

**THE ASSOCIATION OF UPPER  
GASTROINTESTINAL SURGEONS OF  
GREAT BRITAIN AND IRELAND**

**THE PROVISION OF SERVICES FOR  
UPPER GASTROINTESTINAL SURGERY**

## Introduction

In 2011 the Association of Upper Gastrointestinal Surgeons published an updated document describing the provision of services required for patients with upper gastrointestinal surgical disease. This was the first update since the original document had been published in 1999 and reflected the huge changes in the intervening 12 years both in the nature of the diseases seen, and the requirements of patients and surgeons treating these diseases. Since 2011, there has been increasing centralisation of specialist upper GI surgical services, and an increasing emphasis on the quality of the services we provide. The volume – outcome relationship, which drove the initial centralisation of upper GI cancer services 10 – 15 years ago, is now beginning to drive a similar concentration of surgery for benign upper GI disease into the practices of specialist Upper GI surgeons. A consequence of such a centralisation has been the potential dilution of upper GI surgical skills in hospitals without specialist Upper GI teams, and the implications for emergency surgical services. This must be taken into account when considering the optimum site for location of non-cancer Upper GI specialist surgical services. Much of this work will be appropriate for Tier 2 hospitals, perhaps facilitated by out-reach relationships with the appropriate Tier 3 hospital.

We have seen an increasing demand by patients for information about our services, with focus on volume of work and outcomes, and the publication of Consultant Outcomes in oesophagogastric cancer surgery is likely to be followed by similar publications for HPB cancers and benign upper GI disease. It is appropriate, therefore, to update our Provision of Services document, describing the two main subspecialties of upper GI surgery (Hepatopancreaticobiliary and oesophagogastric surgery) and including minimum volumes of work and specific outcomes standards, not only for cancer but also for the whole spectrum of surgery for benign disease. The Provision of Bariatric Surgical Services is described in detail in the separate BOMSS document<sup>1</sup>.

It is intended that this document will be a guide to surgeons, healthcare commissioners and patient representatives so that high quality services can continue to be provided to improve the outcome of patients with these diseases.

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# 1 The Nature of Upper GI Surgery

Diseases or conditions affecting the oesophagus, stomach, liver, spleen, pancreas, biliary tract and duodenum which are primarily managed by surgeons. The Association of Upper Gastrointestinal Surgeons (AUGIS) is the recognised representative body for Upper Gastrointestinal Surgeons in the UK.

## Oesophagogastric (OG) surgery

Definition: Diseases or conditions affecting the oesophagus and stomach, which are managed by surgeons.

OG disease can be broadly divided into the following categories:

- Gastro-oesophageal reflux disease (GORD)
- Achalasia and other motility disorders
- Rupture and trauma
- Disorders of the spleen
- Peptic ulcer disease
- Benign tumours
- Malignant tumours

### Gastro-oesophageal reflux disease (GORD)<sup>2</sup>

Symptomatic GORD is the commonest OG disorder encountered in medical practice. A small minority of patients will be referred for investigation and assessment with a view to surgical treatment when lifestyle and medical interventions have been found to be ineffective or poorly tolerated. Surgical therapy involves a combination of hiatal repair and some form of gastric fundoplication (ARS - anti-reflux surgery). Around 10 in 100,000 people will undergo ARS.

Objective documentation of GORD is mandatory prior to ARS. This can be achieved if at least one of the following conditions exists: endoscopic mucosal break/pathologic oesophagitis in a patient with typical symptoms; Barrett's oesophagus (BO) on biopsy; peptic stricture in absence of malignancy; positive pH-metry or supportive impedance testing.

### Para-oesophageal (giant) hiatus hernia

Hiatus hernias are associated with GORD and are repaired as part of an antireflux operation. Large paraoesophageal hiatus hernias may contain most or all of the stomach, as well as small bowel and colon. In addition to presenting with symptoms of GORD patients may present with mechanical symptoms including a variety of non-specific symptoms such as vomiting, upper abdominal pain and anaemia. Laparoscopic repair of such hernias requires advanced technical skills. Rarely, patients present as emergencies with signs of gastric ischaemia due to volvulus, requiring urgent surgical management.

### Achalasia and other motility disorders

Achalasia is a rare primary motility disorder of the oesophagus of uncertain aetiology. It has an annual incidence of 1 in 100,000 individuals and a prevalence of 10 in 100,000. It is characterised by lack of oesophageal body peristalsis and failure of lower oesophageal sphincter (LOS) to relax appropriately in response to swallowing. Dysphagia of insidious onset is the most common symptom. Other

symptoms include regurgitation of undigested food, aspiration and occasional chest pain with or without weight loss.

Surgical management of achalasia consists of a laparoscopic longitudinal lower oesophageal myotomy (Heller's procedure), often combined with a partial fundoplication. Increasingly surgery is being performed as first line therapy, reserving pneumatic dilatation and/or botulinum toxin therapy for elderly or unfit patients. Patients suffering from a range of rare primary oesophageal motility disorders such as diffuse oesophageal spasm or secondary disorders such as scleroderma may present with common upper gastrointestinal symptoms requiring investigation and management.

Upper GI endoscopy should be carried out to exclude other pathology, and barium swallow is often helpful. Manometry is the gold standard diagnostic test and is mandatory to confirm the diagnosis before surgical intervention.

### Rupture and trauma

Spontaneous oesophageal rupture (Boerhaave's syndrome).

Oesophageal rupture secondary to repetitive forceful vomiting carries a high risk of mortality due to mediastinal sepsis. This mechanism accounts for around 15% of oesophageal perforations. Treatment may require urgent thoracotomy for decontamination and debridement of the mediastinum and thoracic cavity, and occasionally repair if soon after the injury.

Mallory Weiss tear

Mucosal tears of the lower oesophagus can result in dramatic upper gastrointestinal haemorrhage. The treatment of such injuries however is usually conservative.

Iatrogenic, penetrating and blunt trauma

Direct injury of the oesophagus, stomach or duodenum as a result of blunt or penetrating external trauma is rare, accounting for less than 1% of cases of perforation. Blunt trauma is usually associated with multiple injuries of the thorax and abdomen following high energy impact. Iatrogenic perforation of the oesophagus during endoscopy is more common, occurring in 0.01 -0.05% of endoscopies and accounting for over 80% of perforations. Although management may be conservative, therapeutic options may also include oesophageal stenting, surgical debridement, repair or oesophageal resection.

### Disorders of the spleen

Disorders of the spleen are mainly related to haematological disease, although trauma is a common reason for surgical intervention. Elective splenectomy is now usually carried out laparoscopically except in patients where the spleen is very enlarged, typically >20cms / >1.5 kg (e.g. myelofibrosis and some haematological malignancies).

### Peptic ulcer disease

Peptic ulcers are present in up to 4% of the adult population. Patients present with common upper gastrointestinal symptoms and are normally diagnosed by endoscopy and treated by acid suppression therapy in combination with eradication of *Helicobacter pylori*. Occasionally peptic ulcers present with complications of perforation, bleeding or stenosis.

Gastric ulcer

Benign gastric ulcers must be distinguished from ulcerated gastric carcinoma by histology. Gastric ulcer perforation results in peritonitis requiring urgent surgical management. Occasionally partial gastric resection is required. Bleeding gastric ulcers are normally treated by endoscopic therapies but occasionally surgical treatment by under-running, resection or partial gastrectomy is required.

#### Duodenal ulcer

Perforated or bleeding duodenal ulcers requiring urgent surgical intervention are still relatively common. Perforation usually requires surgical repair with an omental patch. Bleeding is usually treated endoscopically or radiologically but occasionally surgical treatment is still required. Rarely a more complex procedure such as pyloroplasty will be necessary.

#### Gastric outlet obstruction

Gastric outlet obstruction due to benign peptic stricture is rare and must be distinguished from malignant obstruction by biopsy and histology. Patients who do not respond to conservative therapy may be treated by balloon dilation of the pylorus. Resistant cases may require pyloroplasty or surgical bypass in the form of gastrojejunostomy, or partial gastric and duodenal resection.

#### Benign tumours

Management decisions about patients with oesophagogastric neoplasia, included suspected benign tumours, should be made in the context of an upper gastrointestinal cancer multidisciplinary team.

#### Adenomas

The majority of gastric polyps are hyperplastic or fundic gland polyps with very little or no malignant potential. Neoplastic polyps or adenomas usually occur in the distal stomach and have a significant risk of malignant transformation.

#### Malignant tumours<sup>3</sup>

All patients are discussed at a specialist OG MDT meeting. Surgical resection in combination with neoadjuvant or adjuvant chemotherapy and / or radiotherapy remains the mainstay of treatment for potentially curable oesophagogastric carcinoma. Effective staging protocols and multidisciplinary discussion are mandatory. The models for management of upper GI tumours and the organisation of services are described in the Improving Outcomes Guidance document<sup>4</sup>.

#### Oesophageal carcinoma

Carcinoma of the oesophagus affects 16 per 100,000 men and 6 per 100,000 women in the UK. Squamous cell carcinoma (SCC) of the oesophagus is decreasing in incidence in the UK and Ireland. The development of improved oncological therapies with outcomes similar to surgical resection has led to a reduction in surgical treatment of SCC. Resection may however form part of the treatment algorithm. The incidence of oesophageal adenocarcinoma at or near the gastrooesophageal junction is increasing rapidly. Surgical resection, usually in combination with oncological therapy offers the only realistic hope of cure. Staging protocols involve CT scan, PET CT scan and selective use of laparoscopy and endoscopic ultrasound. Resection is usually via a transthoracic approach with a two field lymph node dissection and is most commonly performed via a 2 stage (right chest) approach with a thoracic anastomosis, or via a three phase approach with anastomosis in the neck. Some centres prefer a single left thoracoabdominal approach, and increasingly a minimally invasive approach is used, either fully minimally invasive (minimally invasive oesophagectomy MIO) or via a hybrid approach (usually laparoscopic and open thoracotomy).

#### Barrett's oesophagus

Barrett's oesophagus is a premalignant condition. The management of patients with non-dysplastic Barrett's oesophagus will usually include acid suppression therapy and regular endoscopic surveillance. High grade dysplasia and intramucosal carcinoma, are usually treated endoscopically with a combination of endoscopic mucosal resection and endoscopic ablation (most commonly radiofrequency ablation). These techniques are increasingly being used in low grade dysplasia.

### Gastric cancer

Carcinoma of the stomach affects 13 per 100,000 men and 5 per 100,000 women in the UK. Gastric adenocarcinoma, other than carcinoma of the gastroesophageal junction, is decreasing in incidence. Surgical resection in the form of radical total or subtotal gastrectomy including locoregional lymph node resection, in combination with chemotherapy, offers the only realistic chance of cure. Selection of patients suitable for surgical treatment is dependent on accurate staging protocols which include CT scan and laparoscopy.

### Gastrointestinal stromal tumour (GIST)

Oesophagogastric GISTs are usually asymptomatic small submucosal lesions discovered coincidentally during endoscopy for unrelated symptoms. They may however present with obstructive symptoms or bleeding. There is a relationship between tumour size and malignant potential which may necessitate surgical resection of asymptomatic lesions.

### Gastric lymphoma

The stomach is the commonest site for gastrointestinal lymphoma. Accurate staging and MDT discussion are mandatory. Treatment may involve surgical resection although improving chemotherapeutic regimes have reduced the need for surgical intervention.

### Carcinoid tumours

Gastric carcinoid (neuroendocrine) tumours comprise just under 2% of gastric neoplasms. About 8% occur as part of multiple endocrine neoplasia syndrome type 1 (MEN 1). Most are small, asymptomatic and behave in a benign fashion, and are usually treated by local resection. Larger tumours behave in a more malignant fashion and if not metastatic should be treated with more radical surgery, including nodal clearance.

## **Hepatopancreatobiliary (HPB) surgery**

Definition: Diseases or conditions affecting the liver, pancreas, biliary tract and duodenum which are managed by surgeons. The Great Britain and Ireland HepatoPancreatoBiliary Association, a section of AUGIS) is the recognised representative body for HPB surgeons in the UK.

HPB disease can be broadly divided into the following categories:

- Pancreatitis
- Benign biliary disease including stone disease
- Trauma
- Pancreato-biliary neoplasia
- Liver tumours

### Pancreatitis

#### Acute pancreatitis

Acute pancreatitis is an acute inflammatory condition characterised by severe upper abdominal pain and hyperamylasaemia. It varies in incidence between 5-40 per 100,000 population and has an overall mortality of 5%, with 10% of cases fulfilling the criteria of severe pancreatitis (local or systemic complications) which may necessitate admission to the HDU/ITU for supportive care (11). Severe pancreatitis carries a 10% mortality. The most common causes are gallstones, alcohol and post-ERCP. Uncommon causes include viral infections, drugs, injury or surgery around the pancreas, parasites, hypercholesterolaemia and hypercalcaemia, pancreas divisum, hereditary pancreatitis and autoimmune pancreatitis. In 10% of cases the cause remains unknown. However, a number of these cases are probably due to tiny gallstones or biliary sludge.

### Chronic pancreatitis

Chronic pancreatitis is a chronic painful condition which usually starts as recurrent episodes of acute pancreatitis before developing into a chronic condition characterised by pain, weight loss and often diabetes. It affects around 8 per 100,000 population each year in the UK. It is more common in men than women and most commonly occurs in people around 40-50 years. In 70% of cases the cause is alcohol. Other causes include genetic causes, autoimmune disease and malnutrition. In 20% of cases no cause is found.

### Benign biliary disease including stone disease<sup>5, 10</sup>

#### Gall stones

Gallstones represent the vast majority of benign biliary disease and are common, affecting up to 25% males and 40% females by age 75 years. Only a minority of patients with gallstones are symptomatic and treatment, usually in the form of laparoscopic cholecystectomy, is reserved for those patients (100 per 100,000 population) with symptoms. Gallstones present with a whole host of symptomatology including gallbladder disease (acute cholecystitis, biliary colic, mucocele and empyema of the gallbladder, gallbladder perforation) symptoms of choledocholithiasis (including obstructive jaundice and acute pancreatitis) and fistulation of the gallbladder into other organs, most commonly the duodenum which may result in gallstone ileus (small bowel obstruction).

#### Benign biliary stricture

The majority of benign biliary strictures are secondary either to gallstone disease or to complications of gallbladder surgery. A minority of patients with gallstones present with Mirizzi's syndrome - a chronic inflammatory disease of the gallbladder where a large stone (or stones) within Hartmann's pouch results in a benign stricture within the common hepatic duct or at the hilum of the liver.

Bile duct injury is a potentially serious complication of cholecystectomy which may manifest itself as overt damage to the bile duct during surgery or may result in the development of jaundice or bile leak following cholecystectomy. The injury may be associated with damage to the portal vein or hepatic artery and, in the most serious cases, perfusion of the liver may be affected. Bile leak may also occur from the cystic duct stump. The incidence of bile duct injury in the UK is approximately 2 to 5 cases per 1000 cholecystectomies.

#### Choledochal cyst

Choledochal cyst is a rare condition consisting of a localised or fusiform swelling of the bile duct which may extend into the liver. There are various types and they can be associated with intra-hepatic cysts and can predispose to malignancy. Presentation may be as jaundice or recurrent pancreatitis and treatment is usually surgical by excision of the bile duct and hepaticojejunostomy.

### HPB Trauma

Pancreatic and liver trauma is uncommon in the UK. In the USA liver trauma accounts for 15-20% of blunt abdominal injuries but the international / worldwide incidence of liver trauma is not known. Although blunt liver trauma accounts for 15-20% of abdominal injuries, it is responsible for more than 50% of deaths resulting from blunt abdominal trauma. The mortality rate is higher with blunt abdominal trauma than with penetrating injuries. Gallbladder injury is uncommon, occurring in 2-8% patients with blunt liver trauma. Prior to the availability of CT scanning and ultrasonography, gallbladder injuries were rarely diagnosed before surgery.

In the past, most of these injuries were treated surgically but the surgical literature confirms that as many as 86% of liver injuries have stopped bleeding by the time surgical exploration is performed, and 67% of operations performed for blunt abdominal trauma are non-therapeutic. With increased availability and use of CT imaging the vast majority of cases of blunt liver trauma are now treated conservatively. Around 80% of adults and 97% of children are now treated without intervention.

Several systems have been devised to classify liver injuries; however, the lack of consistency of scoring severity in organ injury is a problem. The American Association for the Surgery of Trauma (AAST) has developed a system based on the amount of anatomic disruption of an individual organ which includes six grades of liver trauma based on CT findings.

Pancreatic trauma is uncommon with an incidence of 0.4/100,000 and 3% of abdominal trauma requiring surgery. It is graded 1-4 based on the location and severity of the injury.

#### Malignant pancreatobiliary tumours

Ductal carcinoma of the pancreas (known as pancreatic cancer) is a relatively common and highly lethal malignant tumour with an annual incidence of 100 patients per million population. Long-term survival is only 1.7% and only 15-20% of patients have resectable disease. In addition 35 patients per million population present annually with related malignant tumours which include tumours of the periampullary region, lower bile duct, duodenum as well as pancreatic cystic tumours (10). These related tumours have a combined resection rate of 40-50%. The overall pancreatic resection rate for neoplasia is therefore approximately 35-40 per million population. Resection rates have doubled in the UK in the last 10 years and are expected to rise further with full implementation of Improving Outcomes Guidance (IOG) (2) and more acceptance of pancreatic resection as a safe procedure in the elderly. The majority of patients with pancreatic cancer, however, do not undergo surgery but usually require medical treatments including endoscopic therapy for relief of jaundice. In addition these patients are often referred for chemotherapy.

#### Benign pancreatobiliary tumours

The majority of benign tumours of the pancreas are cystic lesions. The incidence of new cystic tumours of the pancreas is 10 – 15 per million population per year. The majority of these are benign lesions such as serous cyst adenomas or have malignant potential such as mucinous cystic neoplasms or intra-ductal papillary mucinous neoplasms (IPMN). Duodenal adenomas may occur as part of familial adenomatous polyposis whereas ampullary and bile duct adenomas are more likely to be sporadic.

#### Liver tumours

##### Hepatocellular Carcinoma

In the Far East, Hepatocellular carcinoma affects up to 1% of the population. In Europe the annual incidence is only 1-3 per 100,000. The main risk factors for hepatocellular carcinoma are alcohol, hepatitis B and C infection, exposure to aflatoxin and haemochromatosis. In addition when hepatocellular adenomas grow to a size of more than 5 cm there is an increased risk of hepatocellular carcinoma. Surgical resection or transplantation remain the mainstays of treatment.

##### Gall Bladder Cancer

Gall bladder cancer is rare. Approximately 500 people are diagnosed in the UK each year. It is rare in people under 50 and is most often seen in people over the age of 70 and more commonly in women. The cause of most gall bladder cancers is unknown however a number of risk factors have been identified including gall stones and cholecystitis, gall bladder adenomas >10mm, porcelain gall bladder and primary sclerosing cholangitis. Presentation is usually late and surgery the only curative treatment. Gall bladder cancer is staged according to depth of penetration through the wall of the gall bladder, the stage of disease dictating the extent of surgical resection.

##### Bile duct cancer

Only 1,000 people are diagnosed each year in England. Intrahepatic bile duct cancer accounts for 20% cases, distal bile duct cancers 20%, and hilar/Klatskin tumours about 50%. Multifocal cancers affect

5% patients. Risk factors include cholangitis, biliary stones, and parasitic infestation. Surgical resection is the only curative treatment.

#### Secondary liver tumours

Many malignant tumours metastasise to the liver particularly those originating in the abdomen. Some tumours produce small numbers of liver metastases which may be suitable for surgical treatment such as resection or ablation. Colorectal cancer, in particular, commonly gives rise to metastases which are suitable for resection. The majority (60-70%) of patients undergoing liver surgery for malignancy have colorectal liver metastases. With the increases in resection rates due to more effective systemic agents it is expected that 7-8% of colorectal cancer patients would undergo liver resection for metastatic disease which equates to 40 resections per million population per year.

An additional 20 resections per million would be carried out for other indications including primary tumours of the liver making a total of 60 liver resections per million per year, 30 of which would be expected to be 'major' that is 3 segments or more.

## 2 Components of the Upper GI Surgical Service

Upper gastrointestinal surgery is managed in all acute hospitals in the UK and Ireland. Initially patients may be seen by non-specialist general surgeons but the majority of patients should be referred to a specialist upper GI surgeon as soon as possible. This section of the document describes the services which should be provided within an upper gastrointestinal service.

### General Practice and Commissioning of Services

The General Practitioner (GP) will often be the first point of contact for the patient with upper gastrointestinal disease. GPs should be able to initiate early investigation where appropriate and be fully aware of agreed local protocols and pathways for referral into secondary care. This is of particular importance in the case of patients presenting with emergencies (for example jaundice) to prevent any delay in further patient management. General Practitioners also have an important role in both population screening for serious disease (e.g. weight loss, anaemia) and coordinating ongoing management after diagnosis and treatment. The GP should also be aware of local protocols for postoperative follow-up after major resections. For patients who need palliative care, the GP will have a key role in coordinating services between the hospital and the community. In many units GPs provide diagnostic endoscopy.

### Referrals into Upper GI Surgical Services

Patients with suspected OG and HPB malignancy should be referred to the specialist OG or HPB Centres. The essential components of services for the diagnosis and management of oesophagogastric (OG) and hepato-pancreatic-biliary (HPB) malignancy are described in the Improving Outcomes Guidance<sup>4</sup>. These components, as well as those that are necessary for the diagnosis and management of non-neoplastic disease, are described below. The evolving provision of emergency general surgical services has been extensively reviewed and revised by AUGIS, ACP and ASGBI<sup>6</sup>. The demands of emergency general surgery will require surgeons who are participating in the general surgery on call rota to have expertise in the management of common oesophagogastric, duodenal and pancreato-biliary emergencies. Future developments in sub-specialisation are likely to lead to further concentration of both elective and emergency upper GI surgery with increased networking and partnership between smaller and larger centres.

Referral mechanisms for patients with upper GI disease essentially operate at 3 levels:

- Referral from General Practice into secondary care
- Referral from an Accident and Emergency (A&E) Department into secondary care
- Referral from secondary care into a tertiary specialist OG or HPB centre usually from gastroenterology, upper gastrointestinal and colorectal departments or MDTs within district hospitals.

#### Referral from General Practice into secondary care

Rapid access referral mechanisms for suspected upper GI malignancy must allow direct referral for upper GI endoscopy and/or ultrasound as well as outpatient appointments using the “two week wait” system. The “choose and book” scheme allows referral to appropriate specialists for non-urgent consultation. Emergency Upper GI patients should be referred in via the GP on-call system to the on call surgical team or via hospital emergency medicine departments. There must also be a robust mechanism for in-hospital referral from ED or between medical and surgical specialties.

Patients with suspected OG or HPB disease will usually present to their GP in one of a number of ways:

- With non-urgent symptoms of a benign condition
- With acute symptoms suggestive of an urgent benign condition
- With symptoms of a suspected OG or HPB cancer
- With the incidental finding of OG or HPB pathology during investigation for another condition

For each of these specific scenarios there should be in place locally agreed referral mechanisms defining the appropriate pathway to ensure timely review of the patient within the secondary care setting. Depending upon the nature of the presentation this could be into an outpatient clinic, for an urgent assessment in the A&E Department or Surgical Emergency Unit, or for further investigation by the GP. In the case of a suspected cancer then referral should be as set out by the Department of Health or NICE referral guidelines for suspected cancer.

Patients referred to secondary care with upper gastrointestinal disease may be referred to a surgeon with a designated UGI interest or gastroenterologist or patients may be admitted as emergencies and be under the care of a non-specialist admitting surgeon or physician. In such cases hospitals should have clear processes for ensuring that these patients are referred internally to the appropriate upper GI specialists (OG, HPB or bariatric) as soon as possible.

Patients may also present to their local Emergency Department with symptoms of upper GI disease and then be referred to the on-call surgical team. Again where possible further management should be under the responsibility of a surgeon with a designated UGI interest.

### **Structure of Upper Gastrointestinal Surgery Units in Secondary Care**

#### **Surgical Units**

Upper gastrointestinal surgery within secondary care should be delivered by surgeons trained in and with an interest in UGI surgery. When numbers of Consultants allow, this must be done within a team setup to allow appropriate sub-specialization and support and ongoing training of consultants in earlier years.

In Tier 2 Hospitals (typically District General Hospitals without specialist OG and HPB Teams), the majority of upper GI surgeons will manage patients with non-complex OG and HPB disease but will not be engaged in major resectional surgery. The type of surgery will include laparoscopic anti-reflux and hiatal hernia surgery and non-complex benign biliary surgery including cholecystectomy, bile duct exploration, and endoscopic biliary intervention. They will also be diagnostic units for upper GI cancer as part of a cancer network, and such units will usually develop links with bigger units where complex OG and HPB surgery is performed. Upper GI surgeons, along with gastroenterologists, will provide diagnostic and therapeutic upper GI endoscopy. Within these hospitals other departments will provide support for the upper GI surgical service. These will include radiology, pathology, dietetics and palliative care. A proportion of upper GI surgeons will also have a major interest in bariatric surgery. Although in the major Bariatric Centres, their practice may be exclusively bariatric surgery, in the smaller bariatric Units there will be significant overlap with benign OG surgery and OG cancer surgery.

In Tier 3 Hospitals (typically Teaching Hospitals or large Regional Hospitals) upper GI cancer surgery will be carried out by specialist Upper GI cancer teams, into which the Tier 2 local units will refer patients. Many centres still have a hub and spoke system whereby Consultant Surgeons from local units visit the Specialist Centres and take part in major cancer resections. These outreach surgeons must be fully accommodated by the Specialist Centre, but it is essential that such surgeons take part in the out of hours work involved in caring for such patients, and fulfil the minimum volumes and standards criteria described later in the document. Complex benign and revisional benign surgery for both OG and HPB disease is increasingly being centralised into the Tier 3 Specialist Cancer Centres. All

Tier 3 Specialist Centres for OG and HPB disease must provide robust 24 hours a day sub-specialty Consultant cover for both OG and HPB patients.

#### Endoscopy

Upper GI endoscopy is the core diagnostic procedure for patients with symptoms of oesophagogastric disease. Services must have easy access to both diagnostic and therapeutic endoscopy, including 24 hour availability for emergency endoscopy to assess and manage upper GI bleeding, open access endoscopy for direct referral from primary care and protocols for urgent assessment of potential upper GI malignancy under the “two week wait” system. Endoscopy is performed not only by gastroenterologists and upper GI surgeons, but also increasingly by nurse practitioners and general practitioners. Surgeons with an interest in upper GI disease must have training and experience in advanced therapeutic endoscopy and facilities for therapeutic endoscopy, including X-ray screening must be available. Appropriate facilities for endoscopic training and service provision are described by the Joint Advisory Group on GI Endoscopy<sup>7</sup>.

Endoscopic ultrasound (EUS) is a highly skilled procedure and is an essential component of staging some upper GI cancers. It is increasingly used for benign disease, and although mainly restricted to cancer centres, it will also be used in high volume benign centres. ERCP should be readily accessible to all hospitals where upper GI surgery is carried out. The need for diagnostic ERCP has been almost completely eliminated by the development of MRCP and EUS as safer alternatives, and consequently the number of ERCPs being performed is less than it was previously. The number of units performing ERCP is therefore reducing, with JAG recommending that ERCP practitioners should perform at least 75 procedures per year.

#### Radiology

The assessment and management of upper gastrointestinal and HPB disease are dependent on high quality diagnostic and interventional radiology. Fluoroscopy, ultrasound, high resolution CT and MRI / MRCP are essential components of diagnostic algorithms and will be available in all referring cancer units. Initial staging CT scans carried out in referring cancer units should always be carried out according to evidence-based protocols that have been agreed with the relevant specialist cancer centre. Referring cancer units must have access to robust electronic imaging transfer facilities such as PACS to enable transfer of images to the specialist centre for specialist OG or HPB MDT review.

The specialist OG and HPB centres should have Consultant Radiologists with expertise in OG and HPB imaging respectively, and the facilities will comprehensively include fluoroscopy, cross sectional imaging (including CT/MRI), functional imaging (including FDG PET), ultrasonography and interventional radiology. Specialist expert radiology support is an essential component of the specialist MDT, and radiologists must be core members of the specialist cancer multidisciplinary teams. There should be 24-hour access to interventional radiology.

Hospitals carrying out bariatric surgery must have a full range of radiology services to support such surgery, including radiology facilities to support imaging of morbidly obese patients.

#### Pathology

The accurate pathological diagnosis of biopsy and resection specimens is necessary for appropriate management decisions, and this should be carried out by Consultant Histopathologists with subspecialty interest in OG and HPB disease. Services should include the facility for assessment of fine needle aspiration cytology (FNAC) samples by cytopathologists, urgent intra-operative assessment by frozen section histology as well as protocols for the rapid assessment of potential malignancy.

#### GI physiology

The assessment of GORD, achalasia and other motility disorders of the oesophagus requires high resolution oesophageal manometry and 24hr oesophageal pH monitoring as a minimum. Increasingly impedance testing is also required, and surgeons performing antireflux surgery must have access to the full range of upper GI physiology services. Such services are often provided in conjunction with anorectal physiology studies in combined GI units.

#### Dietetics

All patients with upper gastrointestinal disease are at risk of dietary problems and should have access to full dietetic inpatient and outpatient services. Dieticians should be available to see patients during regular outpatient clinics and available for consultation on ward rounds and MDT meetings.

#### Palliative care

All cancer units and cancer centres should have a network of palliative care consultants and nurses linked with community palliative care services. Patients who need palliative care should be able to obtain those services locally in a timely manner which is responsive to their needs.

#### Supportive Care

All patients with a diagnosis of cancer and their families should have access to specialist advice, information and support from the upper GI nurse specialist to support them to make informed decisions about their treatment and care. They should also be helped to access other services such as benefits advice.



oesophagogastric centres. In such centres there should be a minimum of 2 surgeons experienced in complex hiatal surgery.

### **Unit Requirements**

Units must have access to overnight admission if required. Patients should have blood group and saved and access to emergency blood transfusion should be available on site.

Units should have on call cover by an appropriately trained surgeon capable of performing laparoscopic or open surgical re-intervention for complications and access to emergency theatres within 2 hours' notice.

Pathways for admission, re-admission and management of complications should be clearly documented and appropriate contracts for emergency provision in place. There must be robust arrangements with the regional Tier 3 OG Centre for discussion about and transfer (if necessary) of patients with complications of laparoscopic surgery for benign OG disease.

Units must have an upper GI endoscopy service available in and out of hours, and access to an oesophageal physiology service providing 24 hr pH studies and manometry as a minimum, and ideally high resolution manometry and impedance monitoring.

### **Performance related Outcomes Metrics (PROMS) - recommendations**

1. ARS and Heller's cardiomyotomy should be undertaken laparoscopically unless there are specific reasons to perform the procedure as an open operation.

*PROM – Elective laparoscopic cardiomyotomy rate – 95%*

2. The majority of spleens less than 20cm in size should be removed by laparoscopic splenectomy

*PROM – Elective laparoscopic splenectomy rate – >50%*

3. Surgeons should be performing at least 5 ARS per annum to sustain sufficient experience and skills to provide patients with the best outcomes available.

*PROM – Laparoscopic ARS minimum activity per surgeon >5*

4. Units should be performing at least 5 Heller's Cardiomyotomy / laparoscopic splenectomy per annum to sustain sufficient experience and skills to provide patients with the best outcomes available.

*PROM – Laparoscopic Heller's Cardiomyotomy minimum activity per Unit >5*

*PROM – Laparoscopic splenectomy minimum activity per Unit >5*

5. Proficiency of per-operative and peri-operative surgical management for elective ARS can be usefully gauged by conversion to open surgery, readmission and re-operation rates

*PROM - conversion to open surgery rates of <5%*

*PROM - Readmission rates < 5% (2d) and <10% (30d) readmission rates*

*PROM - Re-operation rates of <5%*

6. Patient Reported Outcome should be assessed for ARS

*PROM - GERDQ questionnaire – satisfactory outcome >80%*

<b><u>Operations Performed</u></b>	<b><u>Code</u></b>
Laparoscopic anti reflux surgery / repair hiatus hernia	G24.3
Revision of fundoplication / recurrent hiatus hernia	G25.1
Laparoscopic Cardiomyotomy	G09.2
Total excision of spleen	J69
Other excision of spleen	J70
Partial splenectomy (for large polar cyst)	J701
Marsupialisation of lesion of spleen (for single superficial cysts)	J702
Other specified other excision of spleen	J708
Unspecified other excision of spleen	J709
Gastrostomy                      open / laparoscopic	G34.2
Jejunostomy                      open / laparoscopic	G60.1

**B. Surgery for OG Cancer and complex benign OG disease**

**Spectrum of Services (Tier 3)**

- Surgery for oesophagogastric cancer
- Primary Surgery for complex / rare benign OG disease
- Revisional surgery for benign OG disease

**Population Served**

These services will be carried out in specialist Tier 3 centres serving a minimum population of one million (Improving Outcomes Guidance Document, reference). Over the last 5 years there has been a move towards further centralisation with some units now serving populations of 2.5 million plus. Minimum volumes of work and outcome standards are increasingly being defined, and it is likely that further centralisation will take place over the next decade with most units serving populations in excess of 2 million. An ageing and increasing population is likely to lead to more cancers being diagnosed, but the potential increase in number of surgical resections is likely to be offset by improved staging and increased use of definitive chemoradiotherapy. Thus, it is expected that the number of resections for oesophagogastric cancer is likely to remain static, and may even decrease.

A direct consequence of the centralisation of OG cancer surgery has been the concentration of expertise in advanced benign OG surgery in these centres. Although primary surgery for reflux disease, hiatus hernias and achalasia will continue to be done by specialist benign Upper GI surgeons in other hospitals, complex revisional and reconstructive surgery for benign OG disease will increasingly be centralised in the Tier 3 centres.

## **Location and Distribution of Services**

Oesophagogastric Tier 3 Centres are usually located in University Teaching Hospitals or large Regional Hospitals and share close links with the regional cancer centre. In many parts of the country a “hub and spoke” or network arrangement will exist for the management of both benign and malignant, elective and emergency oesophagogastric surgery. This will allow the concentration of expertise and resources in larger centres but will maintain the provision of high quality specialist care locally where appropriate. These arrangements can be challenging for both individuals and institutions, but will be facilitated by the strong links with bariatric surgery and the designation of bariatric surgery centres outside the regional OG Cancer Specialist Centres

Full and appropriate radiology and endoscopy services and support must be provided within the same organisation, and the regional OG Cancer Oncology Centre should ideally be co-located in the same organisation. Referring cancer units from the surrounding district hospitals must have easy access to the OG centre for advice, and early transfer of patients where appropriate should be facilitated. Electronic imaging transfer facilities are vital for the effective function of any OG cancer centre and district hospitals must have access to robust systems of image transfer for decision making at OG centre MDT meetings. Cancer centres must have at least weekly MDT meetings and all referring units should have access on a weekly basis to decision making from the specialist team. This allows patients to either start their treatment as soon as possible or continue along their cancer pathway in a timely manner.

## **Referral from secondary care into a Tier 3 specialist OG centre**

Referrals from secondary care into the Tier 3 OG centre will usually fall into one of three categories:

- Referral of a patient with known or suspected OG malignancy (urgent or non-urgent)
- Non-urgent referral with a complex benign condition
- Urgent referral of a patient with complex benign diseases (ruptured oesophagus, acute hiatus hernia)

For urgent referrals direct contact with the specialist unit should be initiated. Surgeons in the specialist centres must provide a 24-hour on call service cover for regional OG emergencies. For cancer referrals, there should be clearly defined pathways, agreed by the regional Cancer Network. It is essential that there are mechanisms in place to ensure clear communication between the secondary care and the tertiary unit. There are emergency OG conditions, which demand urgent attention and, often, urgent transfer to specialist centres. There should therefore be clear guidelines with agreements between district hospitals and specialist units as to which emergency conditions demand transfer immediately (such as oesophageal rupture), within 24 hours (e.g. unrelieved dysphagia) or planned transfer at a later time.

All patients with suspected OG malignancy should be referred to, or discussed with, the OG centre. The diagnosis and the initial staging CT scan will usually be at the cancer unit. Specialist staging investigations will be carried out in the Tier 3 OG centre. This will include, if necessary, EUS, laparoscopy and PET scanning. All investigations and pathology carried out in the referring unit will be reviewed in the OG Specialist MDT. Interventions (such as stents) should not be carried out at the referring unit unless specifically discussed with the OG Centre

## **Numbers of Surgeons and Surgeon Volumes**

The Unit must be able to provide management for both elective and emergency OG patients at all times. As General Surgery further sub-specialises there will be surgeons on the General Surgery on call rota in some hospitals who may be unfamiliar or uncomfortable in dealing with upper GI emergencies such as the emergency complications of peptic ulcer disease. The commissioning of

complex oesophagogastric surgery, therefore, must take into account the need for the coexistent provision of out of hours emergency oesophagogastric surgery. This means that the number of surgeons in a Unit should not be less than 4. All surgeons within the centre should contribute to the out of hours emergency oesophagogastric on-call rota for the centre and have the appropriate skills to manage all the recognized complications of elective oesophagogastric surgery and the management of oesophagogastric trauma.

All OG Resectional units will carry out both oesophageal and gastric resections. Units serving a population of 1 million will carry out in excess of 50 resections per year, whilst larger units will be carrying out up to 150 resections per year. A multidisciplinary team approach is essential for the management of these cases, and thus we do not make recommendations about the volume of operations for individual surgeons other than to state that surgeons within the same team should be doing an approximately equal number of cases. For rare, complex and high risk cases (e.g. salvage resections, colonic reconstructions), it is expected that units will rationalise the distribution of cases so that they will be concentrated into the practices of 1 or 2 individuals with the particular sub-specialty interests. The benefits of two Consultant operations for difficult cases is recognised and this practice should be encouraged.

It is recognised that towards the end of one's career, experienced Consultant Surgeons may do less individual operating, and be more involved in mentoring and advising less experienced colleagues. This is encouraged.

### **Early diagnosis and screening**

There are at present no national screening programs for oesophagogastric disease in the UK and Ireland. Although there are clear associations between obesity, gastroesophageal reflux, Barrett's oesophagus and oesophageal carcinoma, as well as between *Helicobacter pylori* colonisation and gastric carcinoma, the natural history and pathophysiology of progression to invasive cancer is poorly understood. Nevertheless an increased awareness of risk factors and alarm symptoms should allow targeted referral and investigation of those most at risk. Open access endoscopy, Barrett's oesophagus surveillance programs as well as national guidance on whom to refer should lead to earlier diagnosis. An increasing understanding of the genetic risk factors associated with development of malignancy may allow targeted testing of individuals by standard diagnostic methods or new investigations based on genetic changes.

### **Specialist Nurse**

Specialist OG Cancer teams should include clinical nurse specialists who will support patients referred to the team. There should be an appropriate number of nurse specialists in each unit or centre so that every patient and their family have access to timely support from diagnosis onwards.

### **Specialist OG radiology**

The specialist OG centre should have consultant radiologists with expertise in OG imaging. This will include fluoroscopy, cross sectional imaging (including CT/MRI), functional imaging (including FDG PET), ultrasonography and interventional upper GI radiology. Specialist expert radiology support is an essential component of the specialist MDT. (For EUS see relevant section), and a radiologist must be a core member of the specialist OG cancer multidisciplinary team. There should be 24-hour access to interventional radiology to support the delivery of an emergency OG service.

### **Specialist endoscopy**

As well as having all the facilities for diagnostic and therapeutic endoscopy, including 24 hour availability for emergency endoscopy to assess and manage upper GI bleeding, and urgent assessment of potential upper GI malignancy, an OG centre must have the appropriate endoscopic equipment, staff and expertise to manage complications of resectional surgery. Facilities for therapeutic endoscopy, including X-ray screening facilities must be available.

### **Specialist pathology**

A specialist OG pathologist must be a core member of the upper GI cancer multidisciplinary team and both diagnostic biopsies and resectional specimens should be reviewed at the weekly MDT meeting. Frozen section facilities must be available to the surgical team.

### **Critical Care**

Complex elective and emergency oesophagogastric surgery requires easy access to Critical Care (level 2 and 3) facilities. Patients undergoing major oesophagogastric resection must be cared for by teams including anaesthetists and intensive care specialists with a particular interest in oesophagogastric disease, enabling optimal pre-, peri- and post-operative management of such patients. Patients undergoing emergency surgery of the oesophagus, stomach or duodenum are often extremely sick, requiring a high level of critical care in the perioperative period.

### **Non-surgical oncology**

Chemotherapy and radiotherapy have integral roles in both curative and palliative treatment of OG cancer. There should be recognised medical and clinical oncology expertise to cover all OG cancers (including carcinoma, GIST, sarcoma and neuro-endocrine tumours), and the Core MDT should have both a Clinical and Medical Oncologist. All specialist centres should have access to, and enrol patients into, clinical trials where available and appropriate for patients with OG malignancies.

### **Audit and data collection**

OG Resectional Centres should record details of all patients diagnosed with OG cancer, and should enter all data pertaining to epithelial malignancy or high grade dysplasia onto the National OesophagoGastric Cancer Audit (NOGCA) database<sup>9</sup> to be used for public information as well as surgeon and unit outcome information. Individual surgeons should collect and audit personal outcome measures. The Association of Upper Gastrointestinal Surgeons is developing SWORD<sup>12</sup>, a National database programme to facilitate individual surgeons and units to view their own and peers outcome data. Data collection is an integral part of any surgeon's appraisal and job plan review and is likely to become compulsory. It is vital that Institutions provide adequate resource for accurate data collection and entry, and surgeons' job plans should include specified time for audit and data entry as part of their Supporting Professional Activities allocation.

### **Research**

All surgeons should be encouraged to participate in clinical research and recruit patients into NIHR funded randomised trials and other NIHR portfolio studies as part of their Continuing Professional Development and to contribute to the future evidence base. Contribution to local and national trials is essential for diagnostic and resectional cancer centres. Oesophagogastric teams should identify

research leads to co-ordinate and develop research projects through local MDTs and the wider Network.

### **Education and Training**

The OG section of AUGIS will coordinate the OG session and training day at the annual AUGIS meeting and will also be involved in coordinating education workshops across the UK in OG disease. Regional Higher Surgical training schemes need to be tailored towards training in OG surgery for future OG surgeons. Surgeons should complete their CCT in General Surgery, having spent a minimum of one and preferably two of years ST7 and 8 in specialist OG training. Reduced exposure to training opportunities in modern surgical training has led increasingly to the development of post CCT fellowships (home and abroad) for advanced OG surgical training. 12 to 24 months in such a post is recommended.

### **Outcome standards**

#### Oesophageal resection (including junctional tumours):

Operative approach	Transthoracic approach with 2 field lymph node dissection. Open or minimally invasive according to surgeon preference and training.
Mortality rates	In-hospital < 5%, 90 day < 10%, 1 year < 20%
Complication rates	Anastomotic leaks < 10%, major morbidity < 20%
Length of stay	Median length of stay < 12 days (likely to come down with ERAS)
Pathology	Median number of nodes harvested 15 or more, LRM positivity < 5%, CRM positivity < 30%

All OG resectional Units should have an ERAS programme in place for patients undergoing oesophagectomy. Long-term survival clearly depends on disease process, however Unit results should be consistent with published national and international data.

#### Gastric resection:

Operative approach	Open or minimally invasive according to surgeon preference and training, with modified D2 nodal dissection
Mortality rates	In-hospital < 5%, 90 day < 10%, 1 year < 20%
Complication rates	Anastomotic leaks < 10%, major morbidity < 20%
Length of stay	Median length of stay < 10 days (likely to come down with ERAS)
Pathology	Median number of nodes harvested 15 or more. Margin positivity < 5%.

All OG resectional Units should have an ERAS programme in place for patients undergoing gastrectomy. Long-term survival clearly depends on disease process, however Unit results should be consistent with published national and international data.

**Operations Performed**

**Code**

Oesophagus

Subtotal oesophagectomy	Ivor Lewis	G01.1
	Left Thoracoabdominal	G01.1
	3 stage (McKeowan)	G01.1
	Transhiatal	G0.1
Partial resection	Merendino	G01.2

Can be open / minimally invasive / hybrid

Gastric

Total gastrectomy	G27.1
Subtotal gastrectomy	G28.2
Proximal gastrectomy	G28.2

Can be open /minimally invasive

**Additional code for minimally invasive approach**

**Y75.1**

## **4 Hepato-Pancreatico-Biliary (HPB) Surgery**

### **A Surgery for gallstone disease**

Gallstone related diseases are one of the commonest complaints seen in Tier 2 units. Patients will present to both surgical and medical units, as elective and emergency referrals (AUGIS / ASGBI Management of Acute Gallstone Diseases document). Once the diagnosis of gallstone disease has been made management of such patients is most appropriately within surgical units (unless a decision for conservative management has been made) since there are no non-interventional options of proven benefit.

Management of gallstone related diseases<sup>5,10</sup> should be undertaken by surgeons who regularly deal with these conditions. Surgery in the form of laparoscopic cholecystectomy to remove the gallbladder and its stones is the definitive treatment in most patients. Patients presenting with acute inflammation of the GB (acute cholecystitis), gallstone related pancreatitis or CBD stones are defined as having complex gallstone disease and should be managed by surgeons trained in and with an interest in Upper GI surgery. When appropriate common bile duct stones should be managed by exploration of the bile duct. There is good evidence on the cost effectiveness and patient benefit in terms of reduction in the number of interventional procedures, length of stay, and return to normal activities<sup>8</sup>.

#### **Spectrum of Services (Tier 2)**

- Laparoscopic Cholecystectomy
- Laparoscopic Bile Duct Exploration

#### **Population Served and Location of Services**

Upper GI units covering these services will typically be based in Tier 2 Hospitals covering populations of about 250 000 to 450 000. HPB Surgeons in Specialist Tier 3 Centres will also provide these Tier 2 services to their local population.

#### **Numbers of Surgeons and Surgeon Volumes**

There should be a minimum of 2 surgeons carrying out laparoscopic cholecystectomy in each unit, and each surgeon should carry out a minimum of 10 cases per annum

#### **Unit requirements**

Operating departments undertaking laparoscopic cholecystectomy should have facilities to perform on table cholangiography (OTC) and have access to overnight admission if required. Patients should have blood group and saved and access to emergency blood transfusion should be available on site.

Units should have on call cover by an appropriately trained surgeon capable of performing laparoscopic or open surgical re-intervention for bleeding, bowel or biliary complications and access to emergency theatres within 2 hours notice.

Pathways for admission, re-admission and management of complications should be clearly documented and appropriate contracts for emergency provision in place.

There must be robust arrangements with the regional Tier 3 HPB Centre for discussion about and transfer (if necessary) of patients with complications of laparoscopic cholecystectomy, intra-operatively if appropriate or promptly after the diagnosis is suspected. Some Tier 3 centres are also able to offer a service to provide immediate attendance and repair in the base hospital.

All units should have a protocol for the management of CBD stones, whether diagnosed pre-operatively, intra-operatively or post-operatively. This will require access to appropriate imaging (MRCP, intraoperative cholangiogram / ultrasound, EUS), ERCP and interventional radiology. Such patients should be dealt with in UGI surgical units. These units will have surgeons familiar with the full repertoire of biliary surgery including laparoscopic and open cholecystectomy and bile duct exploration.

### **Performance related Outcomes Metrics (PROMS) - recommendations**

1. Contraindications to Laparoscopic Cholecystectomy are few and the vast majority of procedures should be offered a laparoscopic procedure unless there are specific reasons to perform the procedure as an open operation (this PROM does not relate to conversion to open procedure, simply to initial intention to perform procedures)

*PROM – Elective laparoscopic rate – 98%*

2. Surgeons should be performing at least 10 laparoscopic cholecystectomies per annum to sustain sufficient experience and skills to provide patients with the best outcomes available.

*PROM – Laparoscopic Cholecystectomy minimum activity per Surgeon >10*

3. Day case surgery has become the norm for most elective laparoscopic cholecystectomies in patients who are ASA 1 or 2 and have appropriate home situations (this PROM applies to whole Trusts / CCGs rather than individual hospitals which may not have day case facilities).

*PROM – Proportion of all patients undergoing elective LC as day case > 50%*

4. In units providing emergency general surgical services acute cholecystectomy should be provided. Patients with acute cholecystitis should where possible and appropriate be offered timely surgery (Management of Acute gallstone diseases – reference) ideally on the same admission but if not within 14 days of admission where symptoms have settled (ref NICE guidance on AC).

*PROM – Cholecystectomy rate within 14 ds following admission with AC >30%*

### **Operations Performed**

### **Code**

Laparoscopic / open cholecystectomy  
Laparoscopic / open exploration of bile duct

J18.1  
J18.2

## **B. Acute Pancreatitis**

### **Spectrum of Services**

- Conservative management of mild acute pancreatitis (all units)
- Conservative and surgical management of severe pancreatitis and complications of pancreatitis (Tier 3 unit)

### **Population Served and Location of Services**

Mild pancreatitis should be managed in any Tier 2 Hospital with an emergency general surgery take. Each acute hospital should identify a lead clinician for pancreatitis, as recommended in the UK Guidelines for Acute Pancreatitis<sup>11</sup>. Upper GI / HPB Surgeons in Specialist Tier 3 Centres will also provide these Tier 2 services to their local population. Patients with severe pancreatitis should be discussed with the regional Tier 3 centre for consideration of transfer or advice on management.

### **Numbers of Surgeons**

In Tier 2 Units patients with mild pancreatitis will be managed by the emergency general surgery teams. In units where there is sub-specialisation of emergency general surgery provision these patients will be looked after by the Upper GI Surgeons.

Tier 3 specialist HPB Centres should have at least 5 HPB surgeons capable of providing specialist advice and surgery for the complications of acute pancreatitis, in order to be able to provide cover 365 days per year and to manage transfer and treatment when appropriate.

### **Unit requirements:**

#### **For Tier 2 General Surgery Emergency Units**

All the facilities necessary to run an emergency general surgery service

There must be robust arrangements with the regional Tier 3 HPB Centre for discussion about and transfer (if necessary) of patients with severe pancreatitis or complications of pancreatitis.

#### **For Tier 3 Specialist HPB Centres**

Access to 24-hour interventional radiology for the placement of intra-abdominal and retroperitoneal drains.

Access to specialised endoscopic ultrasound (EUS)-guided aspiration, cystgastrostomy and EUS-guided necrosectomy under general anaesthetic. A specialist unit should also be able to provide minimally invasive retroperitoneal pancreatic necrosectomy (MIRPN) techniques to manage infected pancreatic necrosis with a minimum unit volume of 5 cases per year.

A pancreatitis Nurse Specialist should coordinate care so that timely management decisions are made about patients. The nurse specialist will support the patients in both the inpatient and outpatient setting and refer to other services where appropriate.

## **Performance related Outcomes Metrics (PROMS) - recommendations**

1. Mild gallstone-related acute pancreatitis should have a cholecystectomy on the index admission according to the latest International Association of Pancreatology and American Pancreatic Association (IAP/APA) guidelines published in 2013. This should be undertaken laparoscopically unless there are specific reasons to perform the procedure as an open operation. Rates of laparoscopic cholecystectomy in this setting are lower than expected for various reasons (unfit, patient preference, inability of HES to differentiate severity of attack).

*PROM – Laparoscopic Cholecystectomy on same admission or within 2 weeks of discharge – 50%*

## **Chronic Pancreatitis**

Specialist units looking after chronic pancreatitis patients should be able to provide endoscopic and surgical management of chronic pancreatitis. They should have a multi-disciplinary approach to their care, ideally with the following healthcare professionals:

- Surgeons
- Medical Pancreatologists
- Clinical Nurse Specialist
- Specialist Dietitians
- Specialists in Pain Management
- Smoking and Alcohol cessation services, and
- Addiction services

## **C. Complex HPB Surgery**

### **Spectrum of Services**

- Surgery for HPB cancer
- Surgery for complex / rare benign HPB disease (including chronic pancreatitis)

### **Population Served**

There are 34 Tertiary HPB Centres in UK including 7 Liver Transplant Centres. HPB Centres should work within their Cancer Network and in England should serve a minimum population of 2 million population (Informing Outcomes Guidance reference). HPB Centres are closely and regularly assessed by Peer review and are given clear targets with respect to patient management and Unit requirements.

### **Location and distribution of services**

HPB Tier 3 Centres are usually located in University Teaching Hospitals or large Regional Hospitals and share close links with the regional cancer centre. Full radiology, endoscopy and oncology support should be provided from within the same organisation. Referring cancer units from the surrounding district hospitals must have easy access to the HPB centre for advice about complex cases and early transfer of patients where appropriate should be facilitated. Electronic imaging transfer facilities are vital for the effective function of any HPB cancer centre and district hospitals must have access to robust systems of image transfer for decision making at HPB centre MDT meetings. Cancer centres must have at least weekly MDT meetings and all referring units should have access on a weekly basis

to decision making from the specialist team. This allows patients to either start their treatment as soon as possible or continue along their cancer pathway in a timely manner.

### **Referral from secondary care into a tertiary specialist HPB centre**

Referrals from secondary care into the tertiary HPB centre will usually fall into one of three categories:

- Referral of a patient with known or suspected HPB malignancy (urgent or non-urgent)
- Non-urgent referral with a complex benign condition
- Urgent referral of a patient with complex benign disease

For urgent referrals direct contact with the specialist unit should be initiated. It is expected that surgeons in the specialist units would provide a 24 hour on call service cover for regional HPB emergencies. For cancer referrals, there should be clearly defined pathways, agreed by the regional Cancer Network. It is essential that there are mechanisms in place to ensure clear communication between the secondary care and the tertiary units. There are emergency HPB conditions which demand urgent attention and often urgent transfer to specialist centres. There should therefore be clear guidelines with agreements between district hospitals and specialist units as to which emergency conditions demand transfer immediately,, urgent transfer within 24 hours or planned transfer at a later time.

All patients with suspected HPB malignancy should be referred to, or discussed with, the regional HPB centre. Initial diagnostic investigations such as ultrasound, CT and MRI may well be carried out by the referring unit and more specialist investigations such as EUS, ERCP and spyglass and interventional radiology and pathology by the HPB centre. Many Tier 2 Hospitals carry out regular ERCP procedures for stone disease and insertion of stents in patients with malignant obstructive jaundice. However, given that there is now strong evidence to carry out major pancreatic resections on patients with bilirubin less than 250umol without preoperative biliary drainage, direct communication needs to exist between the secondary and tertiary centre with regard to the appropriate management of the jaundiced patient. This communication is also important with patients with hilar cholangiocarcinoma.

### **Numbers of Surgeons and Surgeon Volumes**

The Unit must be able to provide management for both elective and emergency HPB patients at all times. This means that the number of surgeons in a Unit must not be less than 5. However, one HPB surgeon is required for approximately 0.5 m population. Most Units provide both liver and pancreatic services but a few cover only one organ. Although all the surgeons must be able to manage acute complex HPB patients there is likely to be subspecialisation within the Unit, for example it may be that only one or two of the surgeons perform resections for hilar cholangiocarcinoma and a different surgeon specialises in advanced laparoscopic resection.

Most HPB units provide liver and pancreatic surgery from within the same team, although not all surgeons will do both liver and pancreatic resections. Units serving a population of 2 million patients will be performing 60-70 pancreatic resections per year and in excess of 100 liver resections for primary and metastatic liver tumours. A multidisciplinary team approach is essential for the management of these cases, and thus we do not make recommendations about the volume of operations for individual surgeons other than to state that surgeons within the same team should be doing an approximately equal number of cases. For rare, complex and high risk cases (eg peri-hilar cholangiocarcinoma, or Hepatocellular carcinoma in a cirrhotic) it is expected that units will rationalise the distribution of cases so that they will be concentrated into the practices of 1 or 2 individuals with the particular sub-specialty interests. The benefits of two Consultant operations for difficult cases is recognised and this practice should be encouraged.

Tumours in the distal pancreas are frequently suitable for laparoscopic resection. These procedures are relatively uncommon and therefore any individual surgeon will have experience of limited numbers. In the interests of improving outcomes it is anticipated that surgeons within units will rationalise the distribution of these cases so that experience will be concentrated and outcomes improve (minimum of 2 Consultant Surgeons).

It is recognised that towards the end of one's career, experienced Consultant Surgeons may do less individual operating, and be more involved in mentoring and advising less experienced colleagues. This is encouraged.

### **Early diagnosis and screening**

The most common HPB resections are for pancreatic cancer and colorectal liver metastases. Pancreatic cancer has an annual incidence of 100 cases per million population but most patients present with advanced disease. Consequently resection rates are low at approximately 15-20% and there is considerable geographical variation in this. Late presentation and subsequent palliative management of pancreatic cancer has been investigated but unfortunately there is currently no effective screening test that can detect the disease at an early stage. Approximately 5% of patients with pancreatic cancer have either a family history of pancreatic cancer or belong to an identified genetic syndrome. Whilst there are not yet UK guidelines on pancreatic screening, EUS screening is being used in high-risk patients in some centres. Research continues to identify early disease in high risk groups but to date no effective screening tool is available.

There are genetic disorders for which endoscopic screening is recommended, specifically patients with familial adenomatous polyposis who should undergo 3 yearly duodenoscopy from the age of 18. Patients at risk of hepatocellular carcinoma, such as those with cirrhosis should undergo regular abdominal ultrasound according to local hepatology guidelines.

For colorectal liver metastases there are currently major variations in the resection rate within different trusts and cancer networks across the UK. Guidance from the Association of Coloproctology (ACP) has outlined recommended tests for the staging of colorectal cancer at presentation and screening in the postoperative period for the development of metastatic disease. Regional variations in resection rates are presumably therefore due to variable implementation of the ACP guidelines and subsequent detection of metastatic disease. The ACP guidelines should be fully implemented, together with the assessment of the radiology of all patients with colorectal liver metastases by the HPB MDT (including liver surgeons). This should help with the early diagnosis of colorectal metastases and lead to less regional variation in resection rates. Patients will also be assessed for other treatment options such as ablation techniques, loco-regional therapies e.g. SIRT and chemotherapy.

### **Specialist Nurse**

Specialist HPB Cancer teams should include clinical nurse specialists who will support patients referred to the team. There should be an appropriate number of nurse specialists in each unit or centre so that every patient and their family have access to timely support from diagnosis onwards.

### **Specialist Radiology**

The specialist HPB centre should have consultant radiologists with expertise in HPB imaging. This would include cross sectional imaging (including CT/MRI), functional imaging (including FDG PET), ultrasonography (including contrast enhanced US), interventional vascular radiology (including embolization procedures such as PVE, PTC, TIPSS), and interventional oncology (including chemo and

radio-embolization procedures and tumour ablation), Expert HPB radiology support is an essential component of the specialist MDT. (For EUS see relevant section).

There should be 24 hour access to interventional radiology to support the delivery of an emergency HPB service.

Where specialist radio nucleotide imaging and therapeutic radioembolization procedures are not available within the HPB unit, there should be established links with a centre able to provide these services.

### **Specialist Endoscopy**

The specialist HPB centre should provide expertise in upper gastrointestinal endoscopy, including therapeutic biliary endoscopy (ERCP) and therapeutic endoscopic ultrasonography. The centre should provide a regional biliary endoscopy service for complex HPB patients. It is recognised that such expertise may be provided by consultants who are primarily surgeons, radiologists, gastroenterologists or hepatologists. Endoscopic biliary intervention (EUS and ERCP) should be available daily, including on an on-call basis over the weekend, to support the emergency management of HPB disease.

### **Specialist pathology**

There should be support for a tertiary HPB unit from the pathology department, with consultant pathologists specializing in HPB disease. This support would include onsite access to immediate analysis of intra-operative frozen section specimens. There should be regular meetings for discussion of cases between pathologists and clinicians usually at the HPB MDT meetings.

### **Critical care**

It is expected that HPB surgeons would work closely with a team of anaesthetists and intensivists who would have a special interest in HPB disease. This team would ensure optimal pre-, peri- and post-operative management of patients undergoing major HPB surgery. Patients with HPB disease often present as emergencies requiring intensive care. There should be access to critical care beds (both level 2 and level 3) with on-site renal support.

### **Non-surgical oncology**

There should be recognised medical and clinical oncology expertise to cover the range of HPB cancers (including primary and metastatic liver, biliary and pancreatic malignancies and neuro-endocrine tumours). All specialist centres should have access to, and enrol patients into, clinical trials where available and appropriate for patients with HPB malignancies.

### **Audit and data collection**

To maintain their status, all HPB cancer centres are required to validate their data. The Association of Upper Gastrointestinal Surgeons and GBIHPBA are developing SWORD<sup>12</sup>, a National database programme to facilitate individual surgeons and units to view their own and peers outcome data. Data collection is an integral part of any surgeon's appraisal and job plan review and is likely to become compulsory. It is vital that Institutions provide adequate resource for accurate data collection and entry, and surgeons' job plans should include specified time for audit and data entry as part of their Supporting Professional Activities allocation.

## **Research**

All HPB surgeons should be encouraged to participate in clinical research and recruit patients into NIHR funded randomised trials and other NIHR portfolio studies as part of their Continuing Professional Development and to contribute to the future evidence base. Contribution to local and national trials is essential for diagnostic and resectional cancer centres. HPB teams should identify research leads to co-ordinate and develop research projects through local MDTs and the wider Network. AUGIS and GBIHPBA are keen to be involved in the design of all new trials in HPB surgery. GBIHPBA can also provide specific advice to trainees who wish to pursue HPB research.

## **Education and Training**

The Great Britain and Ireland HepatoPancreaticoBiliary Association (GBIHPBA) should take a lead role in education and training in HPB surgery. GBIHPBA should be responsible for organising the HPB sessions at the AUGIS annual meeting and training day and be involved in coordinating education workshops across the UK in HPB disease. Surgeons should complete their CCT in General Surgery, having spent a minimum of one and preferably two of years ST7 and 8 in a HPB and/or liver transplant Unit. Experience and exposure to transplantation and donor retrieval surgery is recommended. A further 12 to 24 months in a senior fellowship post is also recommended.

## **Outcome standards**

### **Liver resection:**

Mortality rates	In-hospital < 5%, 90 day < 10%, 1 year < 20%
Complication rates	Major morbidity < 35%
Length of stay	Median length of stay < 8 days (likely to come down with ERAS)
Surgical approach	Open or laparoscopic – approximately 15% of resections should be done laparoscopically

### **Pancreatic resection:**

Mortality rates	In-hospital < 5%, 90 day < 10%, 1 year < 20%
Complication rates	Major morbidity < 55%
Length of stay	Median length of stay < 14 days (likely to come down with ERAS)
Surgical approach	Open for Whipples Procedures / PPPD Distal pancreatectomy >50% should be done laparoscopically.
Pathology	Median number of nodes harvested 15 or more (Whipples / PPPD)

All HPB resectional Units should have an ERAS programme in place for patients undergoing major liver or pancreatic resections. Long-term survival clearly depends on disease process, however Unit results should be consistent with published national and international data.

<u>Operations Performed</u>	<u>Code</u>
<u>Hepatobiliary</u>	
Left hepatectomy	J02.2
Extended left hepatectomy	J02.7
Right hepatectomy	J02.1
Extended right hepatectomy	J02.6
Wedge resection	J02.4
Resection of segment of liver	J02.3
<u>Pancreatic</u>	
Pancreaticoduodenectomy	J56.2
Distal pancreatectomy	J57.2
Puestow operation	J59.3
Local excision	J58.1
Pancreatic Necrosectomy	J57.6
Cystgastrostomy	J61.1
Percutaneous drainage of pancreas	J66.2, J66.3
<b>Additional code for minimally invasive approach</b>	<b>Y75.1</b>

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