation is a marker of advanced disease and despite curative treatment intent, overall survival is worse compared to passable tumours. New screening techniques such as Cytosponge combined with public health interventions to encourage early presentation may enable earlier diagnosis and improved survival.
P-OGC57
Predicting survival and response to therapy using diagnostic biopsies: A machine learning approach to facilitate treatment decisions for oesophageal adenocarcinoma

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¹School of Cancer Sciences, Faculty of Medicine, University of Southampton, Southampton, United Kingdom. ²School of Electronics and Computer Science, Faculty of Engineering and Physical Sciences, University of Southampton, Southampton, United Kingdom. ³School of Cancer Sciences, Faculty of Medicine, University of Southampton, Southampton, Switzerland

Background
Standard of care for locally advanced oesophageal adenocarcinoma is neoadjuvant chemotherapy or chemoradiotherapy followed by surgery. Only a minority of patients (<25%) derive significant survival benefit from neoadjuvant treatment and there are no reliable means of establishing prior to treatment in whom this benefit will occur. Moreover, accurate prediction of survival prior to treatment is also not possible. The availability of machine learning techniques provides the potential to use complex data sources to answer these problems. In this study, we assessed the utility of high-resolution digital microscopy of pre-treatment biopsies in predicting both response to neoadjuvant therapy and overall survival.

Methods
A total of 157 cases were included in the study. Pre-treatment clinical information, including neoadjuvant treatment, was obtained, along with diagnostic biopsies. Diagnostic biopsies were converted into high-resolution whole slide images and features extracted using the pre-trained convolutional neural network Xception. Single representative images were converted into patches from which predictive models were trained. Elastic net regression classifiers were derived and validated with bootstrapping and 1000 resampled datasets. The response to treatment was considered according to Mandard tumour regression grade (TRG). Model performance was quantified using the C-index (for TRG) and time-dependent AUC (tAUC, for Overall survival) along with calibration plots.

Results
Median survival was 78.9 months (95% CI 35.9 months – not reached). Survival at 5-years was 52.1%. Neoadjuvant treatment was received by 123 patients (78.3%), with a significant response seen in 45 cases (36.6%). A response was more likely in those patients who received chemoradiotherapy than chemotherapy (53.3% vs 23.1% p<0.001) and in older patients (median age 69.4 vs 66.0 years, p=0.038), with other characteristics similar. A predictive model for response to neoadjuvant treatment derived from image features and clinical data achieved good discrimination (C-index 0.767, 95% CI 0.701-0.833) and calibration. Accuracy of prediction of overall survival was more modest (tAUC 0.640, 95% CI 0.518-0.762).

Conclusions
Using a small dataset, utility of a feature extraction pipeline in prediction of patient level outcomes has been demonstrated. This was more marked in prediction of response to neoadjuvant treatment than overall survival, which may reflect the importance of pre-treatment clinical data in determining the former outcome. Further study to refine the methodology and confirmation in larger datasets are required before expansion to clinical settings.
Preoperative Enteral Feeding in Patients with Oesophagogastric Cancer

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Background
Patients with Oesophagogastric (OG) cancer undergoing multimodal treatment have a higher risk for progressive decline in their nutritional status. Our centre has seen increased numbers of patients using jejunostomy and gastrostomy tube feeding as an additional support during neoadjuvant chemotherapy and radiotherapy (nCRT). This audit aimed to evaluate the processes surrounding and the impact of this intervention.

Methods
A retrospective review of 2019 medical records. Patients with OG cancer for treatment with curative intent that underwent an elective feeding tube insertion for preoperative supplementary feeding were included.

Results
14 patients were admitted for elective feeding tube insertion in 2019. On admission N=10 patients (71%) had clinically severe weight loss (defined as ≥10% in 6 months, or ≥7.5% in 3 months or ≥5% in 1 month). Four (29%) had a dietetic assessment pre admission, with 1 patient (7%) trained on home enteral nutrition pre admission.

Table 1 Enteral Tube Feeding (TF) Outcomes (n=13, n=1 failed insertion)

<table>
<thead>
<tr>
<th></th>
<th>TF during nCRT (n=8)</th>
<th>TF during nCRT &amp; proceeded to Surgery (n=5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Length of stay (LOS) for tube insertion, days, median (range)</strong></td>
<td>3 (1-18)</td>
<td></td>
</tr>
<tr>
<td><strong>Tube Type</strong></td>
<td>11 Vygon jejunostomy, 2 Mickey button</td>
<td></td>
</tr>
<tr>
<td><strong>Feeding Regimen</strong></td>
<td>11 Overnight, 2 Bolus</td>
<td></td>
</tr>
<tr>
<td><strong>Tube dislodgement N (%)</strong></td>
<td>6 (46.2) (3 replaced, 3 left out)</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions
This service is growing rapidly, patient numbers have more than doubled in 3 years. Enteral feeding is effective in preventing clinically significant weight loss in patients undergoing nCRT who progress to surgery. Short LOS: dietetic consult pre admission is essential to improve patient flow, education, preparation. Jejunostomy tube dislodged in 46% patients (n=6), aim to improve strategies to avoid or best manage this. For future work: Examine effect on body composition (CT: sarcopenia) and examine patient’s perspectives and quality of life.
Pattern of recurrence following neoadjuvant treatment and two-stage oesophagectomy for oesophageal/junctional adenocarcinoma: 10-year results from a high-volume centre

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Northern Oesophago-Gastric Unit, Royal Victoria Infirmary, Newcastle Upon Tyne, United Kingdom

Background
Disease recurrence remains high following oesophagectomy for oesophageal and junctional adenocarcinoma in spite of the incremental gains from improved neoadjuvant treatment (NAT). Follow-up remains important for the detection and treatment of recurrence, although the optimum surveillance strategy remains undefined. Recurrence after treatment can occur locoregionally, distantly, or a combination of both. This retrospective review of a single, high-volume centre’s 10-year experience has sought to determine the pattern of recurrence in those who have received curative NAT followed by two-stage subtotal oesophagectomy (2S-STO) for oesophageal and junctional adenocarcinoma.

Methods
A retrospective analysis was performed on a cohort of patients from a high-volume, single centre between January 2009 and January 2019 who had confirmed disease recurrence after receiving NAT and 2S-STO for either oesophageal or junctional (Siewert I/II) adenocarcinoma. The Unit’s prospectively collected cancer database was utilised as well as patients’ notes to determine the pattern of recurrence seen in this cohort. Patients receiving a three-stage or transhiatal oesophagectomy for any cause, or those diagnosed with squamous cell carcinoma were excluded.

Results
215 patients were identified with recurrence following NAT and 2S-STO for oesophageal/junctional adenocarcinoma within the 10-year period. The median age was 69 (range 23-85) with 67% being male and 33% female. The median time to diagnosis of recurrence was 13 months following surgery. 87 (40%) patients were diagnosed with locoregional recurrence, with the commonest pattern being in mediastinal or abdominal lymph nodes, followed by peritoneal disease. 62 (29%) patients were diagnosed with distant recurrence, with the vast majority being in the liver or lungs. 66 (31%) patients had evidence of both locoregional and distant spread at diagnosis of recurrence.

Conclusions
The incidence of recurrence following curative treatment for oesophageal and junctional adenocarcinoma remains high. Locoregional disease appears to be the commonest pattern of recurrence as identified in this study, which would confirm spread predominates via the lymphatic and transcoelomic routes. Liver and lung remain the commonest sites for haematogenous spread, although other sites include adrenal, brain and bone. Although the optimum follow-up strategy remains undefined in such patients, timely investigation of symptoms is required for early diagnosis so as to optimise the benefits of palliative treatment.
**P-OGC60**

**Predicting the risk of venous thromboembolism during neoadjuvant therapy for oesophagogastric cancer**

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**Background**
Locally advanced oesophageal cancer is usually treated with neoadjuvant treatment (NAT) followed by surgery. Venous thromboembolism (VTE) is a recognised complication in these patients. Those who develop VTE may have an inferior vena cava filter placed prior to surgery to reduce the risk of further complications. This study aimed to identify specific risks for VTE during (NAT) for oesophagogastric cancer (OGC) and whether this increases postoperative morbidity.

**Methods**
Patients undergoing NAT for OGC followed by surgery at a single high-volume centre between January 2015 and June 2020 were identified from a prospectively maintained database. Univariable and multivariable logistic regression analyses were performed to identify independent risk factors for the development of VTE as well as the association between diagnosis of VTE and morbidity.

**Results**
The incidence of VTE in this cohort was 6.7% (27/406). Independent risk factors for developing VTE in multivariable analysis were BMI – OR 1.093 (p=0.045) and age – OR 1.067 (p=0.019). Type of chemo(radio)therapy regimen used, pT, pN stage, previous history of ischaemic heart disease or being an active smoker at diagnosis was not associated with VTE occurrence. Diagnosis of VTE during neoadjuvant treatment was not associated with a higher risk of developing a serious postoperative complication (Clavien-Dindo grade III and above) (p=0.699).

**Conclusions**
Patients with a raised BMI or older age are at higher risk of developing VTE during NAT for OGC. These patients must be appropriately counseled on the higher risk of VTE prior to commencing NAT. However, the development of a VTE does not appear to confer any additional post-operative complication risk.
Long-term outcomes following minimally invasive oesophago-gastric resection for oesophageal and gastro-oesophageal junctional cancer: a single center experience

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1Royal Devon and Exeter NHS Trust, Exeter, United Kingdom. 2Department of UGI Surgery, Frimley Health NHS Foundation Trust, Frimley, United Kingdom

Background
Oesophago-gastric surgical resection for cancer has been associated with high morbidity and poor long-term prognosis. Medical advances have led to improvements and the concurrent development of videoscopic technology enabled a paradigm shift in many areas of surgical practice. Between 2004 - 2010, a three-stage total (thoracoscopic/laparoscopic) minimally invasive oesophagectomy (MIO) with curative intent, was offered to all patients diagnosed and treated for oesophageal and oesophago-gastric junctional (GOJ) cancers as an alternative to open surgery at our specialist Centre. Previously we have reported on safety, feasibility, short term outcomes, quality of life and complication profiles; this study now reports on eventualities at least a decade after surgery.

Methods
All patients who underwent MIO (laparoscopic/thoracoscopic) three-stage procedure from April 2004 to January 2010 for oesophageal and GOJ malignancy were identified. A retrospective analysis of patients’ records in conjunction with an updated clinical follow-up was carried out. Patients’ demographics, oncologic stage (in accordance to the American Joint Committee on Cancer 6th and 7th Edition), overall survival, 5-year and 10-year survival, recurrence rate and disease-free survival (DFS) were retrospectively analyzed. Statistical analysis was conducted using Prism version 9.1.0 (GraphPad Holdings LLC, California).

Results
A total of 120 patients (majority of which were males – 84.2%) were included in the study. Mean age was 66.7 ± 0.74. 43 patients. In-hospital death occurred in 4 (3.3%) patients. Over the time period, 25 (20.8%) patients were alive. Of those deceased Sixty-six (69.5%) succumbed to cancer, and 29 (30.5%) died from other causes. 43 patients (35.8%) were alive at 5 years and 33 (27.5%) at 10 years. Excluding those with Stage 0 disease, the 5-year and 10-year survival rates were 32.4% and 24.1%, respectively. The recurrence rate was 63 (52.5%) patients and the overall median DFS was 24 months (IQR, 186); Stage 3 patients had the shortest DFS (p<0.0001).

Conclusions
Survival and disease-free survival in this historical cohort of patients who underwent a total MIO for cancer is comparable to published data from similar open series of that era as well as modern reported outcomes from specialist centers. Benefits of a minimally invasive approach can therefore be realized without compromise to oncological and overall prognosis.
Home Enteral Tube Feeding: The Patient’s Perspective. Are we delivering an effective dietetic service?

Neasa Forde, Cathy White
Beaumont Hospital, Dublin, Ireland

Background
Long term feeding tubes, managed independently at home have been shown to improve quality of life scores and in general are considered to be well tolerated. Beaumont Hospital has seen an increase in the number of patients referred for home enteral feeding (HEN) prior to neoadjuvant treatment for oesophagogastric (OG) cancer. We aimed to gain an insight into the supports, experiences and challenges encountered by these patients in an emerging service.

Methods
A retrospective qualitative study using data from 2019-2020. A questionnaire was adapted from a multicentre Irish study in 2017. Patients with OG cancer for treatment with curative intent, that underwent an elective feeding tube insertion for preoperative supplementary feeding were included. Patients were provided with a questionnaire via post. Data was analysed using Microsoft Excel.

Results
Response rate was 82% (14 of 17 questionnaires). Mean age 60.4yrs (SD 11.7). 93% male (N=13). In 36% (N=5) tube feeding duration was < 3months and 3-6months duration in 43% (N=6).

Table 1: Provision of Information and patient experience

<table>
<thead>
<tr>
<th>Pre tube insertion</th>
<th>On Discharge</th>
<th>At home</th>
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<tbody>
<tr>
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<tr>
<td>13 (93%) received information on tube feeding prior to tube insertion</td>
<td>HEN contact details were provided to all patients</td>
<td>57%(n=8) reported adequate follow up and rated it as ‘very good’ or ‘excellent’.</td>
</tr>
<tr>
<td>10 (77%) found this information adequate</td>
<td>64% (n=9) of patients used these details for support</td>
<td>29% (n=4) used additional information sources: internet; family members; GP or PHN.</td>
</tr>
<tr>
<td>Dietitians were the most common healthcare professional to provide information</td>
<td>79% of patients felt either ‘very confident’ or ‘quite confident’ with using their feeding tube when going home</td>
<td>64% (n=9) reported an acceptable quality of life</td>
</tr>
<tr>
<td></td>
<td></td>
<td>86% (n=12) felt it was worthwhile having a feeding tube</td>
</tr>
</tbody>
</table>

Complications with tube feeding n (%)

<table>
<thead>
<tr>
<th></th>
<th>4 (29%)</th>
<th>4 (29%)</th>
<th>3 (21%)</th>
<th>1 (7%)</th>
<th>6 (43%)</th>
</tr>
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<tbody>
<tr>
<td>Restitched</td>
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<tr>
<td>Blocked</td>
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<td>Replaced</td>
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<tr>
<td>Infected</td>
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Conclusions
Overall positive feedback was received from patients regarding living with a feeding tube, confirming the important and impactful role of HEN. Priorities for service improvements: improved discharge information and resources may help reduce use of unreliable resources e.g. develop HEN discharge booklet to keep all relevant information in one accessible location, development of video education resources for consolidation of knowledge. Aim to provide more structured follow up with clear plans and channels of communication outlined for the patient. Quality improvement work with surgical team to reduce complication rate with feeding tubes.
Background
With increasingly centralised services for people diagnosed with OG Cancer we wanted to ensure our local service was maintained to provide the appropriate care and management by collaborating with the Specialist Sites and raising the profile of local services. Most patients remain local due to their disease stage, performance status or through choice. We wanted those patients who have tests and treatment on other sites to be able to have their care managed locally as much as possible and therefore only have to travel when absolutely necessary. We aim to facilitate and deliver a streamlined service.

Methods
Weekly Local MDT triages patients to Specialist MDT once appropriate information is available. Established local outreach clinic for specialist service. Ensures patients are known to specialist service from diagnosis. Patients will be diagnosed and managed locally unless input required elsewhere. Local CNS attends both Local/Specialist MDT as patient advocate and provides cross site communication and care planning. Local User Involvement - contributes to service development and feedback both locally and beyond. Local HNA at point of diagnosis to establish a bench mark. Ongoing emotional support is integral to the local service and continues wherever the patient is in their care pathway.

Results
Streamlined care with local and specialist team contacts. Improved communication between professionals. Identifiable contact for patients. Rapid referral process - timely and appropriate discussions. Improved patient satisfaction. Direct access to specialist site from point of diagnosis. Improved patient advocacy across sites. Effective use of clinic time. The right patient being seen at the right time in the right hospital with the right information. Local follow up enables integration of additional local services/teams into patient care. More inclusion for local teams in wider service development. Local leadership within the network has ensured investment in local services and raised the profile.

Conclusions
Care is more streamlined. Patients are assessed by the right person at the right time enabling more open communication. Avoids unnecessary referrals. Less travelling between sites. Reduces patient anxiety. Encourages user involvement - more personalised care. Promotes continuity of patient care. Allows inclusion of local teams in decision making at specialist level. Promotes collaboration and team working with flexible leadership amongst team members. Improved job satisfaction by establishing a shared vision. Upper GI Cancer delivery will continue to go through changes but with a motivated team who work together these changes can be implemented efficiently and effectively.
High Fidelity Patient-Reported Outcome Monitoring following Upper Gastrointestinal and Hepato-Pancreato-Biliary Cancer Surgery. Early Experience with a Novel Application

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Background

BACKGROUND: Patients undergoing complex upper-gastrointestinal and hepatopancreatobiliary resections experience a high incidence of post-operative symptoms. There is significant scope to expand clinicians’ understanding of longitudinal symptom progression and recognise a greater range of post-operative symptoms than those traditionally recorded. By identifying symptoms most troublesome to patients we anticipate improvement in patients’ symptom management, the surgical consent process and, ultimately, patient experience. The myICUvoice application provides patients with the opportunity to report symptoms across a wide range of domains in real-time. We report our early experience using this application with patients in the post-operative setting.

Methods

METHODS: Following institutional governance approval, consecutive patients undergoing pancreatic, or hepatic (H) or oesophagogastric (U) resectional surgery during a four week period at a single tertiary centre were offered the opportunity to use the application. From day-1 post-op to discharge, each patient completed surveys at least twice daily, reporting their experience across a list of 34 symptoms together with pain, breathing, mood and physical state. Both individual and cohort time-series data were obtained for each symptom and stratified by resection type. A dashboard has been developed as part of the application to allow summary data to be easily displayed.

Results

RESULTS: 342 symptom surveys were completed by a total of 15 patients (5U, 10H). The median length-of-stay was 11-days and 91% of patients completed 2 surveys/day (Table-1). High frequency symptoms were tiredness (reported in H:80%;U:86% of surveys), dry mouth (14/15 patients, H:91%,U:59%) and uncomfortable position (13/15 patients, H:27%,U:43%). Whilst most patients remained happy, there were frequent reports of psychological distress; 53% reported nightmares (H:6%,U:12% of surveys), 67% felt depressed, (H:12%,U:6% of surveys) and 53% anxious (H:14%,U:6% of surveys). Pain statement analysis (Figure-1) revealed distinct profiles providing high resolution data on the efficacy of analgesic regimes/techniques.

Conclusions

CONCLUSION: As expected, our patient cohort experienced a wide range, and high frequency, of post-operative symptoms. Experience conducting symptom surveys demonstrated a high incidence of disconnect between clinical expectations and reported symptoms. Our data illustrate the value of detailed symptom monitoring and this application could be used routinely to measure and improve the patient experience. Further research is planned to compare the performance of these standardised symptom surveys to current methods of identifying symptoms. Furthermore, data from specific patient populations could better inform patient expectations of the post-operative symptoms they may experience, thus improving the surgical consent process.
Patterns and timing of recurrence following resection of oesophago-gastric adenocarcinoma

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Background
Recurrence following resection of oesophago-gastric adenocarcinoma (OGA) is frequent and associated with poor outcomes. Predictors of site, timing and mechanisms driving recurrence is poorly defined, which limits the development of anti-metastatic agents. The aim of this study was to investigate the patterns and timing of recurrence following resection of OGA.

Methods
Retrospective review of a prospectively maintained resection database from the Glasgow Royal Infirmary oesophago-gastric unit of patients undergoing surgery for OGA. Primary outcomes were recurrence and cancer specific death following surgery. Recurrence patterns were defined as liver, lung, peritoneal, locoregional only and other distant groups. The latter is a heterogenous group that do not include any liver, lung, or peritoneal metastases.

Results
N = 635 patients were identified having undergone surgical resection of OGA. Of these, n = 262 developed confirmed recurrent disease. Liver metastases (n = 86, 33%) were the most common site of recurrence, followed by peritoneal (n = 35, 13%), lung (n = 33, 13%) locoregional only (n = 51, 20%) and other distant sites (n = 57, 22%). Liver recurrence was associated with significantly worse disease specific (19.1 vs 28.2 months, P <0.001) and recurrence free survival (P = 0.006). There was no association between site of recurrence and known prognostic clinicopathological factors, including anaerobic threshold (P = 0.810), nodal status (P = 0.088), pathological T-stage (P = 0.357), differentiation (P = 0.195), deprivation index (P = 0.996), perineural (P = 0.475) or lymphovascular (P = 0.422) invasion.

Conclusions
Liver metastases is the most common site of recurrence following surgery for OGA. Prognostic clinical and pathological factors do not determine the site of recurrence, suggesting that molecular features of the primary tumour determine and promotes recurrence patterns. Further study to delineate the molecular and microenvironment factors driving recurrence patterns is urgently required.
P-OGC66
Mental Health and Wellbeing Services for Patients with Upper GI Cancer

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Background
Cancer related distress has a major impact on quality of life. The psychosocial needs of patients post an oesophagectomy are significant and exacerbate the physical burden. The Upper GI MDT at our hospital aim to provide holistic patient centred care that equips patients mentally and physically for their treatment pathway. Formal or structured psychoncology services are not routinely available to our patient cohort. The aim of the audit undertaken was to assess awareness of and subsequent engagement with available mental health services in patients undergoing a curative resection for oesophagogastric cancer.

Methods
Patients who underwent either a gastrectomy or oesophagectomy in the Upper GI Centre between Nov 2018 and May 2019 were included. They each received a questionnaire to complete anonymously. Responses were via prepaid post. Responses were collated and analysed.

Results
36 questionnaires sent out with 21 patients responding (Response rate 58%).
Average age: 69 (age range 40-84).
18 of the 21 responses were male
Time diagnosed with cancer: 57% were between 12 to 18 months post diagnosis and 43% between 6 to 11 months.
Source of Information received: 43% reported verbal information provided and 38% reported written information was provided
Current engagement with Mental Health Services: National, Community, and Exercise programmes were used by a very small number of patients - 6 in total out of 21 respondents
Reasons for not engaging with Mental Health Services responses included 'Not being interested or required' to 'fearful' 'No knowledge of service' to 'Cant remember' or 'Plans to engage'
93% of respondents would recommend use of wellbeing or mental health services to someone with a diagnosis of an Upper GI Cancer
Suggestions for improvements varied from use of information packs, information on life post op and more guidance needed surrounding availability of current mental health supports

Conclusions
Psychosocial issues need to be addressed and there is a huge deficit in current service provision. Current service is not meeting service user needs and not empowering patients how best to manage mental burden and thus contribute to maximising treatment outcomes. National Cancer Strategy acknowledges lack of access for cancer patients to psychoncology services. The Cancer Centre is awaiting appointment of a Psychoncology Consultant and Team in the coming months. The Upper GI MDT will seek access to this service once available for their patient cohort. In interim use limited national and community resources available. Provide education to wider team members to standardise approach providing both written and verbal information on available mental health and well being services, embed mental health awareness into daily practice with encouragement for early patient intervention if cancer related distress evident. Re Audit after introduction of these measures.
Gastric GISTs: Can presentation, Location and Radiological Features predict behaviour? – Experience in a UK cohort

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Background
Gastrointestinal stromal tumours (GISTs) most commonly arise in the stomach, vary significantly in behaviour and can be difficult to risk stratify accurately pre-operatively. They are increasingly being identified incidentally during endoscopies or cross-sectional imaging. They have malignant potential but vary from very low to high-risk. Pre-operatively, histological diagnosis can be achieved by performing endoscopic ultrasound (EUS) guided fine-needle aspirate or biopsy, but samples often contain insufficient material. This study aims to assess other features help identify aggressiveness of GISTs pre-operatively to help guide management decisions.

Methods
This is a retrospective cohort study analysing patients treated surgically for GIST from 2011-2020 at a UK tertiary centre. Exclusion criteria were non-gastric GISTs and patients who received a different diagnosis post-operatively. Hospital electronic patient record and e-noting systems were used to collect data. Risk groups were stratified according to the NCCN risk classification for GIST. ‘Very low risk’ and ‘low risk’ groups were combined in the analysis to form the ‘lower risk’ group; ‘moderate risk’ and ‘high risk’ categories combined to form the ‘higher risk’ group. Statistical analyses were conducted using STATA version 15.

Results
171 patients were included in total. OGD diagnosed gist on histology if ulcerated in 14.7% of cases. EUS biopsy was performed in 39% of cases pre-operatively – 84.6% of these were diagnostic. There was a higher proportion of higher risk GISTs in the GOJ/cardia region than lower risk GISTs (16.2% versus 6.7%), though this did not reach statistically significance (p=0.32). A greater proportion of higher risk tumours were irregular in outline (p=.26), heterogenous (p=0.003) and necrotic (p=0.001) than lower risk tumours. In addition, higher risk tumours were significantly more likely to be exophytic than lower risk tumours, which were significantly more endophytic (p=0.05). A ROC curve including all the variables had an AUC of 0.8971.

Conclusions
This is the largest analysis of gastric GISTs in a UK population. This study found that a higher proportion of higher risk tumours were irregular, heterogenous and necrotic than lower risk tumours. In this study, a greater proportion of higher risk tumours arose in the GOJ/cardia. In keeping with muscularis origin, endoscopic biopsy was found to be a poor diagnostic tool unless ulcerated. EUS and FNA biopsies had a much higher rate of histological confirmation. This knowledge might help facilitate a more individualised approach with non-operative surveillance in lower risk tumours or expedited surgery in higher risk lesions.
Prophylactic Endoluminal Vacuum Therapy (EVT) following oesophagectomy

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Background
Endoluminal vacuum therapy (EVT) is an emerging treatment strategy for the management of anastomotic leaks following oesophagectomy. However, patients are often critically unwell with mediastinitis and established sepsis by the time the leak is diagnosed. This results in a protracted recovery period regardless of the effectiveness of EVT in treating the leak. Prophylactic EVT to protect the anastomosis following oesophagectomy may reduce the incidence of anastomotic leak, and/or mediastinitis and sepsis if the anastomosis does fail. We report the outcomes of two patients considered high risk for anastomotic leak who were managed with prophylactic EVT following oesophagectomy for cancer.

Methods
Two patients received prophylactic EVT following oesophagectomy between May and July 2021. The patients were considered high risk for anastomotic leak due to technical concerns with, or complications during, the operation. In both cases the oesophagogastric anastomosis (OGA) was fashioned with a circular stapler. The endoluminal vacuum device (EVD) was constructed using an 18F nasogastric tube and a piece of open cell foam, and placed intraluminally across the anastomosis under endoscopic guidance at the time of surgery. Continuous negative pressure (125mmHg) was applied. Information relating to treatment and outcome was recorded prospectively.

Results
Patient-1, a 72-year-old female, ASA 2, underwent minimally invasive oesophgectomy for an adenocarcinoma at the gastro-oesophageal junction. After creating the stapled OGA, inspection revealed the proximal (oesophageal) tissue doughnut was complete but attenuated. Patient 2, a 67-year-old male, ASA 3, underwent a hybrid Ivor Lewis oesophgectomy for a lower 1/3 oesophageal adenocarcinoma. Surgery was complicated by significant intra-abdominal bleeding requiring blood transfusion and pressor support. In both cases, endoscopic assessment of the anastomosis following removal of the prophylactic EVD was performed day seven post-operatively. The anastomoses were healthy with no evidence of a leak, dehiscence, or early stricture formation.

Conclusions
In this limited case series, prophylactic EVT of the OGA following oesophagectomy was delivered safely with no complications related to insertion of the EVD or delivery of EVT. This intervention should be considered in cases where the risk of anastomotic leak is high. An intraluminal EVD situated across the OGA may minimise the extent of extraluminal contamination, and the systemic consequences of sepsis associated with this, should an anastomotic breakdown occur. Further studies are required to determine the safety of prophylactic EVT following oesophagectomy, and whether this improves surgical outcomes by reducing the incidence and impact of anastomotic leaks.
Incidence, presentation and long-term sequelae of hiatus hernia after oesophagectomy: a 10-year retrospective cohort study

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Background
Hiatus hernia after oesophagectomy is a rare but recognised event, with potentially life-threatening consequences when there is bowel compromise. This 10-year retrospective cohort study aimed to identify the incidence and evaluate the clinical presentation and long-term management of hiatus hernia after oesophagectomy.

Methods
We conducted a retrospective analysis of all oesophagectomies performed in a single tertiary centre over a 10-year study period between 2010 and 2019. Demographics, details of the initial procedure and long-term outcomes were analysed. Patients that underwent post-operative computed tomography (CT) imaging at ≥12 months post-operatively were included in analysis, with all CT scans independently reviewed by a radiologist.

Results
212 patients were eligible for analysis. 25% (53/212) of patients developed a hiatus hernia post oesophagectomy. Demographic data were similar between patients who developed a hernia compared to those who did not. 75.5% (40/53) of post-operative hiatus hernias developed after transhiatal oesophagectomy (p<0.001), and patients with post-operative hiatus hernia had a higher BMI (p=0.009); this association was confirmed on multivariate analysis. Hiatus hernia was frequently under-reported, with only 58.5% (31/53) mentioned on the formal CT report. 81.1% of patients (43/53) were asymptomatic. Operative intervention was only performed in 1 patient presenting with small bowel obstruction as an emergency.

Conclusions
Hiatus hernia is a potentially clinically significant and under recognised long-term complication following oesophagectomy, with a significantly higher incidence following transhiatal oesophagectomy and in obese patients. With increasing long-term survival after surgical resection and its preponderance to be found incidentally on cross-sectional imaging, judicious screening for hiatus hernia is warranted to prevent fatal complications.
Chyle leak management and long-term survival post esophagectomy for oesophageal cancer

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**Background**
Chyle leak can be a serious complication following oesophageal cancer resection. The aim of this study is to determine the rate of chyle leak, its management and impact on short-term surgical outcomes and overall long-term survival.

**Methods**
Analysis of a prospectively maintained database of patients undergoing esophagectomy for oesophageal cancer between January 2011 and April 2019 were undertaken. Short term and survival comparisons were made between the chyle leak and non-chyle leak groups.

**Results**
A total of 190 patients underwent esophagectomy at our hospital over this time period, of whom 3.7% (n=7/190) had a chyle leak. The length of stay was longer in the chyle leak group (27 days, IQR 13-55 vs 12 days, IQR 11-14 days, P=0.001), they had a higher rate of return to theatre (42.9% vs 8.8%, P=0.003) and higher rate of overall mortality (57.1% vs 35.0%, p=0.039) compared to the non-leak group. They also experienced worse survival (9.0 months, 95% CI 5.5-12.4 vs 66 months, 95% CI 59.6-73.6, P=0.001).

**Conclusions**
Chyle leak can occur in approximately 1 in 25 patients and is associated with prolonged intensive therapy unit stay, higher risk of return to theatre as well as a lower overall cancer survival.
Five positive lymph nodes are a significant negative indicator of survival in Oesophago-Gastric Cancer surgery: an 8-year study

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Background
Number of positive lymph nodes involved is an important prognostic indicator in Oesophago-Gastric cancer survival post surgery. We present an 8 year study examining the number of lymph nodes involved and its impacts on long term cancer survival and in particular to determine whether there is a threshold after which survival is significantly worsened.

Methods
A prospectively maintained single-institution database containing data from all patients from Jan 2012 to Dec 2020 was analysed. Survival analyses were undertaken to determine the association between lymph node positivity and survival.

Results
A total of 430 patients underwent surgery for gastro-oesophageal cancer (oesophagectomy: n=311, 72.3%; gastrectomy n=119, 27.7%) of which 80.2% were male and the median age was 68 years old (IQR: 61-74). A median of 23 nodes were examined (IQR 18-33) and a median of one lymph node was positive for cancer (IQR 0-3 lymph nodes). The majority of patients (59.3%) had a T3 tumour, 24.0% had T2, and 12.1% had a T1 tumour. Over a median follow up of 30 months (IQR 13-61), 61.2% of the study population were alive. Kaplan Meier analyses demonstrated that patients who had five or more positive nodes had a survival of 36.3 months (IQR: 24.4-48.3 months) compared to those with four or fewer nodes (45.8 months, IQR: 27.6-64.1 months, p>0.001). Survival did not worsen further with a higher number of positive nodes.

Conclusions
This study shows that having five or more positive lymph nodes significantly worsens Oesophago-gastric cancer survival. These results may suggest that from the threshold of 5 positive nodes, OG cancer behaves as a systemic disease and thus impact on adjuvant treatment strategies.
Morbidity following oesophagectomy: the long-term re-operation rate after surgical resection in a Scottish tertiary centre

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Background
Oesophagectomy remains the best curative option for early stage or locally advanced cancers of the oesophagus and gastro-oesophageal junction. The long-term morbidity associated with oesophagectomy is poorly understood. This study aimed to describe re-operation rates for oesophagectomy-related complications, performed beyond 90 days from index oesophagectomy.

Methods
A retrospective cohort study of all oesophagectomies performed in a single tertiary centre between 01 January 2010 and 31 December 2019 was performed. Electronic records were interrogated and patients dichotomised into two groups, with patients that underwent re-operation at ≥90 days after oesophagectomy for complications directly related to the index procedure compared to patients who did not have further surgery. All endoscopic interventions were excluded from analysis. The median length of follow-up was 34 months (IQR 20-67).

Results
343 patients were eligible for analysis. Patient demographics and index operative approach were similar between the two groups. Beyond 90 days from surgery, 8.7% of patients (30/343) required a further operation for complications directly related to oesophagectomy. The median time to re-operation was 15.5 months (IQR 12-29). 28 out of a total of 38 re-operations performed (73.7%) were for wound complications (including 15 incisional hernia repairs and 7 excision of stitch sinus). Development of a wound infection in the immediate post-operative period was associated with an increased rate of later re-operation (16.7% vs. 4.8%, p=0.022).

Conclusions
A small but significant number of patients require re-operation following oesophagectomy beyond 90 days of surgery. This should form part of the pre-operative informed consent discussion in order to fully appraise patients and manage expectations. Reducing the incidence of early wound infection appears to be a key factor.
Effect of pyloroplasty on the need for endoscopic intervention for delayed gastric emptying post oesophagectomy

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Background
Delayed gastric emptying (DGE) is a common complication following oesophagectomy, affecting 15-39% of patients. Controversy remains regarding the role of pyloric drainage procedures during oesophagectomy with gastric conduit reconstruction in reducing DGE. This study investigated the effect of pyloroplasty at the time of oesophagectomy on the need for endoscopic pyloric intervention post-operatively.

Methods
We performed a retrospective analysis of all oesophagectomies performed in a single tertiary centre over a 10-year study period between 1 January 2010 and 31 December 2019. Electronic records were reviewed to analyse patient demographics, operative details and post-operative outcomes, as well as the need for endoscopic procedures after surgery. Patients were dichotomized into two groups, with those who had pyloroplasty performed at oesophagectomy compared to those who did not. Patients who died ≤30 days after oesophagectomy were excluded from analysis. Patients were followed up for a median of 32 months (IQR 19-60).

Results
298 patients were eligible for the study, of whom 80/298 (26.8%) had a pyloroplasty performed. Demographics were evenly matched between the two groups. Patients undergoing Ivor-Lewis oesophagectomy were significantly more likely to have had pyloroplasty performed (90.0% vs. 24.3%; p<0.001). Pyloroplasty had no significant effect on post-operative complication rates, ICU admission, need for re-operation or length of hospital stay. Patients without a pyloroplasty were significantly more likely to require endoscopic pyloric balloon dilatation (43.1% vs. 12.4%, p<0.001) or pyloric botox injection (12.4% vs. 3.8%, p=0.029) after oesophagectomy.

Conclusions
In this study, patients who had a pyloroplasty at the time of oesophagectomy were significantly less likely to require endoscopic pyloric balloon dilatation and/or pyloric botox injection post-operatively. This has significant long-term implications for both patients’ quality of life post-operatively and demands on over-stretched endoscopic services.
P-OGC74
Effect of pre-operative anaemia on short-term outcomes following oesophagectomy: a 10-year retrospective cohort study

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Background
Pre-operative anaemia is associated with increased length of hospital stay, requirement for allogenic blood transfusion, post-operative complications and mortality. Oesophagectomy is a complex procedure associated with significant physiological insult, thus pre-operative patient optimisation is imperative to improve clinical outcomes. This study aimed to determine the impact of pre-operative anaemia on short-term outcomes following oesophagectomy for benign and malignant disease.

Methods
A retrospective cohort study of all oesophagectomies performed in a single tertiary referral centre between 1 January 2010 and 31 December 2019 was performed. Patients were identified from a prospectively collected database and individual patient electronic records were interrogated. Patients were dichotomised into two groups, based on the most recent pre-operative haemoglobin. Patients with pre-operative anaemia (haemoglobin <130mg/L in males and <120mg/L in females) were compared to those without pre-operative anaemia. Patients with missing data were excluded from the study. Patients were followed up for a median of 32 months (IQR 18-66).

Results
Of 352 patients eligible for inclusion, 173 (49.1%) patients were anaemic immediately pre-operatively. Patients with pre-operative anaemia were older (66 vs. 64 years, p=0.031), with a lower anaerobic threshold (11.7 vs. 12.3ml/min/kg, p=0.011), and were significantly more likely to have undergone neoadjuvant chemotherapy (91.3% vs. 78.8%, p<0.001). Patient comorbidities and disease-related characteristics were similar between the two groups. Patients with pre-operative anaemia were significantly more likely to require post-operative blood transfusion (34.7% vs. 16.8%; p<0.001). However, pre-operative anaemia was not associated with increased post-operative complications, intensive care admission, length of hospital stay, or 30- and 90-day mortality rates following oesophagectomy.

Conclusions
Patients with anaemia immediately prior to undergoing an oesophagectomy were significantly more likely to require post-operative blood transfusion. However, pre-operative anaemia was not associated with an increased rate of post-operative morbidity or mortality. In addition, pre-operative iron transfusion is becoming increasingly utilised to minimise the incidence of pre-operative anaemia: this was not analysed in this study.
Use of a single visit combined contrast enhanced CT with PET (PET/CeCT) in the staging of oesophageal and gastric cancers during the COVID-19 pandemic – is it adequate, timely and cost effective?

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Background
COVID-19 has had a massive effect on service provision within the NHS. At our regional oesophagogastric centre the usual protocol for workup of new cancers involves endoscopy, with separate imaging in the form of a contrast enhanced CT, and standard PET/CT (PET with non-contrast CT). To reduce exposure to the hospital environment and potential infection, a group of patients underwent combined PET/CeCT imaging in a single hospital visit. The aim of this project was to assess whether the combined scans were of adequate diagnostic quality, cost efficient, and if they reduced time to treatment.

Methods
We retrospectively identified all patients who had been discussed in the Upper GI cancer MDT in 2020 at our trust. To be included in the study, the diagnosis must have been made during 2020. Using our MDT records, clinical letters, endoscopy and radiology systems, we obtained dates of investigations along with types and dates of treatment. Data was tabulated in Microsoft Excel. Upper GI consultant radiologists advised on diagnostic quality and technicality of scans, and trust finance directors were able to advise on costs of imaging.

Results
211 new oesophageal or gastric cancers were discussed in our MDT in 2020. 33 patients had PET/CeCT, these took place between March and October. 178 patients had separate imaging. Median time from diagnostic OGD to PET/CeCT was 8 days vs 16 days to final imaging in the separate group. Median time from diagnostic OGD to treatment start date was 36 days for PET/CeCT vs 41 days in the separate group. No PET/CeCT’s required repeating due to poor diagnostic quality. At our trust PET/CeCT had a cost saving of £88.58 compared to separate scans.

Conclusions
Our experience is that PET/CeCT allows accurate radiological staging of oesophagogastric cancers with a single patient visit, at more convenience to the patient and with reduced potential exposure to COVID-19. Patients were able to complete their cancer staging and start their treatment pathway sooner than with separate scans. This comes with a significant cost saving to the NHS per patient, which at our trust scaled up to a potential £18,000 in one year. Our MDT is now planning to perform radiotherapy planning CT images in the same episode.
A patient engagement event to assess feasibility of preoperative enhanced recovery groups in patients with oesophagogastric cancer undergoing surgery

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Background
Enhanced recovery (ER) includes pre-operative counselling during individual patient consultations with multidisciplinary team (MDT) members. Patients can experience lengthy appointments seeing multiple professionals. This negatively impacts on their ability to retain and process information, and results in long, overrunning clinics. Separate, virtual ER group sessions have been proposed to deliver aspects of the pre-operative appointment which are common to all patients undergoing oesophagogastric (OG) cancer surgery. The aim is to improve patient engagement and experience, and improve efficiency of clinics. A patient engagement event was undertaken to gain feedback from patients about the existing service and the proposed virtual group.

Methods
A semi-structured telephone interview was developed with the support of a Patient & Public Engagement Team. The 30 minute interview covered aspects such as patient experience of ER information delivery, the quality of the information they received and their thoughts on attending virtual group sessions. Seventy patients, who had undergone surgery for OG cancer in the previous 14 months were invited to take part. A Health Informatics Team screened the patient list prior to invitation letters being sent. The telephone interviews took place in November 2020.

Results
Twenty-seven patients responded (37%). Of these, 89% felt they received all information required for surgery preparation. Over 50% reported receiving adequate information to support with common post-operative issues (dietary - 81%; physical activity - 55%) but would like more on others (psychological impact - 26%). Patients highlighted that the MDT clinic took many hours and information delivery was overwhelming. The internet was accessible to 85% and 56% thought the information provided prior to surgery could have been delivered in a virtual group. Patient perceived advantages to virtual groups included: peer support; reduced travel; and avoidance of information repetition and overload.

Conclusions
Patient preference, perspective and needs are paramount when designing healthcare services. Results from this patient engagement event suggest that the delivery of preoperative information and counselling as part of ER could be improved through the implementation of virtual ER groups. They also suggest that most patients perceive benefits to such a model, including the addition of peer support. The next steps in the proof of concept are to develop the virtual groups MDT content and pilot in a cohort of patients, evaluating patient related outcome measures and impact on service efficiency.
P-OGC77
Why curative treatment rates are so low for stage I/II Oesophago-gastric cancer in the West of Scotland? — A five year review

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Background
Over the last decade, quality performance indicators (QPIs) have been used to drive improvements in cancer care in Scotland. QPI-11 targets curative treatment rates for oesophago-gastric (OG) cancer and this target has been consistently missed. This study aimed to investigate why patients with potentially curable Stage I and II OG cancer did not receive curative treatment.

Methods
The West of Scotland MCN database was interrogated for patients with newly diagnosed stage I and II OG cancer between January 2015 and December 2019 to identify those patients who did not have curative treatment. Electronic records were then analyzed and the reason for the non curative treatment recorded.

Results
260 patients (mean age 78.3 ± 9 years; 114 (43.8%) female) were identified. Median Scottish Index of Multiple Deprivation was 4 (IQR 2-7). There were 159 (61.2%) oesophageal cancers, 196 (75.4%) adenocarcinomas and 174 (66.9%) were Stage II cancers. Formal CPEX fitness was assessed in only 20 patients (7.7%). Reasons for curative treatment not being received were as follows: not clinically fit (n=216 (83.1%)); patient declined curative treatment (n=17 (6.5%)); disease progression (n=16 (6.2%)) and identification of synchronous cancers (n=9 (3.5%)).

Conclusions
Lack of fitness for radical treatment is the predominant reason for Stage I and II OG cancer patients in the West of Scotland not being treated with curative intent. This may be related to the previously described "West of Scotland" effect on health comorbidities.
One year experience of a newly established super green ERAS pathway for performing oesophago-gastric cancer resections during the Covid-19 pandemic

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Background
Surgical oncology services in the UK have been impacted by the COVID-19 pandemic. Various strategies have been employed in an attempt to continue cancer resectional surgery during the pandemic. This study examined our institution’s experience and outcomes with a newly established Super Green ERAS pathway for oesophago-gastric (OG) cancer resections during the pandemic.

Methods
A retrospective cohort study of consecutive patients who had a resection for OG cancer performed over a 12-month period beginning from the date of the first UK National Lockdown of 23 March 2020. Barring two intervals each lasting 3 weeks, urgent elective cancer surgery continued on our mixed hot and cold site through the establishment of a Super Green ERAS pathway.

Patients were confirmed COVID-19 negative within 72 hours pre-admission and retested 72-hourly post-op. 14 days self-isolation pre-admission was mandated. Patients not complying had their surgery postponed. Transhiatal oesophagectomy was the preferred approach for oesophagectomy during the pandemic.

Results
45 resections (33 oesophagectomies, 10 gastrectomies and 2 trial of dissections) were performed. 37 (82.2%) patients were male with a median age of 64 (IQR 58-71) years. 3 patients were postponed due to non-adherence with self-isolation.

No patients tested positive for COVID-19 post-operatively, hence, there was no COVID-19-related morbidity. Nine patients developed pneumonia. Seven patients had an anastomotic leak, all of whom were successfully rescued. One patient required a clamshell thoracotomy due to intra-operative mediastinal bleeding followed by a return to theatre for reconstruction 48hrs later. Median length of stay was 12 (IQR 9-18) days. There was no in-hospital mortality.

Conclusions
OG cancer resections can be performed safely despite COVID-19, with favorable clinical outcomes when a Super Green ERAS pathway is strictly adhered to. Implementation of such pathways will enable surgical oncology services, including OG cancer resections, to continue to ensure best possible outcomes for cancer patients despite any future waves of the COVID-19 pandemic.
Post-operative NUUn score as a prognostic tool for anastomotic leak after Oesophagectomy

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Background
Anastomotic leak (AL) after esophagectomy is still quite high with incidence reported between 5 and 20%. Early detection of AL will enable patient rescue and the remedial measures may decrease the associated significant morbidity and improve quality of life. Oesophagectomy is also associated with other infective complications such as respiratory infections and collections in the abdomen or chest. Noble and Underwood (NUUn) published the NUUn score combining blood-borne markers of systemic inflammatory response to define risk of anastomotic leak and major complications following oesophageal resection. This study aims to validate the ability of NUUn score to identify AL specifically.

Methods
A total of 113 patients who underwent esophagectomy for oesophageal cancer over 11 years from 2011 to early 2021 in our centre were selected for this study from a prospectively maintained database. Patients with leaks (n = 11) were identified by reviewing their case records, electronic records, endoscopy and radiological results. Patients with missing values were excluded. Postoperative 7-day (POD) biochemical data that included white cell count (WCC), C-reactive protein (CRP) and Albumin were used to calculate NUUn score. Sensitivity and Specificity of NUUn score with a cut-off value of >10 was calculated using the ROC curve analysis using SPSS.

Results
A total of 99 patients were included, among which 10 patients had anastomotic leaks (AL). Overall mean of NUUn of patients with AL was 10.25 vs 9.95 without AL. NUUn scores for day 1 to 7 are shown in the table in figure 1. NUUn with the highest AUC was Day 7 (0.664 [CI 0.499 – 0.829]; p = 0.09), with 70% sensitivity and 57.3% specificity. The trends in WCC, CRP and albumin levels over 7 days were also not helpful in differentiating patients with AL.

Conclusions
In this study, the trends in rising WCC, CRP and decreasing albumin were not helpful in diagnosing anastomotic leaks specifically. The NUUn score had a sensitivity of 70% on day 7. Procalcitonin, blood urea nitrogen or interleukin levels may help, and further studies are being planned. This study shows that current biochemical parameters can complement but not replace careful and regular medical examination and early radiological or endoscopic evaluation if an AL is suspected.
The effect of COVID-19 on new diagnosis oesophagogastric cancer patients in the UK: A single-centre experience

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Background
Covid-19 has had a devastating global impact and resulted in over 4.4 million directly attributed deaths. The UK entered lockdown in March 2020, redistributing its medical workforce and resources. Early estimations suggested at least 4700 extra cancer deaths at 5 years if there was a 3-month delay to surgery. Delays to diagnosis and treatment for oesophagogastric (OG) cancers can be particularly detrimental to survival. The aim of this study is to assess the impact of Covid-19 on new cancer referrals to a centralised UK OG cancer centre, including presentation, decision making and treatment.

Methods
Patients with OG cancer referred to a tertiary, high-volume centre between March 2019 and March 2021 were reviewed. Patients were stratified into Pre-covid (March 2019-March 2020) and Covid (March 2020-2021) cohorts. Number of new referrals, clinical stage, treatment decision, and time to treatment were compared for gastric adenocarcinoma (GA), oesophagogastric-junction adenocarcinoma (OGJA), oesophageal adenocarcinoma (OA) and oesophageal SCC (OSCC).

Results
There was an 11% reduction in new cancer referrals (485 vs 431). GA, OGJA and OA did not have significant change in treatment intent, although there was a significant increase in the decision for definitive non-surgical treatment of OA (P = 0.046). GA and OA patients had a small, but significant increase in mean clinical stage at presentation (P <0.05). There was no increase in time to treatment for GA, OGJA and OA. A significantly higher proportion of OSCC patients were given curative intent treatment in the Covid-19 cohort (P = 0.0006) however, this was accompanied with an increased time to treatment commencement (35.8 days vs 27.9 days P = 0.0198).

Conclusions
This high-volume centre has seen a reduction in new cancer referrals since the first UK lockdown. This was associated with a small, but significant, increase in clinical stage of GA and OA at presentation. This may represent an early indication of excess oesophagogastric cancer deaths due to the impact of Covid-19. This data also confirms initial results showing that oncological decisions were not compromised, although Covid-19 remains a dynamic challenge.
The learning curve for robotic assisted abdominal phase in two stage oesophagectomy

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Background
Robotic assisted oesophagectomy (RAO) is increasingly being utilised in the management of oesophageal cancer. RAO implementation into practice has an inevitable learning curve. As oesophagectomy usually involves at least 2 stages, a staggered approach to training and introduction of RAO can be done. A major advantage of this is that the surgeon can concentrate on overcoming the learning curve in one phase of the procedure at a time, whilst the remaining phase can be completed by an established technique. This study looks at the learning curve of a robotic assisted abdominal phase for two-stage oesophagectomy compared to an open abdominal phase to achieve parity.

Methods
This study uses a prospectively maintained database to retrospectively analyse the abdominal phase of the first 17 RAO compared to the previous 20 open abdominal phase procedures. The cases are sequential, done by a single surgeon at a large UK oesophagogastric referral centre. Operating time, nodal count, and R0 rate were reviewed to determine the number of cases on the learning curve to reach parity with the open procedure.

Results
The open abdominal phase group had a similar age (65.6 vs 65.7), pre-op anaerobic threshold (13.9 vs 14.6 p=0.3) but a higher BMI (mean 30.6 vs 24.6 p<0.05) then the RAO group. All cases were T3 adenocarcinoma except for 2 cases in the robotic group (one HGD and one T2 adenocarcinoma). No RAO cases were converted to open. The mean time for the abdominal phase in the open group was 175.4 minutes with an average nodal count of 32.9. After 8 robotic assisted cases the mean operating time decreased from 267 minutes to 197 minutes, which was when a non-significant difference to the open group (p=0.094) became apparent. The mean nodal count in the first 8 robotic assisted cases was 29.5 and increased to 38.4 in the subsequent cases. All patients had a R0 resection.

Conclusions
The multi-phase nature of oesophagectomy allows for modular implementation of a robotic programme. We have found that the learning curve for robotic assisted abdominal is around 8 cases. This allows for parity to open abdominal phase to be achieved regarding operative time, nodal count and R0 resection.
P-OGC82
Length of stay in hospital as a prognostic tool for post-esophagectomy survival

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Background
Length of stay (LOS) after oesophagectomy is an indicator of efficiency of patient care, practice style, complication rates and their management. Median LOS in specialist centres is 10 to 12 days. The desired LOS as a quality performance indicator (QPI) has recently been reduced from 21 days to 14 days in our country. The aim of this study was to see if this change in LOS could be validated by differences in long term outcomes.

Methods
A total of 110 consecutive patients who underwent esophagectomy for cancer between 2011 and 2020 were included in this study. We compared the statistical significance in overall survival of patients with LOS 14 days and 21 days as two separate datasets. Overall survival (OS) in months was calculated from date of surgery to death or otherwise censored. 4 patients who died in hospital were excluded. Statistical analysis was conducted using IBM SPSSv25.

Results
110 consecutive patients were included in this study. The median postoperative stay for all patients was 18 days with an interquartile range of 14 to 26 days. Kaplan Meier survival comparison with Log Rank of OS with LOS 21 days showed no difference in survival between patients with LOS ≤ 21 days and LOS > 21 days (\(p = 0.487\)). A similar comparison showed a statistically significant difference in survival in patients with LOS ≤ 14 days and LOS > 14 days (\(p = 0.034\)), with a mean survival (months) of 80.9 and 60.2 respectively.

Conclusions
LOS after surgery is a marker of patient health, care efficiency and uncomplicated recovery. No clear LOS with patient benefits has been defined in the past. A LOS of 14 days after oesophagectomy in our cohort is interestingly an indicator and predictor of long-term survival. Further subgroup analysis of patient and tumour characteristics are being carried out to see if we can predict patients who can be discharged in less than 14 days. These characteristics can then be used to predict and study long term survival after oesophagectomy.
The Impact of Covid-19 on Malignant Upper GI Operations in England During 2020

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Background
Due to the Covid-19 pandemic and the overwhelming number of patients requiring ITU due to serious Covid-19 infections, trusts throughout England reduced their operation numbers to reduce the burden on secondary care services. Whilst efforts were made to preserve cancer services in England, the Covid-19 burden still significantly impacted the provision of oesophagectomies and gastrectomies. The following research aims to look at the true impact of Covid-19 on operation numbers in England and compare these to the Covid-19 burden.

Methods
Data relating to operation numbers was taken from The Surgical Workload Outcomes Audit (SWORD) database. The SWORD database was interrogated for the years 2017 – 2020. A mean number of operations was calculated using the 2017-2019 data and compared to data from 2020. Operations performed and other demographic data was analysed regionally and compared to Covid-19 deaths throughout England. Covid-19 data was obtained from the national government dashboards.

Results
Results showed that there was a significant reduction in the number of operations performed in 2020 due to the Covid-19 pandemic. This was closely correlated with Covid deaths throughout England. Variations between centres were present throughout the UK, however the overall trend reflected more than a 40% reduction in gastrectomies and more than a 30% reduction in oesophagectomies, which equated to 1018 less gastrectomies and 490 less oesophagectomies performed in 2020. There was significant variation between centres, the impact on individual centres and oesophagectomy rates ranged from -0.8% reduction to a 100% reduction in operations carried out in 2020. Gastrectomies was similarly affected, varying between a 2.7% and 89.5% reduction in operations carried out in 2020.

Conclusions
Overall, despite efforts to preserve procedures, particularly for malignant disease, there was significant fall in operations performed throughout 2020. As a consequence of this, it is likely that patients requiring life saving or life extending operations did not receive their treatment. The data suggests that overall gastrectomies were worse hit than oesophagectomies across England. Variances in performance across the UK should be further analysed to allow better planning and resource allocation for future waves or future pandemics.
Impact of routine feeding via jejunostomy after oesophagectomy

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Background
Oesophageal cancer is the 8th most common cancer worldwide, with oesophagectomy remaining the mainstay curative treatment, despite significant associated morbidity and mortality. Postoperative weight loss remains a significant problem and is directly correlated to poor prognosis. Measures such as the Enhanced Recovery After Surgery (ERAS) programme and intraoperative jejunostomy feed placement have looked to tackle this. Our aim was to investigate the impact of supplemental jejunostomy feed in practice on mortality, length of hospital stays and postoperative weight loss in a high-volume regional centre.

Methods
Patients undergoing oesophagectomy between January 2012 - December 2014 and January 2016 - December 2019 in a national tertiary oesophagogastric unit were included retrospectively. Variables measured included comorbidities, operation, histopathology, weights (pre- and post-operatively), length of hospital stay, postoperative complications and mortality. Survival data were analysed using R Studio, Inc.

Results
566 patients were included. Median age at diagnosis was 66 years (30-85). Majority of cases included were adenocarcinoma (72.6%), or squamous cell carcinoma (22.3%). Within the two study groups, severe weight loss > 10% of pre-operative weight was seen in 38.6% and 4.87% of patients discharged without and with jejunostomy feeds at 3 months, respectively. At 6 months, severe weight-loss was seen in 47.6% and 0.64% of patients discharged without and with jejunostomy feeds, respectively. Median length of stay was 15 days (7-92) and 12 days (6-338) for patients discharged without and with jejunostomy feeds, respectively. Overall median survival in patients discharged without jejunostomy was 52 months (p=0.035), and in those discharged with jejunostomy, 48 months (p=0.044).

Conclusions
Postoperative malnutrition has associated poor outcomes. Perioperative nutritional support, to include postoperative jejunal feeding post-discharge can reduce weight loss, and influence survival as well as length of hospital stay. Further randomised trials are needed in order to optimise recovery and morbidity in patients post-oesophagectomy.
A Comparison of Outcomes of Definitive Chemoradiotherapy versus Chemoradiotherapy with surgery as salvage for Oesophageal Adenocarcinoma in a Single High Volume Tertiary Unit

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Background
Controversy exists regarding the optimum radical management of oesophageal adenocarcinoma in the West. Chemoradiotherapy is controversial in the definitive management of oesophageal adenocarcinoma with trials focussing on both SCC and ACC outcomes. The aim of this study was to compare outcomes of definitive chemoradiotherapy versus chemoradiotherapy and salvage amongst patients treated in a single high volume tertiary unit.

Methods
Patients’ data were analysed from a prospectively maintained cancer database. Demographic data as well as outcome data, overall survival and disease free survival as well as stage of disease was identified, collected, collated and analysed. Kaplan Meier curves were created with a log rank test to find statistical significance. Statistical analysis was done on SPSS with continuous variables analysed using student’s T test and Chi squared for categorical variables.

Results
A total of 221 patients who had chemoradiotherapy were analysed, 131 males and 90 females with an average age of 76.4 years between 2010 and 2021. Eighty seven of these patients received surgery as salvage. The overall survival is demonstrated in figure 1. 157 patients had T3 disease, 7 had reported T1, 23 had T4 disease. The 5 year overall survival of those who had salvage surgery was 68% and those who did not was 48%, see figure 1. A log rank test showed statistical significance between the two groups (p=0.009). 47 (45%) patients developed a recurrence in the surgical group whereas 107 (81%) patients developed recurrence within 10 year follow up period in the non surgical group.

Conclusions
Chemoradiotherapy with surgery as salvage has a better overall survival than chemoradiotherapy alone for oesophageal adenocarcinoma.
Textbook Outcome following Oesophagectomy for Oesophageal Cancer: An International Cohort Study

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Background
Although textbook outcome (TO) has been proposed as a tool for the assessment of oncological surgical care, an international assessment in patients undergoing oesophagectomy for oesophageal cancer has not been reported. This study aimed to assess TO in an international setting.

Methods
Patients undergoing curative resection for oesophageal cancer were identified from the international Oesophagogastric Anastomosis Audit (OGAA) from April 2018 - December 2018. TO was defined as the percentage of patients who underwent a complete tumour resection with at least 15 lymph nodes in the resected specimen and an uneventful postoperative course, without hospital readmission. A multivariable binary logistic regression model was used to identify factors independently associated with TO, and results are presented as odds ratio (OR) and 95% confidence intervals (CI95%).

Results
This study included 2,159 patients with oesophageal cancer, of whom 39.7% achieved a TO. The outcome parameter ‘no major postoperative complication’ had the greatest negative impact on a TO for patients with oesophageal cancer, compared to other TO parameters. Multivariable analysis identified male gender, increasing Charlson comorbidity index, and higher AJCC T and N staging to be associated with a significantly lower likelihood of TO. After accounting for these factors, high volume centres (>50 cases/year; OR: 1.36, CI95%: 1.06 - 1.75, p=0.015), presence of 24-hour on-call rota for oesophageal surgeons (OR: 2.11, CI95%: 1.33 - 3.35, p=0.001) and radiology (OR: 1.56, CI95%: 1.08 - 2.26, p=0.019), total minimally invasive esophagectomies (OR: 1.60, CI95%: 1.25 - 2.05, p<0.001), and chest anastomosis above azygous (OR: 2.17, CI95%: 1.58 - 2.98, p<0.001) were independently associated with a significantly increased likelihood of TO.

Conclusions
TO is achieved in less than 40% of patients having oesophagectomy for cancer. Improvements in centralisation, hospital resources (i.e. daily 24-hour on-call esophagogastric surgeons and radiologists), access to minimal access surgery, and adoption of newer techniques for improving lymph node yield could improve TO. Understanding how these individual parameters help improve quality of patient care should be the focus of future research.
Robotic Techniques in Esophagogastric Cancer Surgery: An Assessment of Short- and Long-term Clinical Outcomes

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Background
Robotic esophagogastric cancer surgery is gaining widespread adoption. This population-based cohort study aimed to compare rates of textbook outcomes (TO) and survival from robotic minimally invasive techniques for esophagogastric cancers.

Methods
Data from the United States National Cancer Database (NCDB) (2010-2017), was used to identify patients with non-metastatic esophageal and gastric cancers receiving open (esophagus, n=11,442; stomach, n=22,183), laparoscopic (esophagus (LAMIE), n=4,827; stomach (LAMIG), n=6,359) or robotic (esophagus (RAMIE), n=1,657; stomach (RAMIG), n=1,718) surgery. TO were defined as lymph nodes examined >15, margin-negative resections, length of stay <21 days, no 30-day readmission, and no 90-day mortality. Multivariable logistic regression and Cox analyses were used to account for treatment selection bias.

Results
Patients receiving robotic surgery were more commonly treated within high volume, academic centers and with advanced clinical T and N stage disease. From 2010 to 2017, TO rates increased for esophageal and gastric cancer treated by all surgical techniques. RAMIE (odds ratio (OR):1.41, (CI 95% : 1.27-1.58) and RAMIG (OR:1.30, CI 95% : 1.17-1.45) had significantly higher TO rates compared to open surgery. For esophagectomy, TO (hazard ratio (HR):0.64, CI 95% : 0.60-0.67) and RAMIE (HR:0.92, CI 95% : 0.84-1.00) were both associated with long-term survival. For gastrectomy, TO (HR:0.58, CI 95% : 0.56-0.60) and both LAMIG (HR:0.89, CI 95% : 0.85-0.94) and RAMIG (HR:0.88, CI 95% : 0.81-0.96) were all associated with long-term survival. Subset analysis in high volume centers confirmed similar findings.

Conclusions
Despite potentially adverse learning curve effects and more advanced tumor stages captured within the study period, both RAMIE and RAMIG, as performed in mostly high-volume centers, were associated with improved TO and long-term survival. Therefore, consideration for wider adoption but a well-designed phase III RCT is required to fully evaluate the benefits of robotic techniques in esophageal and gastric cancers.
P-OGC88
Is Routine Contrast Swallow after Ivor-Lewis Oesophagectomy Required or Justified?

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Background
Traditionally many Upper-GI cancer tertiary centres have carried out contrast swallow fluoroscopic studies as a routine after Ivor-Lewis “Two-Stage” Oesophagectomy. However, more recently studies have demonstrated the limited value of this test as a routine screening study. The primary outcome of our study was to assess the sensitivity of routine contrast swallow in identifying anastomotic leak post oesophagectomy and identify how the study changed management of these patients.

Methods
This was a single-centre retrospective study involving 2-observer data collection. Data was collected and analysed from clinical notes for all patients who underwent an Ivor-Lewis oesophagectomy for cancer between January 2011 to December 2020.

Results
A total of 220 patients were identified. Protocol at the centre was to obtain a routine contrast swallow in the Fluoroscopy department on the fifth post-operative day– which occurred in 211 patients (96%). A total of 19 (8.64%) patients were diagnosed with an anastomotic leak (clinically and/or radiologically), with contrast swallow imaging and/or computed tomography (CT). There was no correlation between incidence of leak and T stage (p=0.38) and N staging (p=0.22).

Only 3 of 19 anastomotic leaks were positively identified on contrast swallow study. All patients with anastomotic leak identified by contrast swallow study were asymptomatic i.e. “subclinical”. 2 patients were managed conservatively; one underwent endoscopic stent insertion. CT scan with oral contrast was the mode of diagnosis for 16 anastomotic leaks; where 10 patients underwent a CT scan following a normal contrast swallow study due to suspicious symptoms and 6 patients underwent expedited CT scans prior to Day-5 contrast swallow study due to presence of symptoms and limitation of fluoroscopy resources. The sensitivity of the Day-5 contrast swallow study was calculated to be 15.8% (CI 3.4, 39.6) with a specificity of 98.0% (CI 95.0, 99.5).

Conclusions
Our data reflects that routine contrast swallow study on Day-5 post Ivor-Lewis esophagectomy has a poor sensitivity in detecting anastomotic leak and may be falsely reassuring. The vast majority of patients had no change in management as a result of contrast swallow.

This adds to the growing body of evidence limiting the role of contrast swallow in this situation. We recommend that clinical judgement and use of CT and endoscopy be the surgeon’s prime tools in the diagnosis of anastomotic leak post oesophagectomy.
Background
One group and hold sample costs approximately £18 to process whilst it costs £170 to prepare and administer 1 unit of cross matched blood. We aimed to quantify the amount of blood cross-matched for elective oesophagectomy and gastrectomy cases and compare this to the number of units transfused in the peri-operative setting (within 24 hours of surgery). Current unit guidance required all patients to be cross matched for 2 units of blood pre-operatively.

Methods
Baseline data was collected retrospectively over a 10 week period (08/07/19-16/09/19). A new blood ordering protocol, made in agreement with oesophago-gastric and anaesthetic consultants was produced. Blood was only to be requested if: antibodies on group and hold, pre-op Hb < 120g/l, operative team concerns or previous radiotherapy. Data was recollected using the same parameters post-intervention over a 10 week period (23/12/19-08/03/20).

Results
Before implementation of the protocol 24 patients were included, mean age 67 (range 40-84). All patients were cross matched between 2 and 4 units, with a total of 52 units requested and only 1 transfused. After implementation of the protocol 27 patients were included, mean age 69 (range 51-87). 36 units were ordered for 15 patients and 3 units were transfused. The new protocol was correctly implemented in 19 patients (70%). If implemented correctly in all patients in this group a saving of approximately £6120 could have been made. This could equate to a saving of as much as £20,400 per year based on 90 OG operative cases.

Conclusions
Patients were cross-matched far in excess of their transfusion needs. There was significant reduction in the number of patients being cross-matched post intervention. Rationalising this is important to reduce waste, reduce cost and cut down on delays to maximise theatre time.
Hiatus Hernia post oesophagectomy for oesophageal cancer: incidence & outcomes

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Background
The development of a hiatus hernia following oesophagectomy is a well-documented occurrence. The aim of this study is to examine the incidence of hiatus hernia formation, the symptoms patient present with and differences between open and laparoscopic/minimally invasive surgery.

Methods
A dataset containing data on all patients from an upper GI regional tertiary referral centre were analysed. All subsequent patients who underwent oesophagectomy between Nov 2014 and Nov 2020 were included.

Results
A total of 268 patients underwent oesophagectomy over this time, of whom 81.0% (n=217/268) were male and the median age was 68 years old (62-73 years). The median BMI at the time of operation was 27.6Kg/m² (IQR 24.6-30.7Kg/m²). Over a median follow up of 12 months (IQR 5-21), 4.5% (n=12/268) developed a hiatus hernia. Amongst these 12, the most common organ in the hernia was the transverse colon (66.7%, n=8/12) and the small bowel (n=3). The most reported symptoms in those with a hiatus hernia were respiratory symptoms (cough/breathlessness: n=5), reflux (n=3), vomiting (n=3) and chest pain (n=3). There was no correlation between BMI and the occurrence of a hiatus hernia (p=0.145) nor were there differences across males and females in terms of hiatus hernia rates (p=0.845). In patients who had prophylactic repair of the diaphragm (n=126/268, 47.0%) the rate of hernia repair was no different (4.8%) compared with those who did not have a prophylactic diaphragmatic repair with sutures (4.2%, p=0.832). There was however a correlation between the volume of intraoperative blood loss and the occurrence of a hiatus hernia, with increasing blood loss correlating with a higher likelihood of hernia occurrence (r=0.295, p=0.037).

Conclusions
Hiatus hernia is a relatively common occurrence after oesophageal cancer surgery, with most patients suffering from chest symptoms, pain, and reflux. Intra-operative blood loss may influence the chances of developing a hiatus hernia. Prophylactic measures such as reinforcing the diaphragm or hiatus with sutures, do not appear to affect hernia rates.
Significance of the number, size and type of drains used for intercostal drainage after oesophagectomy for cancer

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Background
Pleural space drainage with intercostal drains (ICD) is performed after oesophagectomy to allow the lung to reinflate, remove excess fluid post-operatively, and signal chyle or enteric content. Enhanced recovery protocols encourage the use of the minimum number of drains for the shortest duration to facilitate rapid recovery after surgery. There is wide variability in the type, number and size of drains inserted at operation. This study sought to identify the most effective drain pattern insertion, using the need for respiratory reintervention as the primary end point and secondary outcome of the presence of pleural effusions.

Methods
All patients undergoing oesophagectomy for cancer in one unit were included between November 2014 and December 2020. The operation performed, drain sizes, sides and type were recorded. Respiratory reintervention was defined as replacement of an ICD, bronchoscopy, pleural aspiration or reintubation. The primary and secondary end points, and potential confounders such as age, histology, pre-operative stage of disease, neoadjuvant therapy, pre-existing lung disease, and anastomotic or chyle leak were recorded.

Results
The study period encompassed 258 patients who underwent oesophagectomy for cancer. Median age 69 (range 32-82), 211 male, 226 ACA:32 SCC, 224 neoadjuvant therapy, 212 right-sided thoracic operations, 46 left thoracoabdominal approach.
Post-operative respiratory reinterventions occurred in 47 patients (18.2%). At least one post-operative pleural effusion was present in 52 patients (20.2%): 9 bilateral; 26 contralateral; 17 ipsilateral to the side of thoracic surgery. 67% of effusions were contralateral to the operated side. The use of two or three ICDs (HR 371683269, p<1), one or two operative side ICDs (HR 0, p<1), Blake’s drains in place of rigid ICDs (HR 0.938 [0.422-2.085], p<0.875), and size 24F compared to 28F drains (HR 0, p<0.999) are not significantly associated with post-operative respiratory reinterventions.
Similarly, the presence of post-operative pleural effusions is not significantly associated with the use of two or three ICDs (HR 240242843, p<1), one or two operative side ICDs (HR 0, p<1), Blake’s drains in place of rigid ICDs (HR 0.938 [0.422-2.085], p<0.875), and size 24F compared to 28F drains (HR 1.055 [0.109-10.2], p<0.963).

Conclusions
This study supports the use of contralateral pleural space drainage as two thirds of effusions were contralateral to the operated side. It shows no correlation between the size of drains, number of drains or use of Blakes drains and the likelihood of requiring a post-operative respiratory intervention or development of post-operative pleural effusion. Therefore the ERAS principles of the fewest number of drains for the shortest duration should be adopted.
Esophagogastric Lymphomas; Lymphomas outside Lymphoid tissue

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Background
Primary gastric lymphomas are rare tumours and account for 5% of all gastric neoplasms. Esophagheal lymphomas are even rarer, accounting for 1% of all oesophageal tumours. Incidence of these tumours have been increasing over time and there is increasing need to understand this tumour subtype. This is a single centre study of esophagogastric lymphomas over a period of 15 years.

Methods
Between 2005 to 2020; patients who were diagnosed of having esophagogastric lymphomas, were retrospectively studied. Their clinical records were assessed for age, gender, clinical signs and symptoms, histological type, association with H pylori, LDH levels, stage at diagnosis, treatment type, Endoscopy and clinical follow up and survival.

Results
66 patients were diagnosed of having lymphoma, out of which 4 (6%) were oesophageal and 62 (93.93%) were gastric. Median age was 77 years (Range 41-102 years), 39 were male (59%) and 27(41%) were female. Anaemia was the commonest sign (53%), followed by nausea/vomiting (45%), weight loss (44.5%), abdominal pain (40.6%) and dysphagia (24%). 15.6% patients were found to have H pylori and 10% of patients had Barrett’s. Diffuse Large B Cell Lymphomas were commonest tumours (28.33%) followed by MALToma’s (26.6%). 60% patients were T3/4 at the time of diagnosis and 9.7% had other OG malignancies. 53% patients received antibiotics, 61% received chemotherapy, 16% received chemoradiotherapy and 16% received surgical resection. Median survival was 3 years (range 0-14).

Conclusions
Esophagogastric lymphomas are successfully treated with chemotherapy with promising survival. The stage at diagnosis and presence of comorbidities are limiting factors in overall disease prognosis.
Weight Loss and Complications in Oesophagectomy and Gastrectomy Patients

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Background
Oesophagectomy and gastrectomy are major surgeries which often involve patients fasting for prolonged periods of time post operatively thus requiring alternative nutrition regimens. In addition, patients often suffer dysphagia, anorexia, chemotherapy side effects and significant weight loss prior to surgery. Post-operative concerns include delayed gastric emptying, refeeding syndrome and dumping syndrome. Whilst placement of enteral feeding tubes aids the transition back to normal diet there are often still social, physical and dietary challenges that hinder nutrition. The aim of this study was to review weight loss in patients post operatively and to optimise post-operative nutrition.

Methods
The records of 113 patients who had undergone an oesophagectomy (43) or gastrectomy (64) between June 2018 and November 2019 at a single regional cancer centre were retrospectively examined. These patients’ contemporaneous weights had been recorded at set peri operative timelines and the greatest percentage weight loss calculated. The percentage weight loss was matched to the highest Clavien-Dindo post-operative complication.

Results
89 patients had weights routinely reviewed post operatively, with the remainder not having regular post operative weights documented. The median weight loss was 7.53.
For patients undergoing a total gastrectomy (27) weight loss ranged from 7.36-29.2%. Median weight loss was 11.45%. Patients who underwent subtotal gastrectomy (26) had between 0.37-18.5% with a median of 7.83% weight loss. Those who underwent an oesophagectomy (36) had between 0 - 28.67% weight loss with the median being 7.21%. 6 patients had their operations abandoned.
Post-operative complications, inclusive of Grade II and above, occurred in 16.8% of cases. Majority of complications occurred in those undergoing an oesophagectomy (64%), however complications did not correlate with percentage weight loss. The most common complication was grade IIIb (Grade I: 8, Grade II: 1, Grade IIIa: 1, Grade IIIb: 14, Grade IVa: 2, Grade V: 2).

Conclusions
Significant post-operative weight loss is common after oesophagectomy or gastrectomy surgery. Postoperative weight loss did not correlate with complications. Furthermore, there did not appear to be a correlation with weight loss and type of procedure.
Nutritional status plays an important prognostic role in patients undergoing oesophagectomy or gastrectomy. Optimising nutrition perioperatively and post operatively is important to enhance post-operative recovery and reduce post operative risk. Reviewing a larger cohort of patients would improve the robustness of this study.
Outcomes of oesophagectomy post endoscopic mucosal resection

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Background
Within developed nations, oesophageal adenocarcinoma has the greatest incidence of any solid organ tumour with number escalating on a yearly basis. A recent expert review by the AGA suggests that high grade Barrett’s dysplasia and intramucosal adenocarcinoma are better treated endoscopically rather than oesophagectomy and that endoscopic management is a reasonable alternative to oesophagectomy for selected patients with low risk pT1b tumours... Risk factors for nodal involvement and recurrence have been suggested by Lee et al (1). This study aims to review the pathological and clinical outcomes following oesophagectomy post EMR.

Methods
- Review of oesophageal cancer patients discussed through the Northern Ireland Regional MDM between January 2015 and December 2020 from a prospective database.
- Inclusion criteria: cT1 cN0 cM0 adenocarcinoma following EMR who proceeded to Oesophagectomy.
- All the patients were categorised according to risk based on risk scoring system developed by Lee et al (1) as per below.

Results
- N=12 fit the inclusion criteria. 8/12 high, 1/12 moderate and 3/12 low risk patients respectively.
- 1/12 had recurrent EMR due recurrent adenocarcinoma.
- 6/12 had no residual tumour in resection specimen and no LVI. 5 were in high and 1 in moderate risk groups respectively. 5/12 had pT1a and 1/12 had pT1b. No patients had lymph node involvement.
- 10/12 had ≥15 lymph node examined in resection specimens. A high lymph node yield enables accurate staging and is associated with improved survival (2). In our small sample size, zero patients had positive longitudinal and circumferential margin.

Conclusions
Whilst some low risk patients had residual tumour at oesophagectomy, these findings were similar to Nelson et al 3; recurrent/recurrent local tumour could be potentially managed by repeat EMR. The absence of nodal metastasis in this small series is consistent with the AGA recommendation of EMR as a reasonable alternative to oesophagectomy for patients with selected low risk pT1b tumors.
P-OGC95
Understanding the molecular age of Barrett’s oesophagus in a population-representative sample of patients

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Background
The incidence of oesophageal adenocarcinoma (OAC) increases dramatically with patient age but only a small proportion of patients with diagnosed Barrett’s oesophagus (BO), the precursor to OAC, will develop dysplasia and/or cancer. Beyond chronological age, biomarkers of progression that capture biological aging offer largely untapped potential for objectively identifying BO patients at highest risk of progression, who could undergo personalised surveillance at shorter intervals. We have developed computational tools to determine tissue-specific aging using genome-wide methylation data as a “molecular clock” for estimating patient-specific BO dwell times at the time of incident diagnosis that cannot be clinically measured by other means.

Methods
Using the population-based Northern Ireland BO register in a retrospective study, we have identified 46 non-dysplastic BO patients who have 2-4 serial endoscopic biopsies each, and have not progressed to OAC (age range 29-77 years). FFPE biopsies for 10 age-matched patients who had prevalent HGD/OAC at index BO diagnosis were also retrieved. DNA has been extracted, quantified using fluorescence, quality checked through qPCR, and prepared for Illumina EPIC methylation arrays. We created a Python package called “MethylDrift” to determine genome-wide aging rates in patient data. Model outputs are used in the molecular clock for BO tissue age.

Results
We used MethylDrift to quantify aging rates in both cross-sectional data (population-level epigenetic drift) and longitudinal data within the same patients to obtain individual aging rates. Computational analyses using our previously developed Bayesian framework for the BO molecular clock will be applied to estimate the molecular age of BO in patients, i.e., how long the patient has been living with BO since onset of metaplasia. Results will be compared between age groups, birth cohorts, sex, and importantly between dysplastic and non-dysplastic BO to evaluate biomarker potential. Data analysis is ongoing, and the final results will be presented at the meeting.

Conclusions
Our results from this nested case-control study demonstrate feasibility and generate pilot data on molecular age as a proxy of BO duration at the time of incident diagnosis, in a large population-based registry of patients with BO. This will inform our computational tools for determining biological aging and can be applied in future work to investigate progression risk according to molecular age. Ultimately, this biomarker could inform surveillance frequency for BO patients, enable earlier detection of neoplastic progression, leading to improved patient outcomes and optimal distribution of limited endoscopy capacity for surveillance.
P-OGC96
Oesophagectomy with Enhanced Recovery for Adenocarcinoma in the Elderly

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Background
The incidence of oesophageal adenocarcinoma is rising rapidly in high-income countries. Combined with an ageing population, it is expected that the need for treatment, including surgery, will increase in the next decade. Oesophagectomy in patients ≥70 years old has been associated with a higher risk of complications. The aim of our study is to compare the outcomes of patients ≥70 vs <70 years old, who underwent oesophagectomy for adenocarcinoma with an enhanced recovery (ERAS) protocol.

Methods
A single-centre retrospective study was performed. Eligible cases were divided into the <70 and the ≥70 groups for comparison of baseline variables, postoperative outcomes, and overall survival.

Results
From January 2014 through September 2020, oesophagectomy with ERAS was performed for 230 patients with adenocarcinoma. Most (85%) patients were male. The median age was 70 years. The overall 90-day complication rate was 69.6%. The anastomotic leak rate was 16.1%. The 30- and 90-day mortality rates were 0 and 3.0% respectively. Median length of stay (LoS) was 7.0 days (IQR=5.0) and the readmission rate was 18.7%. The overall complication rate was higher in the ≥70 vs the <70 group (75.6% vs 63.1%; p=0.038). There was no significant difference in major complications, anastomotic leakage, mortality, LoS, or readmission (p>0.05) between the groups. Estimated mean survival was lower in the ≥70 vs the <70 group (45.6 vs 57.9 months; p=0.045).

Conclusions
Elderly patients with oesophageal adenocarcinoma can undergo oesophagectomy with ERAS, achieving similar postoperative outcomes to younger patients. In an era of an ageing population with an increasing disease burden, these findings are encouraging.
**Development and piloting of surgical quality assurance methods for randomised controlled trials (RCTs): an example from a trial comparing laparoscopically assisted oesophagectomy vs. open oesophagectomy**

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**Background**
RCTs in surgery are frequently criticised because the standard to which operations are performed (quality assurance - QA) is not considered during study design and delivery, risking performance bias. Lack of clarity about surgical QA may also influence the successful implementation of RCT results into routine practice, because it is unclear how procedures were undertaken. We developed QA measures for an RCT comparing laparoscopically assisted and open oesophagectomy (LAO and OO).

**Methods**
Five QA categories were developed during the pilot and applied to the main trial, using data from patients receiving their randomized allocation in each group: i) entry criteria for centres; ii) entry criteria for surgeons; surgical protocols for key components of LAO and OO with mandated, prohibited and flexible components, monitored using iii) case report forms (CRFs) to record protocol adherence; and iv) intra-operative photographs to demonstrate protocol adherence (using the visible anatomical structures to determine if the component had been fully completed); and v) lymph node count and length of oesophagus.

**Results**
8 centres and 39 surgeons participated and met entry criteria. 145 (LAO) and 149 (OO) patients underwent their randomized surgical procedure. Key procedural components were reported as complete in CRFs at similar rates in both groups, with >70% undergoing mandated components. However, adherence assessed using photographs was consistently lower than the CRFs. For example, left gastric artery lymphadenectomies were reported as complete in >98% CRFs (LAO and OO) whereas photographs found this to be complete in 42% (OO) and 54% (LAO). Median nodal count was similar in both groups (145 LAO=24.7, SD=10.6 and 149 OO=26.4, SD=10.2) as was length of resected oesophagus.

**Conclusions**
Assessing surgical QA in a multi-centre trial is logistically challenging but feasible. Whilst video data from laparoscopic cases could be collected and assessed, it was not possible with open surgery. Understanding adherence to the study protocol using photographs in addition to CRFs was important because of marked differences between what surgeons reported had been undertaken and images of what had been achieved. It is recommended that surgical trials include QA processes to understand protocol adherence and examine performance bias between groups.
P-P01
Impact of gastric resection and enteric anastomotic configuration on delayed gastric emptying after pancreaticoduodenectomy: a network meta-analysis

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Background
Delayed gastric emptying (DGE) is frequent after pancreaticoduodenectomy (PD). Several randomised controlled trials (RCTs) have explored operative strategies to minimise DGE, however, the optimal combination of gastric resection approach, anastomotic route, and configuration, role of Braun enterostomy remains unclear.

Methods
MEDLINE, Embase, and CENTRAL databases were systematically searched for RCTs comparing gastric resection (Classic Whipple, pylorus-resecting, and pylorus-preserving), anastomotic route (antecolic vs retrocolic) and configuration (Billroth II vs Roux-en-Y), and enterostomy (Braun vs no Braun). A random-effects, Bayesian network meta-analysis with non-informative priors was conducted to determine the optimal combination of approaches to PD for minimising DGE.

Results
Twenty-four RCTs, including 2526 patients and 14 approaches were included. There was some heterogeneity, although inconsistency was low. The overall incidence of DGE was 25.6% (n = 647). Pylorus-resecting, antecolic, Billroth II with Braun enterostomy was associated with the lowest rates of DGE and ranked the best in 35% of comparisons. Classic Whipple, retrocolic, Billroth II with Braun ranked the worst for DGE in 32% of comparisons. Pairwise meta-analysis of retrocolic vs antecolic route of gastro-jejunostomy found increased risk of DGE with the retrocolic route (OR 2.1, 95% CrI; 0.92 - 4.7). Pairwise meta-analysis of Braun enterostomy found a trend towards lower DGE rates with Braun compared to no Braun (OR 1.9, 95% CrI; 0.92 - 3.9). Having a Braun enterostomy ranked the best in 96% of comparisons.

Conclusions
Based on existing RCT evidence, a pylorus-resecting, antecolic, Billroth II with Braun enterostomy may be associated with the lowest rates of DGE.
Incidence and risk factors for chyle leak after pancreatic surgery: a systematic review and meta-analysis

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Background
The incidence of, and risk factors for chyle leak, as defined by the 2017 International Study Group on Pancreatic Surgery (ISGPS), remain unknown.

Methods
MEDLINE, EMBASE, and Scopus were systematically searched for studies of patients undergoing pancreatectomy that reported chyle leak according to the 2017 ISGPS definition. The primary outcomes were the incidence of overall and clinically-relevant chyle leak. A random-effects pairwise meta-analysis was used to identify risk factors where possible.

Results
Thirty-five studies including 7083 patients were included in the meta-analysis. The weighted incidence of overall chyle leak was 6.8% (95% CI 5.6 - 8.2) and clinically-relevant chyle leak was 5.5% (95% CI 3.8 - 7.7). Pancreatectoduodenectomy, total pancreatectomy and distal pancreatectomy were associated with a CL incidence of 7.3%, 4.3%, 5.8% respectively. Fourteen individual risk factors for chyle leak were identified from included studies. Younger age, low prognostic nutritional index, para-aortic node manipulation, lymphatic involvement, and post-pancreatectomy pancreatitis were significantly associated with chyle leak, all from individual studies.

Conclusions
The incidence of overall chyle leak and clinically relevant chyle leak after pancreatic surgery, as defined by the 2017 ISGPS definition is 6.8% and 5.5% respectively. Several risk factors for chyle leak were identified in the present review, however, larger high-quality studies are needed to more accurately define these risks.
Impact of routine nasogastric decompression versus no nasogastric decompression after pancreatoduodenectomy on perioperative outcomes: A meta-analysis of available evidence

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Background
This meta-analysis reviewed the current evidence on the impact of routine Nasogastric decompression (NGD) versus no NGD after pancreatoduodenectomy on perioperative outcomes.

Methods
PubMed, Medline, Scopus, Embase and Cochrane databases were searched for studies reporting the role of nasogastric tube decompression after pancreatoduodenectomy on perioperative outcomes were retrieved and analysed up to January 2021.

Results
Eight studies with total of 1301 patients were enrolled of which 668 patients had routine NGD. Routine NGD was associated with a higher incidence of overall delayed gastric emptying (DGE) and clinically relevant DGE (OR = 2.51, 95% CI: 1.12 - 5.63, I² = 83%, P = 0.03, and OR = 3.64, 95% CI: 1.83 – 7.25, I² = 54%, P < 0.01, respectively). Routine NGD was also associated with a higher rate of Clavien-Dindo ≥ 2 complications (OR = 3.12, 95% CI: 1.05 – 9.28, I² = 88%, P = 0.04), and increased length of hospital stay (MD = 2.67, 95% CI: 0.60 – 4.75, I² = 97%, P = 0.02). There were no significant differences in overall complications (OR = 1.07, 95% CI: 0.79 – 1.46, I² 0%, P = 0.66), or postoperative pancreatic fistula (OR = 1.21, 95% CI: 0.86 – 1.72, I² = 0%, P = 0.28) between the two groups.

Conclusions
Routine NGD may be associated with increased rates of DGE, major complications and longer length of stay after pancreatoduodenectomy.
The cost of acute pancreatitis is amylasing!

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Background
Amylase is the key serum biomarker in the diagnosis of acute pancreatitis, however there is no indication for repeat/serial measurement once the diagnosis is established. It is estimated that £27,000pa is spent unnecessarily on repeat amylase investigations without clinical indication. Anecdotally, within the department, unnecessary repeats were being routinely performed. Resultantly, we audited in 2019 and 2020 to understand the extent of the issue. Following the first cycle, pre-rotation departmental talks were given to all relevant healthcare staff.

Aim(s):
- Determine and understand the extent of repeat amylase investigations and promoting factors.
- Assess the use of imaging.

Methods
Data was collected and analysed retrospectively over 2 audit cycles (C1 & C2) from 79 patient episodes of admissions to the surgical department of a Northern Major Trauma Centre with confirmed diagnoses of acute pancreatitis between 01/05/2019 – 31/07/2019 and 01/08/2020 – 31/12/2020.

Resources used included: patient notes, IMPAX and WebICE.

Data was collected and analysed by one author in C1 but multiple authors in C2.

Results
Mean age = 60 years.
Male:Female ratio was 8:16 and 24:31, respectively.
Initial amylase was diagnostic in >75% (61/79).
81 unnecessary repeats performed.
Most patients underwent imaging (75% and 67%) however, only approximately one-third (30.8% and 32.4%) of scans were performed to confirm the diagnosis.

- Despite imaging confirming the diagnosis in 88%, >50% of imaged patients had repeat amylase testing.

<table>
<thead>
<tr>
<th>Interim improvement</th>
<th>C1</th>
<th>C2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients undergoing unnecessary repeats</td>
<td>62.5%</td>
<td>47%</td>
</tr>
<tr>
<td>Mean number of repeats</td>
<td>2.4</td>
<td>1.73</td>
</tr>
<tr>
<td>Mode number of repeats</td>
<td>3</td>
<td>1*</td>
</tr>
<tr>
<td>Amylase repeated in imaged patients</td>
<td>69.2%</td>
<td>54.3%</td>
</tr>
</tbody>
</table>

* Seldom were >2 repeats requested (3 patients).

Conclusions
The results demonstrate that our intervention, a pre-rotation departmental talk, has significantly reduced the over-requesting of amylase and current practice is of a good standard.

Improvements are still required. Resultantly, we are additionally producing an electronic ‘alert’ into our investigations software that, on requesting a repeat amylase, will prompt clinicians to consider its necessity.

Other centres offering acute treatment for similar patients may benefit from performing a similar audit to optimise care while reducing overall clinical costs.
Acute Pancreatitis during COVID-19 Pandemic: An Overview of Patient Demographics, Disease Severity, Management and Outcomes in Western Health and Social Care Trust (Altnagelvin Area Hospital)

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Background
Acute pancreatitis is a common disease requiring admissions under surgical and critical care units. The two most common causes are alcohol and gallstones. COVID-19 pandemic had a significant impact on service delivery and patient management throughout all surgical specialties. In this study, primary aim was to ascertain incidence of COVID-19 in acute pancreatitis patients. Secondary objectives were to study aetiology, demographics, severity, 30 day mortality, outcomes and management of acute pancreatitis patients from Altnagelvin Area Hospital from 1st March, 2020 till 30th August, 2020.

Methods
A retrospective observational review of all patients admitted under General Surgical team from March 2020 till September 2020 was performed. Information regarding demographics, severity of acute pancreatitis (using Glasgow score, Atlanta classification and CT severity index score), ICU admission and organ support, treatment modalities and follow-up data for outcomes was collected based on RedCap tool used by COVID-PAN study. The results were compared to outcomes results of COVID-PAN study for COVID-19 negative patients in that study as we had only one patient who was positive for COVID-19 at time of concomitant pancreatitis diagnosis.

Results
Forty four (44) patients were admitted with acute pancreatitis. Only one patient (2.3%) was diagnosed with COVID-19 at time of pancreatitis. Aetiology of pancreatitis was found comparable to aetiology reported by large scale studies (2). Mortality was 7% (3 patients). Five patients (11%) needed ICU admission due to organ dysfunction. Three patients (7%) developed ARDS.

Conclusions
The overall incidence of COVID-19 in pancreatitis in our population of study was low. Therefore, results were compared to patients who were COVID-19 negative in COVID-PAN study. Patients with acute pancreatitis in our target population were mostly elderly, about one in five had moderate to severe or severe pancreatitis and in 16.3% the aetiology could not be identified. As has been observed in other centres globally, urgent for gallstone pancreatitis faced significant delays with no patients being offered index cholecystectomy and only 4 out of 19 patients having undergone interval cholecystectomy.
P-P06

Ward based goal directed fluid therapy (GDFT) in acute pancreatitis (GAP) trial: a feasibility randomised controlled trial [ISRCTN 36077283]

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Background
Goal directed fluid therapy (GDF) based on cardiac output assessment has been shown to reduce complications and improve survival for people undergoing major general surgery. There are no reports of cardiac output evaluation being used to optimise the fluid administration for patients with acute pancreatitis who are in a general surgery admission ward.

Methods
The trial protocol has been published. 50 patients with acute pancreatitis were recruited, consented and randomly allocated to either ward-based GDF with intravenous (IV) fluids administered based on stroke volume optimisation or standard ward care but with blinded cardiac output evaluation for 48 hours following hospital admission.

Results
Over a period of 20 months 50 of 142 screened patients were recruited demonstrating that it was feasible to recruit into a randomised trial of this nature in ward patients with acute pancreatitis. 36 (72%) completed the allocated 48 hours of goal directed fluids with 10 (20%) discharged within 48 hours and 4 withdrawals (3 GDF and 1 SC). Baseline characteristics of the groups were similar with only 3 participants having severe disease (6%, 1 GDF, 2 SC). Similar volumes of IV fluids were administered in both groups (GDF 5465 (1839) ml, SC 5211 (1745) ml). GDF group had a lower heart rate, blood pressure and respiratory rate and improved oxygen saturations. GDF was not associated with any harms. Complications of AP appear to be similar as was duration of stay in intensive care. Length of hospital stay was 5 (2.9) in GDF and 6.3 (7.6) in SC groups.

Conclusions
Ward GDF is feasible and shows a signal of possible efficacy in acute pancreatitis in this early-stage study. A larger multi-site RCT is required to confirm clinical and cost effectiveness.
The incidence of Malignancy in Patients with Suspected Periampullary Tumours Who Underwent Blind Whipple Resections: A Single Institution Cross Sectional Review at King Hussein Medical Centre, Amman, Jordan

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Background
In this study, we evaluated the incidence of malignant and benign histopathological findings in patients undergoing blind pancreaticoduodenectomy (PD) for presumed periampullary cancer based on clinical, radiological and endoscopic findings.

Methods
Medical records of 29 patients who underwent pancreaticoduodenectomy at King Hussein Medical Centre were reviewed. Demographics, clinical presentation, preoperative imaging and postoperative histopathological results were analysed.

Results
The percentage of malignancy was 82.8% and that of a benign lesion was 17.2%. All patients with benign results on final histopathology had chronic pancreatitis (100%), and all of them (100%) had abdominal pain on initial presentation. Out of all patients with periampullary malignancy, 21 (87.5%) had jaundice on initial presentation. The most important radiological correlate of malignancy is dilatation of the common bile duct greater than 6mm.

Conclusions
The finding of chronic pancreatitis in pancreaticoduodenectomy specimens of patients with suspected periampullary malignancy is justifiable, because none of the differences in clinical presentation or available diagnostic modalities can be reliably used to distinguish between benign versus malignant disease. Moreover, Pancreaticoduodenectomy in these patients offers the best chance for long term survival with acceptable mortality and morbidity.
Towards effective analgesia in acute pancreatitis: a systematic review of randomised controlled trials

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Background
The optimal analgesic strategy for patients with acute pancreatitis (AP) remains unknown. The present systematic review and meta-analysis aims to compare the efficacy of several analgesic modalities trialled in AP.

Methods
A systematic search of PubMed, MEDLINE and EMBASE was conducted up until June 2021, according to PRISMA Guidelines to identify all randomised control trials (RCTs) comparing analgesic modalities in AP. The primary outcome measure was improvement in pain scores as reported on visual analogue scale (VAS) on day 0, day 1 and day 2.

Results
Twelve RCTs were identified including 542 patients. Seven trial drugs were compared: opiates, non-steroidal anti-inflammatories (NSAIDs), placebo, local anaesthetic, epidural, paracetamol and metamizole. A weighted single-arm effects estimate showed global improvement in VAS across all modalities from baseline to day 2. On visual inspection, epidural analgesia appears to provide the greatest improvement in pain scores within the first 24hrs, however at 48hrs it was comparable to opiates. Within the first 24hrs, NSAIDs offered similar pain-relief to opiates, while placebo also showed equivalence to other modalities but then plateaued. Local anaesthetics demonstrated least overall efficacy. VAS scores for opiate and non-opiate analgesics were comparable at baseline and day 1. The identified RCTs demonstrated significant heterogeneity in pain-relief reporting with relatively small datasets per study.

Conclusions
Given the incidence of AP there is remarkable paucity of level 1 evidence to guide pain management. Epidural administration is most effective analgesic modality within the first 24hrs of AP. NSAIDs are an effective opiate sparing alternative during the first 24hrs.
Salvage transgastric necrosectomy as a part of a step-up approach to managing acute necrotising pancreatitis

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Background
The use of EUS (endoscopic ultrasound) guided drainage with endoscopic LAMS (lumen apposing metal stent) necrosectomy is an emerging treatment option for walled-off pancreatic necrosis (WOPN) secondary to acute severe pancreatitis. It can delay or remove the need for surgical necrosectomy, which can be associated with high morbidity and mortality. However, the endoscopic approach is not always successful due to a multitude of factors and salvage transgastric necrosectomy can be performed using the tract created by the LAMS to achieve internal drainage and remove necrotic pancreas.

Methods
We describe our unit’s experience in managing WOPN in two patients. We suggest a treatment pathway of WOPN which includes a step-up approach including salvage transgastric necrosectomy in patients where multiple endoscopic necrosectomies and washouts have failed.

Results
Two patients, aged 67 and 69, were admitted as intensive care transfers for gallstone and alcohol pancreatitis respectively. They underwent a step-up approach to treat their infected WOPN, starting with the deployment of LAMS and endoscopic necrosectomy. They both showed brief clinical improvement after repeated endoscopic necrosectomy but further imaging showed ongoing large collections that could not be treated endoscopically. Both patients underwent successful transgastric open necrosectomy where necrotic pancreatic tissue was accessed surgically through the already created cyst-gastrostomy. This had the advantage of internal drainage of the collection into the stomach without the need for external surgical drains.

Conclusions
The emphasis in the treatment of WOPN has shifted to minimally invasive percutaneous or endoscopic drainage modalities. Endoscopically inserted LAMS may not always achieve definitive drainage of the WOPN but should be employed in the first instance as they are associated with reduced morbidity and mortality compared to surgery. Ultimately, open necrosectomy with washout remains the definitive management strategy in the step-up approach. We believe that the trans-gastric open necrosectomy approach can be used successfully in patients where the minimally invasive approach has failed.
The survival benefit of pancreatic enzyme replacement therapy in adult patients undergoing treatment of pancreatic neuroendocrine tumours

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Background
Patients with pancreatic neuroendocrine tumours (pNETs), treated with somatostatin analogues (SSAs) or pancreaticoduodenectomy, are at risk of exocrine pancreatic insufficiency. This is frequently undiagnosed but can be treated with pancreatic enzyme replacement therapy (PERT). PERT improves survival and nutritional status in other exocrine pancreatic insufficiency-associated conditions such as pancreatic adenocarcinoma. This single-centre retrospective cohort study aimed to establish whether PERT increases survival or weight maintenance in SSA or pancreaticoduodenectomy-treated patients with pNETs.

Methods
Departmental databases identified patients (n=82) diagnosed with pNETs between 2009 and 2019 and managed with SSAs and/or pancreaticoduodenectomy. Their baseline characteristics, treatments and outcomes were established from clinical records. Cases (n=47) received PERT 3 months after either pancreaticoduodenectomy or commencement of SSAs, controls (n=35) did not. Overall survival was analysed using the Kaplan-Meier method, the log-rank test and multivariable Cox regression. Percentage monthly weight changes were compared using the Mann-Witney U test. The cohort was investigated as a whole and stratified by intervention (pancreaticoduodenectomy or SSAs) as more cases having undergone pancreaticoduodenectomy was a potential confounder.

Results
Median survival was not reached in either group. Cases experienced significantly greater 5-year overall survival (81% vs 53%, p=0.010), however, PERT was not independently associated with survival (Hazard ratio 0.47, 95% CI 0.17-1.30, p=0.143). Cases showed superior median weight maintenance (+0.04% vs -0.10% per month, p=0.013), but had lower mean baseline weights (70.0kg vs 81.9kg, p=0.003). Considering SSA-treated patients (n=55) only, cases (n=27) showed greater median weight maintenance (+0.04% vs -0.21% per month, p=0.025) and a trend towards improved median overall survival (55.5, 95% CI 10.3-100.7 vs 47.7, 95% CI 19.1-76.4 months, p=0.054).

Conclusions
PERT may improve the maintenance of weight and therefore nutrition in patients with pNETs, treated with SSAs or pancreaticoduodenectomy. PERT may also convey a survival benefit in this same population, however, due to the numerous factors which affect survival, this study appears underpowered to reliably explore this outcome. Further studies are required to accurately define the use and benefits of PERT in this population.
A tumour responsive, oxygen-generating nanoparticle to combat hypoxia in pancreatic tumours

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Background
Pancreatic cancer remains a significant therapeutic challenge and its poor prognosis has remained relatively unchanged for the past 40 years. Pancreatic tumours are highly desmoplastic and impenetrable lesions in which both gas and mass transfer is severely compromised. This leads to the development of hypoxia within the tumour and this compromises therapeutic approaches that rely on cytotoxic reactive oxygen species, e.g. photodynamic therapy, sonodynamic therapy and radiotherapy. Hypoxia also results in a relatively low pH within the tumour microenvironment. Here we describe a pH sensitive nanoparticle that can generate oxygen in the tumour and enhance ROS generating therapeutic approaches.

Methods
CaO₂ NPs were generated by exposing to low frequency ultrasound and subsequently coated using a polymethacrylate polymer that becomes soluble at pH 6.4. For some studies, the sonosensitiser, Rose Bengal was attached to the particles. Oxygen generation in tumours (BxPC3) was demonstrated by inserting a dissolved oxygen probe into tumours following IV administration of particles. Particles were also employed together with photodynamic therapy (PDT) and sonodynamic therapy (SDT) using human xenograft and syngeneic pancreatic tumour models. In some cases, tumour tissues were recovered and analysed for tumour infiltrating immune cells using flow cytometry.

Results
1. Polymer coated particles were shown to generate oxygen in response to a decrease in pH.
2. Nanoparticles had an approximate diameter of 240 nm and were shown to be taken up by tumours following IV administration.
3. Particles were shown to enhance PDT.
4. In a bilateral tumour model, SDT-based treatment of one tumour led to a dramatic abscopal effect at the untreated tumour.
5. This SDT induced abscopal effect was shown to be immune-mediated and data suggested that this resulted from a decrease in immunosuppressive regulatory T cells.

Conclusions
Coating CaO₂ nanoparticles with a pH sensitive polymer provides in situ oxygen generation in tumours. Transient provision of oxygen enhances therapies that depend on the generation of cytotoxic reactive oxygen species. When used with SDT, and using a bilateral syngeneic pancreatic tumour model, a powerful abscopal effect was observed and this was shown to be immune-mediated. The above data suggest that the particles may be exploited to enhance other therapies that depend on the generation of ROS, e.g. radiotherapy, and further suggest that the approach can be used to treat either local or disseminated forms of pancreatic cancer.
**P-P13**

**Long-term outcome after portal vein resection during pancreaticoduodenectomy for pancreatic ductal adenocarcinoma: a propensity score matched analysis**

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**Background**

Portal vein resection (PVR) with pancreaticoduodenectomy (PD) is often performed to achieve clear margins for patients with vascular involvement in pancreatic ductal adenocarcinoma (PDAC). However, there is evidence to suggest that patients undergoing PVR often have more advanced cancers, therefore the impact of PVR on survival and recurrence remains unclear. The aim of this study is to assess overall (OS) and recurrence free (RFS) survival in patients who underwent PVR during PD, with particular attention to margin positivity.

**Methods**

A retrospective analysis was performed on 638 patients who underwent PD during a 12-year period. Exclusion criteria included PD for non-PDAC tumours, neoadjuvant chemotherapy or intra-operative radiotherapy. 374 patients were included in the study (90 PVR and 284 non-PVR). Patient characteristics and histopathological factors associated with OS and RFS were then evaluated using univariate and multivariate Cox regression analyses. 270 patients (90 PVR and 180 non-PVR), were matched by propensity score based on perineural invasion, pT and pN staging. The Kaplan-Meier method was used to calculate survival and log-rank tests.

**Results**

Resection margin positivity was associated with shorter OS and RFS (p<0.0001), and the superior mesenteric vein (SMV) margin was the most significant risk factor for survival on competing risks analysis. Absent adjuvant chemotherapy, nodal metastasis and margin positivity were independent risk factors for OS and RFS on multivariate analysis. PVR was associated with higher intra-operative blood loss (p=0.009), but was not associated with increased length of stay, complications or readmissions. PVR patients had increased pT staging, nodal metastasis and perineural invasion, however, there was no difference in OS (p=0.551) or RFS (p=0.256) between PVR and non-PVR after propensity matching.

**Conclusions**

Positive resection margins are associated with shorter survival times, and the SMV margin is the most significant prognostic indicator for overall survival and recurrence compared to other margins. PVR is a relatively safe procedure, however, it does not achieve the intended survival benefits of complete margin clearance. The impact on survival for margin positivity, particularly the SMV margin, and nodal metastasis should be considered when making decisions with regards to vein resection and adjuvant treatments.
A multi-centre retrospective cohort study exploring weight loss and nutritional interventions in severe acute pancreatitis

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Background
Acute pancreatitis is among the most common acute gastrointestinal diseases. Severe acute pancreatitis (SAP) develops in up to 20% of patients and is associated with increased morbidity and mortality. Patients may have long and complex hospital admissions; nutritional support is a cornerstone of management. Due to increased metabolic demands and development of pancreatic exocrine insufficiency (PEI) patients frequently endure excessive weight loss. There has been little research into the effect of SAP on nutritional status and necessary nutritional interventions. This project aimed to characterise weight loss in SAP, routes of feeding, and PEI - including pancreatic enzyme replacement therapy (PERT).

Methods
Participating centres were recruited via the Nutrition Interest group of PSGBI and were required to retrospectively recruit 5-10 consecutive patients admitted following January 1st 2018 using a predefined data collection tool. Inclusion criteria included; age ≥18 years and diagnosed SAP of any aetiology (defined by organ failure of >48hrs). The exclusion criterion was where death occurred during hospital admission. Data were collected regarding, weight changes, anthropometric measures, nutritional interventions used, PERT administration and diabetic status, including insulin use. All analyses were performed with IBM SPSS 22 (IBM Corp. Armonk, NY), with p <0.05 considered statistically significant.

Results
34 patients (22 male) from five centres met the inclusion criteria and were included in data analysis. Most common aetiologies were gallstones (13/34) and alcohol (11/34). A mean weight reduction of 12.6% (SD ± 10.77) (p<0.001) was observed. Multivariate analyses showed that higher premorbid weight (p=0.02) and PERT administration with tube feeding (p=0.005) were associated with weight loss. Most patients (29/34) received tube feeding; mean duration 56.8 (SD ± 58.29) days. There was a significant increase in patients with diabetes requiring insulin therapy from admission (n=3) to discharge (n=9) (p=0.03). Most (29/31) patients required oral PERT prescription on discharge.

Conclusions
Patients with SAP lost significant weight during the course of their illness despite aggressive, extended nutritional support and the correction of PEI with PERT. The significant increase in insulin dependence among patients with diabetes, and the number of patients requiring PERT on discharge, reflects the destructive effect SAP has on pancreatic function. These multicentre findings could be used as a baseline for determining effectiveness of nutritional interventions in SAP and may provide a basis for further prospective research in this area.
P-P15
Margin Accentuation Irreversible Electroporation in Stage III Pancreatic Cancer: A Systematic Review

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Background
The present systematic review aimed to summarise the available evidence on indications and oncological outcomes after MA IRE for stage III pancreatic cancer (PC).

Methods
A literature search was performed in the Pubmed, MEDLINE, EMBASE, SCOPUS databases using the PRISMA framework to identify all MA IRE studies.

Results
Nine studies with 235 locally advanced (LA) (82%, 192/235) or Borderline resectable (BR) PC (18%, 43/235) patients undergoing MA IRE pancreatic resection were included. Patients were mostly male (56%) with a weighted-mean age of 61 years (95% CI: 58–64). Pancreatoduodenectomy was performed in 51% (120/235) and distal pancreatectomy in 49% (115/235). R0 resection rate was 73% (77/105). Clavien Dindo grade 3–5 postoperative complications occurred in 19% (36/187). Follow-up intervals ranged from 3 to 29 months. Local and systematic recurrences were noted in 8 and 43 patients, respectively. The weighted-mean progression free survival was 11 months (95% CI: 7–15). The weighted-mean overall survival was 22 months (95% CI 20–23 months) and 8 months (95% CI 1–32 months) for MA IRE and IRE alone, respectively.

Conclusions
Early non-randomised data suggest MA IRE during pancreatic surgery for stage III pancreatic cancer may result in increased R0 resection rates and improved OS with acceptable postoperative morbidity. Further, larger studies are warranted to corroborate this evidence.
P-P16
Management of acute pancreatitis in a busy district general hospital

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Background
Pancreatitis is a common surgical presentation and can be life threatening, with complications such as acute respiratory distress syndrome and necrosis occurring. Due to high hospital incidence, it is important to ensure patients are managed appropriately using available guidelines. This audit aims to assess the management of acute pancreatitis in a busy district general hospital and identify areas for improvement to better patient safety.

Methods
Only cases of acute pancreatitis were used in this audit. Case notes for the period between October and December 2020 were collected respectively. A data collection proforma was created using guidelines from the British society of gastroenterology for the management of acute pancreatitis. Data was then analysed using Excel.

Results
23% of cases had documented scoring, with Glasgow-Imrie the only scoring tool used.
41% had documented oxygen saturation.
33% had been reviewed by alcohol liaison team for pancreatitis secondary to high alcohol consumption.
No patients were given the guideline’s recommended rate of fluid resuscitation (5-10ml/kg/hr).
All patients had amylase/lipase in their blood profile.
80% of patients had antiemetics prescribed should they require them, whilst 95% of patients had opioids prescribed for analgesia.
50% of patients were given antibiotics despite them not being indicated.
18% were kept nil by mouth (NBM) whilst having abdominal pain.

Conclusions
Our results suggest that guidelines for acute pancreatitis are not adequately adhered to. Many aspects of the guidance were not followed including documentation of oxygen saturation, antibiotic use, IV fluid resuscitation and alcohol liaison review for patients who required review.
We have developed a proforma to use for the management of acute pancreatitis to ensure that cases are managed in accordance with evidence-based literature and to make the management of these cases easier.
We will reaudit to analyse the effects of our intervention and determine whether there has been an improvement in the management of acute pancreatitis.
Casting a Wider NET: Defining PEI in patients with Neuroendocrine Tumours using the $^{13}$C-MTG breath test

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Background
Somatostatin-analogues (SSAs) are the first-line treatment of unresectable, symptomatic neuroendocrine tumours (NETs). However, SSAs inhibit pancreatic secretions which could lead to pancreatic exocrine insufficiency (PEI). There is, however, very limited data regarding the physiologic link between SSAs and PEI. PEI negatively impacts patient quality of life (QoL), nutritional status, and clinical outcomes. This is a prospective, observational, cohort study to establish the impact of SSAs on pancreatic exocrine function in patients with NETs, using the $^{13}$C-Mixed-Triglyceride ($^{13}$C-MTG) breath test.

Methods
Adult patients commencing SSA therapy for NETs, were recruited from December 2020. Patients were excluded if they had a diagnosis of other pancreatic disease, history of upper-gastrointestinal surgery that may alter pancreatic function, or already on SSA therapy. The impact of SSAs on exocrine function was assessed using the $^{13}$C-MTG breath test. A quotient of $^{13}$CO$_2$/12CO$_2$ was measured by mass spectrometry and the cumulative percent dose recovered at 6 hours (cPDR) is reported. Secondary endpoints investigated were changes in patient weight and Vitamin D levels.

Results
Exocrine function reduced in all patients (n=7) following SSA therapy (median reduction from baseline: -22.2%, range: -5.6–42.1%; p=0.018) (Figure 1). Vitamin D levels decreased in all but one patient (median decrease from baseline: -11.7%, range: -29.3-10%; p=0.126). Change in patient weight did not show any significant change (median decrease from baseline: -0.69%, range: -4.26 – 3.6%, p=0.933).

Figure 1: A composite line graph to show the percentage change in pancreatic exocrine function (according to change in cPDR of $^{13}$C), for each patient.

Conclusions
SSA therapy appears to have a consistent impact on exocrine function from early in the treatment course. This suggests that there is a widespread underestimation of PEI in this setting. Whether such decrease in exocrine function leads to weight loss remains to be seen. Further studies are required to confirm this work, determine the clinical relevance of this observation, and optimise medical therapy of PEI in this cohort. The $^{13}$C-MTG breath test is a feasible and acceptable measure of pancreatic exocrine function in patients treated with SSA therapy for NETs.
P-P18  
**Thoracic epidural VS intrapleural analgesia for pancreaticoduodenectomy – a study on analgesic and non-analgesic outcomes**

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**Background**
Thoracic epidural analgesia (TEA) has been the traditional option for post-operative pain management for Kausch-Whipple pancreaticoduodenectomy (KWPD) via a ‘reverse L’ incision. An alternative option with inter-pleural analgesia (IPA) has become popular. However, the superior form of analgesia for KWPD regarding analgesic and non-analgesic outcomes is unclear. This study aims to establish if IPA is equivalent to TEA.

**Methods**
Retrospective study of all patients who underwent KWPD with ‘reverse L’ incision by a single surgeon between February 2014 to June 2016. All received either IPA or TEA post-operatively; patients who had rectus sheath catheter and spinal anaesthesia were excluded. To reduce bias, the Anaesthetist, rather than Surgeon, decided the choice of analgesia based on personal skill. Efficacy regarding analgesia were collected by nursing staff as patient-reported pain severity (mild, moderate or severe). Data were collected from patient case notes and electronic records. This study analysed analgesia efficacy, complications, inotrope use, and intensive treatment unit (ITU) stay.

**Results**
A total of 40 included in the study. Twenty-two patients had TEA (45% female, median age 68 years) and 18 had IPA (44% female, median age 67 years). Median Charleson Comorbidity Index (CCI) was 5 for both. Patient-reported pain was not statistically different (p=0.15). We noted more analgesia complications with TEA (not working=4, leakage=2, haemodynamic instability=1, lower limb anaesthesia=1) than IPA (leakage=1; p=0.027). Eleven (50%) TEA and eight (44%) IPA patients required inotropes. TEA patients required significantly longer duration (median duration 35 VS 18 hours, p=0.047). Median ITU stay was 3 and 2 days for TEA and IPA patients, respectively.

**Conclusions**
Both TEA and IPA provide adequate pain relief for KWPD performed via a ‘reversed L’ incision. However, evidence suggests TEA was associated with significantly more analgesia-related complications and longer inotropic requirements. Furthermore, there was also a trend towards ITU stays with TEA. Therefore, we would recommend the use of inter-pleural analgesia over thoracic epidural.
Incidentally detected Double Duct Sign (InDDuS): a study on the long-term outcomes

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**Background**
The long-term outcomes of patients with biliary and pancreatic ductal dilatation (double duct sign-DDS), without a detectable underlying cause, is unclear in the current literature. This study aims to review the five-year outcomes of patients with incidentally detected double duct sign.

**Methods**
This is a retrospective study of patients that were found to have DDS between January 2010 to December 2015 at a tertiary referral Hepato-Pancreatico-Biliary unit. Patients were identified from the departmental performance team and cross-checked with the Radiology department. Patients who had malignancy and benign causes of DDS (such as pancreatitis and gallstones) were excluded. Five-year patient outcomes were collected from subsequent MDT outcomes and clinic letters.

**Results**
Initial screen identified 108 patients with DDS. Of these, 37 patients (81% female, median age 69 years, range 26-94 years) had no identifiable cause and were analysed. Main presenting complaints were abdominal pain (n=22), weight loss (n=9), and asymptomatic (n=3). Twelve had anaemia, 14 had derange LFTs and 2 patients had elevated serum CA19-9. A median of two (range 0-9) further investigations were performed to determine the underlying cause of DDS (US=6, CT=24, MRCP=17, endoscopy=16). Median follow up of 7.2 (range 5-11) years detected no pancreatic or ampullary cancer amongst all patients.

**Conclusions**
Results from this study suggests DDS without evidence of malignancy on Magnetic resonance cholangiopancreatography (MRCP) and endoscopic ultrasound (EUS) have minimal risk of developing pancreatic or ampullary cancer in the next five years. Thus, they can be safely discharged from follow up.
**P-P20**

‘Fast Recovery’ A multidisciplinary approach to improving recovery after pancreatic resection and ultimately increasing uptake of adjuvant chemotherapy

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**Background**

Pancreatic cancer surgery has a multi-system impact on a potentially vulnerable population. Current rates of adjuvant chemotherapy uptake are low. Our group developed a multidisciplinary bundle of care with the aim of improving recovery after surgery. The primary aim was to improve uptake of adjuvant chemotherapy and the secondary aim was to prevent nutritional decline.

**Methods**

This prospective, observational, cohort study evaluated the effect of the ‘Fast Recovery’ programme. This programme, developed with input from dieticians, physiotherapists, surgeons, and geriatricians and comprising pre- and post-operative frailty assessments, nutritional support and physiotherapy was implemented for all within our unit undergoing pancreatic resection for cancer. (See Fig. 1)

**Results**

Over 1 year, patients enrolled in the Fast Recovery programme (N=44) were compared to those treated prior to the pathway change (N=409). The Fast Recovery programme was not associated with a significant increase of adjuvant chemotherapy uptake (80.5 vs. 74.3%, p=0.452), but did lead to a significantly lower average weight loss (4.3 vs. 6.9 kg, p=0.013). Patients that did not receive adjuvant chemotherapy performed significantly worse on a pre-operative six minute walk test (mean distance: 277 vs. 454 metres, p=0.001).

**Conclusions**

Feasibility of a multimodal package to improve patient care following pancreatic resection has been shown by this pilot study. No significant improvement in the chemotherapy uptake was observed, however, this was potentially a result of the study being underpowered. Pre-operative physical assessments were found to be predictive of adjuvant chemotherapy uptake and could potentially be used to identify those in need of additional support. Further work is needed to evaluate the routine use of such a programme.
Endoscopic bipolar radiofrequency ablation for treating biliary obstruction caused by unresectable cancer: systematic review of clinical and cost effectiveness

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Background
Early evidence suggests using radiofrequency ablation (RFA) as an adjunct to stenting may improve outcomes in patients with malignant biliary obstruction. RFA can be deployed either at the initial stent insertion or to clear tumour ingrowth in a previously placed stent.

Methods
To assess the clinical and cost effectiveness and potential risks of RFA for malignant biliary obstruction. MEDLINE, EMBASE, Cochrane Library, Scopus, CINAHL, HTA and DARE, 3 websites and 7 trial registers were searched from 2008 to 2021. Study inclusion criteria were: malignant biliary obstruction; intervention as endoscopic RFA, either to fit a stent (primary RFA) or to clear a blocked stent (secondary RFA); primary outcomes were survival, quality of life or procedure-related adverse events. Risk of bias was assessed using the RoB 2.0 and ROBINS-I tools. Primary analysis was meta-analysis of the hazard ratio of mortality.

Results
68 studies (1742 patients) were identified but only 2 randomised trials, 1 retrospective case-control study and 3 retrospective cohort studies reported a hazard ratio of death for primary RFA compared to stent-only control. The pooled hazard ratio of mortality for primary RFA compared to stent-only was 0.34 (95% confidence interval (CI) 0.21 to 0.55). There was moderate heterogeneity (I² = 53%) however studies were consistently in favour of primary RFA. There was insufficient evidence available to analyse effectiveness in secondary RFA. No evidence relating to quality of life. There was no evidence of increased risk of cholangitis (risk ratio 1.15, 95% CI 0.63 to 2.12) or pancreatitis (risk ratio 1.34, 95% CI 0.55 to 3.25), but there was an increase in cholecystitis (risk ratio 11.47, 95% CI 2.28 to 57.66). Inconsistencies in standard reporting and study design were noted e.g. adverse outcomes and lack of standardised comparator groups. RFA was estimated to cost £2,659 and produced 0.18 QALYs more than no RFA on average. With an ICER of £14,392/QALY, RFA was likely to be cost-effective at a threshold of £20,000/QALY. The source of the vast majority of decision uncertainty lay in the effect of RFA on stent patency.

Conclusions
Primary RFA is associated with increased survival and appears cost-effective. The evidence for the impact of secondary RFA on survival and of quality of life is limited. There was no increase in the risk of post-ERCP cholangitis or pancreatitis but increased risk of cholecystitis. High quality RCTs to investigate primary and secondary RFA are needed with accurate documentation of quality of life, adverse event rates and survival.
Background

Somatostatin Analogue (SSA) therapy of neuroendocrine tumours (NETs) leads to pancreatic exocrine insufficiency (PEI). PEI symptoms include diarrhoea, abdominal discomfort, bloating, and steatorrhea, which negatively impact quality of life (QoL). NETs (and the sequelae of carcinoid syndrome) however, have similar symptomatology to PEI, with a comparably negative impact on QoL. QoL tools exist to assess PEI and its response to enzyme therapy; however, we hypothesise that PEI symptom scale scores will be unreliable in SSA-induced PEI due to the concurrent improvement of the carcinoid symptoms.

Methods

Adult patients commencing SSA therapy for NETs were recruited from December 2020. Qualitative assessments of the impact of SSAs and pancreatic exocrine function on patient QoL were performed before and during (at 8 weeks) therapy. The Pancreatic Exocrine Insufficiency Questionnaire (PEI-Q) was used to capture patient-reported assessment of relevant symptoms. Health-related QoL was assessed using the European Organisation Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLC)-C30, supplemented by the EORTC GI.NET.21. Patients were specifically asked about steatorrhea at both assessments.

Results

Seven patients completed the study. 5-HIAA levels were raised in 4/7 patients, indicative of carcinoid syndrome, secondary to the NET. Pancreatic exocrine function reduced after SSA therapy in all patients (data reported elsewhere) but paradoxically PEI-Q symptom scale scores reduced (median decrease from baseline: -18.5%, range: -1.5- -55.6%; p=0.018) (Figure 1). According to PEI-Q, all seven patients would meet the criteria for a mild PEI at baseline, and two would be considered severe. One patient reported steatorrhea after commencing SSA-therapy. No changes in relevant domains of EORTC questionnaires were statistically significant, including functional, symptomatic, and overall health scores.

Conclusions

The PEI-Q tool is not useful for assessing SSA-related PEI due to substantial symptom overlap with the tumour itself and SSA therapy. The decrease in symptom score is likely due to improvement of carcinoid syndrome, independent of PEI. Although the cardinal PEI symptom is steatorrhea, there is no distinction between that and diarrhoea in the EORTC tool, and confounding aetiologies of diarrhoea in NET patients may further complicate assessment. Current available QoL measures are of limited use in the setting of SSA-related PEI, and care should be taken if evaluating PEI or response of PEI to treatment.
Adjuvant chemotherapy in the treatment of intraductal papillary mucinous neoplasms of the pancreas: systematic review and meta-analysis

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Background
The present systematic review aimed to compare survival outcomes of invasive intraductal papillary mucinous neoplasms (IIPMNs) treated with adjuvant chemotherapy versus surgery alone and to identify pathologic features that may predict survival benefit from adjuvant chemotherapy.

Methods
A systematic search of Medline, Pubmed, Scopus, and EMBASE was performed using the PRISMA framework. Studies comparing adjuvant chemotherapy and surgery alone for patients with IIPMNs were included. Primary endpoint was overall survival (OS). A narrative synthesis was performed to identify pathologic features that predicted survival benefits from adjuvant chemotherapy.

Results
Eleven studies and 3393 patients with IIPMNs were included in the meta-analysis. Adjuvant chemotherapy significantly reduced risk of death in the overall cohort (HR 0.57, 95%-CI:0.38-0.87, p=0.009) and node-positive patients (HR 0.29, 95%-CI:0.13-0.64, p=0.002). Weighted median survival difference between adjuvant chemotherapy and surgery alone in node-positive patients was 11.6 months (95%-CI:3.83-19.38, p=0.003) favouring chemotherapy. Adjuvant chemotherapy had no impact on OS in node-negative patients (HR 0.53, 95%-CI:0.20-1.43, p=0.209). High heterogeneity ($I^2>75\%$) was observed in pooled estimates of hazard ratios. Improved OS following adjuvant chemotherapy were reported for patients with stage III/IV disease, tumour size >2 cm, node-positive status, grade 3 tumour differentiation, positive margin status, tubular carcinoma subtype, and presence of perineural or lymphovascular invasion.

Conclusions
Adjuvant chemotherapy was associated with improved OS in node-positive IIPMNs. However, the findings were limited by marked heterogeneity. Future large multicentre prospective studies are needed to confirm these findings and explore additional predictors of improved OS to guide patient selection for adjuvant chemotherapy.
P-P24
Optimising post-operative nutrition in patients undergoing pancreaticoduodenectomy

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Background
A considerable number of patients undergoing pancreaticoduodenectomy require supplemental nutrition in the postoperative period. However, there remains no national consensus on the optimal postoperative supplemental feeding modality. Furthermore, at our institution a variation in practice exists when considering post-operative enteral (via the naso-jejunal (NJ)) or parenteral nutrition (PN). This study aimed to evaluate the utility of post-operative enteral or parenteral nutrition at our centre and to explore risk factors predisposing patients to post-operative nutritional deficits requiring supplementation.

Methods
We retrospectively analysed the electronic case records of all patients undergoing a pancreaticoduodenectomy between November 2019 and November 2020 at our HPB specialist centre. Key patient demographic data and post-operative nutritional requirements with route, length and indication for supplemental feeding as well as biochemical markers, length of stay (LoS) and complications were collected and analysed. Data were analysed via intention to treat analysis.

Results
48 patients underwent a pancreaticoduodenectomy, of which 26 had an NJ tube inserted intra-operatively. 16 (33%) patients required supplemental feeding, via NJ route in 7 and PN in 9. 2 patients were intolerant to NJ feeds and progressed to PN. NJ fed patients had shorter LoS (12(10-42) vs. 28(14-63) days)(p=0.09) compared to PN feeding. PN-related line infection or thrombosis in 4 (36%) patients. Supplemental feeding met daily kcal requirements in 13 (81%) patients, but PN was associated with greater weight loss (-5%) than NJ feeding (-3%). Significantly increasing the risk of needing supplemental nutrition: advanced age(p=0.04), ASA≥2(p=0.04) and anastomotic leak(p=0.02).

Conclusions
In this group of patients, NJ feeding was largely well-tolerated and the majority of patients met their required daily kcal via this route. Due to the increased incidence of complications associated with PN, NJ feeding should be considered as the 1st line option for post-operative nutritional supplementation, with intra-operative insertion of an NJ tube considered for higher-risk patients.
Hot Axios stent removal following endoscopic pancreatic necrosectomy

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Background
Symptomatic pancreatic pseudocysts or walled off necrosis following pancreatitis can be drained via a stoma from the collection to the GI tract, this is typically facilitated by endoscopic stents. These stents are left in-situ until the area has drained, this can take several months. The stent is then ideally removed endoscopically. Little is known about the consequences of failed endoscopic stent removal or factors contributing to this failure.

Methods
Retrospective analysis of prospective data at LUHFT between 1st January 2018 and 31st December 2019 of patients receiving at least one Hot Axios stent for management of pancreatic collection. Normally distributed data were compared using Student’s two tailed T test, with non-parametric data compared using Mann-Witney U test, categorical data were analysed using Chi^2 test

Results
131 patients were included in analysis, of which 74 were male with a median age of 56 years (IQR 46-66.5). Failure of endoscopic removal (14 patients) was associated with a longer time to removal; 101 days (IQR 78-121) to first attempt vs. 49 days (IQR 19-104) to first endoscopic attempt where the stent was successfully retrieved endoscopically (p<0.01). Surgical removal was undertaken in 6 patients, with significant morbidity in 2 of 6 patients. Overall 90-day mortality in patients undergoing Hot Axios stent placement was 8 of 131 (6%).

Conclusions
Endoscopic stent removal fails more frequently in patients where the stent has remained in situ for a long time before removal is attempted. Surgical removal of Hot Axios Stents is associated with significant morbidity, and this should be balanced against the as yet unknown consequences of leaving Hot Axios stent in-situ permanently.
Post-laparotomy pain: the Rectus Sheath Pocket technique compared to other analgesic modalities

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Background
Wound pain is a major cause of morbidity after laparotomy, leading to reduced mobility, poor respiratory effort, and delayed discharge. In our centre, we have developed a safe and effective post-operative analgesia technique that reliably delivers a continuous, stable infusion of local anaesthetic solution into a pocket superficial to the posterior rectus sheath.

Methods
Sixty-eight adult patients were enrolled in the study. Group A, n=38 received rectus sheath catheter (RSC) analgesia and Group B, n=30 received standard post-operative analgesia. The pain score on day 1 and total opioid dosage over the first 72 hours post-operatively were recorded. All patients were recruited from Mater Dei Hospital which is the main acute hospital in Malta. The patients who were recruited consecutively for the study group underwent elective or emergency laparotomies within a pancreatic-biliary firm. For the control group, patients underwent elective or emergency laparotomies under the care of other teams within the same surgical department.

Results
Group A displayed significantly diminished mean pain scores (2.81±2.26 vs 4.66±2.86 p=0.003) but no statistically significant reduction in cumulative opiate usage. On further subgroup analysis, patients over 65 years of age with RSC, displayed significantly less overall cumulative opiate usage (10.09±15.71 vs 25.79±32.97, p=0.005). Few mild complications were recorded; catheter dislodgement (5), entrapment of catheter in wound sutures (1) and a wound hematoma (1) caused upon insertion.

Conclusions
Although inter-cohort demographics are consistent, case heterogeneity is acknowledged as a weakness of this endeavour. In adult patients, RSC has been demonstrated to be feasible, safe, and effective at diminishing pain scores in the postoperative period, especially so in the elderly population.
Long term follow-up after pancreatico-duodenectomy: A UK wide survey

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Background
Pancreatecto-duodenectomy (PD) results in major anatomical changes that have an impact on nutritional status and quality of life. Issues such as pancreatic exocrine insufficiency (PEI), diabetes mellitus (DM), malnutrition, micronutrient deficiency, osteoporosis and other gastrointestinal diseases are common in the post-operative setting (1, 2). Appropriate treatment of these surgical consequences is associated with improved survival (3, 4), and should improve quality of life.

The aim of this survey was to assess current practice and identify which disciplines were reviewing patients following PD, what format that review takes and the duration of follow up.

Methods
A UK wide electronic survey was developed using Qualtrics® software (SAP America Inc. USA) to capture all the nutritional aspects of follow up thought to be relevant in the long term. Markers of endocrine failure and malnutrition (weight, nutritional assessment and biochemical vitamin and mineral screens), smoking and alcohol cessation advice and the use of dual energy x-ray absorptiometry (DEXA) scans were included.

The survey was piloted on 5 staff locally prior to being circulated through a professional network – the Pancreatic Society of Great Britain and Ireland (PSGBI). Data were analysed using Chi-Square tests in SPSS (Version 26).

Results

One hundred and one (23% response rate) clinicians completed the survey, with 83 useable data sets. Surgeons and dietitians were most likely to reply to the questionnaire, 88% of respondents worked in tertiary centres, half (55%) had more than 10 years’ experience.

There were highly significant variations in practice according to clinician experience, underlying pathology, and institution (p<0.001 in all cases). Diabetes screening did not occur in 30% of cases.

Lifelong follow up was offered by 24% of clinicians (17 surgeons, 3 dietitians, 1 nurse), in pre-malignant (n=15), benign (n=11) and malignant disease (n=10) (P<0.001).

Conclusions

Whilst this study may be biased towards those with an interest in follow up, we still demonstrated a need to improve the provision of long-term follow up for patients who have undergone PD, especially since provision of a comprehensive assessment appeared to be associated with clinician experience, and varies between institutions.

More evidence for the benefits of long-term follow up and the optimal content is required to inform the development of clinical guidance. Early detection of clinical consequences may improve quality of life and reduce complications associated with poorly managed endocrine and exocrine failure.
Long term follow-up after pancreatico-duodenectomy for chronic pancreatitis; are we compliant with NICE guidelines

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Background
Patients with chronic pancreatitis experience malnutrition, osteoporosis, pancreatic exocrine insufficiency and have a 80% lifetime risk of diabetes (1). These are progressive consequences and require proactive surveillance for detection and optimisation of treatment. The NICE pancreatitis guidelines recommend long-term follow up for patients with chronic pancreatitis (1). European guidelines recommend regular assessment of bone density, biochemical assessment of micronutrient status and a comprehensive nutritional assessment (2).

The aim of this survey was to assess compliance with the NICE guidelines by analysing current practice in patients with chronic pancreatitis after pancreaticoduodenectomy.

Methods
A UK wide electronic survey was developed using Qualtrics® software (SAP America Inc. USA) to capture all the nutritional aspects of follow-up thought to be relevant in the long term. Markers of endocrine failure and malnutrition (weight, nutritional assessment and biochemical, vitamin and mineral screens), smoking and alcohol cessation advice and the use of dual energy x-ray absorptiometry (DEXA) scans were included.

The survey was piloted on 5 staff locally prior to being circulated through a professional network – the Pancreatic Society of Great Britain and Ireland (PSGBI). Data were analysed using Chi-Square tests in SPSS (Version 26).

Results
One hundred and one (23% response rate) clinicians completed the survey, with 83 useable data sets. Eighty eight percent worked in tertiary centres.

Lifelong follow up was only offered in tertiary centres (n=12) and was only provided by surgeons or dietitians (p=0.03). The duration of follow up did not vary by region (p=0.463).

Patients in the South of England were more likely to undergo a micronutrient screen (p=0.027). Only 26% of all patients were offered a DEXA scan. Clinicians with more than 10-years’ experience were more likely to assess weight (p=0.039), glucose and HbA1c (p=0.035) and assess symptoms (p=0.031).

Conclusions
This survey demonstrated a need to improve the provision of long-term follow up for patients with chronic pancreatitis. Lack of clarity on the format and who within the clinical team should take responsibility may explain the lack of structured follow-up in this patient group.

The importance of long-term assessment needs to be included in training programmes for junior clinicians, to standardise management, improve nutritional screening and improve access to bone mineral density scanning and diabetes screening.

Responsibility for follow up should be agreed between primary, secondary and tertiary care.
The glycated haemoglobin (HbA1c) test is not a predictor of pancreatectomy specific complications or survival

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Background
The glycated haemoglobin (HbA1c) test is a venous blood test used as a diagnostic test for diabetes mellitus and to monitor glucose control in patients known to have diabetes. The test has been recommended by National Institute for Health Care Excellence (NICE) clinical guidelines in the pre-operative setting since 2016. The purpose of testing is to reduce perioperative morbidity and mortality by optimising management of blood glucose levels in the perioperative period. The aim of this study was to assess the prognostic value of HbA1c in pancreatic cancer patients treated with pancreaticoduodenectomy.

Methods
This is a retrospective analysis of a prospectively managed database of pancreatic resections at a single institution from January 2016 to December 2020. Included patients had confirmed pancreatic adenocarcinoma and underwent a pancreaticoduodenectomy with preoperative measurement of their HbA1c. Patients who were already prescribed insulin were excluded. Demographic data, survival, operative and perioperative details were collected. Included patient records were assessed for the incidence of postoperative complications in accordance with International Study Group of Pancreatic Surgery guidelines for pancreatic fistula, delayed gastric emptying and post pancreatectomy haemorrhage. An HbA1c greater than 41 was deemed elevated.

Results
There were 145 patients who met the inclusion criteria. The HbA1c level was normal in 101/145 (70%) and elevated in 44/45 (30%). The postoperative pancreatic fistula rate was 18% in the patients with a normal HbA1c and 23% in those with elevated HbA1c (p=0.499). The rate of delayed gastric emptying was 21 and 23% in the patients with normal and elevated HbA1c respectively. There were five relaparotomies overall, one of these patients had an elevated preoperative HbA1c. There were no perioperative deaths. Overall survival was 31 months (95%CI 27-35) with a normal preoperative HbAlc and 32 months (95%CI 27-38) if elevated.

Conclusions
There is little doubt that the preoperative HbA1c is helpful in the package of preoperative assessment tests to optimise patients for surgery. However, the preoperative HbA1c level in patients planned for pancreaticoduodenectomy is not predictive of pancreaticoduodenectomy specific complications such as postoperative pancreatic fistula, delayed gastric emptying, relaparotomy or mortality. In addition, long-term overall survival is not influenced by an elevated preoperative HbAlc.
Outcomes from resection of pancreatic metastases and non-neuroendocrine, non-pancreatic tumours

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Background
Isolated metastatic disease within the pancreas is an uncommon finding. The potentially higher perioperative risk and low incidence of resectable metastases has limited the development of evidence based guidelines for pancreatic metastectomy. However, reports in the literature suggest a considered approach to resecting patients with limited disease, favourable tumour type and a significant disease free interval. The aim of this study was to examine the indications and outcomes of pancreatic resection for metastatic disease and non-pancreatic, non-neuroendocrine malignancy at a high-volume pancreatic surgery centre.

Methods
This is a retrospective analysis of a prospectively managed database of pancreatic resections for metastatic disease or primary non-pancreatic, non-neuroendocrine tumours at a single institution. Data collected and analysed included patient demographics, operative details and peri-operative outcomes, subsequent survival and mode of recurrence.

Results
Records of 711 patients who underwent pancreatic resection were examined. 21 consecutive patients met the inclusion criteria, representing 3% of the unit’s throughput. The perioperative morbidity and mortality were 33% and 0% respectively. Overall survival was 86 months (95% CI 63-107) for renal cell carcinoma and 64 months for other tumours.

<table>
<thead>
<tr>
<th>Tumour Type</th>
<th>Number of patients</th>
<th>Median disease free interval (months)</th>
<th>1yr Survival</th>
<th>3yr survival</th>
<th>5yr Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Renal cell carcinoma</td>
<td>12</td>
<td>73 (8-1333)</td>
<td>75%</td>
<td>58%</td>
<td>42%</td>
</tr>
<tr>
<td>Melanoma</td>
<td>3</td>
<td>14 (10-38)</td>
<td>100%</td>
<td>67%</td>
<td>33%</td>
</tr>
<tr>
<td>Diffuse large B cell lymphoma</td>
<td>2</td>
<td>0</td>
<td>100%</td>
<td>100%</td>
<td>50%</td>
</tr>
<tr>
<td>Breast</td>
<td>2</td>
<td>710 (65-1355)</td>
<td>100%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>Lung</td>
<td>1</td>
<td>18</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>Colorectal</td>
<td>1</td>
<td>40</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Conclusions
When coupled with the low morbidity and mortality rates of a high-volume pancreatic surgery centre using careful patient selection, pancreatic metastectomy has the potential to result in good long-term survival. Recent improvement in the efficacy of systemic therapies, particularly for renal cell carcinoma and melanoma contribute to the utility of resection and to the improved survival of patients.
Splanchnic vein thrombosis in acute pancreatitis: Incidence, risk factors and long term outcomes

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Background
There is paucity of data on the incidence, risk factors and role of anticoagulation for splanchnic vein thrombosis (SVT) in acute pancreatitis (AP).

Methods
A retrospective review of AP admissions between 2018-2021 across North East England was undertaken. Data on demographics, etiology, severity of AP and SVT was collected. In addition, a selective anticoagulation policy for portal vein thrombosis (PVT) and progressive splenic vein thrombosis was explored.

Results
401 patients were included with a mean age of 57.0 and M:F ratio of 1.6:1. 152 patients developed intestinal oedematous pancreatitis and 249 developed necrotising pancreatitis based on Revised Atlanta criteria (RAC). 109 patients (27.2%) developed SVT of which 27 developed a PVT and splenic vein thrombus, 36 PVT only and 46 splenic vein thrombus only.

On univariate analysis, alcoholic aetiology, severe pancreatitis, necrotising pancreatitis with >50% necrosis and elevated CRP at 2 weeks were risk factors for developing SVT. On multivariable analysis, alcohol aetiology (OR 2.6, p = 0.002), and >50% pancreatic necrosis (OR 14.6, p = 0.048) increased the risk of developing SVT.

58 patients received anticoagulation for SVT, with a median duration of 90 days of anticoagulation. Recanalization rates were higher for PVT when compared to splenic vein thrombosis. 6 patients developing bleeding complications whilst on anticoagulation therapy.

Conclusions
A third of patients with AP develop SVT, particularly those with severe AP secondary to alcohol and with extensive pancreatic necrosis. A selective anticoagulation policy was associated with improved recanalization rates and fewer bleeding complications.
Training Pathway to start Robotic Hepatobiliary and Pancreatic Surgery

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Background
Literature is now teeming with evidence that robotic HPB surgery is safe and can enable surgeons to perform minimally invasive procedures which are otherwise extremely challenging with standard laparoscopic approaches. With over 150 robotic systems already in action, it is a matter of time that multiple centres will start their robotic HPB programme in the near future. It is therefore timely to suggest a training pathway to safely start robotic surgery in the NHS.

Methods

Approvals
- Departmental, robotic case group, management, governance, finance and new intervention procedure committee approval.

Preparation
- Online robotic modules, console and patient cart training.
- Roll simulation exercised with fellows.
- Key and水务 training and gain certificate of console competence.
- Two surgeons should build up to start the programme.

Stage I
- Identify a practising and observe level I cases.
- Perform 5-10 level I cases independently before moving on to level II.
- Record all cases for video review and maintain outcome data prospectively.

Stage II
- Identify a practising and observe level II cases.
- Perform 1-3 level II cases followed by independent level II cases.
- Record all cases for video review and maintain outcome data prospectively.

Stage III
- Identify a practising and observe level III cases.
- Perform 4-10 cases followed by independent level III cases.
- Record all cases for video review and maintain outcome data prospectively.

Long term
- Record outcomes via HPB national robotic database (HNRDB).

Conclusions
This pathway is a suggestion based on personal experience and discussions with national and international leaders in robotic HPB surgery, literature review and feedback from HPB surgeons who are at different stages of developing their robotic service in the NHS.

The proposed training pathway is not exclusive to a specific robotic system and should be followed by all HPB surgeons irrespective of the make of their surgical platform.

Results

Level I case: cholecystectomy, liver cyst marsupialisation, CBD exploration.

These are index training cases and should be performed to familiarize the surgeon and theatre team with the strengths and limitations of robotic platforms and how to troubleshoot common problems.

Level II case: gastro-jejunostomy, non-anatomical liver resection, left lateral liver resection, distal pancreatectomy, splenectomy, hepatico-jejunostomy, bile duct excision/repair.

These are the cases usually performed laparoscopically in most HPB units. This should be a safe transition from laparoscopic to robotic surgery.

Level III case: Whipples procedure, total pancreatectomy, right and left Hepatectomy.

A team should progress to level III cases if they can demonstrate safe implementation of robotics in their department and have identified a proctor who would support them both short and long term.
Quality of Life Assessment in Patients undergoing Robot Assisted Pancreaticoduodenectomy

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Background
Robot-assisted pancreaticoduodenectomy has recently gained attention as there is evidence from high volume centres suggests better outcomes and quick recovery. This study aimed to evaluate the quality of life after robotic-assisted pancreaticoduodenectomy

Methods
The study included the first 12 consecutive patients who underwent robotic pancreaticoduodenectomy. The RAND SF 36-Item health survey form was used to assess the quality of life through a one-hour face-to-face interview carried out by a junior doctor from a different team with no prior involvement in patient care. The interview was carried out at least three months postoperative period. Each item in the subscale was recorded with a pre-coded numeric value. The comparison was made between preoperative periods' scores defined by the onset of disease symptoms to surgery and the postoperative follow-up score. The SF-36 survey questions were supplemented with additional items such as postoperative pain, emotional wellbeing, and fatigue status.

Results
Analysis of SF-36 domains showed better quality of life postoperatively than the baseline, as evidenced by the mean physical functioning score from 82.91 to 90 and mean general health score from 37.9 to 69.5 postoperatively. 91.66% of the patients reported that they felt better at the time of study and were happy overall.

Conclusions
Robotic-assisted pancreaticoduodenectomy shows a better quality of life than in the preoperative period, which can be attained in a brief postoperative period.
Impact of an Enhanced Recovery After Surgery Protocol on Short-Term Outcomes in Elderly Patients Undergoing Pancreaticoduodenectomy

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Background
In an effort to improve postoperative recovery and reduce complications, enhanced recovery after surgery (ERAS) pathways have been introduced across a range of surgical disciplines. The demographics of patients being considered for PD have evolved over recent decades, with older patients undergoing increasingly more complex procedures. The feasibility and benefits of an ERAS protocol for elderly patients undergoing PD is debated, a recent study suggesting that age over 70 years is an independent risk factor for protocol failure. Existing studies on ERAS after PD in elderly patients are limited by small sample sizes and failure to include a pre-ERAS control.

Methods
830 consecutive patients who underwent PD between January 2009 and March 2019 were divided according to age: elderly (≥75 years) vs. non-elderly patients (<75 years). Within each age group, cohort characteristics and outcomes were compared between patients treated pre- and post-ERAS (ERAS was systematically introduced in December 2012). Univariable and multivariable analysis were then performed, to assess whether ERAS was independently associated with length of hospital stay (LOS).

Results
Of the entire cohort, 577 of 830 patients (69.5%) were managed according to an ERAS protocol, and 170 patients (20.5%) were aged ≥ 75 years old. Patients treated post-ERAS were significantly more comorbid than those pre-ERAS, with a mean Charlson Comorbidity Index of 4.6 vs. 4.1 (p<0.001) and 6.0 vs. 5.7 (p=0.039) for the non-elderly and elderly subgroups, respectively. There were significantly fewer medical complications in non-elderly patients treated post-ERAS compared to pre-ERAS (12.4% vs. 22.4%; p=0.002), but not in elderly patients (23.6% vs. 14.0%; p=0.203). On multivariable analysis, ERAS was independently associated with reduced LOS in both elderly (14.8% reduction, 95% CI: 0.7-27.0%, p=0.041) and non-elderly patients (15.6% reduction, 95%CI: 9.2-21.6%, p<0.001), with the effect size being similar in each group.

Conclusions
ERAS protocol can be safely applied to patients undergoing pancreaticoduodenectomy irrespective of age. ERAS is associated with a significant reduction in postoperative LOS in elderly and non-elderly patients, despite higher comorbidity in the post-ERAS period.
P-P35
Textbook outcomes after pancreaticoduodenectomy in high risk patients: results from a high volume UK centre

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Background
Textbook Outcome (TO) after pancreaticoduodenectomy (PD) is a quality metric that may be used to compare outcomes between centres, but the effect of casemix on TO is unknown. The aim of this study was to determine if TO after PD is affected by casemix.

Methods
TO was evaluated in a prospectively maintained database of 830 consecutive patients who underwent PD between 2009-2019 in a high volume centre. TO was defined as an absence of POPF, bile leak, haemorrhage, Clavien III+ complications, readmission and hospital mortality. Frequency of TO was compared between high and low risk cases. High risk was defined as any of the following: age ≥ 75 years, significant comorbidity (Charlson index ≥5), vascular resection or additional procedures. Multivariable analysis using binary logistic regression analysis was performed to assess factors associated with TO.

Results
Overall, 599/830 patients (72%) had TO after PD. There has been no change during the study period (2009-2013 v 2014-2018: 70% v 75%; p=0.148). There was no difference in TO in elderly patients (p=0.774), severe comorbidity (p=0.483), vascular resection (p=0.187) or additional procedures (p=0.189). On multivariable analysis, cardiac disease (OR 0.47, 95%CI 0.28-0.81; p=0.006), pancreatic adenocarcinoma (OR 1.55 95%CI 1.02-2.35; p=0.039) and hard gland (OR 3.12, 95%CI 2.06-4.736; p<0.001) were independently associated with TO.

Conclusions
Acceptable Textbook Outcomes can be achieved in high risk patients and those undergoing complex surgery, when performed in high volume specialist centres with appropriate patient selection.
**P-P36**

**AXIOS™ stents in the management of pancreatic fluid collections: case series from a single healthcare trust**

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**Background**

This was a consecutive case-series of all pancreatic fluid collections (PFCs) managed with AXIOS™ stents in a 3 year period from a single healthcare trust, retrospectively analysed to determine the rate of technical success, clinical success and adverse events related to the procedure.

**Methods**

All patients in who underwent AXIOS stenting for PFCs in the Belfast Health and Social Care Trust between May 2016 and July 2019 were included, with a follow-up period of 1 year. Electronic care records (ECR) and Radiology reports were reviewed for each patient. PFCs were categorised into walled-off pancreatic necrosis (WOPN) and pseudocysts as per the revised Atlanta classification. The number of repeat procedures, endoscopic lavage +/- necrosectomy, the need for definitive surgery or any adverse events post-procedure were recorded.

**Results**

45 patients were included in the study (21 male, 24 female). 17 patients (37.8 %) had WOPN and 28 (62.2 %) pancreatic pseudocysts. Median collection diameter on CT imaging was 12 cm (range 6.2 – 22 cm)

The procedure was technically successful in 43 patients (95.6%), with stent mal-deployment in the remaining 2. Median duration for stenting was 29.5 days (Range 13 – 92).

The procedure was clinically successful for 33 patients (73.3%). n=8 (17.8%) of patients were re-admitted with sepsis following stent insertion requiring intravenous antibiotics. n=16 (35.6%) patients required repeated endoscopic lavage +/- necrosectomy following stent blockage (n=11 WOPN, n=5 pseudocyst). n=2 (4.4%) stents accidentally dislodged during lavage necessitating surgical removal. n=4 (8.9%) patients required a second AXIOS stent within 45 days of removal, n=2 (4.4%) required CT guided drainage and n=8 (17.8%) ultimately required surgical intervention. The rate of adverse events post-procedure was 33.3%.

**Conclusions**

AXIOS stenting appears to be effective first-line in the "step-up" approach to managing PFCs. Despite some drawbacks, our study showed they were technically successful in 95.6% and clinically successful in 73.3% of cases, requiring no further intervention. For PFCs that do require surgery, AXIOS stenting may allow for a period of patient optimisation prior to definitive treatment.
P-P37
Robot assisted pancreaticojejunostomy may be associated with lower risk of post-operative pancreatic fistula in high-risk cases: Initial experience

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Background
Robot assisted pancreaticoduodenectomy has increased in popularity over recent years. There is evidence from high volume centers which suggests that it is associated with lower risk of post-operative pancreatic fistula than open surgery. The aims of this study were to evaluate our initial experience after robotic assisted pancreaticoduodenectomy and compare if a low volume center can produce similar positive outcomes.

Methods
The initial 12 patients who were listed for a robot assisted pancreaticoduodenectomy were included in the study in a consecutive manner. A standardised method of anastomosis was used in all surgeries, this being a duct-to-mucosa two-layer modified Blumgart pancreato-jejunostomy. Data was collected prospectively and stored in an encrypted database. Surgical outcomes were then analysed.

Results
The study included first 12 consecutive patients who underwent robotic pancreaticoduodenectomy between August 2019 and January 2020. None of the patients had clinically relevant postoperative pancreatic fistula despite 75% of the patients falling into moderate to high-risk group for fistula development. Median operative time and length of stay was 547 minutes and 8 days respectively with three Clavien Dindo grade III complications and three Clavien-Dindo grade II complications.

Conclusions
Robotic assisted pancreaticoduodenectomy maybe associated with lower risk of post-operative pancreatic fistula in high-risk cases.
External validation of post-operative pancreatic fistula prediction scores in pancreatoduodenectomy: a systematic review and meta-analysis

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Background
Multiple risk scores claim to predict the probability of post-operative pancreatic fistula (POPF) after pancreatoduodenectomy. It is unclear which scores have undergone external validation which score is the most accurate.

Objective: To identify risk scores and assess the clinical validity of these scores.

Methods
Areas under receiving operator characteristic curve (AUROCs) were extracted from studies that performed external validation of POPF risk scores. These were pooled for each risk score, using intercept-only random-effects meta-regression models.

Results
Systematic review identified 34 risk scores, of which six had been subjected to external validation, and so were included in the meta-analysis, namely the Tokyo (N=2 validation studies), Birmingham (N=5), FRS (N=19), a-FRS (N=12), m-FRS (N=3) and ua-FRS (N=3) scores. The overall predictive accuracies were found to be similar for all six scores, with pooled AUROCs of 0.61, 0.70, 0.71, 0.70, 0.70 and 0.72, respectively. Considerably heterogeneity was observed, with I² statistics ranging from 52.1-88.6%.

Conclusions
Most risk scores lack external validation, their predictive accuracies were limited and similar across risk scores. Consensus is needed for which score to use in clinical practice. Due to the limited predictive accuracy, future studies to derive a more accurate risk score are warranted.
Perioperative Interventions to Reduce Pancreatic Fistula following Pancreaticoduodenectomy: A Systematic Review and Meta-Analysis

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Background
Many studies evaluate interventions to reduce POPF following PD, but often report conflicting results. Previous meta-analyses have generally included non-randomised trials and not considered novel interventions.

Aim: To evaluate interventions to reduce postoperative pancreatic fistula (POPF) following pancreatoduodenectomy (PD) with level 1 data.

Methods
A systematic review and meta-analysis assessed randomised controlled trials (RCTs) evaluating interventions to reduce All-POPF or clinically relevant (CR)-POPF after PD. A post-hoc analysis of negative RCTs assessed whether these had appropriate levels of statistical power.

Results
Among 22 interventions (n=7,512 patients, 55 studies), 12 were assessed by multiple studies, and subject to meta-analysis. Of these, external pancreatic duct drainage was the only intervention found to be associated with significantly reduced rates of CR- and all-POPF. In addition, Ulinastatin was associated with significantly reduced rates of CR-POPF, whilst invagination (vs duct to mucosa) pancreatojejunostomy was associated with significantly reduced rates of all-POPF. Review of negative RCTs found the majority to be underpowered, with post-hoc power calculations indicating that interventions would need to reduce the POPF rate to ≤1% in order to achieve 80% power in 16/34 (All-POPF) and 19/25 (CR-POPF) studies, respectively.

Conclusions
Meta-analysis supports a role for several interventions to reduce POPF after PD, although data is often inconsistent and/or based on small trials. Systematic review identifies other interventions which may benefit from further study. However, underpowered trials appear to be a fundamental problem, inherently more so with CR-POPF. Larger trials, or new directions for research are required to further understanding in this field.
Can trainees safely perform pancreatoduodenectomy? A systematic review, meta-analysis and risk-adjusted analysis of post-operative pancreatic fistula

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Background
The complexity of pancreaticoduodenectomy (PD) and fear of morbidity, particularly post-operative pancreatic fistula (POPF), can be a barrier to surgical trainees gaining operative experience.

Objective: to compare the POPF rate following PD by trainees or established surgeons.

Methods
A systematic review of the literature was performed using PRISMA guidelines, with differences in POPF rates after PD between trainee-led vs. consultant/attending surgeons pooled using meta-analysis. Variation in rates of POPF was further explored using risk-adjusted outcomes using published risk scores and CUSUM analysis in a retrospective cohort.

Results
Across 14 cohorts included in the meta-analysis, trainees tended towards a lower, but non significant rate of All-POPF (odds ratio [OR]: 0.77, p=0.45) and clinically relevant (CR)-POPF (OR: 0.69, p=0.37). However, there was evidence of case selection, with trainees being less likely to operate on patients with a pancreatic duct width <3mm (OR: 0.45, p=0.05). Similarly, analysis of a retrospective cohort (N=756 cases) found patients operated by trainees to have significantly lower predicted All-POPF (median: 20 vs. 26%, p<0.001) and CR-POPF (7 vs. 9%, p=0.020) rates than consultant/attending surgeons, based on pre-operative risk scores. After adjusting for this on multivariable analysis, the risks of All-POPF (OR: 1.18, p=0.604) and CR-POPF (OR: 0.85, p=0.693) remained similar after PD by trainee or consultant/attending surgeons.

Conclusions
PD, when performed by trainees, is associated with acceptable outcomes. There is evidence of case selection among patients undergoing surgery by trainees; hence, risk adjustment provides a critical tool for the objective evaluation of performance.
Systematic review of Sarcopenia in Chronic Pancreatitis: prevalence, impact on surgical outcomes and survival

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Background
Chronic pancreatitis (CP) is characterised by progressive inflammatory changes to the pancreas, leading to loss of endocrine and exocrine function. Emerging literature suggests sarcopenia may adversely affect outcomes for chronic pancreatitis patients. This systematic review examines the evidence surrounding the impact of sarcopenia on patients with CP.

Methods
A systematic literature search of PUBMED, MEDLINE and EMBASE databases identified articles describing body composition assessment in patients with CP. Data collected included definitions of sarcopenia, assessment methodology, baseline demographics, surgery related data and short- and long-term outcomes.

Results
9 studies, including 977 patients and a sarcopenia prevalence of 32.3% were included. Alcohol was the predominant aetiology. There was significant heterogeneity in definitions of sarcopenia used. CT was the main modality to assess for sarcopenia in 7 papers, MRI in 2 papers and clinical measurements in 2 papers. 2 papers included patients undergoing total pancreatectomy and Islet cell transplantation. None of the studies found a significant increase in complications with sarcopenia. 1 Year mortality in outpatients from one study of patients with CP was 16% in sarcopenic patients versus 3% (HR:6.69(95%CI:1.79–24.9),p<0.001).

Conclusions
Sarcopenia is prevalent in patients with CP and has adverse impact on short- and long-term survival.
P-P42
Neo-adjuvant Chemoradiation for Borderline Resectable Pancreatic Adenocarcinoma: A UK Tertiary Surgical Oncology Centre Series

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Background
Pancreatic ductal adenocarcinoma (PDAC) is associated with a historically poor long-term survival of 5-10%, despite surgical resection. Borderline resectable pancreatic ductal adenocarcinoma (BR-PDAC) is reported as potentially resectable disease with a degree of vascular involvement, increasing the risk of a positive surgical margin. This cohort of patients have the worst survival despite curative resection and adjuvant chemotherapy. Emerging evidence suggests that neo-adjuvant chemoradiation (NCR) improves R0 resection rates in BR-PDAC patients. We evaluated the R0 resection rate, disease free survival (DFS) and overall survival (OS) in our patients, who had undergone NCR for BR-PDAC at our institution.

Methods
Data was collected retrospectively for all patients undergoing NCR for BR-PDAC between Jan 2010 to Mar 2020 for this study. Surgical management was ratified by clinical assessment and cross-sectional imaging in a pancreatic multidisciplinary team meeting (MDM). Patients underwent NCR by a number of standardised regimens. Patients with proven regressive or stable disease on imaging underwent a pancreatic resection. All BR-PDAC patients underwent resection in the form of classical Whipple’s or pylorus preserving pancreaticoduodenectomy (PPPD) depending on intra-operative findings. Patient morbidity, R0 resection rate, histological parameters, DFS and OS were evaluated.

Results
29 patients were included in the study (16 men and 13 women), with a median age of 65 years (range, 46-74 years). 17 patients received FOLFIRINOX and 12 patients received gemcitabine (GEM) based NCR regimens. All patients received chemoradiation at the end of chemotherapy (range 45-56Gy). 75% had an R0 resection, with a greater proportion in the FOLFIRINOX group. Whole cohort median DFS was 35 months, survival was superior in the FOLFIRINOX group (42 months). Median OS was 30 months for the whole group, with a greater median OS in the FOLFIRINOX versus the GEM cohort (42 versus 29 months).

Conclusions
We present a single centre retrospective study utilising NCR for BR-PDAC, we reiterate the strong association of an R0 resection with superior patient overall survival following surgery in this cohort. We show that in patients with BR-PDAC, NCR results in superior R0 resection rates with an associated increase in patient survival. Our results show that survival advantage is greatest in BR-PDAC patients who received neo-adjuvant FOLFIRINOX.
Our findings affirm the advantage of NCR prior to surgery, particularly FOLFIRINOX based treatment, in this cohort of patients.
Lymph Node Negative Duodenal Adenocarcinoma Is Associated with Long-term Patient Survival following Pancreaticoduodenal Resection

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Background
Duodenal adenocarcinoma (DA) is a rare gastrointestinal malignancy. Due to the low incidence of DA there is limited data reporting patient outcomes following radical pancreatic resection. Large retrospective single and multi-centre studies suggest that lymph node metastasis is an important factor for long-term patient survival following resection. The management of DA has tended to favour aggressive surgical resection with pancreaticoduodenectomy (PD), although a morbidity of up to 50% has been reported, mostly related to post-operative pancreatic fistulas. We assessed the disease-free (DFS) and overall survival (OS) in patients undergoing pancreaticoduodenectomy for DA in our institution.

Methods
We retrospectively analysed all patients undergoing pancreatic resection for DA at our institution between January 2009 – March 2020 inclusive. All DAs were cytologically or histologically proven prior to surgical resection following imaging review in a Hepato-pancreaticobiliary multidisciplinary team meeting. Patients underwent a Whipple’s with distal gastrectomy or pylorus preserving pancreaticoduodenectomy (PPPD) based on tumour size and location. Statistical analysis was performed by a Mann-Whitney U test using a p-value significance of 0.05 (SPSS, IBM, USA). DFS and OS curves were presented by Kaplan-Meier survival curves.

Results
19 patients underwent pancreatic resection at our institution for DA during the study period. 12 patients underwent Whipple’s with distal gastrectomy and 9 patients underwent PPPD. The overall postoperative morbidity and mortality was 37% and 5% respectively. R0 resection was achieved in 18 patients (95%). 9 patients (47%) had no nodal involvement. Median follow up was 31 months (range 1-108 months). Median DFS was 17 months but was significantly higher in patients with no nodal metastasis [p<0.001]. Median OS was 9.5 months for the whole cohort but was significantly higher in the patients with no nodal vs nodal metastasis (60 vs 17.5 months respectively) p<0.003.

Conclusions
DA can be resected by PD or segmental resection. PD is favoured due to improved resection margins and overall increased patient survival, despite an increased morbidity. Our series reports comparable morbidity and mortality to the published literature for DA resected by PD. This study reports a 95% R0 resection rate for DA with a 3- and 5-year survival of 50% and 30% respectively. DFS was found to be significantly higher in patients with no nodal disease, despite predominant T4 disease. This series has identified that lymph node metastasis is one of the most important prognostic determinants of long-term patient survival.

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yes
Clinical outcomes of consecutive patients undergoing distal pancreatectomy over the last decade at a high volume tertiary pancreatic surgery unit

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Background
Distal pancreatectomy (DP) enables resection of lesions in the body and tail of the pancreas. Over the past decade, the Laparoscopic approach has become frequently employed. There remains scarce outcome data available following laparoscopic distal pancreatectomy over a long time period from high volume centres. Postoperative pancreatic fistula (POPF) remains the main source of morbidity and mortality after DP. The causes of POPF are multifactorial and poorly understood. The optimal method of pancreatic stump closure is still debated with variation in clinical practice.

Methods
All patients that underwent distal pancreatectomy at a UK tertiary pancreatic surgery centre between January 2011 and January 2021 were identified and clinical outcomes examined. Patients undergoing completion pancreatectomies were excluded. Clinical, pathological and surgical data for the included patients was retrospectively collected from the electronic patient record. Clinically significant POPF was defined as Grade B or C as per the ISGPF guidelines. For stapled stump closure, the Compression Index (CI) was calculated using closed staple height (mm) divided by the pancreatic thickness (mm). High and low CI was defined around the median.

Results
233 patients (n=90 open and n=143 laparoscopic) were included in the final analysis. The laparoscopic approach was associated with comparable morbidity and significantly lower blood loss, shorter operative time and shorter length of stay. There were no significant differences in age, sex, final histology, closure technique, or ASA Score of 3 or more amongst patients with clinically relevant POPF (CR-POPF). The POPF group had a significantly higher BMI, drain duration and readmission rate. CI data was available for 78 cases (range 0.04-0.21). There was no significant difference in low vs high CI for patients with CR-POPF.

Conclusions
Laparoscopic distal pancreatectomy is associated with favourable clinical outcomes in this series. Stapled vs sutured closure of the pancreatic stump offered equivocal outcomes with relation to POPF. POPF continues to have a significant impact on a clinical recovery as evident from longer drain duration and high readmission rates. Further research is required to try to establish methods for reducing the incidence of POPF after distal pancreatectomy.
P-P45
Prognostic Value of CRP in Post-PPPD and Whipple’s Re-Intervention

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Background
Several studies have aimed to use different biochemical and haematological markers to predict relevant post-operatively pancreatic fistulas after hepatobiliary operations, however none has been defined as the gold-standard. This study aimed to evaluate the sensitivity and specificity of day 3 C-reactive protein (CRP) and drain amylase values in predicting re-intervention in patients who have undergone pancreatico-duodenectomy (PPPD) or Whipple’s procedure.

Methods
Retrospective collection of data from a prospective database of patients who underwent PPPD or Whipple’s procedure between January 2017 and February 2021. Serum CRP was collected from day one to day five post-operatively, and day three or the closest available result of post-surgery drain amylase values were considered. Cutoff values were determined as follows: day three CRP optimal level was determined by the median (175 mg/L), and drain amylase was determined by three times the upper limit of normal serum amylase level (330 U/L).
Post-operative pancreatic fistulas (POPF) were classified as per the 2016 International Study Group for Pancreatic Surgery (ISGPS). Re-intervention was defined as any deviation from the normal post-surgical care – including interventional radiology procedures, embolisation, re-look laparotomies and re-admission to Intensive Care.

Results
A total of 217 patients were included in this study – 182 underwent pylorus preserving pancreaticoduodenectomy as opposed to those who had Whipple procedure. 55 (25%) patients required re-intervention post-operatively. A day three CRP above 175 showed a sensitivity of 78% and specificity of 66% in predicting re-intervention in these patients. The combination of this and elevated drain amylase proved to be more sensitive (85%) and specific (87%) than the CRP alone.

Conclusions
Day 3 CRP and drain amylase are accurate predictors of post-PPPD and Whipple’s re-interventions. We aim to include this as part of the local Enhanced Recovery Pathway to help identify patients that will potentially develop complications requiring further surgical management.
The use of FDG-PET/CT in the pre-operative staging of pancreatic ductal adenocarcinoma

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Background
The NICE Quality Standard for Pancreatic Cancer(December 2018) recommends that ‘adults with localised pancreatic cancer on CT(should) have staging using fluorodeoxyglucose positron emission tomography/CT(FDG-PET/CT) before they have surgery, radiotherapy or systemic therapy’. Such FDG-PET/CT staging aims to provide additional information to conventional cross-sectional imaging, thus presenting the most accurate staging of disease. However, the sensitivity and specificity of FDG-PET/CT to deliver relevant additional clinical information must be balanced with potential delays to treatment, and additional cost associated with its use, in the management of a time-critical pathology.

Methods
Consecutive pancreatic ductal adenocarcinoma(PDAC) patients deemed resectable on conventional imaging, and therefore referred for FDG-PET/CT assessment, were included for analysis. Data were derived from a single tertiary Hepatopancreaticobiliary(HPB) centre between May 2018 and June 2021. Data were collected and analysed from a combination of prospectively-collated electronic databases and paper patient records.

Results
Of 89 patients analysed, 55(61.7%) patients were male. Primary pancreatic lesions were PET avid in 81 cases(91%). Median time from request to FDG-PET/CT performance was 11 days(Range 1-35).
Additional clinical information from FDG-PET/CT was provided in 61(68.5%) patients. Further investigations to assess FDG-PET/CT findings were arranged in 23 patients(25.8%; including liver MRI and EUS), demonstrating that FDG-PET/CT findings were true-positive in 6(26.1%), false-positive in 15(65.2%) and equivocal in 2(8.7%). There was a median delay of 60.5 days(Range 26 to 256) from FDG-PET/CT to surgery in those undergoing additional investigation.
In total, a new diagnosis of metastatic/non-resectable disease was made in 14(15.7%) patients, preventing progression to planned operative intervention.

Conclusions
FDG-PET/CT provided additional information to conventional imaging that led to cancellation of planned operative resection in 14(15.7%) PDAC patients-8 directly and 6 following further investigation. However, there was a median delay of 11 days to FDG-PET/CT and 60.5 days from FDG-PET/CT to surgery in those undergoing additional investigation.
Whilst FDG-PET/CT can lead to avoidance of unnecessary surgical intervention in PDAC patients with unsuspected metastatic/non-resectable disease, it can lead to delay, over-investigation, excess cost and anxiety in resectable patients. HPB units should audit their own findings to assess whether the use of FDG-PET/CT should be considered on a standard or selected basis.
Impact of neoadjuvant chemotherapy on postoperative pancreatic fistula in patients undergoing pancreaticoduodenectomy


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Background
Pancreatic adenocarcinoma (PDAC) is one of the most lethal tumours with a five-year survival rate of less than 7% for all stages. However, current evidence suggests neoadjuvant treatment (NAT) may have survival benefits in those with borderline resectable disease. Post-operative pancreatic fistula (POPF) is a potential complication after pancreaticoduodenectomy (PD) and is associated with long-term morbidity. The rate of developing POPF post-PD in those receiving NAT is currently unclear.

Methods
Patients undergoing PD (both classical and pylorus-preserving) were identified from a prospectively collected local database. Those who received NAT prior to surgery were identified, and case-matched controls based on their age and sex, were then identified from the database. Post-operative drain amylase levels were used to compare POPF between groups. For the analysis, drain amylase levels greater than three times the upper limit of normal at day five were consistent with biochemical POPF.

Results
A total of 34 patients (14 females, 20 males) underwent PD after receiving NAT at our unit from January 2013 to July 2021. The median age was 66 years at the time of surgery. Two patients (5.9%) in the NAC group had biochemical leaks on day five compared to 4 (11.8%) in the case-matched control group (p=0.7).

Conclusions
Our early data suggest a possibility of a lower incidence of biochemical POPF in those undergoing PD post-NAT. Aetiology on the development of POPD post-NAT is still unclear, and this requires further study and long-term follow up.
Clinical Benefit of Surveillance after Resection of Pancreatic Ductal Adenocarcinoma: A Systematic Review and Meta-Analysis

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Background
The clinical benefit and acceptability to patients of routine surveillance after resection of pancreatic ductal adenocarcinoma (PDAC) remains unclear. Furthermore, expert guidelines around the world offer conflicting recommendations. This study is a systematic review of evidence for surveillance programs.

Methods
A systematic review of studies evaluating different surveillance methods was undertaken. Meta-analyses were performed for those studies reporting rates of asymptomatic recurrence, treatment of recurrence and overall survival, according to different surveillance methods.

Results
There were ten studies included in the literature review. Five studies were appropriate for meta-analysis (1,596 patients). If enrolled in an active surveillance program, patients were more likely to have recurrence detected at an asymptomatic stage (Pooled Rate: 49.3% vs. 19.1%, p=0.043). In terms of clinical outcomes, patients with asymptomatic recurrence were more likely to receive treatment for recurrence (Odds Ratio 3.49; 95% CI: 1.73-7.07; p<0.001) and had longer overall survival (Mean Difference: 9.5 months; 95% CI: 4.1-14.8; p<0.001) than those with symptoms at time of recurrence.

Conclusions
From this systematic review and meta-analysis of early data it appears that routine surveillance after surgery for PDAC detects more patients at the asymptomatic stage. Data from these non-randomised trials also suggest that treatment rates and survival may be superior in patients where recurrence is detected when asymptomatic. As such, these data suggest that routine surveillance may improve patient outcomes, however an appropriately conducted trial would be required to address concerns that various sources of bias may be affecting these results.
Predicting Future Pathological and Operative Complexity in Pancreatoduodenectomy: 30 Years of Experience

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Background
Patient selection for pancreatoduodenectomy (PD) is largely based upon local experience and established practice. This study sought to observe changes in complexity and patient cohort over time with the aim of predicting future cohort characteristic of patients undergoing PD.

Methods
All PDs at our institution between 1988 and 2020 were reviewed (n=1,878) to observe changing trends in patient demographic, pathological diagnosis, operative factors and postoperative outcomes. Coefficients from regression models were reported as gradients per decade, to quantify the rate of change over time. The resulting models were then plotted to illustrate the trend across the study period, as well as forecasts for subsequent years.

Results
The annual volume (7 to 128) and proportion of pancreatic ductal adenocarcinoma (PDAC) (28 to 53%) increased at a linear rate. The proportion of associated vein resection (3 to 25%) and technical difficulty (type 2-4; 5 to 28%) increased in a nonlinear way, increasing more rapidly in later times. The average age (48 to 67) increased in a log linear trend. Length of stay reduced by 9.3%, whilst mortality reduced with an odds ratio of 0.69, per decade. Furthermore, When performance at our institution was compared to recently established benchmarks, it was shown that our institution regularly performed within these standards with few exceptions. By 2030 our predictions indicate that the average age will increase to 69, PDAC will comprise 62% of pathology, 40% will have an associated venous resection and 43% will be graded 2-4 in technical difficulty. Length of stay will have reduced to 9.6 days and mortality to 2%.

Conclusions
Despite increasing complexity of surgery and patient age, length of stay and mortality after PD are reducing. Understanding changes over time permits an estimation of a future surgical cohort where complexity will increase. It is important that surgeons continue to push boundaries. Patient selection, based upon prior experience may inhibit progression and development of services.
Analysis of the efficiency of the hepatobiliary multidisciplinary team meeting to identify quality improvement strategies

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Background
The multidisciplinary team meeting is the mainstay of management of patients with hepatopancreatobiliary (HPB) cancer and is considered the gold standard of care. Disadvantages of these meetings include large numbers of patients to be discussed covering multiple super-specialities over a short time span. This can lead to decision fatigue amongst clinicians. Logistical factors such as information technology and presence of clinicians with relevant expertise may also hamper the progress of the meeting.

The aim of this study was to analyse the efficiency of our HPB MDT with a view to identifying multi-factorial quality improvement interventions.

Methods
13 weeks of prospectively generated multidisciplinary team meeting outcomes were analysed from our departments weekly 150-minute long MDT meeting between 01/06/21 and 24/08/21. Patient demographics and pathology were noted. The number of overall discussions in each meeting were recorded. Number of patients in each sub-category (1. Regional pancreatic cancer service, 2. Hepatocellular carcinoma or liver adenoma, 3. pancreatic cystic neoplasms, 4. Gallbladder cancer and cholangiocarcinoma, 5. Pancreatic neuroendocrine tumours and 6. Other) were recorded. The number of patients without a recorded outcome was collated and reasons for no outcome being generated were categorised.

Results
174/ 869 patients (20 %) did not receive an outcome from the meeting and were carried forward to the next week. Of the patients carried forward to the next week; 33/177 (18.6%) had no available histopathology following biopsies. Of these 33 patients, 23 did not have post-operative histopathology yet available for discussion. 82/177 (46 %) patients did not have the relevant investigations performed or available to move the discussion forward. These investigations were wide ranging and included radiological and endoscopic interventions. Of these, 19 patients (2 % over-all) had not had images sent across from a peripheral centre. 3 patients required both histology and radiology for further discussion.
59/869 (6%) of patients were not discussed due to time constraints. This equated to an average of 4 patients per meeting.

Conclusions
This study demonstrates the breadth and depth of a general HPB MDT. Strategies are required to simplify the MDT process to allow for time for discussion of the most complex patients, in particular those requiring surgery. Multifactorial reasons for a lack of MDT outcome at any single meeting have been found in this study. This signifies that a more robust triage process involving multiple specialities needs to be considered. Logistical factors also need to be in place allowing for transfer of relevant images from peripheral units. Histopathology reporting takes time and appropriate expectations for the availability of these results needs to be in place. The next step in this study is to identify and implement effective quality improvement strategies to improve outcome rates and allow more time for complex case discussions.
Assessing the severity of pre and post-operative malnutrition in cancer patients undergoing pancreaticoduodenectomy: A review of a virtual dietetic prehabilitation service

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Background
The prevalence of malnutrition amongst pancreatic cancer patients is widely reported. This is due to reduced nutritional intake, increased energy expenditure and increased nutrient losses secondary to malabsorption. A Whipple’s procedure or pancreaticoduodenectomy is the only potentially curable intervention for pancreatic cancer patients. Malnutrition is associated with increased peri and post-operative complications including delayed wound healing, longer hospital admission and higher mortality rate. Dietetic prehabilitation is a proactive intervention to assess patients’ nutritional status in preparation for elective surgery and, through early dietetic intervention, has the potential to improve perioperative outcomes. This pilot study reviewed the severity of nutritional risk in both the pre and post-operative stages to understand the need for dietetic prehabilitation in this patient group.

Methods
All patients referred were nutritionally assessed as part of a dietetic cancer prehabilitation pathway, which includes pre-surgical nutritional assessment within one week of referral and early post discharge nutritional assessment. Nutritional assessment was carried out using the PG-SGA short form and patients were triaged as requiring either a universal, targeted or specialist dietetic intervention dependent on severity of nutritional risk. Patients who scored <4 were triaged as universal, and were low nutritional risk. Patients who scored 5-9 were triaged as targeted and were medium nutritional risk, and patients who scored >9 were triaged as specialist, and were high nutritional risk.

Results
35 patients were referred for dietetic prehabilitation assessment. 71% of patients were triaged as requiring either a targeted or specialist prehabilitation intervention. BMI ranged from 15.7kg/m² to 35.9kg/m² and median weight loss was 10.0%. 23 patients received early post surgical nutritional assessment, within 12 days of discharge from hospital. All 23 patients required targeted or specialist dietetic intervention. 22 patients reported post-operative weight loss, with a median weight loss of 7.5%. There was no correlation between pre-surgical and post-surgical nutritional risk.

Conclusions
Patients undergoing pancreaticoduodenectomy are at high nutritional risk in both the pre and post-operative periods. Patients without evidence of malnutrition in the pre-operative stage remain at high risk of malnutrition and the associated complications in the post operative stage. A prehabilitation programme can identify patients at nutritional risk and institute interventions to optimise perioperative nutritional status. Findings from this review will form the basis of a study examining the effects of a prehabilitation programme on outcomes following pancreaticoduodenectomy.
Overuse of CT scans in the diagnosis of Acute Pancreatitis

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Background
Acute pancreatitis is an acute inflammatory process affecting the pancreas with variable involvement of local tissues and remote organs and may sometimes progress into necrosis of the pancreas. Diagnosis is usually made based on the clinical presentation of abdominal pain alongside a positive biochemical result of either serum amylase or lipase levels. Current guidelines by International Association of Pancreatology (IAP) state that early use of computed tomography (CT) is only indicated in patients who have no definite diagnosis, and should be delayed to at least 96 hours after the onset of the symptoms to evaluate complications. We aimed to assess the over-utilization of CT scans in the diagnosis of acute pancreatitis.

Methods
We performed a prospective cohort study of patients with confirmed acute pancreatitis who presented to a single NHS trust between March and April 2021. We included patients with at least two out of the three findings: (1) an acute abdominal pain, (2) elevated serum amylase levels of more than three times the normal range and (3) acute pancreatitis as evidenced on abdominal imaging. We defined inappropriate CT scans as those performed within 96 hours in the presence of both clinical and biochemical diagnostic criteria.

Results
A total of 53 patients met the inclusion criteria and were admitted with acute pancreatitis during this 2-month period at our trust. 54.7% (29/53) of this cohort had at least one CT scan performed during the index admission. 28.3% (15/53) of the admitted patients had an early CT scan performed in the presence of positive biochemical and clinical diagnostic criteria. This represents 51.7% of the total number of CT scans performed in the study group.

Conclusions
We found evidence of excessive use of CT scans in the early phase of acute pancreatitis for diagnostic purposes. Limiting the overuse of CT scans in the diagnosis of the same will not just reduce the financial burden of the hospital and trust, but also limit the avoidable exposure of patients to radiation.
Textbook outcomes in pancreatoduodenectomy are improved in high volume specialist pancreas-only centres

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Background
Traditional single surgical quality indicators are commonly used however they are poor for assessing global outcomes for patients. Composite outcomes such as the ‘Textbook Outcome’ (TO) is a composite outcome to determine the success of the quality of the surgical process, and compare outcomes between institutions and patient groups, described by the Dutch Pancreatic Cancer Audit Group for Pancreatoduodenectomy (PD). They reported national TOs for PD of 58.3%, we compared this to TOs in a UK high volume specialist pancreas-only centre, Royal Stoke.

Methods
Patients who underwent PD from January 2017 to December 2020 were identified from our database. TO was defined as absence the following: post-operative pancreatic fistula (POPF) (grade B/C), post-pancreatectomy haemorrhage (PPH), bile leak, severe complications (Clavien Dindo grade III or more), 30-day readmission and 30-day mortality.

Results
153 patients underwent PD during the 4-year study period. The median age was 71 years (range 37-85 years), and there was a slight male preponderance (54.9%, 84/153). 47% had pancreatic ductal adenocarcinoma (72/153), 17% ampullary carcinoma (26/153), 9% cholangiocarcinoma (14/153), 9% duodenal carcinoma (14/153), and benign pathology included cases with IPMN and duodenal polyps with high grade dysplasia. There was a statistically significant difference in textbook outcome in our cohort compared to the Dutch Study (70.3%, 108/153 vs 58.3%, 895/1536; p=0.003086), with components of TO shown in Figure 1.

Conclusions
TO represent composite outcome for identifying good practice, areas for shared learning and areas for improvement. PD performed in high-volume pancreas-only specialist centers appear to have better outcomes following PD than lower-volume centres. Further investigation is required to assess why outcomes are different between centres, and identify how best practice can be shared.
Interpreting trends in post-operative drain fluid amylase according to type of anastomosis used to form a pancreaticojejunostomy

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Background
The formation of the pancreaticojejunostomy during pancreaticoduodenectomy is the most technically challenging aspect of the procedure, with its failure increasing rates of both morbidity and mortality significantly. Early identification and management of a clinically relevant post-operative pancreatic fistula (CR-POPF) can be critical in reducing the threat of potentially avoidable harm to the patient. The most used indicator for a CR-POPF is the level of drain fluid amylase. There are many different techniques for forming the anastomosis, with considerable analysis but no consensus on superiority. We aimed to look at our centres experience using different techniques and the trends we observed in drain amylases and clinical outcomes.

Methods
A prospective database of all patients in a single UK centre undergoing pancreatic or duodenal resection has been maintained. This includes patient demographics, diagnosis pre and post operatively, operative details and duration, complications, and outcomes. All patients undergoing a pancreaticoduodenectomy between 1st January 2020 and 31st July 2021 were identified and their data retrospectively analysed.

Results
Thirty-three patients underwent a pancreaticoduodenectomy during the study period. The pancreaticojejunostomy was formed using a duct-to-mucosa anastomosis in twenty-eight patients and using a dunking technique in five patients.

The mean of the highest drain fluid amylase on post-operative day one for the patients with a dunking anastomosis was 14804.8 (range 3643-43686), on day three 2376.12 (range 167-8008.6) and of the three patients whose drains were in situ at day 5 it was 522.2 (range 31 to 983. An 83.9% reduction in mean drain amylases was observed between Day One and Day Three, followed by a further 78% reduction between day 3 and day. One patient (20%) had a CR-POPF with a grade B fistula, two others had a biochemical leak.

Eight patients (28.6%) had a CR-POPF – 3 grade B and 5 grade C fistula - and three patients had a biochemical leak.

Conclusions
In our centre’s experience, the type of anastomosis used to perform the pancreatic reconstruction post pancreaticoduodenostomy significantly impacts the post-operative trend in drain fluid amylase. This is important for clinicians to appreciate in order to avoid premature suspicion of a CR-POPF and prevent potentially unnecessary intervention.
CT-PET use in potentially resectable pancreatic cancer

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Background
CT-PET has become increasingly used in the diagnostic pathway for pancreatic cancer (PC) and was introduced into National Guidelines (NICE) in 2018 in the United Kingdom. It can improve the diagnosis of metastatic disease, though some believe it is not significantly better than a staging CT and MRI, and there are concerns that it can significantly delay the treatment pathway for patients, without adding benefit.

Methods
A retrospective national study undertaken by 26/27 specialist pancreatic resectional centres in the United Kingdom. All adult patients listed for pancreatoduodenectomy for suspected PC were included. Baseline demographics, length of pathway (days from MDT to surgery), number and type of investigations, interventions (ERCP or PTC) and associated complications were recorded, in addition to the operation performed and 12-month survival. Patients undergoing neoadjuvant chemotherapy were excluded.

Results
1709 cases were entered from 2017-2020. 155 patients were excluded due to neoadjuvant chemotherapy, with 8 further patients excluded due to incomplete data entry. The median age was comparable for patients undergoing CT-PET (68 years IQR 60.0-73.0) and those who did not undergo CT PET (68 years IQR 60.0-74.0). 363/1546 patients (23.5%) underwent a pre-operative CT-PET. There was a significantly longer pathway with CT-PET (56 vs 42 days, p<0.001) and a non-significant tendency towards an increased bypass rate with CT-PET (9.9% vs. 7.8%, p=0.065), and no improvement in survival (1-year survival 76.9% vs 75.7%, p=0.712).

Conclusions
There is a statistically significant increase in the length of pathway with CT-PET, without any improvement in bypass rate or one year survival compared the no-CT-PET group. CT-PET undoubtedly has benefits but should be used selectively rather as standard investigation for all patients as failed to demonstrate survival improvement.
Successful endovascular embolisation of a recurrent gastroduodenal artery aneurysm in a patient presenting with acute on chronic pancreatitis

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Background
Pseudoaneurysms are recognised to be a serious complication of chronic pancreatitis. Visceral artery aneurysms (VAA) can be difficult to determine and most commonly occur in the splenic or hepatic artery. Gastroduodenal artery pseudoaneurysms (GDA) have been reported to be the most common VAA following pancreatic surgery. We aim to outline the successful management of a patient with a recurrent 5.5cm GDA pseudoaneurysm following previous embolisation 2 years prior.

Methods
The 59yr old patient had a history of alcohol related necrotic pancreatitis with pseudocyst formation requiring percutaneous drainage in 2019. This was complicated by pseudoaneurysm formation requiring embolisation of the inferior pancreatico-duodenal artery and GDA. In April 2021 they were readmitted with recurrent abdominal pain thought to be secondary to chronic pancreatitis and one episode of haematemesis.

Results
Endoscopy revealed inflammation of D1 with signs of recent mucosal bleeding with a recent abdominal ultrasound showing a 4.7x4.6cm apparent pseudocyst. A CT pancreas was performed to assess the pseudocyst however an incidental pseudoaneurysm at the pancreatic head with a sac measuring 5.5cm in diameter and contrast material measuring 3cm in diameter was present. Peripancreatic and retroperitoneal inflammation indicative of acute on chronic pancreatitis. The patient underwent embolisation of the recurrent GDA pseudoaneurysm successfully with no more filling of the previously seen pseudoaneurysm and was safely discharged.

Conclusions
Recurrent GDA pseudoaneurysms are a very rare complication of recurrent pancreatitis, however should be considered in patients presenting severe epigastric pain with a history of previous pseudoaneurysms.
The first experience of intraoperative radiotherapy for pancreatic cancer in the UK

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Background
Intraoperative radiotherapy (IORT) involves giving a targeted single fraction of high dose radiation to the resection bed. The main advantages are exclusion of vulnerable structures from the radiation field and ability to direct the electron beam to threatened margins. IORT in pancreatic cancer is not new, with Japanese centres reporting series from the 1970s. Early reports were exciting, suggesting that IORT was useful in reducing visceral pain, achieving local control and improving survival in locally advanced and unresectable patients. However, paucity of randomised trials in the ensuing decades has limited its widespread adoption.

Methods
With funding from the PLANETS charity (www.planetscharity.org), University Hospitals Southampton acquired a Mobetron 2000 linear accelerator (IntraOp, USA) in 2016. Testing was done at the National Physical Laboratory (Teddington, UK) over two months to collect beam data and ensure consistency in treatment delivery. Staff training included visits to the Heidelberg Cancer Centre and several dry runs. Inclusion criteria were: (i) patients with pancreatic head adenocarcinomas; (ii) threatened vascular margins; (iii) WHO performance status 1-2; (iv) no evidence of distant metastasis.

Results
Nineteen patients had pancreaticoduodenectomy (traditional or pylorus preserving) combined with IORT. Median age was 66 (42-81) years. Median ASA grade was 2 (2-3). 16/19 had locally advanced pancreatic cancer and 18/19 had neoadjuvant chemotherapy. Median IOERT dose was 15 (10-15) Gy, energy 7.5 (6-12) MeV, to a mean depth of 1.6 +/- 0.8 cm, with median cone size 5 (4-6) cm and bevel angle 15 (0-30) degrees. All tumours were pT1-T3 and 10/19 had positive regional nodes. 10/19 were R1 resections, with 4/19 specimens exhibiting vascular invasion and 6/19 perineural invasion. Mean operating time (including IOERT) was 534 +/- 77 min. Median length of stay was 8.5 (6-41) days. 30-day mortality was zero. 6/19 patients had post-operative complications (Clavien-Dindo 1-2 only), with clinically detectable pancreatic fistula in 1/19.

Conclusions
This is the first UK experience of IORT for pancreatic cancer, showing that this treatment modality is safe and feasible. With the appropriate expertise, an IORT service can be implemented within 12 months of acquiring the Mobetron system. We hope that these data will encourage other UK and European HPB units to consider setting up regional IORT services, such that larger scale prospective trials can be initiated to demonstrate its efficacy.
The role of PET-CT in the management of pancreatic cancer. A Northern Ireland experience

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Background
Diagnosis and staging has proven to be difficult in 10-20% of patients with pancreatic cancer. The PET-PANC study found that PET-CT significantly influenced the staging and management of pancreatic cancer and therefore the NICE guidelines now advise PET-CT in all patients who have localised potentially resectable disease. This study aimed to investigate the impact of PET-CT on the management of pancreatic cancer patients in a single tertiary referral centre.

Methods
There were 288 patients with pancreatic cancer discussed at the Northern Ireland Regional Hepatobiliary MDM from January 2020 to March 2021. Of these patients, 176 were deemed to have inoperable disease based on initial CT, 5 had borderline resectable disease, 1 had holding chemotherapy due to COVID restrictions and 57 were excluded from surgical resection for a variety of reasons. These included the patient being unfit for surgery, the patient declining operative intervention and an alternative treatment offered as result of COVID-19 pandemic. Therefore, there were 49 patients with pancreatic adenocarcinoma which the MDT concluded should be considered for surgical resection.

Results
A total of 27 patients who were due to undergo a curative resection had a pre-operative PET-CT scan (55.1%). This demonstrated metastatic disease in 9 cases (33.3%). Four patients who did not have a preoperative PET-CT were found to have metastatic disease at operation (9.7%). This equated to a total metastatic incidence of 26.5% in those who had been initially deemed resectable based on CT scan alone. The time interval from MDM decision to surgery averaged 25.4 days in those who did not have a PET/CT compared to 40.43 days in those who did. This was an average delay of 15.07 days until treatment.

Conclusions
This study demonstrates the important role the PET-CT has in the management of patients with pancreatic cancer. A significant number of patients avoided an unnecessary operation which would have delayed the commencement of chemotherapy. However, there are limitations to PET-CT, demonstrated in the patient with an inconclusive result, who was found to have liver metastases at surgery. The introduction of PET-CT in the staging process does undoubtedly cause delays to surgical resection and a more streamlined pathway needs to be developed to limit the delay to curative treatment.
Minimally Invasive Oesophagectomy: Technique of Linear Stapled Anastomosis

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Background
Several anastomotic techniques have been described when performing an oesophagectomy. Each technique has its own merits and drawbacks. The stapled side to side technique creates a widely patent anastomosis with low stricture rate.

Methods
This video highlights the technique adopted and developed over the last 5 years. There are several key steps that need to be adhered to, to create a reliable, robust and reproducible anastomosis. These include the orientation of the oesophagus during transection, the use of mucosal retaining sutures, the use of a 34 bougie for the oesophagotomy and the correct retraction of the conduit when performing the anastomosis.

Results
The anastomosis was successfully performed without complications. Check endoscopy revealed a widely patent secure join. The anastomosis typically now takes 15-18 minutes. At the end of the procedure, the conduit cap was buried under the pleura and the anastomosis wrapped in omental fat. The patient was discharged on day 10 on a low residue diet.

Conclusions
This technique has been adopted and developed over the last 5 years. It has proved reliable and reproducible with a low stricture rate and a very low leak rate. It is easier to perform than a total hand sewn anastomosis and permits visualisation of the luminal oesophagus prior to anastomosis.
Video demonstration of abdominal lymphadenectomy in a robotically assisted oesophagectomy

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Background
Lymphadenectomy is essential for adequate oncological clearance and accurate staging during oesophagectomy for malignant disease. Adequate lymph node clearance has implications on patient outcomes and confers a survival benefit. Abdominal lymph node clearance may be technically challenging due to the location of nodes along key structures such as the common hepatic artery and splenic vessels. Robotic assistance during abdominal lymphadenectomy permits improved 3-D visualisation and instrument articulation in a potentially constricted space. This video demonstrates a technique for robotic abdominal lymphadenectomy during oesophagectomy.

Methods
This video demonstrates a technique for coeliac axis lymph node clearance during the abdominal phase of an oesophagectomy, as practiced at this institution. The intention for such a video is for ongoing appraisal and refinement of robotic techniques within the unit, as well as for teaching and training. The video was edited using iOS software, and text has been used to explain each step in conjunction with the images.

Results
Dissection of all relevant coeliac axis nodal stations is successfully demonstrated, with the lymph nodes resected en-bloc with the specimen. Text has also been used to explain the steps seen in the video images.

Conclusions
Robotic assistance permits safe and adequate lymphadenectomy during minimally invasive oesophagectomy, as demonstrated in this video.
V-OG03
Robotic Epiphrenic Diverticulectomy, Myotomy and Hiatus Hernia Repair

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Background
Oesophageal epiphrenic diverticulum’s are rare; reported in less than 0.5% of the population. They are noted however in 1-3% of patients complaining of dysphagia. They are almost always associated with a motility disorder of the oesophagus. Surgery is generally the only solution to help with the symptoms of dysphagia and reflux.

Methods
This video highlights a case of a moderate sized diverticulum causing dysphagia and significant reflux. The procedure was performed on the DaVinci X system; to my knowledge, this is the first time this technique has been performed on the DaVinci X in the UK. A 4 arm technique was used, utilising two right arms and one left. Instruments used were cadieire forceps, hook and sureform staple. The 12mm port was docked with arm 3 and sited on the patients left. A stapled diverticulectomy was performed with the Sureform blue cartridge. An endoflex was used to retract the liver.

Results
The procedure was successfully performed in 150 minutes and involved resection of the diverticulum, hiatal repair and short myotomy up to the neck of the diverticulum.

Conclusion
The robotic platform allows for better visualisation of the hiatal structures and vagal nerves and the enhanced magnification make for a safer myotomy. The articulating instruments permit safer dissection of the diverticulum. A 4 arm technique makes the myotomy easier and safer to perform.
Paravertebral catheter placement in minimally invasive oesophagectomy

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Background
Pain control is a vital component of enhanced recovery programmes for patients undergoing an oesophagectomy. Multimodal analgesia using intrathecal diamorphine and local anaesthetic infusion catheters into the paravertebral space and rectus sheath is increasingly utilised. Multimodal analgesia can provide comparable pain relief while potentially reducing side effects associated with thoracic epidurals. This video demonstrates the placement of paravertebral catheters following thoracoscopic oesophagectomy.

Methods
The video demonstrates the technique for paravertebral catheter placement at the end of the thoracic phase of an oesophagectomy, as practiced at our institution.

Results
Once the catheter has been placed and flushed, a bolus 15-20mls of 0.25% Levobupivicaine is injected. A 600ml reservoir of Levobupivicaine is attached at the end of the procedure.

Conclusions
Paravertebral catheters provide a safe and feasible option for pain control following oesophagectomy.
V-OG05
Robotic heller’s myotomy

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Background
Achalasia is a rare condition affecting less than 1:100,000 patients. Treatment for this rare condition include balloon dilation, botox injection, endoscopic myotomy (POEMS) or surgical myotomy. Laparoscopic surgical myotomy is the “go to” approach for most surgeons; it is tried and tested, can be performed safely and quickly with a low complication rate, minimal pain and a short length of stay.

Methods
This video presents the technique adopted for robotic oesophageal myotomy in a patient with type II achalasia. A 4 arm technique was adopted with arm 4 on the patients left. The Davinci X system was used in this case. A Nathensen liver retractor was used to retract the liver; robotic instruments included the hook and cadire forceps x2.

Results
The procedure was successfully performed; the operative time was 53 minutes, LOS was <24 hours. Check endoscopy revealed a wide open gastro-oesophageal junction and a long myotomy. The patient noted an improvement in symptoms with 24 hours and has had no significant reflux.

Conclusion
The enhanced magnified 3D view on the robotic platform allows better visualisation of the hiatal structures, vagal nerves and muscle fibres when performing the myotomy. Using the 4th arm to retract the lateral edge of the oesophageal muscle provides a very safe and stable platform to perform a long myotomy. I think the robotic system should be adopted as the standard approach for a heller’s myotomy.