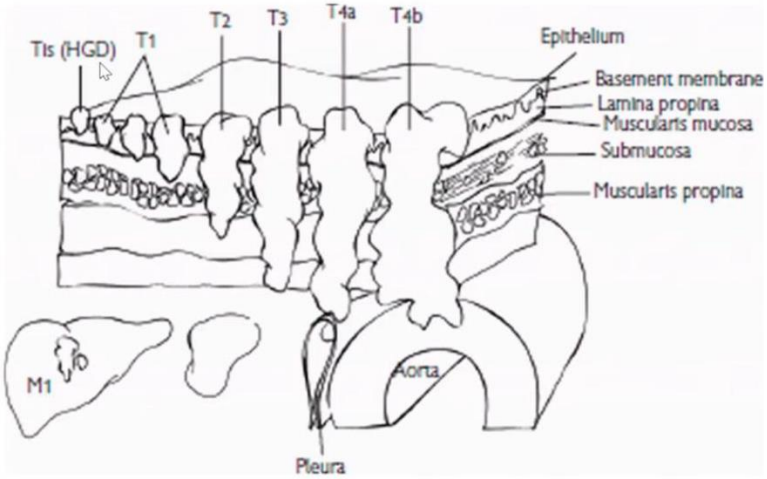
Esophagus	Clinical presentation	Diagnosis	Treatment
Achalasia	Dysphagia to solids and liquids, progressive.	- Barium swallow (best initial test): bird's beak appearance. - Upper endoscopy. - Manometry (diagnostic): high resting pressure of LES, no relaxation.	- Pneumodilation (endoscopic balloon). - Heller's myotomy Complication: GERD - Botulinum toxin injection.
Diffuse esophageal spasm, Nutcracker esophagus (AKA. Jackhammer esophagus)	- Atypical chest pain, intermittent, not related to exertion. - Intermittent dysphagia.	- Barium swallow: corkscrew appearance. - Manometry (diagnostic): High intensity, intermittent, disorganized contractions. DES → aperistaltic Nutcracker → peristaltic	- CCB (diltiazem/ nefidipine) + nitrates: 1st line. - Isosorbide dinitrate or sildenafil: 2nd line. - Botox injection: 3rd line.
Esophageal webs and rings	Intermittent dysphagia to solids, not progressive.	- Barium swallow - Endoscopy	- Endoscopic dilation
Esophageal stricture	Constant dysphagia, slowly progressive. History of GERD, or prolonged NG tube placement, or alkali ingestion.	- Barium swallow - Endoscopy	- Endoscopic dilation
Sclerodema esophagus	Dysphagia for solids, progressive. Heartburn.	- Clinical - Manometry	Treat the reflux with PPI, follow up every 2-3 months
Zenker's diverticulum	- Oropharyngeal dysphagia (difficulty initiating swallowing). - Posterior neck mass.	- Barium swallow *endoscopy and NG are <u>contraindicated</u> (risk of perforation)	Surgical resection.
Hiatal hernia	Most cases are	- Barium swallow.	Type 1: 85% medical (PPIs)

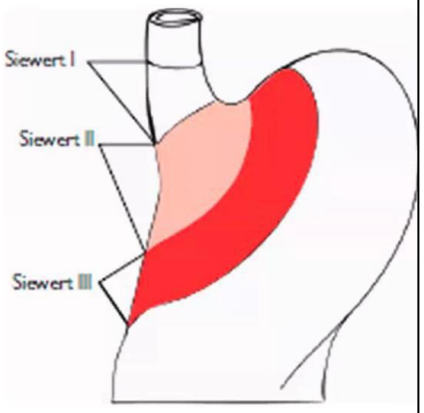
	asymptomatic. Type 1 (sliding): GERD symptoms. Type 2 (paraesophageal): dysphagia, gastric ulcer and strangualtion if mechanical obstruction.	- Endoscopy: Type 1 → GE junction herniates into the thorax. Type 2 → GE in its normal location.	15% surgical Type 2: surgical only
GERD	Heartburn, water brush, regurgitation. Cough, wheezing. Dysphagia due to stricture	- Clinical - Should do endoscopy if alarm symptoms (dysphagia, odynophagiea, nausea, vomiting, UGIB, anemia, weight loss, failure to respond to PPI..). - Esophageal 24 hour PH monitoring: gold standard (when atypical symptoms, refractory GERD or negative endoscopy): Drop in esophageal pH to 4 or less that correlate with symptoms of acid reflux (normal esophageal PH is 7).	Medical (PPIs, H2 blockers). Indications for surgery: 1. Failure of medical treatment. 2. Respiratory problems. 3. Severe esophageal injury Surgical: - Lap Nissen: 360 fundoplication. - Belsey mark IV: 270 fundoplication. - Toupet procedure: 200 wrap. - Hill procedure.
Esophageal cancer	Constant Dysphagia to solids rapidly progressive to liquids. Weight loss, anorexia.	- Barium swallow - Endoscopy and biopsy For staging: -Endoscopic US (for T and N) -CT and PET (for N and M)	T1,T2 and N0 → surgery T3,T4a→ neoadjuvant chemo/radio then surgery. Stage 4 (M1) → primary chemoradiotherapy. Adjuvant chemo. For residual N1, or R1, R2 resection.

Esophageal adenocarcinoma	Squamous cell carcinoma
General risk factors: **Old age, male gender, smoking, alcohol, history of radiation to the mediastinum.**	

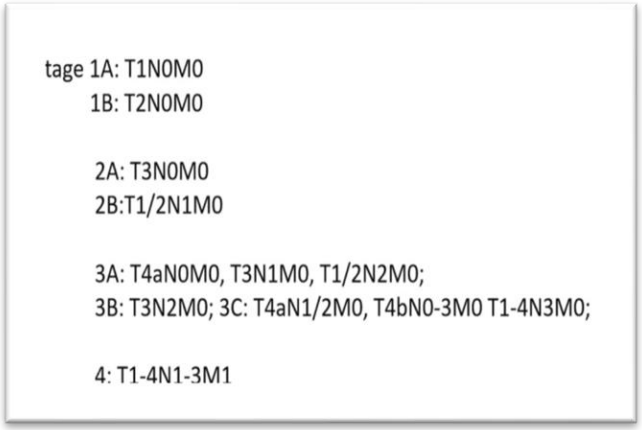
Risk factors: - GERDs → Barret's esophagus → dysplasia - H. pylori - EGF polymorphism	Risk factors: -Irritation to the mucosa. -Hot beverages -Underlying esophageal disease (achalasia, stricture, web). -Dietary: Nitrosamines (e.g. Red meat), pickled vegetables, low folate and zinc. -Toxin producing fungi (e.g. aflatoxin) -Prior gastrectomy. -Tylosis (inherited condition that causes thickening of the skin of palms and soles, and white lesion inside the mouth)
Lower 1/3 of the esophagus	Upper 2/3 of the esophagus
Endoscopy: Lesions similar to Barret's esophagus.	Polypoid, white plaques, or scar-like lesions.
Invades celiac lymph nodes.	Invades cervical and mediastinal lymph nodes.
	Could invade the trachea causing tracheoesophageal fistula, aorta causing bleeding, recurrent laryngeal nerve causing hoarseness of voice, sympathetic nerves causing horner's syndrome.

Siewert classification of distal esophageal tumors.





Siewert 1 (above LES) → resection of Esophagus only.
Siewert 2 (involve LES)→ resection of esophagus with negative gastric margins.
Siewert 3 (below LES) → resection of esophagus and the whole Stomach.

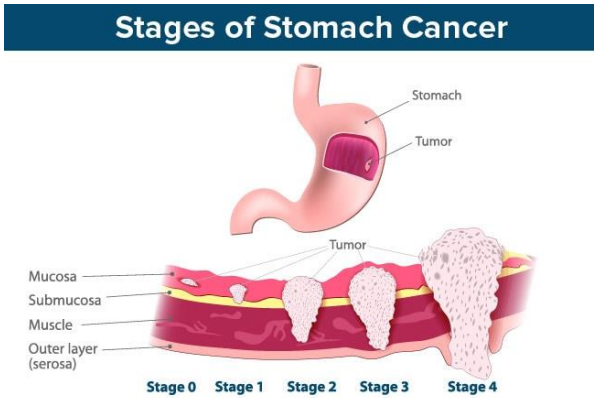


(staging depends mostly on LN involvement)

Stomach	Clinical presentation	Diagnosis	Treatment
Peptic ulcer disease	Epigastric pain Gastric: increase after eating → weight loss Peptic ulcer: relieved with food intake → weight gain	Endoscopy is performed when there is dyspepsia + alarming symptom or age > 60 years. Endoscopy and biopsy to test for H. pylori (histology, rapid urease test, culture, PCR). If no alarming symptom: non-invasive tests for H. pylori (urea breath test, stool antigen, serology).	Medical: eradication of H. pylori, stop NSAIDs. <u>Indications for surgery:</u> <u>Acute complication (bleeding, perforation, obstruction), non-healing peptic ulcer.</u> Surgery options: - Highly selective vagotomy (preserve the fibers to the pylorus). - Selective vagotomy (cut the nerve supply to the whole stomach) - Truncal vagotomy→ Requires drainage procedure: pyloroplasty, antrectomy and anastomosis: Billroth I: anastomosis with

			duodenum. Billroth II: anastomosis with jujenum.
Perforated PUD	Sudden onset diffuse abdominal pain and rigidity (peritonitis), Fever, tachycardia, tachypnea, hypotension.	Clinical Chest X-ray: air under diaphragm	Conservative: IV fluid, IV antibiotics, IV PPI, analgesics. Surgical: (urgent) Graham patch (using a piece of omentum to close the perforation) +/- vagotomy.
Gastric adenocarcinoma	Early: nonspecific symptoms of epigastric discomfort and indigestion. Late: weight loss, dysphagia, anorexia, early satiety, vomiting. Late signs: Abdominal mass, Virchow node, sister marry joseph's nodule, Krukenberg tumor (ovarian mets).	Upper endoscopy and biopsy (7 biopsies from ulcer edges) For staging: -Endoscopic US -CT and PET -Chest X-ray, LFT, exploratory laparotomy (to detect mets)	T1 → curative surgery. T2 or higher → neoadjuvant chemo. then surgery +/- adjuvant chemo. M1 → palliative. Proximal or midbody tumor → total gastrectomy. Distal tumor → subtotal gastrectomy. Then anastomosis (billroth II) or Rheu-in-Y. Lymph node dissection: usually D1 and D2. Endoscopic mucosal resection (EMR): for early gastric cancer.
GIST (60% in stomach, 30% in small bowel)		Endoscopy and biopsy C-KIT mutation positive	Laparoscopic resection with 2 cm negative margins. Adjuvant chemo.: tyrosine kinase inhibitor (imatinib). No need for lymph node resection.

Gastric MALToma	70-80 years of age Nonspecific symptoms (fatigue weight loss)	Endoscopy and biopsy + H. pylori test (90% associated with H. pylori)	Low grade → H. pylori eradication High grade → radio/chemotherapy.



Staging depends mostly on T (wall invasion)
T1, T2 → stage 1
T3, T4 → stage 2 and 3
M1 → stage 4

Gastric adenocarcinoma (95%): Lauren classification	
Intestinal type (70%)	**Diffuse type (30%)**
Arise from gastric mucosa	Arise from lamina propria (no glands), composed of signet ring cells
Distal part of the stomach	More in Proximal part of the stomach, but could be found anywhere in the stomach
Well- formed glandular structure	Thickening of the stomach (linitis plastica)
In old age group and in men	In young age group and in women
Associated with H. pylori and atrophic gastritis	Associated with blood type A and familial cases suggesting genetic etiology
Well differentiated	Poorly differentiated
Hematogenous spread	Transmural and Lymphatic spread

Most common site of GI lymphoma and GIST is stomach, then small bowel.
Most common gastric lymphoma is diffuse large B-cell lymphoma. Other types include: MALToma (marginal zone lymphoma), Burkitt's lymphoma, mantle cell lymphoma.

Bariatric surgeries	
Sleeve gastrectomy	**Roux-en-Y gastric bypass**
Restrictive	Combined (restrictive and malabsorptive)
60-70% excess weight loss	70-80% EWL
Weight loss is slower	Faster weight loss and better for very high BMI
40% regain weight	Less possibility of weight regain
Worsens GERD (high pressure zone)	Better for GERD and hiatal hernia patients
Better for non sweet eaters	Better for sweet eaters
Preferred in type 1 diabetes	type 2 diabetes remission
	Dumping syndrome
	Risk of internal hernia (due to mesenteric defect)
Need lifelong supplementation	Need lifelong supplementation
	Not preferred in smokers (high risk of anastomotic ulcers and leak)

Liver	**Clinical presentation**	**diagnosis**	**Treatment**
Pyogenic liver abscess (MCC is E.coli)	RUQ pain and tenderness, fever, jaundice, hepatomegaly, features of sepsis	CBC: leukocytosis LFT: elevated alk. Phosphatase High ESR, CRP Positive blood culture Abdominal CT or US (confirmatory)	- IV antibiotics including Metronidazole. - Percutaneous drainage. - surgical drainage is indicated if multiple, loculated abscesses or failure of percutaneous drainage.

Amebic liver abscess (Entameba histolytica)	Same May be preceded by diarrhea due to intestinal amebiasis	Serological antibody detection	- Medical (metronidazole IV). - Percutaneous drainage/ surgical only if refractory to metronidazole or bacterial co-infection or rupture.
Hydatid cyst (echinococcus granulosus)	Latency (asymptomatic). RUQ pain, palpable mass. Cyst rupture or suppuration → anaphylactic reaction (could be fatal)	Mild eosinophilia Serological antibodies detection Ultrasound: Hydatid sand (scoleces), water lily sign, honeycomb sign, eggshell calcification. CT scan	- Medical: albendazole/ praziquantel - Percutanous drainage: use PAIR procedure (puncture, aspiration, injection, reaspiration). - Surgical: cystectomy + pericystectomy
Benign liver neoplasms: Hemangioma > focal nodular hyperplasia > hepatocellular adenoma	Females 30-50 years. Mostly asymptomatic. Large tumors: RUQ abdominal pain. If rupture or bleeding (higher risk in HCA) → life-threatening hemorrhage.	Initial: RUQ Ultrasound Contrast enhanced CT scan Or contrast enhanced MRI. CT hemangioma: centripetal enhancement. CT FNH: central stellate scar.	Hemangioma and FNH: conservative Resection only if symptomatic by compression. HCA: surgical resection in males. Females → life style change (stop OCPs) and MRI after 6 months → if size >5 cm: surgical resection. If < 5 cm: annual MRI. (Male sex and lesion > 5 cm

			carry high risk for malignant transformation)
Hepatocellular carcinoma	M>F Increase with age. In cirrhosis from any etiology ,HBV infection. Asymptomatic early, symptoms of cirrhosis decompensation late (e.g. variceal hemorrhage). Paraneoplastic: hypoglycemia (IGF2), erythrocytosis (EPO), hypercalcemia, diarrhea.	Elevated AFP (not specific). Contrast enhanced CT or MRI → diagnostic. No need for biopsy except if dx is uncertain.	-surgical resection. -Liver transplantation Milan criteria: solitary HCC < 5cm or up to three <3cm, no vascular invasion, no LNs involvement, no distant mets. -Locoregional ablation therapy (thermal, TACE, TARE)
Fibrolamellar carcinoma (subtype of HCC)	No male predominance. Younger age group (5-35 years). No cirrhosis or risk factors. Normal AFP. Better prognosis.		
Intrahepatic cholangiocarcinoma	Risk factors: PSC, choledochal cyst. RUQ pain, weight loss, elevated ALP.	Tumor markers: CA19-9, CEA, AFP. CT/ MRI.	Surgical resection. Preoperative portal vein embolization permits a margin negative resection.
Hepatoblastoma	Children (first 2 years of life). M>F Rapid growth, rupture and hemorrhage can lead to death.	Elevated AFP	Chemotherapy then surgery
Epithelioid hemangioendothelioma	Middle-age females. Low grade tumor, high rate of metastasis. High risk of budd-chiari syndrome.		
Angiosarcoma	Old men (>60 years old).		

	High grade tumor. Budd-chiari is rare. Hepatomegaly+-splenomegaly, thrombocytopenia, rupture and bleeding can lead to death.		
Secondary liver tumors	Mostly asymptomatic, symptoms of primary cancer, carcinoid syndrome if NET.	-CEA → for colorectal liver metastasis. -US (conventional, contrast enhanced, EUS, intraop. US). -CT with contrast (triphasic: arterial, porto-venous, delayed). -MRI -Histology -Immunohistochemical: to determine the tissue of origin).	CRLM: Surgical resection, locally ablative therapy, adjuvant and neoadjuvant chemo.

Biliary tree	**Clinical presentation**	**diagnosis**	**Treatment**
Gallstones (cholelithiasis)	80% asymptomatic. If symptomatic: intermittent RUQ abdominal pain < 6 hours, radiates to the right subscapular area, precipitated by eating fatty meals, nausea and vomiting	RUQ US: hyperechoic stones in the gallbladder, posterior acoustic shadow. *Most gallstones are radiolucent so they don't appear or X-ray.	Lap. Chole. Indications: Symptomatic Asymptomatic and: -Porcelain gallbladder, gallbladder polyp, gallstone >3cm (due to increased risk of CA). -Hyperbilirubinemia. -DM, immunosuppression (increased risk of complications).

Cholecystitis	RUQ pain > 6 hours, severe, postprandial, radiates to the right scapula. Positive murphy's sign. Painful palpable gallbladder. Fever, elevated WBC count.	- RUQ US: thick gallbladder wall (>3 mm), dilated gallbladder (>8x4 cm), pericholecystic fluid, gallstone or cystic duct stone. - HIDA scan: filling defect of the gallbladder after 4 hrs.	IVF, NPO, IV antibiotics. Lap. Chole. Within 24-48 hours (urgent) In high risk and unstable patients (grade 3 tokyo – MOD) → cholecystostomy tube.
Choledocolithiasis (CBD stone)	RUQ pain, jaundice, nausea and vomiting, pale stool, dark urine, pruritis, steatorrhea (obstructive jaundice)	- Elevated LFTs, bilirubin, amylase, lipase. - RUQ US: dilated CBD > 6mm. - MRCP (intermediate likelihood) - ERCP (high likelihood): diagnostic and therapeutic.	- ERCP: sphincterotomy and stone extraction with a basket or balloon. - Interval cholecystectomy (within 72 hrs)
Ascending cholangitis	1.RUQ pain 2.jaundice 3.fever (Charcot's triad) 4.shock 5.ultered mental status (Reynold's pentade: indicates suppurative cholangitis and sepsis)	- Elevated LFTs, bilirubin, amylase, lipase, <u>leukocytosis, elevated CRP, fever.</u> - RUQ US: dilated CBD.	- NPO, IVF, IV antibiotics. - ERCP: biliary drainage and stone extraction if present (emergent). Or: PTC with catheter Or: open drainage with T-tube -Interval cholecystectomy (6-8 weeks)
Primary sclerosing cholangitis	Signs of cholestasis (jaundice, dark urine pale stool, pruritis, fatigue). Could lead to acute cholangitis. Symptoms of concomitant IBD.	ERCP: beads of string appearance. Positive P-ANCA	-Endoscopic balloon dilations and stent placement. - resection of the affected ducts and hepatoenteric anastomosis.

Choledocal cyst **type I. Fusiform/ diffuse dilatation (75%)** **II. Isolated saccular diverticulum.** **III. localized dilatation of intradudenal part of CBD.** **IV. Multiple cystic dilatations inside and outside liver.** **V. Single/ multiple lesions only intrahepatic. (ex: caroli's disease)**	Age < 10 years (congenital) F > M Triad: Jaundice, RUQ pain, RUQ mass	Ultrasound or CT	Excision of the cyst. Type I & IV: hepatojejunostomy. Type II: cyst excision. Type III: cyst unroofing and sphincteroplasty. Type V: hemihepatectomy.
Cholangiocarcinoma	Extrahepatic: Painless obstructive jaundice + nontender palpable gallbladder (Courvoisier's sign).	Elevated CA 19-9 US/CT/MRCP/ERCP with biopsy	Proximal: resection + hepaticojujenostomy. Distal: Whipple procedure.

Pancreas	**Clinical presentation**	**diagnosis**	**Treatment**
Acute pancreatitis	Severe epigastric pain that radiates to the back, nausea, vomiting, fever	Elevated amylase and lipase > 3X upper limit of normal. CT: only if complications are suspected (no improvement after 48 hours) US: to detect the presence of gallbladder stones, pancreatic edema. AXR: Sentinel loop sign, colon cut-off sign.	NPO + IVF + Analgesia. If biliary → interval cholecystectomy.

Necrotizing pancreatitis	fever, persistent tachycardia, or insufficient symptomatic improvement over several days. If infected: persistent or worsening leukocytosis, bactere mia, increasing inflammatory markers.	CT: nonenhanced areas in the pancreatic parenchyma. Infective: CT: gas within the pancreas. CT guided FNA of necrotic tissue.	Conservative. If infected: broad spectrum antibiotics. Drainage if didn't improve with Abs.
Walled-off necrosis	After 4 weeks of onset of necrotizing pancreatitis	CT: encapsulated heterogeneous collection containing fluid and debris	percutaneous drainage or transmural endoscopic necrosectomy.
Pancreatic pseudocyst	After 4 weeks of acute pancreatitis. Recurrent or persistent upper abdominal pain, Nausea and vomiting, Mild fever, Weight loss. Epigastric mass	US: fluid filled mass CT	- Endoscopic drainage. - ERCP with transpapillary stent: if communicating. - Operative drainage: Internal: via cysto-gastrostomy or duodenostomy. External drainage (percutaneous). - Excision.
Pancreatic abscess		CT with FNA and gram stain or culture	Antibiotics and percutaneous drain placement
Hemorrhagic pancreatitis	Shock, tachycardia Signs: Cullen's sign, grey turner sign, fox sign	Reduced Hb and Hct CT	Embolization of the affected vessel
Chronic pancreatitis	Abdominal pain, steatorrhea, insulin dependent DM, weight loss, nausea, vomiting	X-ray: calcification CT: calcification MRCP: chain of lakes appearance of the pancreatic duct	Supportive (Creon, fat soluble vitamins, insulin..) Surgical: - Puestow procedure: pancreaticojujenostomy.

			- Beger procedure: resection of the pancreatic head. - Frey procedure: both - Whipple procedure. - Distal pancreatectomy. Total pancreatectomy
Pancreatic cancer	Painless obstructive jaundice. Nausea, vomiting, weight loss, fatigue, abdominal pain, nontender palpable gallbladder (Courvoisier's sign).	CA 19-9 is elevated in 75%. US: dilated CBD without stone. CT: double duct sign (dilatation of both pancreatic duct and CBD duct), calcifications.. EUS: to detect small masses if CT was negative and malignancy is still suspected, to take biopsy for chemo. or if not sure whether the mass is malignant or benign. Diagnostic laparoscopy: to upgrade the tumor (20% are found to be nonresectable after laparoscopy).	Whipple procedure Contraindications of resection: Liver mets, peritoneal implants, celiac LN involvement, hepatic hilar LN involvement, involvement of >180 of celiac axis, hepatic artery or SMA Palliative: -bile duct stent or choledocojujenostomy. -If duodenal obstruction: bypass gastrojujenostomy. -narcotics or celiac plexus nerve block

Done by: Leen Hajeer

GOOD LUCK ^_^