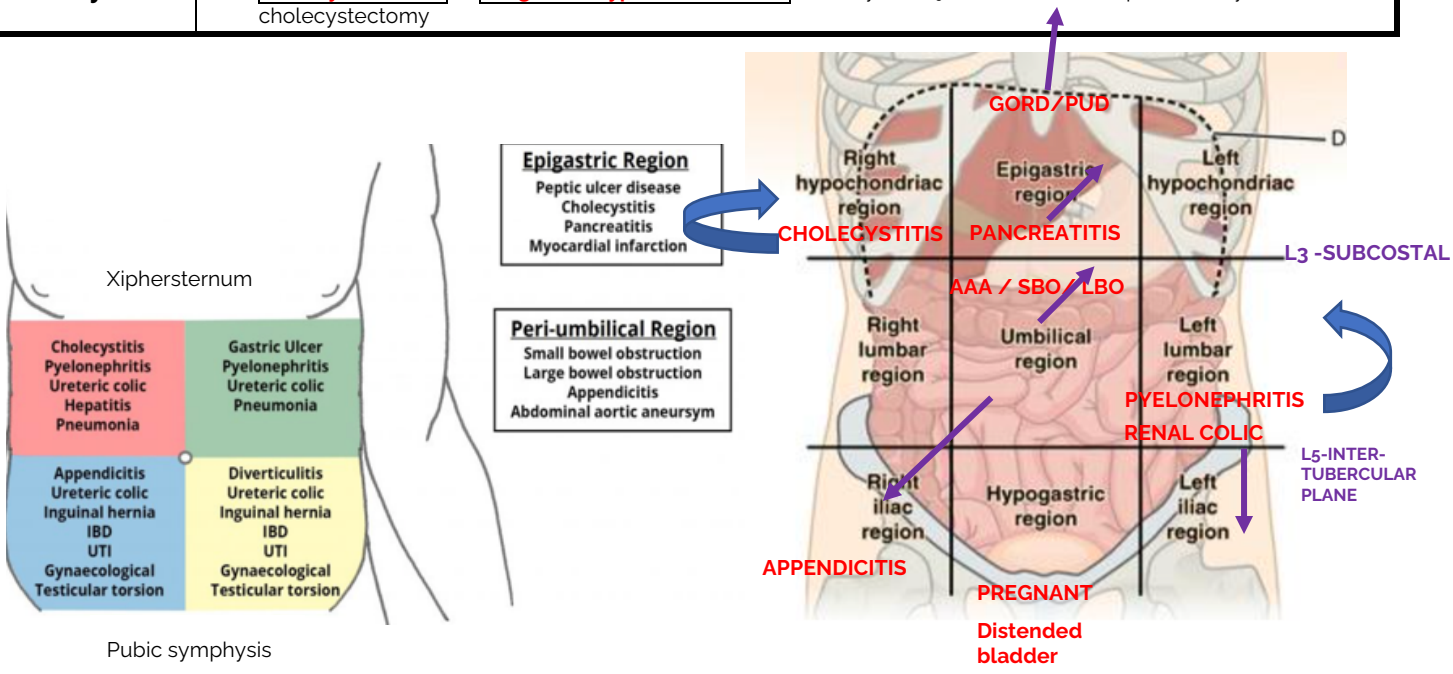
GASTROENTEROLOGY H+E:

	Details		
History of presenting complaint *[DDD's]*	• Diarrhoea /contraption	• **Altered bowel habit:** Volume, smell, colour, freq, consistency, • **Weight gain/loss** • **Appetite/Anorexia**	**Red flags: ALARMS** 1. **A**naemia 2. **L**oss of weight 3. **A**norexia 4. **R**ecent onset progressive symptoms 5. **M**elaena/Haematemesis / Persistent vomiting [***Melaena (****Exc. Fe tablets, peptic ulcers, small bowel bleed****)***] 6. **S**wallowing difficulty /dysphagia (esp. >55 y.o., >4 weeks/relapsing) 7. **Painless** *bleed* = aortic enteric fistula (AAA) 8. **Painful** *bleed* = fissure, IBD, abscess
	• Dysphagia	• Solids/liquids/both (which came 1st) • Intermittent + due to food = eosinophilic oesophagitis • Odynophagia	
	• Dyspepsia	• Acid regurgitation (GORD) • **Abdominal Pain (Socrates)** ○ CHRONIC + altered bowel habit = iBS	
	• General	• N +V + bloating + pruritus • Fever + NS + fatigue	
	• Urological [FUND WISE]	• **Storage**: freq, vol., urgency, nocturia, incontinence • **Infection**: dysuria. Heamaturia, odour	
	• Gynaecological	• **P**V bleeding: menorrhagia, post-coital • **P**V discharge • **P**ain: pelvic, dysmenorrhoea, dyspareunia • **P**regnancy	
Past MHx [CHOMV STAVE]	• **Conditions: Previous H. pylori infections | gallstones | Diabetes| SCI/MS/Hirschsprung disease | Thyroid issue** • **Medications** (calcium antacids, opiates, TCAs cause constipation) • **Surgeries - Abdominal** (appendectomy, anaesthesia) • **Tests (exploratory) = (biopsies, tTg-IgA,** colonoscopy, gastroscopy) • **Allergies**? (e.g. to aspirin, NSAIDs, intravenous contrasts)		**If ANAEMIA suspected, exclude:** 1. GI malignancy 2. Fe deficiency or B12/Folate 3. Menorrhagia 4. Vwf Disease 5. Upper GI bleed or peptic ulcer 6. Coeliac disease/ IBD
Social Hx [WHIT SADOM]	• **Home life/accommodation + partners + single** (sex – condom?) • **Occupation: HCW (hepatitis exposure)** • **Tattoos & Illicit Drugs** (injections) • **Smoking** (pack years) + when did they quit • **Alcohol (CAGE questions) = ESSENTIAL**		
Family Hx	• Family Hx of **colon cancer** (esp. family polyps) | **IBS** | **Coeliac disease** | **H. pylori infections | pancreatitis** • **Hemolytic anemia** or **congenital hyperbilirubinemia** = family Hx of jaundice, anemia, splenectomy or cholecystectomy		



Acute Abdominal Pain (**Visceral** vs. **Peritoneal** (somatic) Pain)

- **Visceral** pain (**non-localised | focal**) starts much earlier than **peritoneal** pain (**localised** – somatic pain – may **radiate/referred pain)**
- **Visceral** pain **Creates** "MIGRATORY" pattern → DIVIDED into foregut, midgut or hindgut pain depending on blood supply

	Division	Location	Level	Somatic Pain	SNS	PSNS
Celiac trunk	Foregut	RUQ and LUQ	T12	T7-9 (epigastric)	Greater splanchnic T5-9	Vagus (CNX)
SMA	Midgut	to proximal 2/3 transverse colon (Central/paraumbilical)	L1	T10-11 (umbilical)	Lesser sphlanchnic T10-11	Vagus (CNX)
IMA	Hindgut	RLQ and LLQ	L3	T12-L1 (suprapubic)	Least splanchnic T12-L2	Pelvic splanchnic (S2-4)

OTHER MAJOR SYMPTOMS IN DETAIL:

VOMITING

"contents frequency amount

- *Involuntary explosive ejection of stomach contents through mouth*

Colour	Location
Bile (green-yellow)	SBO, duodenal atresia,
Faeculent (brown)	Small or large bowel obstruction
Coffee ground	Fe tablet, red wine & coffee ingestion
Undigested Food	Gastric outlet obstruction (level of pylorus)
Red blood/ Haematemesis	• **Upper GI Bleeding or maligancy(any bleeding proximal to Duodenal-Jejunal flexure)** • **Multiple** episode of vomiting? = **Mallory-Weiss Tear**
Chronic unexplained	• Pregnancy (AM sickness), Bullemia, Alcoholism or drugs (e.g. digoxin, opiates, chemo)

CHANGE OF BOWEL HABIT

(*Wide range of normal; 3 x /day to once every 3 days)*

"Have you noticed your bowel habit change? What happened?"

"Do you mean less/more frequent toilets or change in stool"

DDx	KEY FEATURES
Colon cancer	• **Elderly> UWL > Anaemia (SOB, fatigue)** • **Melaena (**Exc. Fe tablets, peptic ulcers, small bowel bleed**)**
Gastroenteritis	• Acute diarrhoea • N+V
IBS (*Rome IV criteria – at least 2 of 3*)	• **(1)abdominal cramping pain/bloating ➔ relieved on defecation** • **(2 + 3) Altered stool frequency + appearance→ Fluctuate diarrhoea/constipation "***toothpaste stools***"** • **Anxiety/stress > Jaundice > Pruritus, lethargy**
Coeliac disease	• **Steatorrhea [fat malabsorption]** ○ *excl. pancreatic disease with lipase deficiency, OR use of weight-loss drug - orlistat* • *Assoc with:* **Anaemia, T1DM, Osteoporosis, autoimmune disease (e.g. thyroid), malignancy (e.g.** *lymphoma, small intestinal carcinoma***)** • **Abd discomfort** (N+V, flatulence, cramping) *Investigations:* • **Serology**: Elevated tTG IgA • **Genetics**: HLA DQ2/8 to **EXCLUDE** CD • **Gold standard** = duodenal biopsy (x6)
IBD (*UC or crohn's*)	• **Bright red Blood (heamatochezia)/mucus in stool** (exc. colon cancer, beetroot ingestion) • Abd pain + weight loss ○ Crohn's = affects entire GIT ○ UC = affects only colon ○ **Small bowel or Right colonic bleeding** = Maroon-coloured blood mixed with stool ○ **Left colonic bleeding (UC)** = Fresh blood mixed ○ **Anal fissure, Haemorrhoids** = Anorectal Bleeding [NOT mixed in stool – only coated!]
Anal fissure, Haemorrhoids	• **Anorectal Bleeding [COATING OF BLOOD – not mixed in stool]** • Straining/post-defaecation anal pain
Endocrine	• **Thyrotoxicosis** = *diarrhoea, heat intolerance, irritable, tremor, amenorrhoea* • **Hypothyroidism** = *constipation, cold intolerance, lethargy, menorrhagia*
Other	• **Drugs (opiates, Fe, antacids, Abs), chronic infection, overflow constipation** • **lactose intolerance, dietary & lifestyle changes** • **bowel obstruction (not passing flatus)**

REFLUX / SWALLOWING DIFFICULTY

Heartburn / Regurgitation	• **GORD**, but ALSO **oesophagitis** or **malignancy** Ask about **chronicity**, **frequency** and **medication** • **Assoc**: weight loss | severity | orthopnoea | PND | Dysphagia | Malignancy | Resp. infection
Dysphagia (Difficulty swallowing)	• If just **solids** → mechanical issue /Obstruction ○ **Internal**: oesophageal carcinoma, eosinophilic esophagitis [intermittent], foreign body ○ **External**: Retrosternal goitre, mediastinal tumours, bronchial carcinoma • If **liquids** → motility issue | Or issue with **BOTH?** ○ MND → bulbar or pseudobulbar palsy ○ Polymyositis, myasthenia gravis ○ **Progressive worsening = Achalasia, scleroderma**
Odynophagia (Painful swallow)	• ***infectious oesophagitis (****E.g. candida, HSV****)*** • ***radiation or caustic damage to oesophagus***

ANOREXIA / WEIGHT LOSS

"Could be caused by: GI, systemic, psychiatric illness OR organic disorder"

Personal	• *Intentional vs unintentional* • Collateral history from relatives about Mental stress or mood is also helpful
Early Satiety *[post-prandial fullness]*	• *Do you feel hungry? Complete loss of appetite? (neurological – hypothalamus)* • indicator of **gastric outlet obstruction** or **impaired gastric emptying (motility related → impaired peristalsis due to diabetes)** causing anorexia and weight loss
Rapid unexplained weight loss	• *What size of pants did you wear 6 months ago? How about now?* • *Have you been on any diet?* • Rapid unexplained weight loss is concerning, especially if no recent dietary change
Weight loss + increased appetite	• *Malabsorption of nutrients or hypermetabolic state (e.g.* ***thyrotoxicosis****)* • ***Liver disease*** *=taste disturbance (can cause smokers to give up smoking)*

JAUNDICE / DARK URINE / STOOL

Jaundice (see under natural light)	• Excess bilirubin deposited in conjunctivae and skin→ **LIVER FAILURE** • *Have you noticed your skin or eye colour change?* • *Have you noticed your urine or stool colour change?*
Dark urine	• *Have you noticed your urine becoming dark or "tea" coloured?* ○ *NOTE:* concentrated urine may be called dark urine • Pale stool + dark urine = **obstructive or cholestatic jaundice** (urobilinogen cannot reach intestine)
Stool	• *Fatty stool = steatorrhea (nutrient malabsorption →e.g. coeliac disease, pancreatitis* • Pale stool = **post-hepatic** jaundice

Pruritis

- Itching of the skin (generalised or localised) → **Cholestatic Liver Disease**

Lethargy

- Tiredness | easy fatigability = **acute or chronic liver disease** OR **anaemia due to GI or chronic IBS**

GIT examination

RED FLAG (ACUTE ABDOMEN)

1. REBOUND TENDERNESS
2. GUARDING/RIGIDITY
3. SEPTIC SIGNS
4. ABSENT BOWEL SOUNDS

"bleed/perforation, obstruction, infarction"

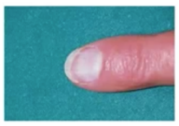
Ask patient to lie 45° (both hands on side)

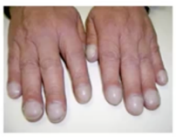
General inspection

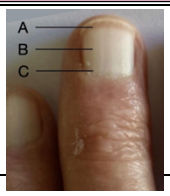
1. **Equipment (e.g. O_2, nasogastric feeds, medications?), *Vomit bowls, IV infusions, catheters***
2. **Jaundice (liver disease)**
3. **Body habitus (**obese, cachexia, ascites)
4. **Well/unwell (responsiveness)** → *Mental state (encephalopathy) / Pain / Agitation (thyrotoxicosis)*
5. **Pigmentation** (haemochromatosis, Whipple's disease) & **Xanthomata** (chronic cholestasis)

Nails

- **Clubbing** (cirrhosis, IBD, coeliac)
- **Leuconychia** (transverse white lines → **hypoalbumineamia** from chronic liver disease)
- **Koilonychia** (spoon-shaped nails from ***severe Fe or B12/Folate deficiency)***
- **Terry's nail (red line on tip of nail) = Chronic liver disease**

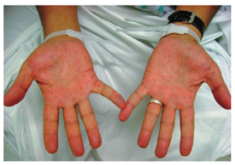

Leuconychia

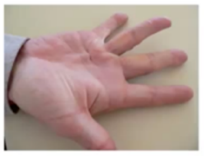

Clubbing



Palms

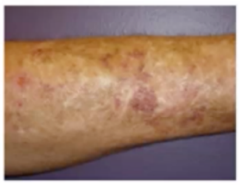
- **Pale palmar creases** (anaemia)
- **Palmar erythema** (chronic liver disease / pregnancy)
- **Dupuytren's contractures** (alcohol) = thickened palmar fascia ➔ fixed finger flexion usually ring or 5th finger
  - **EtOH, CLD, anti-epileptic**
- **Asterixis/hepatic flap (hepatic encephalopathy / uraeamia** → jerky movements of wrist due to toxic ammonia retention)
- *Fingertip capillary glucose monitoring marks (**diabetes**)*

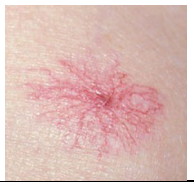

Palmar erythema


Dupuytren's contracture

Arms

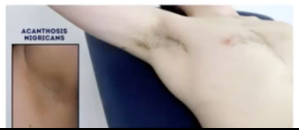
- **Measure BP** (ask for BP in exam, don't to do it)
- **IV Track marks** (→ hepatitis C infection?) **or tattoos** (unregulated pallor, prison)
- **Bruising (***clotting factor deficiency – Vit K deficiency)*
- **Spider naevi (chronic liver disease) (> 2 is abnormal**) = Blanches
  - *Petechiae does NOT blanch
- **Muscle Atrophy**
- **Scratch marks** (severe itch (pruritus) = obstructive or cholestatic jaundice = due to primary biliary cirrhosis and progressive bile duct destruction


Bruising



Axilla

- lymphadenopathy
- **Acanthosis nigricans** = darkening and thickening of skin (rarely assoc. with GIT carcinoma)
  - Hyperinsulinemia ➔ Acromegaly, PCOS, T2DM

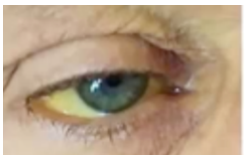


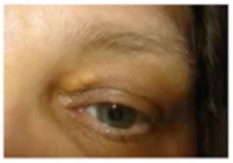
Face /eyes

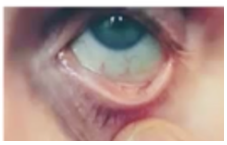
- Uveitis = IBD, autoimmune
- **Sclerae**: jaundice, anaemia, iritis
- **Xanthelasma (biliary cholangitis/cholestasis** → yellowish lipid plaque in periorbital region)
- **Conjunctival pallor (anaemia)**
- **SLIT-LAMP = Cornea**: brown-greenish **Kayser–Fleischer rings (Wilson's disease)** → (abnormal Cu deposition)→ low serum ceruloplasmin & Cu
- **Parotidomegaly = XS EtOH, MUMPS, Sjogrens, IgG4 disease**

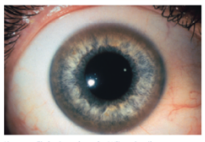
STIGMA OF CHRONIC LIVER DISEASE:

- Jaundice → hepatic encephalopathy (asterixis)
- Hair loss
- XS E2 = palmar erythema, spider naevi
- Ascites → SBP
- *Esophageal varices, caput medusae, haemorrhoids (variceal bleed)*



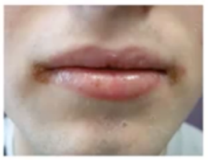


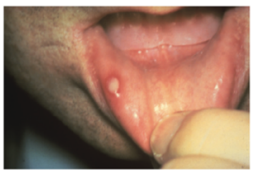



Kayser-Fleischer rings in Wilson's disease

Mouth

- **Angular stomatitis** (cracks at corner of mouth) → Fe, folate or B12 deficiency and water soluble Vit deficiencies (e.g. B2, B6, B12, B1/thiamine)
- **Apthous ulcers** (IBD or coeliac disease) = tiny ulcers in lips and mouths
- **Sweet Breath Smell**: fetor hepaticus (end-stage chronic liver disease)
- **Teeth:** Poor dentition (chronic liver disease, alcoholic)
- **Gums**: **gingivitis** (smoking), **hypertrophy** (pregnancy, scurvy),
- **Tongue: atrophic glossitis** = (Fe, folate or B12 deficiency)


Angular stomatitis

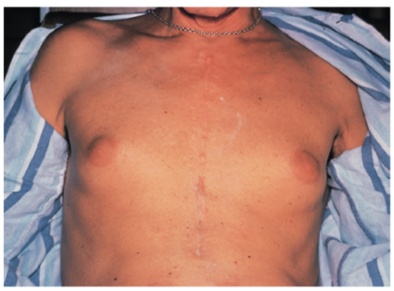

Aphthous ulceration

Neck/ Chest

- **Cervical lymphadenopathy**
  - esp. ***Virchow's node*** *[left supraclavicular LN which is linked to GI malignancy]*
  - Troisier's signs = presence of Virchow's node + gastric cancer
- **Hyperpigmentation**
  - heavy metals
  - heamochromatosis
  - Addison's

Inspect front/back

- **Spider naevi [Blanching test = sign of cirrhosis]**
- **Gynaecomastia** (male breast enlargement and body hair loss)
  - **Chronic liver disease and cirrhosis**
  - **Alcohol** = ↓Leydig cell = teste atrophy + gynacomastia
  - **Drugs** (DISCO MTV – *digoxin, isoniazid, spironolactone, cimetidine, E2, methyldopa, TCA, verapamil)*
  - **Endocrine (Hypogonadism, Hyperthyroidism)**
  - **Seminoma (testeicular cancer) = ↑B-HCG, ↑E2**
- **Cullen's (central umbilical) and grey-turner's (flank – retroperitoneal haemorrhage) sign (**pancreatitis)


Gynaecomastia with prominent breasts and unassociated with confounding obesity

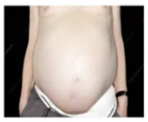
Ask patient to lie flat (both hands on side) + pillow under head FOR ABDO EXAM

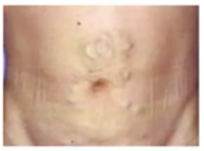
Abdomen (begin here if asked to do so)

Inspect

Stand back then squat down beside bed at eye level (look for distensions)

- **Distension** (**Fluids, flatus, faeces, fat, foetus, "filthy" big tumours, fibroids, fake pregnancy,**
  - *liver cirrhosis → hypoalbuminemia → ascites*
  - **Acute sudden distension due to flatus**: IBS (benign) or post-bowel surgery
- **Scars/Stomas (indicates previous bowel surgery) → CHECK position of scar**
- **Caput Medusae** = distended veins flowing away from umbilicus in Portal H (e.g. liver cirrhosis, persistent ductus venosus)
- **IVC obstruction** = distended veins flowing **towards umbilicus**
- **Bruising/Pigmentation/Striae** (*pregnancy, Cushing's*)
- **Visible peristalsis + Pulsations (AAA)**


Ascites

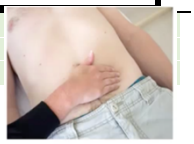

Caput Medusae

Causes Of Abdominal Masses

Right Iliac Fossa	Left Iliac Fossa	Upper Abdomen	Pelvis
• **Appendiceal** abscess • **Ceacal Carcinoma** / distension • **Crohn's disease** (due to abscess) • **Ovarian tumour or cyst** • **Hernia** • **Transplanted kidney**	• **Faeces** (*note:* can often be indented) • **DC/SC** Carcinoma • **Psoas** abscess • **Ovarian tumour or cyst** • **Hernia** • **Transplant kidney**	• **Retroperitoneal LN** (e.g. lymphoma in mediastinum) • **Left lobe of the liver** • **AAA** (expansile) • **Stomach Carcinoma** • **Pancreatic** pseudocyst or tumour • **Gastric dilation** (e.g. *pyloric stenosis, acute dilation in DKA*)	• **Bladder** • **Ovarian tumour or cyst** • **Uterus** (e.g. pregnancy, tumour, fibroids) • **Small-bowel obstruction**

Palpate

1. **Any pain? (begin to palpate away from pain) → watch for discomfort**
   a. **Press down with stethoscope to check for TRUE guarding**
2. *Palpate over 9 regions* **(superficial then deep) → Look for** tenderness, rigidity, organomegaly



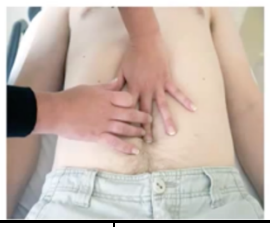
Painful	Inflammatory ➢ *voluntary/involuntary* ***guarding/rigidity*** **(*peritoneal irritation – blood, pus*)**, ➢ ***rebound tenderness*** **(*peritonitis***
Craggy	➢ **Neoplastic** ➢ **Hepatomegaly** = *RHF, CCF, Hepatitis, PBC, PSC, Wilson's, hemochromatosis , MALFD* o **Big liver BUT no liver issue** = GB issue, Reidel's lobe, hyperinflated lung ➢ ***Splenomegaly*** = Haematological malignancy, Portal HTN, Infiltrative ➢ ***Balloting Kidney (L/R flank)***
Tympanic	Palpable bowel loops, SBO/LBO
Reducible masses	Hernia – incisional, spigelian (semilunaris), direct vs indirect inguinal
Pulsatile	AAA
Special tests	1. *Courvoisier' sign* (***palpable non-tender gallbladder + jaundice***) ➔ ***head of pancreas cancer*** 2. *Rovsing's sign* (***appendicitis***), 3. *Murphy's sign* (***cholecystitis***) → *holds breath while palpate R subcostal area (pain = +ve test)* 4. *Murphy's punch (pyelonephritis) → costovertebral angle tenderness over R12 ➔ ADPKD*

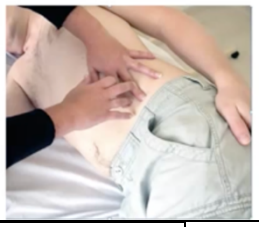
GOOD SIGNS GUIDE 14.2
Ascites

Sign	LR+	LR–
INSPECTION		
Bulging flanks	2.4	0.3
Oedema of ankles	2.8	0.1
PALPATION AND PERCUSSION		
Flank dullness	2.6	0.3
Shifting dullness	5.8	0.5
Fluid thrill	9.6	0.6

Percuss

- **Ascites (shifting dullness)** → assoc. with portal HTN, sphlanchnic vasodilation, cirrhosis (hypoalbuminemia), raised RAAS
  - Percuss for dull note in 9 regions → if dull, keep hand on position and roll patient to opposite side
  - Keep hand in position → wait 30s → percuss again → if resonant = ascites
- **Percussion tendereness**





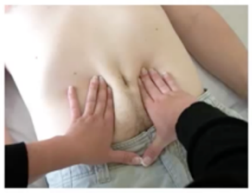
Auscultate

(BEST HEARD IN RIF)

Normal	• Borborygmic (gurgling, rumbling, or growling)	
Absent	• Functional obstruction due **denervation** o loss in peristalsis and GI motility	• Hirschsprung disease • paralytic ileus or peritonitis
High-pitched tinkling sound	• Mechanical bowel obstruction	• Acute SBO • Left colon carcinoma
Reduced	• Reduction in the loudness, tone, or regularity of the sounds	• Peritonitis, Pancreatitis • Medication | Post surgery

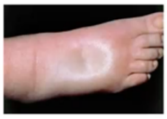
OTHER

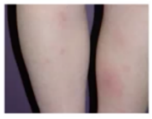
Abdo aorta	• Between umbilicus and xiphoid process (lateral → medial) • Expansile pulsation (**outward movement**) ➔ AAA
AAW Masses	Patient to lift their head up → intra-abdominal mass **disappears or decrease in size** • E.g. *sebaceous cyst, epigastric/incisional hernia, rectus sheath haematoma or divarication*
Bladder	• Smooth and firm + **suprapubic dullness** over pubic symphysis ➔ **bladder scan ➔ IDC (urinary retention)**
DRE	• Anal sphincter tone (anal wink)



Legs

- **Skin lesions**
  - **Erythema** nodosum → IBD
  - **Pyoderma gangrenosum → IBD**
- **Arthralgia**:
  - Enteropathic arthritis
- **Pitting Oedema** (hypoalbuminemia due to chronic liver disease)
- **Neurological signs** (alcohol) → chronic liver disease


Pitting oedema (chronic liver disease)


Erythema nodosum (inflammatory bowel disease)

Summary

"Today I performed an abdominal exam on___ . On inspection, any peripheral stigmata of GIT disease.

1. **On palpation** (*was abdomen soft/tender/masses?*) ➔ **On auscultation** (normal bowel sounds? Bruits?)
- **To complete the exam, check external hernial orifices, inguinal LNs, external genitalia and perform DRE**
- **DRE + PV exam → inspect** (fistulae, tags, blood, mucus), **palpate** (masses) → look for rectal masses and haemorrhoids
- **STOOL colour** ➔ *pale* (chronic pancreatis), *maleena* (haemorrhoids, colonic pathology)
- **Urinalysis** (for bilirubin and urobilinogen, and glucose) → **Temperature chart** (infection)

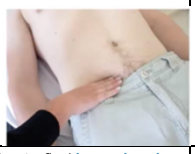
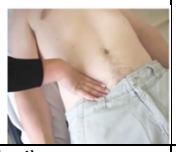
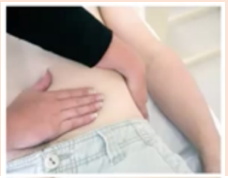
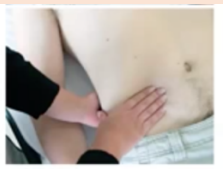
Further Ix

Bedside:
1) **Urine M/C/S**
2) **Urine dipstick (bilirubin)**
3) **Urine B-HCG**
4) **ECG**
5) **Stool M/C/S**
6) **Bladder scan**

Bloods:
2. **FBC**
3. **EUC**
4. **LFT**
5. **CRP**
6. **LIPASE/AMYLASE**
7. **COAG +/- GROUP = HOLD**

Imaging:
- **USS – transabdominal, transvaginal**
- **AXR**
- **ERECT CXR**
- **CT-abdo-pelvis +/- contrast**

EXAMINATION OF THE ABDOMINAL ORGANS: (in detail)

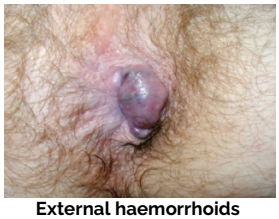
	Hepatomegaly	Splenomegaly	Kidney (Bimanual method)
Cause	• *Metastasis, hepatitis, RVF,* • *leukaemia/lymphoma,* • *fatty liver, alcoholic liver disease* • *portal HTN*	• *myelofibrosis* • *leukaemia/lymphoma or myeloproliferative disorder* • *malaria/EBV*	• *Hydronephrosis* • *carcinoma*
Location	**RIF → RUQ (Right costal margin)**	**RIF → LUQ (left costal margin)**	○ **Left and right flanks**
Palpate	• Push hand **IN** towards right costal margin **during each INpiration** • *Liver edge* may be palpable on lateral margin with **deep palpation of index finger** *Small liver = cirrhosis 	• Patient rolls to right side with tucked legs **Spleen vs kidney** • ***Cannot get above spleen*** • ***Splenic notch*** • ***Spleen not ballotable*** • ***Spleen moves* inferior-medially *on inspiration*** • ***Dull percussion note* (*unlike kidney which is resonant*)**	• One hand anterior, one hand posterior → push up into renal angle with posterior hand and push down with anterior hand • **Flex MCP joints in posterior hand to "Ballot" kidney [flick → flick → stop]** • Swap hands for other kidney ***Normal size kidney = NOT palpable**
Percuss	• Repeat like palpation to find **lower border of liver (esp. on expiration)** • Percuss down from chest along **right mid-clavicular line** until you hear dullness (i.e. **top of liver**) • Measure to the palpable liver edge *(with ruler or width of hand (9-10cm wide))*	**Splenomegaly** = DULL percussion note • Percuss over left costal margin in the left anterior axillary line during complete inspiration • Percuss **Traube' space** (above left costal margin in mid-clavicular line → dull note = splenomegaly) 	• Enlarged kidney: **Resonant percussion note**  
Auscultate	Hepatic **friction rub (liver cancers)** → rough grating sound during breathing	For **Splenic rub/bruit (splenic infarct)**	**For renal bruits (renal artery stenosis)** → 5cm superior + lateral to umbilicus

DIGITAL RECTAL EXAMINATION [DRE]

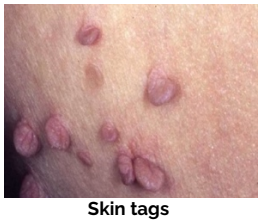
Indication	• **Suspected haemorrhoids** *(i.e. engorged external or internal BV) → Rx: rubber bands, proctosedyl topical* • **Unexplained bleeding on history** → *bright red (distal), mixed in (left colic – UC), Maroon colour (upper GI)* • **Prostate screening →** *oliguria* • **Altered bowel habits** (esp. >40 y.o.)
Equipment	• Gloves → bluey → gel
Consent & rationale	Explain examination and offer **chaperone [clinically trained!]** • **"Have you had one done before?" →** *always address patient anxiety/privacy/past experiences* • **"Undress from waist down, then lie on your left side while bringing your knees up to your chest"** **NB: for prostate exam →** patient standing and in the bent-over position
Inspect	Spread buttocks → look for: • ***Blood*** • ***Excoriations - Rash/eczema/pruritus ani*** *(due to faecal soiling)* • ***Fistula*** *→ may occur with Crohn's disease or perianal abscess* • ***Fissures →*** *IBD, malignancy or STDs* • ***Anogenital Warts*** *(a.k.a. condylomata acuminata) → HPV infected (needs removal)* • ***Hemorrhoids (****small <1cm tense bluish swellings)* • ***Skin tags (collagen proliferation) →*** *due to haemorrhoids or Crohn's* • Patient Bends down → look for ***pelvic organ prolapse*** ○ Anterior (cystocoele) ○ Middle/Apical (uterine prolapse/ enterocoele) ○ Posterior (rectocoele)
Palpate	1. Test anal wink → stroke 4 quadrants of anus with cotton pad → observe brisk anal contraction (if none = spinal cord issue) 2. Excruciating pain → **ANAL FISSURE (**due to primary or secondary constipation) → abandon exam
Exam	3. Lubricate **gloved index finger →** approach anus posteriorly → pause when over anus → wait until sphincter relaxes 4. Warn patient → advance finger into anus a. Faeces consistency b. Ask patient to squeeze finger → Anal tone? [**high tone = constipation**] c. Ask patient to bend down → brings high Rectal lesions down 5. 360° sweep for mass/wall thickenings a. **For men**: feel 2 lobes of *anterior wall of prostate* and comment **mass, size, symmetry, texture** 6. Remove finger → wipe on gauze → inspect mucus, blood and melaena a. **Careful of false +ve →** red meet, aspirin, oral Fe, peroxidase, anticoagulants 7. Clean anus
To complete	1. Thank + redress + dispose waste + hand hygiene 2. Document findings and name chaperone 3. ***To complete the exam I would perform***: a. PSA serology, Rectal US, FBC (anaemia), sigmoidoscopy and colonoscopy

CAJ COLD for general inspect:
- Cyanosis
- Anaemia
- Jaundice
- Clubbing
- Oedema
- Lymph nodes
- Dehydration

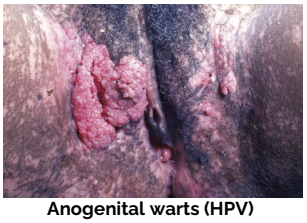
Feeling of prostate	Disease
Very hard nodule	Carcinoma of the prostate
Boggy and tender	Prostatitis
Mass above the prostate or cervix	Metastatic deposit on blumer's shelf



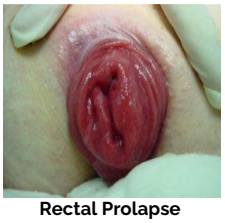
External haemorrhoids
(venous plexus engorgement)



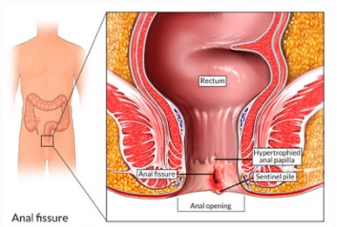
Skin tags



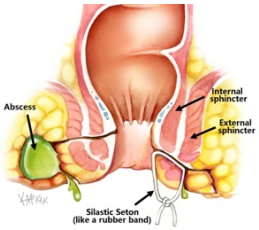
Anogenital warts (HPV)



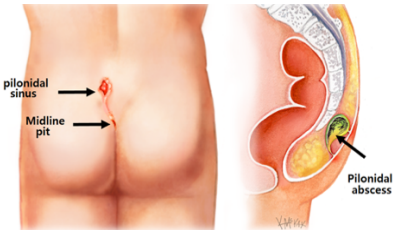
Rectal Prolapse



Anal fissure
Rx: fibre, fluid, sitz bath and GTN ointment



Anal fistula
examined under GA,
MRI- check for fistula and abscess
Rx: incision and drain + post-op ABx



Pilonidal sinus
(hair from scalp)

OTHER:

Fournier's gangrene "wet necrotising fasciitis"
→ *severe pain disproportionate to clinical signs*

Anal Fistula:
Goodsall's law
Park's law

INGUINAL HERNIA EXAMINATION

CAJ COLD for general inspect:
- Cyanosis
- Anaemia
- Jaundice
- Clubbing
- Oedema
- Lymph nodes
- dehydration

Indication	• **Obvious mass**
Consent & rationale	Explain examination and offer **chaperone [clinically trained!]** • **Put on gloves**
Inspect	• General = responsive, pallor. Cachexia, Abd distension (obstruction), vomit bowls • Lumps = Size, shape, position, scrotal extension • Observe cough impulse
Palpate	• **Scrotal contents** → *palpate anteriorly. If lump present, you should be able to get above it* a. *Palpable upper border* = **hydrocele** b. *Impalpable* = **inguinoscrotal/indirect inguinal hernia** • **Lump/inguinal area (bilateral)** → palpate lateral to medial along inguinal ligament with one hand on patient's back • **SITE** • **SIZE** • **SHAPE** • **CONSISTENCY** • **CONTOURS** • **COLOUR** • **TENDER** • **TEMP** • **TRANSILLUMINATION** • **Feel with cough impulse** → compress lump/inguinal area firmly (ask patient to turn away and cough) a. **If mass tenses + expands = positive cough impulse** • **Reducibility (indirect vs direct)** a. Locate deep inguinal ring (between ASIS + pubic tubercle) b. Press on lump beginning inferiorly → compress deep inguinal ring c. Ask patient to cough: i. Hernia is still absent = **indirect hernia** ii. Hernia reappears = **direct hernia** d. Release and watch hernia reappear i. Hernia slides down **obliquely** = **indirect** ii. Hernia projects **forward** = **direct** **If cannot reduce hernia → repeat with patient supine*
Percuss & Auscultate	Determine if bowel is present in hernia
To complete	***To complete the exam I would perform***: • Full abdominal exam

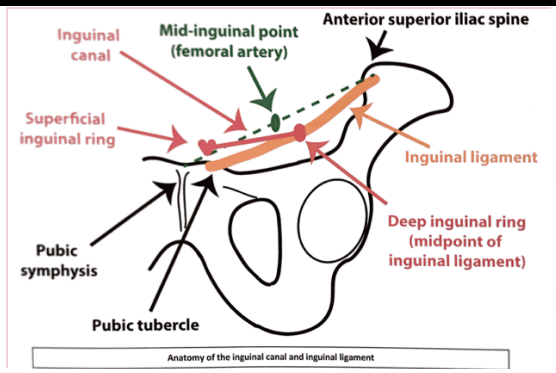
WHAT ARE HERNIAS?
- Abnormal protrusion of any organ through any fascia or muscle
- Abdominal, cerebellar, hiatal, lumbar (QL)

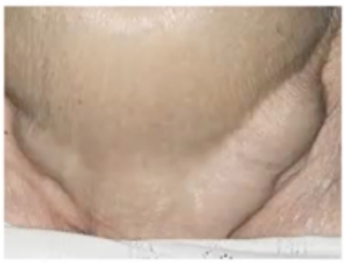
	Indirect inguinal	Direct Inguinal
Location	Between inguinal ring + scrotum	Superior to pubic tubercle
Herniated Abd contents	run within inguinal canal	Come out of abd in straight line
Exits	Deep inguinal ring	Superficial ring
Reducibility	Can be contained	Cannot contain (i.e. incarcerated)

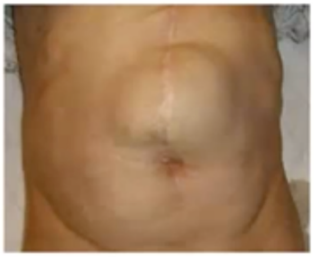
Other hernia types:
1. Inguinal hernia = medial and superior to pubic tubercle
2. Femoral hernia = **ALWAYS** lateral and inferior to pubic tubercle [***commonly mistaken for enlarged inguinal LN***]
3. Epigastric hernia = *hernia in epigastric region*
4. Incisional hernia = abd scar causes abdominal weakness
5. Umbilical hernia = after pregnancy
6. Hiatal hernia = stomach herniates diaphragm

RISK FACTORS FOR HERNIA:
1) ++ intra-abdo pressure (obese, pregnant, abscess)
2) weak fascia or muscle (XS manual labour, previous abdo surgery)

RED FLAGS:
1. Inflammation
2. Irreducible
3. Obstructed bowel lumen within hernia
4. Strangulated hernia (vascular compromise of bowel) – esp. femoral hernias



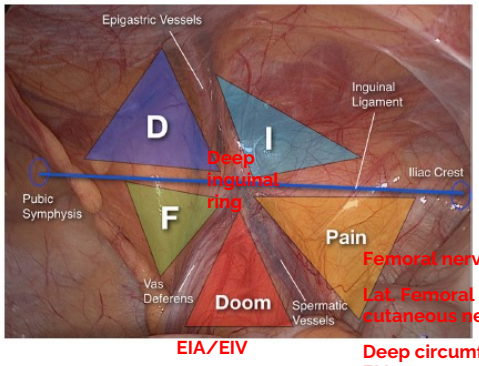

Inguinal hernia


Incisional hernia

DDx: divarication of recti
RF: Obese, male

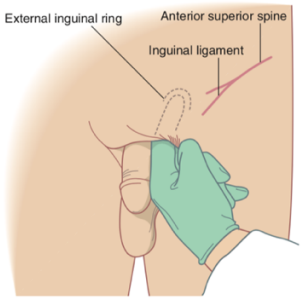
Ix: see lump when doing crunches

Rx: lose weight (not surgery)



EIA/EIV

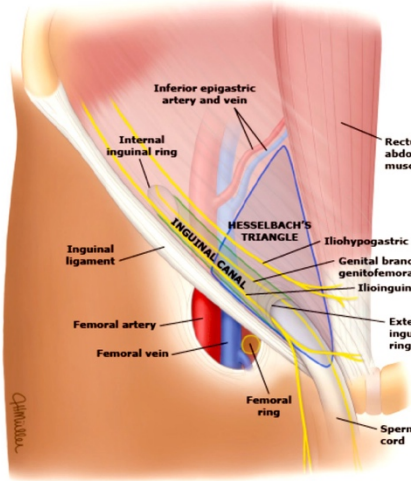
Genital branch of genitofemoral nerve



Femoral nerve

Lat. Femoral cutaneous nerve

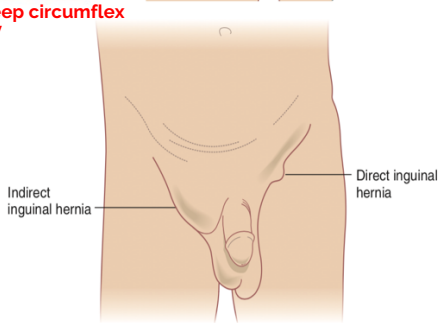
Deep circumflex BV



CONTENTS OF INGUINAL CANAL
MALE: spermatic cord,

FEMALE: round ligament

BOTH: ilioinguinal nerve and genital branch of genitofemoral nerve (from deep to superficial)



Liver Failure & Hepatobiliary Injury

Anatomy:

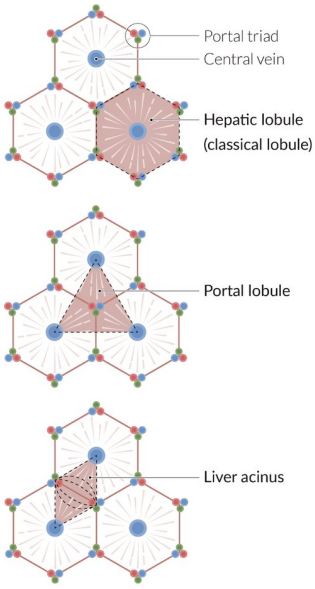
- Portal area:
  1. hepatic artery
  2. Portal vein
  3. Bile ductule
  4. lymphatics
- **Sinusoids** = interaction between blood and hepatocytes via Fenestrated endothelium
- **Hepatocytes** = secrete 500-1200mL bile (i.e. bile salt + bilirubin + cholesterol + water etc.)
  - **Bile → canaliculi → Hepatic ducts → duodenum → fat digestion**
- **Kupffer cells (macrophages)** = remove cell debris and bacteria from GIT
- **Stellate (Ito cells)** = store Vit A within space of Disse (between sinusoid and hepatocyte) → become myofibroblasts (can develop into cirrhosis)

Blood supply:

1. Hepatic artery (25%) = oxygen rich
2. Portal vein (75%) = nutrient rich
3. Hepatic veins → IVC

Hepatic zones:

- **Zone 1 (outer/peripheral)** = high O_2 ➔ GNG,
- **Zone 2 (middle/transitional)**
- **Zone 3 (inner/pericentral)** = low O_2 ➔ anaerobic tasks (e.g. detoxification, glycolysis, lipogenesis etc.) ➔ prone to hypoxia



Main functions of liver:

1. **Bile** drainage
2. **BSL** regulator – produce ketones and stores glycogen
3. Synthesise and store AA, vitamins, and fats
4. **Blood circulation & filtration**
5. **Immunologic → acute phase proteins (CRP) & Detoxification**
6. Clotting factor production
7. Albumin production

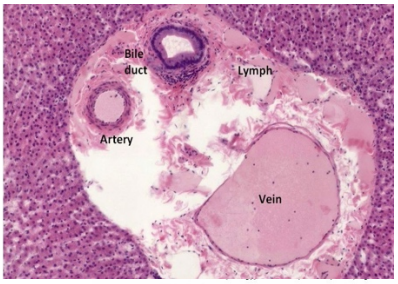
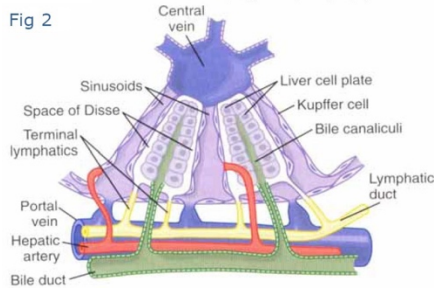
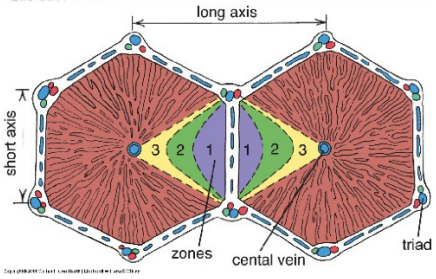


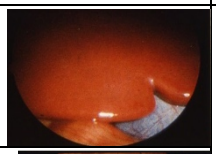
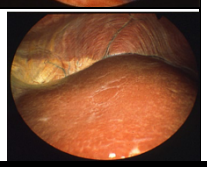
Fig 2

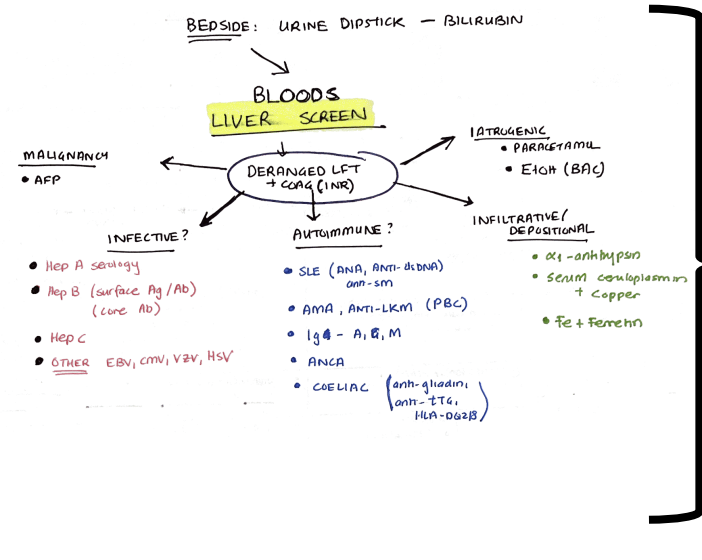


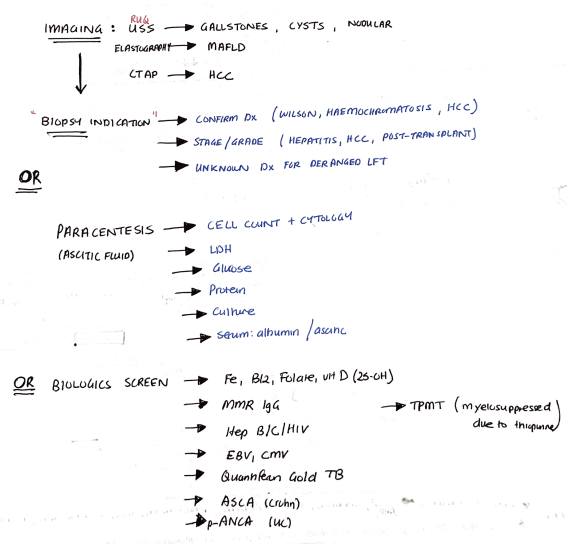


*Zone 1 = closest to artery = high O_2

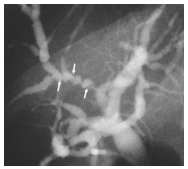
INTERPRETATION OF LIVER FUNCTION TESTS

	AST	ALT	ALP	GGT	Cause	Rx
Paracetamol Toxicity	++++	++++	+	+	• **XS acetaminophen saturates conjugation pathway by glutathione→ ↑↑ reactive NAPQI** • NAPQI = *Irreversibly* binds to cysteine groups on hepatic macromolecules → oxidative hepatocyte injury • Affect **Centrilobular region (Zone III)** ➔ near central vein • **DDX: statin, glue sniffing, phenytoin, cocaine, carbamazepine**	• IV N-Ac within 4hrs (will also Rx baby if pregnant) • **Check for reaction (flush + wheeze)** • **Cyclizine for nausea** *(no harm to baby)*
Liver shock or ischaemic hepatitis	+++++	+++++	+	+	• Check Coags • Rx cause (Portal vein or hepatic artery thrombosis)	• *HIGHLY vascular liver vulnerable to shock*
Acute hepatitis	+++++	+++++	+	+	• **Viral** (Hep A/B/E) *also CMV, EBV, HSV* • **Drugs** (paracetamol) • **Fulminant Wilson's** → children, teens • **AIH** → females • DDx: biliary obstruction? Cholangitis? 	• *ICU admission* • *Invasive vital monitoring* • *Organ replacement therapy* • *Liver transplants* ***Check **Factor V/VII** (which affects PT/INR) if fulminant hepatitis → prognostic indicator (determine suitability for liver transplant)*
Chronic hepatitis	+++++	+++++	+	+	• **HBV, HCV, HDV**→ 96% hepatitis death due to sequelae • **Alcoholism** → exacerbated by con-current HBV, HCV infection • **Liver fibrosis** 	





RARE HEPATIC PATHOLOGIES

	Autoimmune hepatitis	HAEMOCHROMATOSIS	WILSON'S DISEASE	ALPHA 1 ANTITRYPSIN DEF.	PRIMARY BILIARY CIRRHOSIS	PRIMARY SCLEROSING CHOLANGITIS
Def	Rare cause of chronic hepatitis	• HFE gene mutation (Chr 6) • Autosomal recessive	• XS copper accumulation due to mutated ATP7B copper-binding protein • Autosomal recessive	Mutated gene for protease inhibitor (a1-antitrypsin) → prevents inhibition of neutrophil elastase ➢ Autosomal recessive (A1AT gene Chr 14)	Autoimmune attack on small bile ducts (1st = intralobular ducts – canals of hering) **RISK FACTORS:** ➢ Middle aged women ➢ Autoimmune hx (e.g. thyroid, coeliac) ➢ Rheumatoid hx (e.g. SSc, Sjogren, RA)	➢ **Stricture** and **fibrotic** intrahepatic and extrahepatic ducts ➢ **Sclerosis** = stiffened and hardened bile ducts **RISK FACTORS:** ➢ Male aged 30-40s ➢ Ulcerative colitis (70%) ➢ FHx
Sx	• **Type 1 (adults)** = women 40-50s (menopausal) • **Type 2 (children)** – teenagers (acute hepatitis w/ high ALT/AST and jaundice)	• Fatigue • Arthralgia • Bronze diabetes • Hair loss • ED • Amenorrhoea • Cognitive (memory and mood swings)	**Neuro problem (50%)** ➢ Dysarthria ➢ Dystonia ➢ Basal ganglia (Parkinson's) – asymmetrical motor sx **Hepatic problem (40%)** ➢ Chronic hepatitis → cirrhosis **Psych Problem (10%)** ➢ Depression → full psychosis **Other**: ➢ Kayser-Fleischer rings ➢ Haemolytic anaemia ➢ Renal tubular acidosis ➢ Osteopenia	**Lung issues:** ➢ SOB ➢ Reduced exercise tolerance **Hepatic issues:** ➢ Fatigue ➢ jaundice	• Fatigue • Pruritus • GI disturbance + abdo pain • Jaundice • Pale stools • Xanthoma & xanthelasma • Cirrhosis signs (ascites, +SM, spider naevi)	• Jaundice • Chronic RUQ pain • Pruritus • Fatigue • + HM 
Comp.	• Cirrhosis • Death Assoc. ➢ Arthritis ➢ Hashimoto's	• **T1DM** (pancreatitis) • **Liver cirrhosis** • **Pituitary & gonad infiltration** (hypogonad, impotence, amenorrhea, infertility) • **Cardiomyopathy** • **HCC** • **Hypothyroidism** • **Pseudogout** & Chondrocalcinosis		**2 main complications:** 1. Bronchiectasis and emphysema (>30yo) 2. Liver cirrhosis (after 50yo) leading to HCC	Inflamed bile ducts causes obstruction of bile outflow = cholestasis 1. Fibrosis 2. Advanced liver Cirrhosis 3. Portal HTN and liver failure o Symptomatic pruritus o Steatorrhea (greasy stools) o Hypothyroidism o OP o HCC	Chronic bile obstruction leads to: 1. Fibrosis 2. Advanced liver Cirrhosis 3. Portal HTN and liver failure ***SPECIFIC*** ➢ Acute bacterial cholangitis ➢ Cholangiosarcoma ➢ CRC ➢ Biliary stricture ➢ Fat soluble vit. Def (A,D,E,K)
Ix	➢ **Deranged LFT** ➢ **Elevated IgG** **Type 1 Autoantibodies**: (**ADULTS**) • ANA • Anti-SM • Anti-SLA/LP **Type 2 Autoantibodies: (CHILDREN)** ➢ anti-LKM1 ➢ anti-LC1 **liver Biopsy** to confirm Dx	• **Fe studies** (raised serum ferritin & transferrin) • **Liver biopsy** – Perl's stain → Fe concentrated in parenchymal cells • **Genetic testing (H63D, c282y)** • **CTAP** • **MRI** – Fe deposition on liver	• **REDUCED** Serum ceruloplasmin (not specific) • **REDUCED serum Cu** • **RAISED** 24 hr urinary Cu assay • **Liver biopsy (gold standard)** 	• **REDUCED** serum alpha-1 antitrypsin • **Liver biopsy (gold standard) – acid-Schiff +ve staining globules** • Genetic testing (A1AT gene) • **HRCT thorax** → diagnose bronchiectasis and emphysema	**Bloods**: ➢ Raised ESR ➢ Raised IgM **Deranged LFT:** ➢ Raised ALP (1st) ➢ ALT/AST raised later ➢ (AST:ALT >1 = CIRRHOSIS) **Autoantibodies**: ➢ AMA (most specific to PBC) ➢ ANA (present in 35% of patients)	**Deranged LFT:** ➢ Cholestatic picture ➢ Elevated ALT/AST if progression to cirrhosis **Autoantibodies (not useful)** ➢ P-ANCA (94%) ➢ ANA (77%of patients) ➢ Anti-cardiolipin (63%) **MRCP (gold standard)** ➢ MRI of liver, bile duct and pancrease → lesions/strictures ➢ **Beaded pattern stricture**
AST	++++ (2x ALT)	NOT HELPFUL	++++ (2x ALT)	NOT HELPFUL	+	NOT HELPFUL
ALT	++	NOT HELPFUL	++	NOT HELPFUL	+	NOT HELPFUL
ALP	NOT HELPFUL	NOT HELPFUL	NOT HELPFUL	NOT HELPFUL	++++	++++
GGT	NOT HELPFUL	NOT HELPFUL	NOT HELPFUL	NOT HELPFUL	++++	++++
Mx	1. High dose steroids (pred) 2. Azathioprine (life-long) 3. Liver transplant (may recur)	1. Venesection (weekly) 2. Monitor serum ferritin 3. Avoid alcohol 4. Genetic counsel (family) 5. Rx complications	Cu chelation using: 1. Penicillamine 2. Trientene	➢ Stop smoking ➢ Symptomatic Mx ➢ Lung and liver transplant ➢ Monitor for complications (e.g. HCC)	1. **Ursodeoxycholic acid** (reduced intestinal absorption of cholesterol) 2. **Cholestyramine** (binds to bile acids to prevent gut absorption – improve pruritus) 3. **Immunosuppression** (steroids) 4. **Liver transplant** (end-stage)	➢ **ERCP** – dilate + stent strictures (XR guided + contrasts used) ➢ **Cholestyramine** (binds to bile acids to prevent gut absorption – improve pruritus) ➢ **Monitor comp.** (cholangiosacroma, oesophageal varices) ➢ **Liver transplant (curative intent – 80% 5-year survival)**

COMMON LIVER DISEASE – NAFLD, ALCOHOLIC, CIRRHOSIS

Risk factors

MAFLD / NAFLD

- 30% of adults
- Part of metabolic syndrome

Risk factors

- Obese – poor diet low PA
- MetSyn (HTN, HC, T2DM)
- Smoker
- Middle-aged

ALCOHOLIC LIVER DISEASE

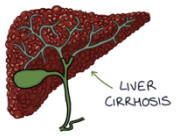
- Long-term EtOH consumption
- Genetic predisposition
- **80% alcohol** → metabolised by Alcohol dehydrogenase into **Acetaldehyde → forms adducts with proteins in hepatocytes → activate immune response = cell injury**
- **20% alcohol** → metabolised by Cytochrome CYP2E1 into acetate **releases ROS** → *lipid peroxidation and mitochondrial damage*
- **increased gut permeability** → **Endotoxin released** → inflammatory cytokines → accelerated damage

LIVER CIRRHOSIS

- Chronic inflammation and damage to liver cells
- Damaged cells replaced by scar tissue (fibrosis) and nodules

Common causes:

- Alcoholic liver disease
- NAFLD
- Hep B/C



Comp.

Step wise progression:

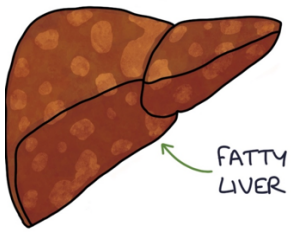
- **Non-alcoholic fatty liver disease**
- **Non-alcoholic steatohepatitis (NASH)**
- **Fibrosis**
- **Cirrhosis**

Increased risk of:

1) heart disease`

2) stroke

3) diabetes mellitus



Step wise progression:

1. **EtOH -related fatty liver** (reversible within 2 weeks of stopping alcohol)
2. **Alcoholic hepatitis** (reversible with permanent abstinence)
3. **Cirrhosis** (shrunken liver w/ scar tissue – irreversible

SPECIFIC COMPLICATIONS

- **B1 deficiency = Wernicke-Korsakoff syndrome**
  1. EtOH prevents absorption of B1
  2. ***Wernicke enceph (high mortality rate)*** = confusion, oculomotor distriubance, ataxia
  3. ***Korsakoff syndrome (irreversibel)*** = retrograde and anterograde amnesia, confabulation, behaviour change
- **Alcohol withdrawal**
  1. 6-12 hrs = tremor, sweat, craving
  2. 12-24 hrs = hallucinations
  3. 24-48 hrs = seizures
  4. 24-72 hrs = **delirium tremens (Emergency**!!) → downregulation of GABA system by chronic EtOH consumption causes upregulated glutamate → acute confusion, agitation, delusions, tremor, tachycardia, HTN, hyperthermia, ataxia, arrythmias
- **Other complications:**
  1. **Pancreatitis**
  2. **Alcoholic cardiomyopathy**
  3. **Alcohol dependence**

Fibrotic liver increase resistance in hepatic vessels causes:

- **Portal HTN → variceal bleeding, ascites → SBP**
- **Liver dysfn (**malnutrition + encephalopathy**)**
- **Hepato-renal syndrome**
- **HCC**

Child-Pugh score [AA-BEC] – severity of cirrhosis

Factors: *Ascites, encephalopathy, bilirubin, albumin, coagulopathy*

Points	1	2	3
Encephalopathy	None	Mild	Mod-severe
Ascites	Absent	Controlled	Refractory
Total bilirubin	<34 (<2)	34-50 (2-3)	>50 (>3)
Albumin (g/dL)	>3.5	2.8-3.5	<2.8
PT time (sec)	<4 or <1.7	4-6 or 1.7-2.3	>6 or >2.3
	A	B	C
Score	5-6	7-9	10-15
(1-5yr survival)	95%	75%	50%

MELD score [BIC-Na] – use very 6/12 for comp. cirrhosis

Factors: *Bilirubin, INR, creatinine, Na + need for dialysis*

MELD Score = 10 x ((0.957 x ln(Creatinine)) + (0.378 x ln(Bilirubin)) + (1.12 x ln(INR))) + 6.43

- **Assess severity of CLD (3/12 mortality %) to determine need for liver transplant**
  - >25 (gravely ill)
  - 24 to 19 = difficult transplant
  - 18 to 11 = candidate
  - < 10 (less ill)

Sx

Asymptomatic

- ***Jaundice*** = *raised bilirubin*
- ***+HM*** = *(but may shrink if more cirrhotic)*
- ***+SM*** = *due to portal HTN → hypersplenism (↓plt)*
- ***Spider naevi*** – *telangiectasia w/ central arteriole and small vessels radiating away*
- ***Palmar erythema*** = *hyperdynamic circulation (↑E2)*
- ***Bruising*** = *abnormal clotting*
- ***Gynecomastia and testicular atrophy in*** *males = endocrine dysfunction*
- ***Ascites*** = *portal HTN*
- ***Caput medusae*** = *distended periumbilical veins due to portal HTN*
- ***Asterixis "flapping tremor"*** – *decomp. Liver disease*

Ix

- ***LFT*** = ***+ ALT/AST***
- ***COAGS*** = *raised PT/INR time*
- ***Hep B/C serology***
- ***Autoantibodies*** – *ANA, SMA, AMA, LKM-1 (autoimmune hepatitis, PBC, PSC)*
- ***Immunoglobulins*** *(autoimmune hepatitis, PBC)*
- ***Caeruloplasmin*** *(Wilson's)*
- ***A1-antitrypsin levels***
- ***Fe studies*** *(hereditary heam)*
- ***Liver USS /*** = *increased echogenicity to confirm fatty liver*
- ***NAFLD fibrosis score (***algorithm that uses age, BMI, LFTs to rule out fibrosis**)**
- ***Fibroscan (****indication of fibrosis****)***

- ***FBC*** = *raised MCV*
- ***EUC*** = *deranged (hepatorenal syndrome)*
- ***LFT*** = ***+ ALT/AST, +++GGT***
  - AST:ALT ratio > 2
- ***COAGS*** = *raised PT/INR time*
- ***Liver USS / fibroscan*** = *increased echogenicity*
- ***Endoscopy*** = *assess and treat oesophageal varices*
- ***CT/MRI*** = *fatty infiltration of liver, HCC, +HSM, ascites, abnormal BV changes*
- ***Liver biopsy***- *is it alcoholic hepatitis or cirrhosis*

- ***EUC*** = *hypoNa (fluid retention due to severe liver disease)*
- ***LFT*** = *often normal (until decompensated cirrhosis)*
- ***AFP*** = *MARKER FOR HCC*
- ***Liver USS - nodular liver surface +***
  - "corkscrew" arteries w/ increased blood flow to compensate for ↓flow
  - enlarged portal vein
  - ascites
  - splenomegaly
- ***Liver fibroscan (elasticity of liver)***
- ***Endoscopy*** = *assess and treat oesophageal varices*
- ***CT/MRI*** = *fatty infiltration of liver, HCC, +HSM, ascites,*
- ***Liver biopsy***- *is it alcoholic hepatitis or cirrhosis*

ALT/AST	**Mildly elevated**	**AST:ALT ratio > 2**	
ALP/GGT	**NOT HELPFUL**	**NOT HELPFUL**	**NOT HELPFUL**

Mx

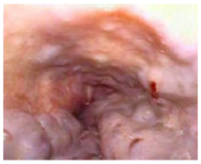
- Weight loss
- Exercise
- Stop smoking
- Stop alcohol consumption
- T2DM, HC, HTN control

- Stop EtOH immediately and permanently
- Detoxication regime
- **Nutritional support** (B1 supp) + high protein diet
- **Manage withdrawal Sx (delirium tremens)**
  - Benzo = Chlordiazepoxide "librium" PO every 1-4 hrs for 5-7 days
  - IV high-dose B vitamins (pabrinex)
  - Oral thiamine

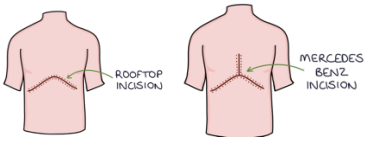
General Management

- **High protein, low sodium diet**
- **MELD score** every 6 months
- **Liver USS and AFP levels** every 6 months for hepatocellular carcinoma
- **Endoscopy every 3 years** in patients without known varices
- **Consideration of a liver transplant**
- Managing complications as below

MANAGEMENT OF CIRRHOSIS / CHRONIC LIVER DISEASE

Complication	Description	Management
Malnutrition + muscle wasting	Liver dysfn = affects protein metabolism and stop glucose storage	• **Low Salt diet (<2 g)** • **High protein diet** → regular meals • **Avoid alcohol**
Ascites	• Fluid accumulation in peritoneal cavity ← hypoalbuminemia + portal HTN • Fluid wave sound **SAAG > 1.1** — Type: Portal HTN (transudate) — Causes: CCF, Cirrhosis, hepatitis budd-chiari, HCC, liver mets, **SAAG <1.1** — Type: Exudate — Causes: SBP, TB, peritonitis, SBO, nephrotic syndrome, pancreas- biliary issue, ovarian cancer	• **Low Salt diet (<2 g)** • **Diuretics** (spironolactone – K+ sparing → block RAAS) • **Paracentesis (ascitic tap)** • **Prophylactic Abx** (quinolones) protect against SBP if < 15g/L of protein in ascitic fluid • **TIPS or transplant** in *refractory ascities*
Spontaneous Bacterial Peritonitis (SBP) = infection	• **Infected ascitic fluid** (only in cirrhosis) usu. **E.coli cause (also Klebsiella, staph, enterococcus)** • Abd pain & distension • **Fever (specific sx)** • Confusion • Ileus • HypoTN • Deranged bloods (raised WBC, CRP, creatinine, met. Acidosis)	1. Paracentesis → Ascitic tap: a. **elevated PMN > 250** b. **SAAG < 1.1 (exudate) = NOT portal HTN** c. +ve bacteria culture 2. IV empirical Abx (cefotaxime) or oral quinolones
Variceal Haemorrhage	• **Rule out first → check Hb (FBC) and urea** o ↓ Hb and ↑Urea • **Portal HTN → swollen tortuous vessels (varices)** o Can bleed out very quickly due to high blood flow through varices • **Occurs at:** o Gastro-oesophageal junction o Ileocecal junction o Rectum o Anterior abdominal wall via umbilical vein (caput medusae) 	***Acute (bleeding varices)*** 1. Resus 2. IV prophylactic empirical Abx (cephalosporin 3. urgent upper GI endoscopy – inject sclerosant or band ligation 4. Sengstaken-Blakemore tube (tamponade bleeding varices) if endoscopy fails ***Stable varices → Prevention***: • Surveillance (upper GI endoscopy -2 years) • **Non-selective BB (propranolol)** →reduce variceal bleeding risk • **Elastic band ligation of varices** • **TIPS –** connect hepatic vein with portal vein to reduce pressure through portal system
Hepatic / portosystemic ***Encephalopathy***	**Triggers:** ➢ Constipation ➢ Electrolyte disturbance ➢ Infection (SBP) ➢ GIB ➢ High protein diet ➢ Medications (sedative meds) **Reversible neuropsychiatric disturbances:** • Acute = NO fever, confusion • Chronic = asterixis, personality change, Sleep wake inversion	• **High dose Laxatives (oral lactulose)** o promote excretion of ammonia o 2-3x soft motions a day • **Abx (rifaximin)** → reduce number of intestinal bacteria producing anaemia • **Nutritional support** → NGT feeding • **Identify + Rx cause** ➔ infection, sedative, variceal haem
Hepatocellular Carcinoma (HCC)	**Higher risk in cirrhosis** • chronic Hep B/C infection [oncogenic virus]	Rx: Hep B/C to reduce risk of malignancy • **Every 6/12: Liver USS, check AFP levels**
Hepatorenal Syndrome	**Liver cirrhosis → portal HTN → reduced blood vol. through kidneys** Activation of RAAS → renal vasoconstriction → worsens renal perfusion	➢ Fatal within a week ➢ Liver transplant

LIVER CANCER AND LIVER TRANSPLANTS

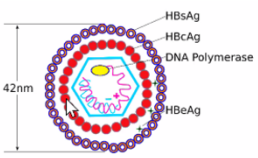
	LIVER CANCER (2 types)	LIVER TRANSPLANT
TYPES	**Benign** ➢ **Haemangiomas (incidental finding – no Rx needed)** ➢ **Focal nodular hyperplasia (fibrotic tissue) –** more common in women and those on OCP (estrogen related - **no Rx needed**) **Malignant** ➢ **Primary = HCC (80%) OR cholangiocarcinoma (20%)** ➢ **Secondary (from breast, skin, bowel or unknown primary)**	**Indications:** 1. **Acute liver failure (immediate transplant) →** acute viral hepatitis or paracetamol OD 2. **Chronic liver failure -** may need to wait for 5/12 **Factors affecting unsuitability** ➢ Significant co-morbidities (CKD, HD) ➢ XS weight loss + malnutrition ➢ Acute hep B/C ➢ End-stage HIV ➢ Active alcohol use (need 6/12 abstienence)
Risk factors	• Viral HEPATITIS (B/C) • Alcohol • NAFLD • CHRONIC LIVER DISEASE	
Sx	*Asymptomatic +/-* ➢ ***NON-specific sx (****UWL, abdo pain, anorexia, N/V, >* ➢ ***Specific*** *sx: jaundice and pruritus)*	**Surgery:** ➢ Living Donor Transplant – Split Donation ➢ "Rooftop" or "Mercedes Benz" incision 
Ix	➢ ***AFP (HCC)*** ➢ *CA 19.9 (cholangiocarcinoma)* ➢ *Liver USS (identify tumour)* ➢ *CT + MRI (stage and diagnose cancer)* ➢ *ERCP (biopsy to diagnose cholangiocarcinoma)*	
Mx	**HCC & Cholangiocarcinoma** ➢ Both have Poor prognosis (unless diagnosed early) ➢ Both unresponsive to chemo and RT ➢ Resection cw. Curative intent **SPECIFIC Rx:** ➢ HCC → TKI (e.g. soarfenib, lenvatinib) → extend life by motnhs ➢ Cholangiocarcinoma → ERCP – stent insertion in bile duct to drain bile	**Post-transplantation care:** ➢ **Life-long immunosuppression (**e.g. steroids, azathioprine, tacrolimus) ➢ **Avoid alcohol, smoking** ➢ **Treat opportunistic infection** ➢ **Monitor disease recurrence (**E.g. hepatitis, PBC**)** ➢ **Monitor cancer recurrence (**higher risk in immunosuppressed patients**)**

Viral Hepatitis

➢ PRACTICE POINT = EBV produces same results +splenomegaly

	HAV (Picorn)	HBV (hepada-)	HCV (flavivirus)	HDV (delta)	HEV (hepe-)
Type	ssRNA	dsDNA (*immune mediated killing of infected cells*)	RNA (*viral pol. = no proof reading = higher mutations*)	RNA low dose	RNA (unenveloped)
Epi	Poverty areas *Most common acute viral hepatitis in children*	***Most common liver infection*** *(esp. Western Pacific/Africa & ATSI)*	*Good prognosis = young and females* *Bad prognosis = male, HIV, older, EtOH usage* *¾ of patients are asymptomatic*	Co-infect (acute HB/HDV) = 90% recovery Superinfect Chronic hep B + acute hep D → 90% chronic	*Most common acute hep in Asia, ME, North Africa* ***Aus****: from pigs (undercooked)*
Tx	Faecal/oral (*frozen berries, seawater*) Person-to person	**Vertical/Perinatal (mother-child)** **Horizontal (***infants, contacts***)** **Bloodborne** **Sex** (semen)	**Perinatal (***mother-child***) Bloodborne (***IVDU, needlestick injury***)** **Sex** (*semen*)	**Bloodborne**	**Oral/faecal** Water/food
Acute infection	Case fatality increases with age IgM positive	Mortality increases w/ age **95% (adults)** *Asympt* *Acute viral Hep* *ALF*	Uncommon - *slowly progressive hepatitis*	fulminant disease (10x more common)	High mortality = fulminant in **pregnant women (esp. after recent monsoon)** IgM positive
Chronic infection	No	**90% (children)** *Chronically infected → chronic Hep B → compensated cirrhosis → decompensated cirrhosis*	75% → **precursor to HCC, oesophageal ca. & mixed cryoglobulinemia, porphyria cutanea tarda (***rash on sun-exposed area*	Worsen hepatitis B ➔ fulminant cirrhosis, death >> mono- HBV infection	Very rare (but possible)
Comp.*	Cholestasis	HCC – Leading cause (50%) Polyarteritis Nodosa (PAN)	HCC, cirrhosis Sicca Cryoglobulinemia (palpable purpura) GN Thyroiditis		No
Serology	IgM = acute ➔ RNA PCR IgG = chronic (protected)	**PCR TESTING - VIRAL DNA** **HBcAB (igM) = acute** **HBcAB (igG) = previous infect** Anti-HbsAg = vaccinate/protect	**PCR TESTING - VIRAL RNA** **(seroconvert within 1st month)**	Anti-HDV IgM/IgG (past/current infection	Elevated ALT Anti-IgM for HepE Viral Load Test
Vaccine	Yes	Yes (Essential to prevent chronic HBV infection esp. after childhood infection)	No	HBV vaccine	No
Rx for acute	None (usu. self limiting within 3/12) analgesia	(**supportive care** – recover within 2/12) ***Hep B Ig →*** *PEP for hep B pts wiithout 3-dose vaccination or did not properly respond to it*	**Available** (pegIFN-alfa & ribavirin) NOT protected from re-infection	New agents ?	None (lifelong immunity)
Rx for chronic		***Rx*** • **Lifetime** *Nucleoside/Nucleotide Analogues (e.g. Entecavir)* • **Goals**: ↓↓ HBV DNA load + normalise ALT • Cure if HBsAg <5% of patients **If pregnant + HBV positive:** ➢ Low load = vaccinate baby ➢ High load = tenofivir + hep B Ig for baby	*For chronic Hepatitis C* • **Direct Acting Antivirals (DAAs) e.g.** sofosbuvir and ledipasvir (CI if cirrhotic) **Elbasivir (**newer more effective but more expensive) **Cure** = sustained virologic response • **Goals**: undetectable HCV load ≥ 12 weeks after completion of therapy		
Public health	Must notify	Must notify	Must notify	Must notify	Must notify

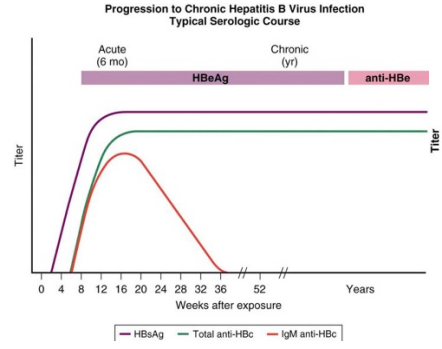
HEP B SEROLOGY

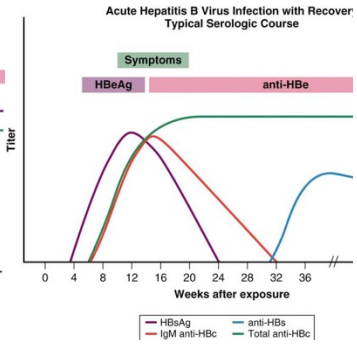


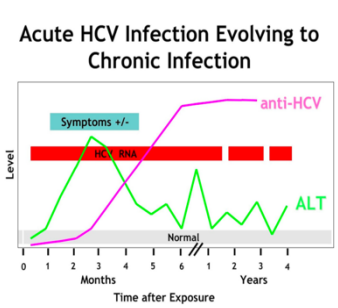
HBsAg or HBV DNA	HBcAb (IgM)	HBcAb (IgG)	HbeAg	HbsAb	Interpretation
					Susceptible to HBV infection
					Acute
					Early acute
			+/-		Chronic
					Resolved acute
					Vaccinated

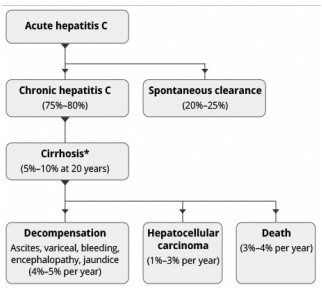
HEP C SEROLOGY

	HCV RNA	IgM anti-HCV	IgG Anti-HCV
Acute	+	+	+
Chronic	+	-	+
Cleared	-	-	+

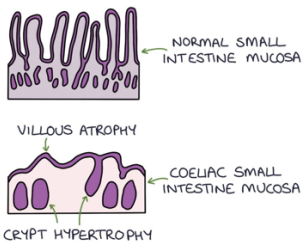








COMMON GI ISSUES – GORD, PUD, UGIB and coeliac disease

	GORD	PEPTIC/DUODENAL ULCERS	COELIAC DISEASE	IRRITABLE BOWEL SYNDROME
Def	• Stomach acid refluxes through LES and irritates oesophageal lining	• Ulcerated mucosa of stomach or duodenum • Duodenal ulcers more common (1) **Breakdown protective mucosa:** ➢ Chronic NSAID/steroids ➢ H. pylori **(2) Increase Acid secretion** : ➢ Stress ➢ Spicy food ➢ Smoking + EtOH ➢ Caffiene	➢ Autoimmune reaction to ingestion of gluten ➢ Inflamed small bowel ➢ Begins at any age Assoc. autoimmune conditions: ➢ T1DM ➢ Pernicious anemia ➢ Thyroid disease ➢ PBC, PSC ➢ Autoimmune hepatitis	• Functional bowel disorder • Diagnosis of exclusion • 20% of population • Women > men • Young adults
Comp.	**Barrett's oesophagus** (metaplasia from squamous to columnar) -→ premalignant to develop AC of oesophagus 1. Low grade dysplasia 2. High grade dysplasia 3. Adenocarcinoma	➢ **Bleeding** ➢ **Perforation** → acute abdomen and peritonitis ➢ **Scaring and strictures of muscle and mucosa** → pyloric stenosis	• Vitamin def • Anaemia • OP • Ulcerative jejunitis • Enteropathy-associated T cell lymphoma • NHL	
Sx	*Dyspepsia = indigestion seen as:* ➢ *Heartburn, acid brash* ➢ *Epigastric pain* ➢ *Bloating* ➢ *Nocturnal cough* ➢ *Hoarse voice*	***Eating***: ➢ ***Worsens*** *gastric ulcer pain* ➢ ***Improves*** *duodenal ulcer pain* ***Common Sx*** ➢ *Epigastric discomfort* ➢ *n/v* ➢ *dyspepsia* ➢ *Haematemesis / coffee brown vomitus + melaena* ➢ *Fe def anaemia*	➢ ***FTT*** ➢ ***Diarrhoea*** ➢ ***Abdo bloating*** ➢ ***UWL*** ➢ ***Mouth ulcers*** ➢ ***Anaemia*** *(secondary to Fe, B12, folate)* ➢ ***Dermatitis herpetiformis*** *(itchy blistering skin rash on abdomen)*	**Rome IV criteria:** **Abdominal pain / discomfort**: • Relieved on opening bowels, **or** • change in bowel habit **AND 2 of:** • Abnormal stool passage • Bloating • Worse symptoms after eating • PR mucus
Ix	***H. Pylori -*** *Gram -ve aerobic* ➢ *Urease enzyme converts urea into ammonia damaging epithelium* ➢ ***Urease breath test*** ➢ ***Stool antigen test*** ➢ ***Endoscopy + Rapid urease test + biopsy*** ***Endoscopy indications*** ➢ *Peptic ulcers* ➢ *Malignancy (gastric, oesophageal)* ➢ *UGIB (Malaena or coffee brown vomitus)*	***Endoscopy (gold standard)*** ➢ ***Endoscopy + Rapid urease test + biopsy*** ➢	***Genetic testing*** ➢ *HLA-DQ2 gene (90%)* ➢ *HLA-DQ8* ***Autoantibodies*** ➢ **Raised** anti-TTG – IgA antibodies ➢ **Raised** Endomysial antibodies (EMAs) – IgA antibodies ➢ **Raised** Deaminated gliadin peptides antibodies (anti-DGPs) *Nb: patients with IgA deficiency → need to check total IgA levels to confirmt this then check IgG version of anti-TTG or endoscopy* ***Duodenal biopsy***: ➢ *Crypt hypertrophy* ➢ *Villous atrophy*	➢ Normal FBC, ESR and CRP blood tests ➢ ***Faecal calprotectin*** negative to exclude IBD ➢ Negative coeliac disease serology (***anti-TTG antibodies***) ➢ Cancer is not suspected or excluded if suspected
Mx	**LIEFSTYLE** • Weight loss • Reduce tea, coffee and alcohol • Stop smoking • Stop alcohol • Avoid heavy meals before bed time • Stay upright after meals **Medications**: ➢ Gaviscon (acid neutraliser) ➢ PPI ➢ Ranitidine (H2 antagnoist) ➢ **H. Pylori** ➔ Triple therapy (PPI + amoxil + clarithromycin) for 7 days PO od → test of cure w/ urease breath test (stop PPI 4 wks before) **Surgery** ➢ Laparoscopic fundoplication ➢ Laser or cryotherpay to destroy epithelium in Barrett's oesophagus	**LIEFSTYLE** • Weight loss • Reduce tea, coffee and alcohol • Stop smoking • Stop alcohol • Avoid heavy meals before bed time • Stay upright after meals **Medications**: ➢ Gaviscon (acid neutraliser) ➢ PPI ➢ Ranitidine (H2 antagnoist) ➢ **H. Pylori** ➔ Triple therapy **Acute abdomen signs:** ➢ DR ABCD ➢ Urgent laparoscopic repair	**LIEFSTYLE** ➢ **Lifelong gluten free diet** ➢ Monitor disease by checking coeliac antibodies *Rare neurological symptoms* • Peripheral neuropathy • Cerebellar ataxia • Epilepsy 	**LIEFSTYLE** ➢ **Adequate fluid intake** ➢ **Regular small meals** ➢ **Reduced processed foods** ➢ **Limit caffeine** and alcohol ➢ **Low "FODMAP"** diet (ideally with dietician guidance) ➢ **Trial of probiotic supplements** for 4 weeks **1ST LINE MEDS**: ➢ Loperamide for diarrhoea ➢ Laxatives for constipation. Avoid lactulose as it can cause bloating. Linaclotide is a specialist laxative for patients with IBS not responding to first-line laxatives ➢ Antispasmodics for cramps e.g. hyoscine butylbromide (Buscopan) **2ND Line Medication**: Tricyclic antidepressants (i.e. amitriptyline 5-10mg at night) **3RD Line Medication**: SSRIs antidepressants **Cognitive Behavioural Therapy (CBT)** ➔ help patients psychologically manage the condition and reduce distress associated with symptoms.

GOR: GIT MEDICATIONS:

	Antacids (e.g. *Mylanta And Gaviscon*)	H_2 receptor antagonist (*Ranitidine (Zantac)*)	Proton Pump Inhibitors (PPI) E.g.: *Omeprazole (Losec), Esomeprazole (Nexium) & Pantoprazole (Somac)*	
Mechanism of action	• *Base + acid = salt + water* • Weak bases react with gastric acid to neutralise it → increase pH	**Competitively** block H_2 receptors on parietal cells → reducing gastric acid secretion	• **Irreversibly inactivate** the H^+/K^+ ATPase enzyme system • Supressing both stimulated and basal acid secretion.	
Indications For Use	• **Dyspepsia** • **PUD** • **GORD**	• **Dyspepsia** • **PUD** • **GORD** • Stress-ulcer prophylaxis	• **Dyspepsia** • **Peptic ulcer disease (PUD)** • **GORD**	• Zollinger-Ellison syndrome • H. Pylori eradication • Scleroderma oesophagus • Alongside NSAIDs
Adverse effects	• Diarrhoea (Mg) • Constipation (Al and Ca) • Belching + flatulence (Ca CO_3) • Alkalosis (HCO_3^-)	well tolerated. No common AE	Well tolerated BUT common AE are: • Headache, Nausea, vomiting, rashes • Diarrhoea, constipation, flatulence • Risk of C. difficile infection,, B12 def, OP fractures and pneumonia	

H. pylori-related ulcers

CAUSE: Drugs inhibiting/neutralising gastric acid secretion

- Triple therapy regimen (First-line): PPI + ≥2 anti-bacterials
- improves eradication rates + reduces subsequent acquired resistance associated with partial treatment)

NSAIDs related ulcers → do not use for *H. pylori*

CAUSE: Adverse effect of long-term use of NSAIDs

- In the stomach, COX-1 produce prostaglandins (PGE_2 and PGI_2) → stimulate mucus and bicarbonate secretion to cause vasodilation
- Non-selective NSAIDs *inhibit* COX-1 enzymes →frequent upper GI side-effects (e.g. bleeding and ulceration
- **SOLUTION (if possible)**: stop NSAIDs.
- If not: medication can be used to mitigate adverse effects

DIARRHOEA: GIT MEDICATIONS:

*#1: PRIORITY – **MAINTAIN HYDRATION*** → *1ST LINE = ORAL REHYDRATION*

*#2 : Treat **reversible cause***

- **1st line** = atropine (pre-med esp. for pro-cholinergics such as irinotecan)
- Immune-mediated colitis → infliximab then tapering prednisone
- Surgical resection → cholestyramine
- Carcinoid syndrome → octreotide
- Steatorrhea / fat malabsorption → Creon + PPI
- Abx usage → stool M/C/S (C. difficile) → metro or vanco
- Faecal impaction → laxatives

For uncontrolled (late) diarrhoea:

1. **Loperamide** (2mg after each stool) → opioid agonst → slow Gi motility
2. **Codeine 30mg qid**
3. *ABx if neutropenic or symptoms persist*
4. **Combination**
5. **Specialist advice**

*#1: PRIORITY – **MAINTAIN HYDRATION*** → *1ST LINE = ORAL REHYDRATION*

- *Since most cases of diarrhoea are **self-limiting***

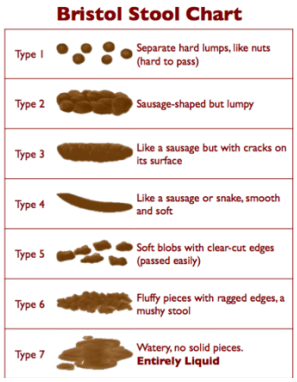
Drug class	Drugs
Oral rehydration salts	**Hydralyte**
Anti-diarrhoeals (reduce GIT motility) ***Do not give to children!! [CTG guidelines] -ileus!**	• **Opioids** = Loperamide (**Imodium**) → poorly crosses BBB • **Diphenoxylate** (with atropine: **Lomotil**) → combined with anti-cholinergic to **avoid abuse** of opioids due to their adverse effects
Bulking agents: absorb fluid to reduce diarrhoea	• *Psyllium* (Metamucil) • ispaghula (Fibogel)
Other	• **Probiotics**: conflicting evidence • **Zinc**: children (malnourished)

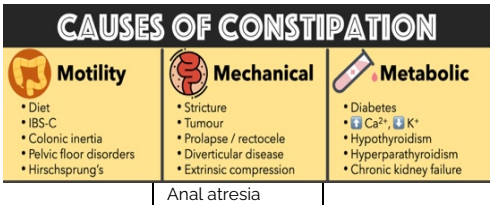
Constipation: GIT MEDICATIONS:

Definition: ROME III criteria:

- 25% straining
- 25% Bristol stool chart 1 or 2
- 25% sensation of incomplete evacuation
- < 3 bowel motions/week
- Manual manoeuvres to defecate

***Red flag** = altered bowel habit, PR bleed, UWL, fatigue





- Spina bifida
- Delayed passage (Hirschsprung)
- Anti-chol (anti-sludge drugs)
- Verapamil
- Cystic fibrosis
- Sepsis

Complications

1. Faecal impaction = Abdo pain, distension, N/V
2. Rectal prolapse
3. Anal fissure + haemorrhoids

Investigations:

- Wt, BMI
- Abdo exam – look, palpate, percuss and listen
- DRE – anal tone, faeces
- Lower limb neuro
- AXR – ONLY if suspected for obstruction (faecal loading)

When to refer to gastro?

- Obvious obstruction
- Sepsis
- Red flags for malignancy (PR bleed, UWL, NS)

Mx (conservative):

1. Lifestyle (↑fibre, ↑fluid)
2. ↑PA = ↑colonic motility
3. Behavioural change = scheduled toilets
4. Review meds
5. Knees to chest = reduce rectal angle

Mx (meds):

1. **Bulking agents** (bran & husk, PEG, methycell) = good long-term use
2. **Osmotic 2-3 days** (sugars = Movicol, lactulose, Mg) = make sure to keep hydrated as these draw water from colon to soften stool
3. **Stimulants 1 days** (coloxyl/senna) = for those who are immobile (NOT permenant fix) ➔ take PM to poo AM
4. **Stool softeners (**docusate sodium) =
5. **Suppositories/Enemas (rectal stimulants e.g. glycerin)**

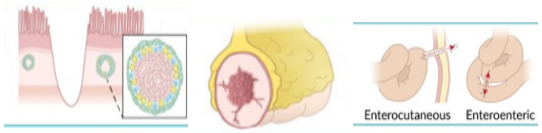
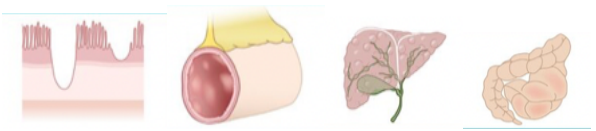
Practice note:

Increase in soiling/diarrhoea is common after the initiation of laxatives due to spurious overflow. If this occurs, treatment should **NOT** be reduced or stopped

NAUSEA: GIT MEDICATIONS:

Drug	Metoclopramide (Maxolon)	Ondansetron (Zofran)	Cyclizine	Dexamethasone
MoA	• Prokinetic • D2 antag + 5-HT3 antag	5-HT3 antag (central + peripheral) ➢ Targets CTZ	H1 antag	Steroid
Dose	10mg tds ORAL	25-50mg ORAL/SC	25-50mg	4-8 mg
Indication	• Drug Metabolic, • Chemical • Gastric stasis	• Post RT or Post chemo • Pregnant	• **Vertigo OR motion sickness** • **raised** ICP • SBO/LBO	• +ICP • Early BO • Post-chemo
A/E	• Dystonia • Avoid SBO/LBO	Constipation - Avoid SBO/LBO	• SAS • Anti-chol (anti-sludge)	Steroid A/E
Other	**Haloperidol (D2 antag – 0.5mg) = 2nd line**	Comes in wafer forms	**2ND LINE = Stemetil** *(D2 antag – 10mg tds)* *2ND LINE = hyoscine (buscopan)*	

INFLAMMATORY BOWEL DISEASE

	Crohn's	Ulcerative colitis
PP	Mediated by Th1 → IFN**γ** → macrophages (TNFa) and TH17 cells	Th2 mediated → IL4,13
Location	**Usu. terminal ileum (mouth → anus)** • Montreal classification → CD "Age, location, behaviour – inflammatory, structuring, perianal"	**Sigmoid colon → rectum** (Montreal classification) • E1 = proctitis • E2 = L sided UC • E3 = Pancolitis
RF	• FHx of autoimmune • Genetics (more evident) • Smoking (main risk factor) • Western diet + stress + high SES	• FHx of autoimmune • Western diet + stress + high SES • Nb: **smoking is a protective factor**
Clinical Sx	➢ **Crampy abdominal pain** - NOT affected by diet or stress ➢ **Malaena** – watery loose diarrhoea ➢ **Uncontrolled bowel movements** ➢ **Fever** ➢ Exhaustion ➢ UWL 	***MAYO Score*** ➢ PR bleed + loose diarrhoea ➢ Tenesmus + urgency ➢ Chronicity of symptoms ➢ New constipation and diarrhoea 
Extra-intestinal manifestations (EIM)	More likely to develop EIM ➢ Arthritis (symmetrical vs asymmetrical) = 40% ➢ Axial arthropathy = Ank spondylitis or sacroiliitis ➢ **Episcleritis** ➢ **Aphthous ulcers** ➢ **Uveitis** ➢ ***Erythema nodosum (painful red papules on shin)***	➢ Arthritis (symmetrical vs asymmetrical) = 40% ➢ Axial arthropathy = Ank spondylitis or sacroiliitis ➢ **PSC** ➢ **Pydoderma gangrenosum** ➢ *Less common = episcleritis, aphthous ulcer, erythema nodosum (painful red papules on shin)*
Ix + Dx (combination)	➢ Clinical Hx ➢ Serial CRP and faecal calprotectin ➢ Endoscopy / colonoscopy (**Definitive diagnosis)** ➢ Barium X-ray = string sign (CD), lead pipe colon (UC) ➢ Histo findings Acute flare: ➢ CRP > 30 ➢ Hb <100 ➢ Raised remp	***DDx***: ➢ IBD (UC, CD) ➢ Coeliac ➢ PUD, GORD ➢ IBS ➢ Colitis (ischaemic, infectious, RT, microscopic, TB-induced, NSAID) ➢ Food allergy (FPIES, cow's milk protein) ➢ Giardiasis ➢ Appendicitis
Histo-specific Findings	• Transmural inflammation (creeping fat) • Skip lesions "cobblestoning" • Granulomatous non-caseating inflammation (XS giant cells and lymphoid aggregates + ↑goblet cells) • ASCA (yeast) antibodies 	• Friable Submucosal inflammation → **anal region sparing** • Continuous lesions • Less goblet cells • Crypt abscess • P-ANCA +ve 
Comp.	• Fistulas (due to adhesions to viscera) o Enterourinary (UTI, air bubbles in urine) o Entero-vaginal o Enterocutaneous • Strictures / obstructions • Fissures • Nephrolithiasis	• Toxic megacolon → perforation → peritonitis o Subtotal colectomy + ileostomy +/- Hartmann's pouch • Haemorrhage /VTE • CRC • PSC → **cholangiosarcoma "Coursevier's signs"**
Medical Treatment	1) **Prednisolone** (oral pred or IV hydrocortisone) ***2) DMARDS (mod)*** a. **Azathioprine (thiopurine)** - also used in RA, ALL → A/E = thrombocytopenia, liver, pancreatitis, ↑lymohoma b. **MTX** (add folic acid) ***3) Biologic (severe)*** a. **Infliximab (Anti-TNF)** for acute flares + mod-severe disease not responding to immunomdulators b. **Anti-IL12,23 (ustekinumab**) also for psoriasis c. **Vedoluzimab (anti-a4b7 intregin)**	***Inducing remission*** ***1) DMARDS (mod)*** a. Sulfasalazine b. Azathioprine (thiopurine) c. Mercaptopurine ***2) Biologic (severe)*** a. **Infliximab (Anti-TNF)** for acute flares + mod-severe disease not responding to immunomodulators b. **JAK inhibitor** (tofacitinib) c. **Vedoluzimab (anti-a4b7 intregin)** ***Maintaining remission***: 1) Aminosalicyclate (e.g. mesalazine oral or PR) 2) Azathioprine or mercaptopurine 3) Clexane = ↓clot risk
Surgery	**Only** for strictures and fistulas (if affecting only distal ileum)	Curative – panproctocolectomy Subtotal colectomy + permanent ileostomy or ileo-anal anastomosis (J-pouch)
Long-term	• **Abx – metronidazole** (Flagyl) + cipro • **Biologic screen:** o Viral serology (Hep B/C /HIV/ CMV/EBV/VZV) o MMR IgG +/- TB quantiferon gold o ANCA/ASCA o TPMT (myelosuppression due to thiopurine usage) → if low TPMT → lower dosage required o Fe, folate, B12 and vit D • **Endoscopy 6-9 months** after initial treatment • **MDT support to manage EIM** – *Physio, rheumatologist, gastroenterologist* • **No live vaccines** (MMR, yellow fever) while on immunosuppressants	

APPROCH TO GI BLEEDING

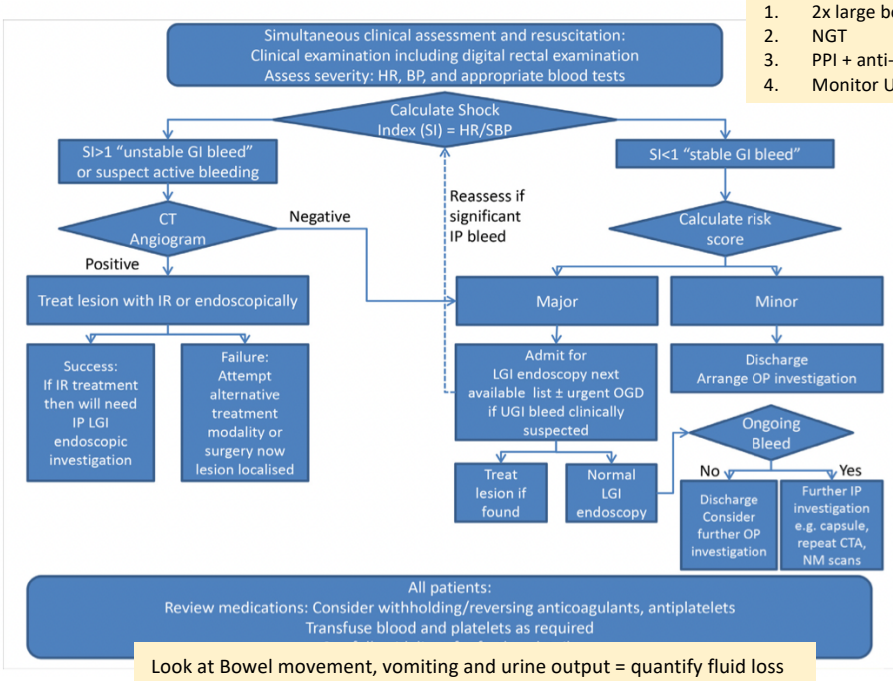
	UGIB (50-150/100000)	**LGIB** (20-30/100000)
Location	Oesophagus, stomach, or proximal duodenum • Variceal ? • Non-variceal?	Colon/rectum • Colonic • PR bleeding?
Sx - apparent	• haematemesis or coffee-brown vomitus • bloody NGT drainage	• altered blood PR • Bright blood PR (Haematochezia)
Sx subtle	• Epigastric pain • anaemia • melaena (black tarry stool suggests > 150mL blood loss/day) • faecal occult blood loss	• anaemia • melaena • faecal occult blood loss

DDx	• **PUD** (duodenal > gastric)
	• **Oesophageal variceal bleeds** (i.e. Portal HTN – Hx of chronic liver disease +/- encephalopathy)
	• **Mallory Weiss tear** (2° to vomit – often EtOH induced)
	• **Inflammation** (oesophagitis, gastritis)
	• **Malignancies** (stomach, duodenum)
	• **Dieulafoy lesion**
	• **Vascular ectasia**
	• **Aorto-enteric fistula** (post AAA repair) – painless haematochezia
	• **Boorheave syndrome** "oesophageal perforation" = gastrograffin oesophagography(90% dx)
		• **Diverticulosis (# 1 cause) – *due to* ↑ *colonic distension***
		  ○ True = all bowel wall layers (Meckel's)
		  ○ False = **ONLY** mucosa and serosa (sigmoid)
		• **Aorto-enteric fistula** (post AAA repair) – painless haematochezia
		• **Haemorrhoids**
		• **Colitis** (IBD, infectious, ischaemic) → septic Sx → CT contrast → surgery
		• **Malignancy** (polyps, cancer)
		• **Angiodysplasia** – usu. R colon, painless PR bleed
		• **Dieulafoy lesion**
		• **Post-polypectomy bleed**
		• **Rectal ulceration** (irradiated proctitis)

Risk stratify	• **Blatchford score = need for endoscopy**
	  ○ **Raised Urea > 6.5mM (**blood broken down by acid in gut and reabsorbed by intestines)
	  ○ **Low Hb,**
	  ○ **SBP > 100,**
	  ○ **HR <100**
	  ○ (0-1 is low risk)
	  ○ > 6 has > 50% chance of requiring intervention
	• **Rockall score (/3) → risk of rebleeding and overall mortality**
	  ○ Higher risk = shock, older age + co-morbidities
	  ○ Endoscopic stigmata of recent haem (e.g. clots, bleeding vessels)
		• **Oakland score (≤ 8 is low risk ➔ SAFE TO DISCHARGE)**
		  ○ Age > 40
		  ○ Male
		  ○ Previous LGIB
		  ○ Blood on DRE
		  ○ HR (0-3), SBP (0-5), Hb (0-22)
		• Gas-colon → for Dx + Rx
		• SI > 1 ➔ CT angiogram
		• If CT angio -ve or SI < 1 ➔ "gas/colon"

Rx	**ABATED**
	➢ ABCDE for immediate resus
	➢ Bloods
	➢ Access (2x large bore cannula)
	➢ Transfuse if appropriate – bloods, plts, FFP (avoid XS transfusion)
	  ○ Plt < 10
	  ○ Prothrombinex if pt on warfarin
	➢ Endoscopy (within 24 hrs)
	➢ Drugs (strop anti-coagulants and NSAIDs)	

Management of Acute LOWER GI bleed



Immediate Mx:

1. 2x large bore cannula
2. NGT
3. PPI + anti-emetic
4. Monitor UO

Look at Bowel movement, vomiting and urine output = quantify fluid loss

IP, inpatient; IR, interventional radiology;

OGD, oesophagogastroduodenoscopy; OP, outpatient

1st line investigations:

- **Bloods** – FBC, EUC, LFT, BSL, ESR/CRP,
  - Elevated Urea!
  - Hb > 80 g/L = hold off
  - Hb < 70g/L = transfuse
- **X-match (2units of blood) + save**
- **Coags** (INR/APTT)
- **NGT/Lavage +** *irrigation + aspirate contents*

2nd line investigations:

- **Stools** in blood – DRE / FOBT
- **Endoscopy** within 24 hrs (UGIB)
- **Catheter angio via brachial/femoral vein →** inject vasoconstrictive agent
- **Gas-colon (if Blatchford < 2, Oakland < 8)**
- **SI < 1**

Consider transfusion strategy:

- **Patients RARELY bleed to death →** ***80% deaths –*** *non-bleeding related e.g.* ***malignancy*** *[MAINLY], MI, pulm disease, MOF)*

Clinical Setting		Action
INR	**Sig. Bleeding**	
High but <4.5	No	Lower dose/omit warfarin
5-9	No	If high bleed risk give vit. K
>9	No	Low risk – vit. K High risk – PTX
Any	Yes	Vitamin K + PTX+/- FFP

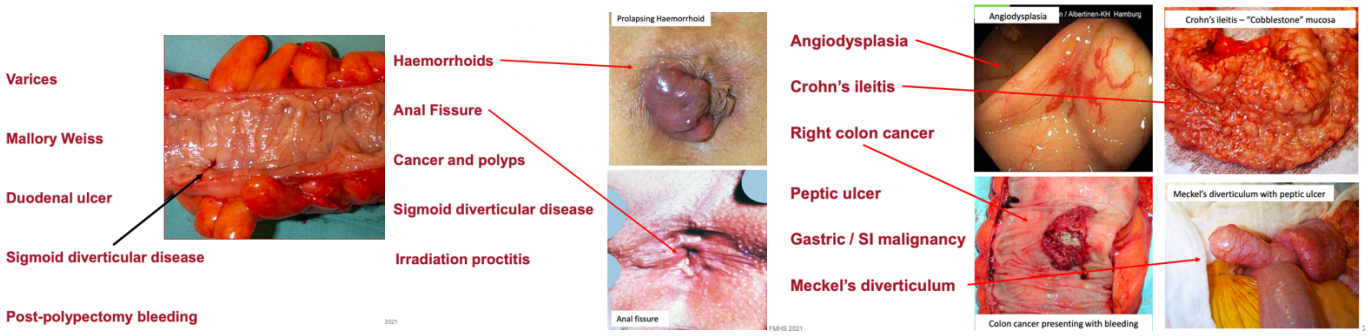
Upper Gastrointestinal Bleeding(UGIB) ➔ Nonvariceal and Variceal [80% resolve naturally]

	Non-Variceal UGIB	Variceal [high pressure bleeds]	
Def	any etiology of UGIB other than **varices**	Caused by esophageal or gastric **varices** • 1/3 = cirrhosis → 1/3 fatal → 1/3 = survive (> 1 year)	
Risk factors	• Use of NSAIDs and low-**dose** aspirin (LDA) • H. pylori infection	**Predictors of *large* oesophageal varices** • Severity of liver disease (Child-Pugh Classification) • Hypersplenism (splenomegaly) → Thrombocytopenia < 100 x10^9 /L	

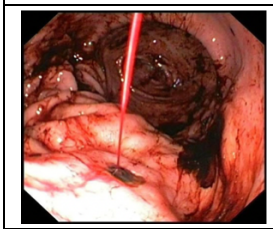
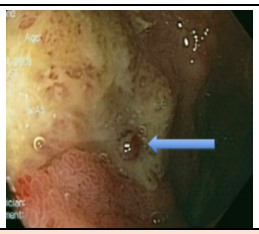
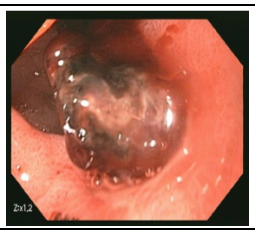
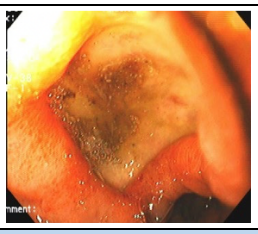
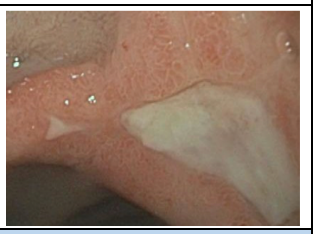
Mx	**Pre-endoscopic**
	• Resus + ABCD (blood transfusion if Hb < 70 + HypoTN)
	• *Risk stratification* Glasgow Blatchford
	  ○ < 1 = outpt endoscopy
	  ○ > 6 = need urgent endoscopy
	• **PPI** (8mg/hr) → ↑ clot formation + "downstages" lesion) *BUT* does NOT reduce bleeding or mortality
	• **Erythromycin** = prokinetic agent
	• If **cirrhosis** → vasoactive drugs and ABx
	• STOP anti-coag or reverse (e.g. PTX for warfarin)
	
	Early Endoscopy
	• Within **24 hours** if *acute UGIB*
	• *Indications*: Ulcers w/ active bleeding or non-bleeding visible vessels
	• **Injection therapy (e.g. adrenaline)** – temporary measure →still need to stop rebleeding w/ endsocopy and embolisation
	• **Thermal probes, and clips**
	• Oesophageal Variceal bleeds → **tissues glues**
	• Refractory bleeding → **TIPS**
	
	Post-endoscopy [NOT Dying > NOT rebleeding]
	• Check *H. pylori status* in all ulcer patients
	• *High ulcer risk* = High-dose PPI for 72 h
	• *low risk ulcers* = fed promptly+ oral PPI
	• *Cirrhosis pts* = ABx for 7 days (regardless of bleeding)
	• *Variceal bleed* = vasoactive drugs for 5 days
	• Restart low dose aspirin in CV-patients once bleeding resolved
		Vasoconstrictor therapy	➢ **Octreotide** (somatostain analogue) → reduce splanchnic blood flow
			➢ ***Terlipressin****/somatostatin*
			➢ ***Vit K/FFP***

		Antibiotics	Prophylactic broad spectrum ABx→sig. **reduces** early rebleeding + infection/sepsis
		Resuscitation	Minimise rapid expansion → can remove clot IVF bolus beware!!!
		ICU level care	
		Endoscopy (OGD)	Within 12 hrs + ETT required (band ligation preferred)
		Alternatives	• **Early** placement within 24-72 hrs of **TIPS** (**T**ransjugular **I**ntrahepatic **P**ortosystemic **S**hunt) • **SB Tube [Provide time for TIPS] ➔ Gastric balloon** *for immediate temporary control BUT high complication rate (e.g. necrosis, oesophageal perforation)*
		Beta Blockade (prevention)	• **Non-selective BB (propanolol)** → ↓↓CO, reduces splanchnic vasoconstrict (i.e. vasodilate) = ↓↓ blood flow portal vein • Reduce risk for recurrent variceal haemorrhage

BRISK BLEED	PR BLEED	MALAENA/ANAEMIA



SURGICAL IMAGES OF ACTIVE VS INACTIVE BLEEDS

Major stigmata			Minor stigmata	
○ High-bleeding risk endoscopic therapy			○ Low rebleeding risk – NO endoscopic therapy needed	
				
Active Spurting [*active bleeding*]	**Non-Bleeding Visible Vessel**	**Adherent clot** → usually removed with underlying lesion assessed	**Flat pigmented spot**	**Clean base ulcer**
55-90%	**40-50%**	**0-35%**	7-10%	< 5%
FORREST 1A – spurt FORREST 1B – oozing	**FORREST 2A**	**FORREST 2B**	**FORREST 2C**	**FORREST 3**

#A: Anatomy and Pathology of Upper GI and Pathology of the Pancreas

HPS

- 56 year old male Presents with abdominal pain
  - Localised → parietal peritoneum
  - Poorly localised → visceral peritoneum/organs
- Pain is constant, not associated with eating → exc. *GORD, achalasia*
- Radiates to the back → *pancreatitis, AAA, gastritis (PUD), costochondritis?*
- Sudden onset 3 hours ago
- Has been progressively becoming worse
- Has noticed a dull epigastric pain for many weeks prior which he put down to reflux
- Not associated with N&V or diarrhoea →exc. impaired gastric emptying
- No fever, night sweats → *exc. infection, lymphoma*
- No mucous, melaena or blood in the stool → *exc. cancer?, Upper /Lower GI bleed*
- Is passing wind → *important to exc. bowel obstruction*
- Not constipated (last past stool yesterday, appeared normal)
- Has lethargy
- 8kg weight loss in last 6 months → *cancer? Parasitic organisms – tapeworm?*
- No rashes but has intensely itchy skin → *suggests cholestastis →jaundice /scleral icterus*

Examination

- Appears cachectic
- Has palmar erythema
- Scleral icterus → *yellow eyes (Hepatic dysfunction)*
  - *Best inspected under natural light (by window)*
- Mouth normal
- Umbilical hernia noted with ascites
- No caput medusa or spider naevi → *No portal HTN*
- Liver enlarged and tender to palpation → hepatomegaly
- Epigastrium tender
- No guarding
- Testes normal → *exc. testicular torsion*
- DRE normal

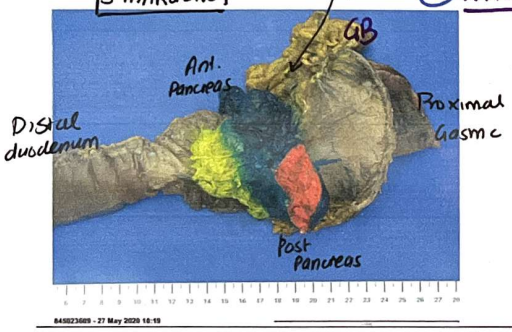
Investigations

- FBC – WCC raised → check infection
- EUC – normal →check renal function
- LFT – GGT and LDH high → check liver dysfunction
- COAGS – normal → liver dysfunction → loss of vitamin K derived clotting factors
- Lipase - High → check pancreas
- Amylase – High → check pancreas
- **CEA (carcinoembryonic antigen) – High**
  - sign of certain cancers (e.g. colon and rectum, prostate, ovary, lung, thyroid, or liver)
  - may also be a sign of some noncancerous conditions, such as cirrhosis, noncancerous breast disease, and emphysema
- **CA19.9 (Carbohydrate antigen)- High**
  - differentiate cancer of the pancreas or bile ducts and other conditions OR monitor response to pancreatic cancer treatment and watch for recurrence

Detailed investigations

- CT abdomen – liver, kidneys and spleen
- Endoscopic-ultrasound-guided FNA (minimise excision – as pancreas is highly vascular endocrine)

5 MARGINS



- Red = pancreatic neck region
- Green-blue = portal vein bed
- Yellow = peri-uncinate soft tissue (lymph nodes)

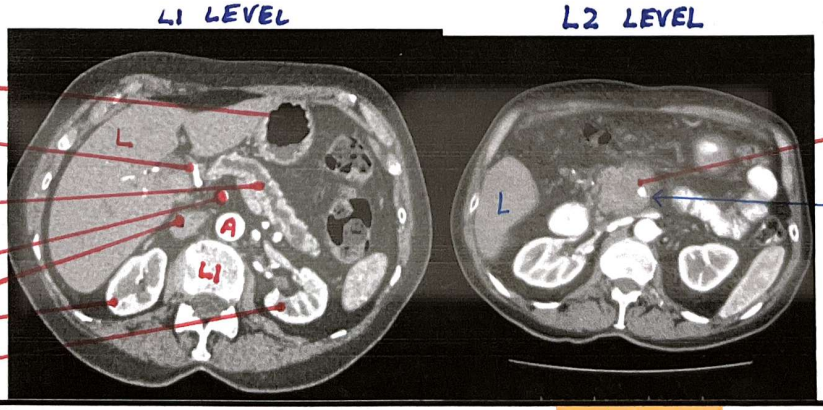
(1) WHIPPLES PROCEDURE (ONLY FEW PANCREATIC Ca RESECTABLE)

- Mucosal ulceration at head of pancreas (MOST COMMON = AC)

(2) ENDOSCOPIC STENT – Sx Mx FOR JAUNDICE

L1 LEVEL

L2 LEVEL



Stomach
Gastroduodenal artery
Enlarged major pancreatic duct
SMA
IVC
Right Kidney
hilum of left kidney
Enlarged head of pancreas
SMA

Interpretation: 40mm head of pancreas mass with double duct sign = simultaneous dilitation of CBD + pancreatic duct

- Nb: Arterial contrast used (left) → as seen by hyperattenuating aorta, SMA and
- Enlarged heterogenous pancreatic duct suggestive of blockage → causing compression of gastroduodenal artery (bright line)
- Blockage cause: either gallstone OR mass

USU. HEAD

STAGE IV

DDx for pancreatic mass causes

- Stone with obstruction and chronic pancreatitis (check alcohol)
- Intraductal papillary mucinous neoplasm
- Mucinous cystic neoplasm
- Neuroendocrine tumour (glucagonoma, insulinoma)
- Solid pseudopapillary neoplasm
- Acinar cell carcinoma (exocrine) → ↑amylase ↑lipase
- Lymphoma
- Adenocarcinoma of duodenum
- Vascular lesion (thrombus in SMV)

Final Dx:

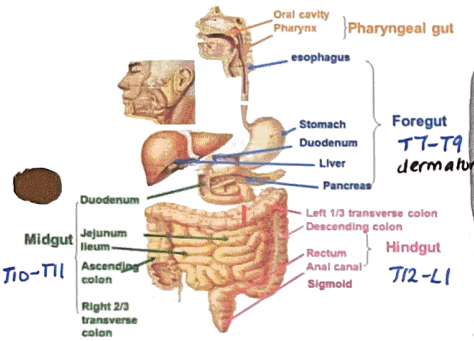
- Pancreatic ductal adenocarcinoma
- Involves portal vein bed
- **PNI and LVI** (i.e. perineural and lymphovascular invasion)
- Metastatic carcinoma present in umbilical hernia

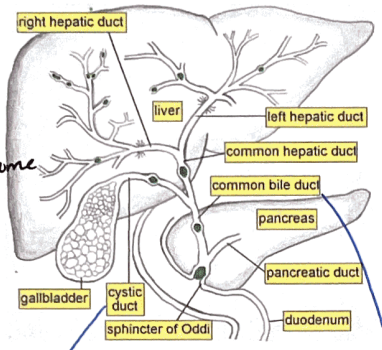
Indicates Stage IV

Treatment MOST UNRESECTABLE

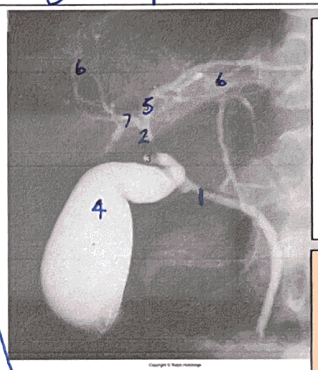
- Completion pancreatectomy — depends if margins have been exceeded
- FOLFOX chemotherapy → consider severe debilitation on patient (toxicity)
- Radiotherapy? → relatively easier as retroperitoneal location (for pancreas exc. tail)
- Palliation (if all fails)
- Poor prognosis → 7.1% 5-year survival rate

Describe anatomy & relationships of organs derived from embryonic foregut





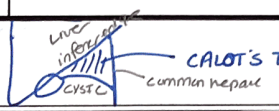
Mirizzi Syndrome



Asc. Cholangitis

Biliary tree:
1. Common bile duct
2. Common hepatic duct
3. Cystic duct
4. Gallbladder
5. Left hepatic duct
6. Intrahepatic duct
7. Right hepatic duct

Important:
For cholecystectomy, important to ligate **cystic duct NOT cystic artery to prevent common bile duct (CBD) injury**



CALOT'S TRIANGLE =
- R. hepatic artery
- cystic artery
- Lymphnode

Retroperitoneal	Intraperitoneal	Portosystemic anastomoses
• Supra-adrenal • Aorta/IVC • Duodenum (2nd and 3rd part) • Pancreas (exc. tail) • Ureter • Ascending and descending colon • Kidneys • Esophagus SADPUCKER • Rectum	• Liver • Stomach • Jejunum and ileum • Spleen • TC • SC • Upper rectum	Affected during portal HTN (e.g. caused by cirrhosis (liver scar tissue) leading to increased blood flow resistance: • **Backflow into left gastric vein causing dilatation of oesophageal veins resulting in oesophageal varices** (fragile to rupture → haemetemesis) [VARICEAL BLEED] o Oesophageal veins → hemiazygos → azygos → SVC → RA) • **Caput medusae** (varices in umbilical vein) • **Haemorrhoids** (varices in superior rectal vein that drain into IVC)

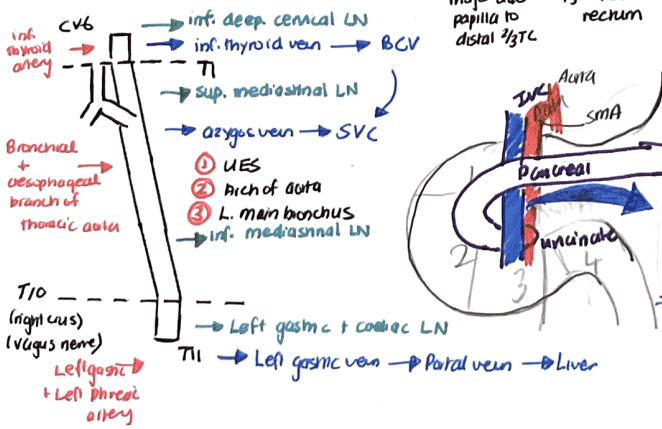
Vascular supply

	Foregut	Midgut	Hindgut
BV	Coeliac trunk	SMA	IMA
Level	T12	L1	L3
Somatic pain region	T7-T9 (epigastric)	T10-T11 (umbilical)	T12-L1 (suprapubic)

epigastric umbilical suprapubic

major duo papilla to distal 2/3TC

1/3rd TC to rectum



SMA Syndrome
= SMA + aorta compress 3rd part of duodenum
= bilous vomit + extreme UWL
NB nutcracker syndrome
= SMA + aorta compress L renal vein

Nerve supply

PSNS	SNS
• **Vagus nerve (duo to mid-TC)** o *Left* (hepatic branch) anterior to stomach o *Right* (coeliac branch): posterior to stomach • **Pelvic splanchnic – S2-S4** (mid-TC – anal canal)	**Thoracolumbar SNS ganglia (T5-L2)** foregut • Greater splanchnic: T5-T9 • Lesser splanchnic = T10-11 midgut • Least splanchnic = T12-L2 (sacral) → bladder drainage

(splenic flexure)

Parietal peritoneum = supplied by anterior rami of lower thoracic spinal nerves

R myenteric plexus = motor (SNS + PSNS) to muscularis externa

R Meissner plexus = PSNS secretomotor in all submucosa of GIT

mucosa submucosa mm