STATION 1 - ABDOMEN

STEPS OF EXAMINATION

(1) APPROACH THE PATIENT

- Read the instructions carefully for clues
- Approach the right hand side of the patient, shake hands, introduce yourself
- Ask permission to examine him "I am just going to feel your tummy, if it is all right with you"
- Position patient lying flat on the bed with one pillow supporting the head (but not the shoulder) and arms rested alongside the body
- Expose the whole abdomen and chest including inguinal regions (breasts can remain covered in ladies)

(2) GENERAL INSPECTION

STEPS	POSSIBLE FINDINGS
1. **Scan the patient**. Palpate for glandular breast tissue in obese subjects if gynaecomastia is suspected	➢ Nutritional status: under/average built or overweight ➢ Abnormal Facies: Cushingoid (steroid therapy in renal disease or post renal transplant), bronzing/slate-grey skin (haemochromatosis) ➢ Skin marks: Spider naevi (see theoretical notes), scratch marks, purpura, bruises, vitiligo (autoimmune disease) ➢ Decreased body hair (in face and chest for males and in axilla and pubic hair for both sexes) ➢ Gynaecomastia ➢ A-v fistula
2. Examine the **eyes**: pull down the eyelid.	➢ Xanthelasma (primary biliary cirrhosis). ➢ Anaemia (pallor) in the conjunctivae at the guttering between the eyeball and the lower lid ➢ Check the sclera for icterus ➢ Kayser-Fleischer rings (see theoretical notes)
3. Examine the **mouth**: ▪ look at the lips ▪ Ask the patient to evert his lips (inspect the inner side of the lips) ▪ Then to open his mouth (shine your pen torch into the opened mouth), ▪ Then to protrude his tongue out and then to move it from side to side (inspect the posterolateral edge of the tongue) ▪ Then to touch the roof of the mouth with the tip of the tongue (inspect the under surface of the tongue and the floor of the mouth).	➢ Central cyanosis (in the under-surface of the tongue) ➢ Cheilosis/angular cheilitis (swollen cracked bright-red lips in iron, folate, vitamin B12 or B6 deficiency) ➢ Abnormal odour of breath (see theoretical notes) ➢ Mucous membrane ulcers ➢ Mucosal telangiectasis (Osler-Weber-Rendu)…see theoretical notes ➢ Gum hypertrophy (phenytoin, cyclosporine, AML) ➢ Abnormal pigmentation (Addison's, drugs, Peutz-Jeghers…see theoretical notes) ➢ Smooth and red tongue of B12 deficiency ➢ Smooth pale tongue of atrophic glossitis ➢ Geographical tongue that may occur in riboflavin/B2 deficiency ➢ Leucoplakia (see theoretical notes)
4. Examine the **hands**: tell the patient "outstretch your hands like this (dorsum facing upwards)"… then "like this (palms facing upwards)"… demonstrate. Feel the palm with your thumb for Dupuytren's contracture	➢ Clubbing (cirrhosis, IBD, amyloidosis) ➢ Palmar erythema ➢ Cyanosis ➢ Leuconychia (hypoalbuminaemia) ➢ Koilonychias (chronic iron deficiency)
5. **Flapping tremors** (asterixis): ask patient to maintain his hand in dorsiflexion and fingers spread out (demonstrate)	➢ In case of positive flapping tremors, this posture is periodically dropped (usually every 2-3 seconds) and then resumed resulting in a jerky flapping tremor. See theoretical notes for Pathophysiology and causes.

(3) LOCAL INSPECTION

STEPS	POSSIBLE FINDINGS
1. Stand at the end of bed (and if needed kneel at the patient's side as well) and observe the abdomen carefully. 2. Ask the patient to take a deep breath in and look carefully for descending masses, e.g. liver, spleen or kidney.	➢ Distension/swelling: ▪ Generalized distension (see theoretical notes for causes) ▪ Localized swelling (asymmetry), e.g., due to massive enlargement of liver or spleen ➢ Scaphoid abdomen (see theoretical notes for causes) ➢ Scars (see theoretical notes for types of abdominal scars) ➢ Stretch marks (see theoretical notes) ➢ Intertrigo (see theoretical notes) ➢ Pubic hair distribution and thickness ➢ Corkscrew hairs with perifollicular haemorrhage are frequently seen in alcoholics with vitamin C deficiency (along with gingivitis) ➢ Visible peristalsis: intestinal obstruction
3. Look for and palpate any visible pulsations	➢ Visible pulsations of the abdominal aorta may be noticed in the epigastrium. It must be distinguished from an aneurysm of the abdominal aorta, where pulsation is more obvious and a widened aorta is felt on palpation
4. Look for visible veins and detect the direction of blood flow: place 2 fingers side by side across the vein, move the lower finger away thus emptying part of the vein, then remove the lower finger: you may see the vein filling from down upward. If the vein remains empty, re-place the lower finger and remove the upper finger: the vein will be seen filling from above downward.	➢ Prominent veins with direction of flow away from the umbilicus → portal hypertension (e.g. caput medusa) ➢ Prominent veins with direction of flow upwards from the groin → IVC obstruction. ➢ Determining the flow in a vein below the umbilicus will differentiate between portal hypertension and IVC obstruction. ➢ Rarely, obstruction to the SVC will give rise to distended veins, which all flow downwards ➢ Thin veins over the costal margin may be seen in normal people

(4) LIGHT AND DEEP PALPATION FOR MASSES

STEPS	POSSIBLE FINDINGS
1. **Kneel at the bedside**. Ask the patient to show you where he feels pain before you start and to report any tenderness as you examine him. Look at the patient's face and not your hand whilst palpating to ensure you are causing no discomfort 2. **Palpate** with your arm parallel to the patient's abdomen and the wrist and forearm in the same horizontal plane where possible. Palpate with the pulps of the fingers rather than the tips, with the relaxed hand is held flat and moulded to the abdominal wall and the fingers slightly flexed at the MCP joints. 3. Start away from the site of maximal pain and **move systematically** through the nine regions (RIF → hypogastrium → LIF → left flank → umbilical region → right flank → right hypochondrium → epigastrium → left hypochondrium). Initially palpate the nine regions lightly then palpate again more deeply for masses. <u>If you find a mass</u>: 4. **Ask the patient to tense the abdominal muscles** by lifting the head and shoulders off the pillow while you press firmly against the forehead; a mass in the anterior abdominal wall will still be palpable, whereas a mass in the peritoneal cavity will not. 5. Estimate the **size** in two directions between your thumb and index 6. Feel the **surface** and **edges** 7. Look at the patient face while palpating (for any **tenderness**) 8. Feel the mass with the back of your hand (for hotness) 9. Move the mass in both horizontal and vertical axises (to check for **mobility**) 10. Ask the patient to take deep breath (to check for **movement with respiration**) 11. Pinch the skin overlying (to check **attachment to the skin**) 12. Try to **get above it** (i.e. to palpate its upper edge) 13. Try **bimanual ballottement** (for masses in the flanks) 14. Place both your index fingers parallel to each other over the mass to check for **pulsatility** 15. Feel over the mass with your palm (for **thrill**) 16. **Percuss** across the mass in two directions 17. **Auscultate** over the mass (for bruit)	• Describe the mass (while presenting your findings) in the terms of: ➢ Site: intra-abdominal or in the anterior abdominal wall, and in which region (RIF, LIF, epigastric, RIQ, LUQ, pelvic) …see theoretical notes for types of abdominal masses according to the site ➢ Shape, Size, consistency, surface and edge ➢ Tenderness, hotness, redness, and skin overlying (normal, scar, fistula) ➢ Mobility in both the horizontal and vertical axises, movement with respiration, and attachment to the skin ➢ Whether you can get above it and whether it is bimanually ballotable ➢ Pulsatility, thrill, percussion note and bruit • See theoretical notes for examples of abdominal masses according to characteristics

(5) PALPATION FOR THE LIVER

STEPS	POSSIBLE FINDINGS
1. Palpate with the right hand, using the **radial edge and the pulps of the index and middle fingers**, while keeping your hand flat on the abdomen (Do not dig in with your fingertips as you may get a false impression of the liver edge). Start in the right iliac fossa, working upwards towards the right hypochondrium 2. Keep your hand stationary and ask the patient to breathe in deeply. Try to feel the edge of the enlarged liver as it **descends on inspiration**, at which time you can gently press and move your hand inwards and upwards in an arc to meet it. 3. **During expiration, advance your hand** 1-2 cm towards the costal margin 4. **Repeat** the previous two steps until you reach the costal margin (or detect the edge). <u>If the liver is palpable</u>: 5. Estimate the **size**, e.g. In cm below the right costal margin in RMCL (using your fingers or a tape measure) 6. Feel the **edge, surface** and **consistency** 7. Look at the patient face while palpating (for any **tenderness**) 8. Feel bimanually (for **pulsatility**) 9. Obtain direct measure of the hepatic size (liver span) by **percussion** as follows: ▪ Locate the lower palpable edge by light percussion proceeding from the resonant to dull areas. Percussion should follow a similar pattern to palpation, starting in the right iliac fossa and moving vertically up. ▪ Locate the upper border by heavy percussion from the 4th ICS in the right MCL (right nipple in men) downwards. In the normal liver, the upper border is found at the 5th ICS, where the note will become dull. Keep your finger on the site of dullness and ask the patient to breathe in deeply then percuss lightly again and if that area is now resonant, this confirms that that dullness was the upper border of the liver. ▪ Estimate the liver span in cm (the distance from the upper border to the lower edge) using your fingers or a tape measure 10. **Auscultate** (for bruit)	• Describe the liver (while presenting your findings) in the terms of: ➢ Size by palpation (in cm below the costal margin in the RMCL). The normal liver may be palpable 2 cm below the costal margin) ➢ Liver span by percussion (normally 12 cm in the right MCL) or at least the location of the upper border by percussion (normally at the 5th left ICS). This determines whether the palpable liver is truly enlarged or just displaced inferiorly (see theoretical notes for causes of inferior displacement of upper border of the liver) ➢ Edge (smooth or irregular) ➢ Surface: smooth or nodular (if nodular → micronodular or macronodular) ➢ Consistency: soft (normal), firm (inflamed or infiltrated) or hard (advanced cirrhosis or metastasis) ➢ Tenderness → TR, Budd-Chiari syndrome, hepatitis, hepatocellular cancer, abscess ➢ Pulsatility → TR ➢ Bruits → hepatoma (increased blood flow within the tumour) ➢ Riedel's lobe: a tongue-like projection from the inferior surface of the right lobe (it can extend to the right iliac fossa) • See theoretical notes for causes of hepatomegaly

(6) PALPATION FOR THE SPLEEN

STEPS	POSSIBLE FINDINGS
1. Palpate with the right hand, using the **radial edge and the pulps of the index and middle fingers**, while keeping your hand flat on the abdomen. Use your left hand to press forward on the patient's left lower ribs form behind (the purpose of the left hand is more that of steadying the patient than feeling the spleen, which is protected largely by the ribs posterolaterally). Start in the right iliac fossa, working diagonally towards the left costal margin 2. Keep your hand stationary and ask the patient to breathe in deeply. Try to feel the edge of the enlarged spleen as it **descends on inspiration**, at which time you can press and move your hand inwards and upwards in an arc towards the left costal margin to feel it. 3. **During expiration, advance your hand** 1-2 cm towards the left costal margin 4. **Repeat** the previous two steps until you reach the costal margin (or detect the edge). Feel the costal margin along its length, as the position of the spleen tip is variable. 5. If you cannot feel the splenic edge, ask the patient to **roll onto his right side** facing towards you (it may help to ask the patient to place his left hand on your right shoulder). Keep your left hand pressing forward on the patient's left lower ribs from behind. Place the right hand beneath the left costal margin and ask the patient to breathe in deeply, press in deeply with the fingers of the right hand beneath the costal margin, at the same time exerting considerable pressure medially and downwards with the left hand. The spleen may be tipped in this position. <u>If you detect the splenic edge</u>: 6. Estimate the **size**, e.g. In cm below the left costal margin (using your fingers or a tape measure) 7. Feel the **edge** and try to find its characteristic medial **notch** midway along its leading edge 8. Feel the **surface** and **consistency** 9. **Insinuate your hand** between the enlarged spleen and the costal margin to confirm that you cannot feel its upper border. 10. Look at the patient face while palpating (for any **tenderness**) 11. Locate the lower palpable edge by light **percussion** proceeding from the resonant to dull areas. Percussion should follow a similar pattern to palpation, starting in the right iliac fossa and moving diagonally up to the 9th rib in the mid-axillary line (which is the surface marking of the lower border of a normal spleen) 12. **Auscultate** (splenic bruit)	• Describe the spleen (while presenting your findings) in the terms of: ➢ Size (e.g. in cm below the left costal margin). The spleen has to enlarge in size threefold to be palpable, so a palpable splenic edge always indicates splenomegaly. The lower border of a normal spleen is the 9th rib in the mid-axillary line. Dullness between this surface marking and the costal margin may indicate mild splenomegaly even in absence of palpable spleen ➢ Edge and medial notch ➢ Consistency and surface ➢ Tenderness ➢ Bruit • See theoretical notes for causes of splenomegaly

(7) PALPATION FOR THE KIDNEYS

STEPS	POSSIBLE FINDINGS
1. Use the **bimanual technique** to feel the kidneys. Place your left hand behind the patient's back below the lower ribs, just lateral to the long strap muscles of the spine. Place your right hand over the upper quadrant anteriorly just lateral to the rectus muscle. 2. Press the left hand forwards, and the right hand inwards and upwards as the patient breaths out. Then ask the patient to breathe in deeply. You may feel the lower pole of enlarged kidney moving down between the hands (i.e. bimanually palpable). 3. **Flex the posterior fingers quickly at maximal inspiration.** You may feel the kidney floating towards the anterior hand. If this happens, gently push the kidney from one hand to the other to demonstrate its mobility. This is known as "balloting", and helps to confirm that the structure is the kidney. <u>If you feel the kidney</u> 4. **Get above it** and separate it from the costal edge to confirm that you can feel its upper border 5. Assess its **size, consistency** and **surface** 6. **Percuss** over it	• In very thin subjects, the lower pole of a normal right kidney may be palpable and is felt as a smooth, rounded, firm swelling which descends on inspiration and is bimanually palpable and may be balloted. • The left kidney is not usually palpable unless either low in position or enlarged. • Describe the kidney (while presenting your findings) in terms of: ➢ Size, consistency and surface ➢ percussion note over it: percussion note over the enlarged kidney is usually resonant because of overlying bowel • See theoretical notes for characteristic features to differentiate kidney from spleen

(8) <u>PALPATION BY DIPPING OR BALLOTING</u>: palpation of the internal organs may be difficult if there is ascites. In this case, the technique is to press quickly, flexing at the wrist joint, to displace the fluid and palpate the enlarged organ.

(9) <u>PERCUSSION</u>

1. Use only light percussion in the abdomen (as the abdominal viscera can have thin leading edges that are easily missed by heavy percussion). A resonant (tympanic) note is normally heard throughout (due to gas content of the intestine) except over the liver, where the note is dull.
2. Always percuss from the area of resonance to the area of dullness to identify the position accurately.
3. Assess each organ with both palpation and percussion before moving on to the next organ (liver, spleen, bladder, any other localized swelling)
4. **Shifting dullness:** this test is to demonstrate the presence of ascites:
   - Percuss laterally from the midline, keeping your fingers in the longitudinal axis, until dullness is detected (if no dullness detected, do not complete the test).
   - Keep your finger on the site of dullness and ask the patient to turn onto the opposite side. Pause for at least 10 seconds to allow any ascites to gravitate; then percuss again and if that area is now resonant, and the area of dullness has moved towards the umbilicus, then ascetic fluid is probably present.
5. **Fluid thrill:** In patients with large volume ascites, a fluid thrill may be elicited as follows:
   - Place the palm of your left hand against the left side of the abdomen and ask the patient or assistant to place the edge of a hand on the midline of the abdomen and press firmly down (to prevent transmission of the impulse via the abdominal wall).
   - Flick a finger of your right hand against the right side of the abdomen. If you feel a ripple against your left hand, this is a fluid thrill.

(10) AUSCULTATION

1. **Bowel sounds**: listen to the right of the umbilicus (for up to 30 seconds) for bowel sounds: with the diaphragm of the stethoscope. Bowel sounds are gurgling sounds caused by normal peristaltic activity of the gut. They normally occur every 5-10 seconds, but the frequency varies widely. You must listen for up to 2 minutes before concluding that they are absent (paralytic ileus or peritonitis). In intestinal obstruction, bowel sounds occur at increased frequency and have a high-pitched tinkling quality.
2. **Aortic bruits**: **listen over the aorta (above the umbilicus) for aortic** bruits (atheroma or aneurysm)
3. **Renal bruits**: listen 2-3 cm above and lateral to the umbilicus, over the epigastrium, and in loins (at the sides of the long strap muscles, below the 12th rib) for renal bruits (renal artery stenosis): It is not possible to distinguish renal artery stenosis bruits from those arising in adjacent vessels, such as the mesenteric arteries, but such bruits support a decision to investigate by renal angiography.
4. **Hepatic bruit**: listen over enlarged liver for bruits (hepatocellular carcinoma, hepatoma, acute alcoholic hepatitis, large AV malformation) or friction rub (perihepatitis)
5. **Splenic bruit**: listen over enlarged spleen for friction rub
6. **Venous hum**: listen in region of umbilicus or xiphoid for venous hum: due to collateral flow in portal hypertension (rare, but almost pathognomonic)
7. **Succussion splash** (if one suspects pyloric obstruction):
   - Explain first what you are going to do. Place the stethoscope over the epigastrium. Shake the abdomen by lifting the patient with both hands under the pelvis, then rolling the patient from side to side to agitate in fluid and gas in the stomach.
   - If the stomach is distended with fluid a splashing sound, like shaking a half-filled water bottle, will be heard.
   - An audible splash more than 4 hours after the patient has eaten or drunk anything, indicates delayed gastric emptying, e.g. pyloric stenosis.

(11) LYMPHADENOPATHY

1. Cervical → supraclavicular → if you do find lymph nodes, proceed to examine the axillary and inguinal lymph nodes (see Ch 17. Endocrine – neck)…N.B: enlargement of Virchow's nodes in the left supraclavicular fossa is Troissier's sign, which is classically, but not exclusively seen in advanced gastric carcinoma
2. Examination of the LN in the neck form behind is an opportunity to examine the patient's back for spider naevi, scars, tattoos, etc.

(12) HERNIAL ORIFICES

1. Ask the patient to cough and look for any expansile impulse over the inguinal or femoral canals (the inguinal canal extends from the pubic tubercle to the ASIS; with an internal ring at the mid-inguinal point and an external ring at the pubic tubercle- and the femoral canal lies below the inguinal ligament).
2. If none is apparent, place both hands in the groins so that the fingers lie over and in line with the inguinal canal, and ask the patient to give a loud cough and feel for any expansile impulse.
3. Identify the anatomical relationships between the bulge and the pubic tubercle to distinguish a femoral from an inguinal hernia. To locate the pubic tubercle, push the index finger gently upwards from beneath the neck of scrotum. The pubic tubercle will be felt as a small bony prominence 2 cm from the midline on the pubic crest. If the hernial sac passes medial to and above the index finger on the pubic tubercle, then the hernia is inguinal; if it is lateral to and below, then the hernia is femoral.

(13) ADDITIONAL SIGNS

1. Examine for sacral or lower limb oedema
2. Tell the examiner that you would normally examine the genitalia and perform a rectal examination, and test the patient urine with a dipstick

(14) THANK THE PATIENT AND COVER HIM (HER)

THEORETICAL NOTES

IN PACES, THE MAJORITY OF PATIENTS WILL FALL INTO ONE OF THREE MAIN PATTERNS OF PATHOLOGY:

1. **Liver disease (primary or secondary)** – cirrhosis, portal hypertension, encephalopathy; or associated with heart failure, metastatic disease, infective agents, infiltration or inflammation
2. **Splenomegaly or hepatosplenomegaly** – myeloproliferative, lymphoproliferative or autoimmune disease
3. **Renal disease** ± evidence of renal replacement therapy

SPIDER NAEVI: isolated telangiectatic lesions found in drainage site of SVC (the upper trunk, arms and face). They are fed by a central arteriole; so, can be obliterated by pressure over the arteriole. Up to five may be found in normal individuals (more in women on oestrogen therapy and pregnant women). More than five are probably abnormal and signify chronic liver disease.

KAYSER-FLEISCHER RINGS: a brownish-yellow ring in the outer rim of the cornea of the eye. It is a deposit of copper granules in Descemet's membrane and is diagnostic of Wilson's disease. When well developed it can be seen by unaided observation, but faint Kayser-Fleischer rings may only be detected by a slit lamp

ABNORMAL BREATH ODOURS:

- **Fetor hepaticus:** stale (mousy) smell of the volatile amine, methyl mercaptan, on the breath of patients with liver failure
- **Sweet odour** in diabetic or starvation ketoacidosis due to acetone.
- **Fishy odour** of severe uraemia
- **Halitosis (bad breath)** caused by decomposing food wedged between the teeth, gingivitis, stomatitis, atrophic rhinitis and tumours of the nasal passage.
- **Alcohol**

LEUCOPLAKIA: a thickened white patch on a mucous membrane, such as the mouth lining or uvula that cannot be rubbed off. It is not a specific disease and is present in about 1% of the elderly. Occasionally Leucoplakia can become malignant. **Hairy Leucoplakia**, with a shaggy or hairy appearance, is a marker of AIDS

PEUTZ-JEGHERS' SYNDROME: autosomal dominant condition with brown spots on the lips, oral mucosa, around the mouth, face and occasionally elsewhere on the skin; associated with hamartomatous polyps of the small and large bowel which only rarely become malignant

OSLER-WEBER-RENDU SYNDROME (HEREDITARY HAEMORRHAGIC TELANGIECTASIA):
autosomal dominant condition with mucosal telangiectasia; presents with GI bleeding or epistaxis. The telangiectasia also occur in the retina and brain

PATHOPHYSIOLOGY OF FLAPPING TREMORS (ASTERIXIS): it is the result of intermittent failure of the parietal mechanisms required to maintain posture

CAUSES OF FLAPPING TREMORS (ASTERIXIS):
Severe ventilatory failure and carbon dioxide retention
Liver failure and advanced renal failure
Acute focal parietal or thalamic lesions

CAUSES OF GENERALIZED DISTENSION:

1. Fat (obesity): the umbilicus is usually sunken in case of obesity, whereas in the other conditions it is flat or even projecting
2. Fluid (ascites),
3. Flatus (obstruction/ileus),
4. Faeces (constipation), or
5. Fetus (pregnancy). In obesity,.

SCAPHOID ABDOMEN is seen in advanced stages of starvation and malignant disease, particularly carcinoma of the oesophagus and stomach.

TYPES OF ABDOMINAL SCARS:

- Vertical scars: Midline, Right paramedian, or Left paramedian (each could be upper or lower according to the position from the umbilicus)**:**
- Right subcostal scar = Kocher's (open cholecystectomy)
- Mercedes Benz: liver surgery
- Diagonal scar in the right iliac fossa: appendectomy
- scar in either iliac fossa: nephrectomy or renal transplant (transplanted kidney would be palpable as a smooth mass beneath the scar)
- Diagonal scar in either inguinal region (hernia repair)
- Small infra-umbilical incision (previous laparoscopy, previous chronic ambulatory peritoneal dialysis scar)
- Horizontal suprapubic scar = Pfannenstiel (gynaecological surgery)
- Scars in the loins (renal tract surgery)
- Puncture scars (laparoscopic surgery, e.g. in the right hypochondrium for lap-chole)

STRETCH MARKS: atrophic and silvery marks indicates previous distension (usually striae gravidarum, occasionally drained ascites), or purple and livid marks (Cushing's)

INTERTRIGO is a superficial inflammation of two skin surfaces that are in contact (such as between the thighs or under the breasts) particularly in obese people. It is caused by friction and sweat and is often aggravated by infection, especially with Candida.

ABDOMINAL MASSES ACCORDING TO THE SITE

- **Right iliac fossa masses:**
  - The caecum is often palpable in the right iliac fossa as a **soft**, rounded swelling with indistinct borders
  - ileocaecal TB (chest signs)
  - Caecal cancer (elderly, non-tender **hard** mass, LN)
  - Crohn's disease (look for mouth ulcers)
  - Lymphoma (look for hepatosplenomegaly, lymph nodes elsewhere)
  - Appendicular mass
  - Ovarian tumour
  - Transplanted kidney (smooth mass in either iliac fossa, an overlying scar, stigmata of renal failure, artificial AV fistula)
  - Amoebic abscess (history of amoebiasis or travel abroad)
  - Ileal carcinoid
  - Actinomycosis
  - Ectopic kidney
- **Left iliac fossa masses:**
  - Pelvic colon loaded with faeces (constipation)**:** pelvic colon is frequently palpable, particularly when loaded with hard faeces. It is felt as a firm, tubular structure some 12 cm in length, in the left iliac fossa, parallel to the inguinal ligament. Faeces in the bowel can be indented by the examining finger, a unique feature
  - Sigmoid colon cancer (non-tender, look for hepatomegaly)
  - Diverticular abscess (tender, mobile)
  - Ovarian tumour
  - Transplanted kidney (smooth mass in either iliac fossa, an overlying scar, stigmata of renal failure, artificial AV fistula)
  - Amoebic abscess (history of amoebiasis or travel abroad)
- **Epigastric masses:**
  - Aortic aneurysm: pulsatile (N.B. normal aortic pulsation may be palpable in thin people). The aorta should be palpated for in the mid-line above the umbilicus. The normal diameter is up to 3 cm.
  - Gastric or pancreatic tumour: may be pulsatile if transmitting underlying aortic pulsation. Both gastric and pancreatic tumour may cause palpable scalene LN in the supraclavicular fossa, most commonly on the left side (Troisier's sign). Pancreatic cancer → enlarged GB (Courvoisier's sign) and jaundice.
  - Lymphoma (look for hepatosplenomegaly, lymph nodes elsewhere)
  - Pancreatic pseudocysts, if large, can be felt in the epigastric region; they feel fixed and do not descend
  - The transverse colon is sometimes palpable in the epigastrium. It is felt as a firm, tubular structure (like the pelvic colon but rather larger and softer), with distinct upper and lower borders and a convex anterior surface

- **Right upper quadrant masses:**
  - Liver: confirmed by classic palpation for the liver (see below)
  - Right kidney: confirmed by classic palpation for the kidney (see below)
  - Gallbladder: normal Gall bladder cannot be felt. However, when it is distended, it forms an important sign and may be palpable in the right hypochondrium, just lateral to the edge of the rectus abdominis near the tip of the ninth costal cartilage. It is felt as a firm, (smooth, rough, or globular) swelling with distinct rounded borders, and, unlike the liver, you can palpate above it. It is differentiated from the right kidney by its location just beneath the abdominal wall and being not bimanually palpable. GB becomes swollen in case of obstruction either of the cystic duct or the CBD. If the GB is palpable in jaundiced patient, the obstruction is likely to be due to pancreatic cancer or distal cholangiocarcinoma but not due to gallstones (Courvoisier's low)
  - Carcinoma of the colon
  - Retroperitoneal sarcoma
  - Lymphoma (look for hepatosplenomegaly, lymph nodes elsewhere)
  - Diverticular abscess (tender, mobile)
- **Left upper quadrant masses:**
  - Spleen: confirmed by classic palpation for the spleen (see below)
  - Left kidney: confirmed by classic palpation for the kidney (see below)
  - Carcinoma of the colon
  - Retroperitoneal sarcoma
  - Lymphoma (look for hepatosplenomegaly, lymph nodes elsewhere)
  - Diverticular abscess (tender, mobile)
- **Pelvic masses:**
  - Distended bladder is palpable as a smooth firm regular oval-shaped swelling in the suprapubic region and its dome may reach as far as the umbilicus. The lateral and upper borders can be readily made out, but it is not possible to feel its lower border (i.e. the swelling is arising out of the pelvis). On percussion, the upper and lateral borders can be readily defined from adjacent bowel, which is resonant. Pressure on the distended bladder gives the patient a desire to micturate. Palpable bladder will disappear after urethral catheterization.
  - Gravid uterus: firmer, mobile side to side and vaginal signs different
  - Fibroid uterus: may be bosselated, firmer and vaginal signs different
  - Ovarian cyst or tumour: usually eccentrically placed to left or right side

<u>EXAMPLES OF PALPABLE ABDOMINAL MASSES ACCORDING TO CHARACTERISTICS</u>:

- **A pulsatile mass in the upper abdomen** may be normal aortic pulsation in thin people, a gastric or pancreatic tumour transmitting underlying aortic pulsation, or an aortic aneurysm.
- **The normal Gall bladder** cannot be felt. When it is distended, however, it forms an important sign and may be palpable in the right hypochondrium, just lateral to the edge of the rectus abdominis near the tip of the ninth costal cartilage. It is felt as a firm, (smooth, rough, or globular) swelling with distinct rounded borders, and, unlike the liver, you can palpate above it. Unlike the right kidney, distended Gall bladder lies just beneath the abdominal wall and is not bimanually palpable. GB becomes swollen in case of obstruction either of the cystic duct or the CBD. If the GB is palpable in jaundiced patient, the obstruction is likely to be due to pancreatic cancer or distal cholangiocarcinoma but not due to gallstones (Courvoisier's low)
- **A transplanted kidney** is palpable as a smooth mass in either iliac fossa with an overlying scar
- **A distended bladder** is palpable as a smooth firm regular oval-shaped swelling in the suprapubic region and its dome may reach as far as the umbilicus. The lateral and upper borders can be readily made out, but it is not possible to feel its lower border (i.e. the swelling is arising out of the pelvis). On percussion, the upper and lateral borders can be readily defined from adjacent bowel, which is resonant. Pressure on the distended bladder gives the patient a desire to micturate. Palpable bladder will disappear after urethral catheterization. In women, the palpable bladder should be differentiated from:
- **A gravid uterus** (firmer, mobile side to side and vaginal signs different)
- **A fibroid uterus** (may be bosselated, firmer and vaginal signs different)
- **Cystic masses** are either pancreatic, mesenteric, or ovarian (an ovarian cyst is usually eccentrically placed to left or right side)
- **The pelvic colon** is frequently palpable, particularly when loaded with hard faeces. It is felt as a firm, tubular structure some 12 cm in length, in the left iliac fossa, parallel to the inguinal ligament.
- **The caecum** is often palpable in the right iliac fossa as a soft, rounded swelling with indistinct borders.
- **The transverse colon** is sometimes palpable in the epigastrium. It feels like the pelvic colon but rather larger and softer, with distinct upper and lower borders and a convex anterior surface.

CAUSES OF INFERIOR DISPLACEMENT OF THE UPPER BORDER OF THE LIVER: the liver dullness normally extends from the 5th ICS down to the lower border (at or just below the right subcostal margin). The upper border of the liver may be displaced inferiorly due to:

- Severe emphysema
- Large right pneumothorax
- Shrunken liver
- Gas or air in the peritoneal cavity
- Interposition of the transverse colon between the liver and the diaphragm.

LIVER CIRRHOSIS is irreversible destruction and fibrosis of liver architecture on 4 stages: liver cell necrosis, inflammatory infiltration, fibrosis, and nodular regeneration

CHRONIC LIVER DISEASE is chronic impairment of liver functions. Causes include all causes of liver cirrhosis and causes of hepatomegaly or hepatosplenomegaly if associated with impairment of liver function

SIGNS OF CHRONIC LIVER DISEASE (*Words in bold italic font are signs of decompensation)*

Skin	➢ Slate grey pigmentation (haemochromatosis) ➢ ***Purpura*** (bleeding) ➢ Scratch marks (itch) ➢ Tattoos (viral hepatitis) ➢ Needle track marks (viral hepatitis)
Hair	➢ Paucity of body hair and inverted pubic hair distribution
Eye	➢ ***Jaundice*** ➢ Pallor (anaemia) ➢ Xanthelasmas (PBC) ➢ Kayser-Fleischer ring (Wilson's)
Tongue	➢ Cyanosis (pulmonary venous shunts)
Nails	➢ Clubbing ➢ Leuconychia ➢ Koilonychia (iron deficiency from blood loss)
Hands	➢ Dupuytren's contracture (alcohol) ➢ Palmar erythema ➢ ***Flapping tremors*** (encephalopathy)
Limbs	➢ Muscle wasting
Neck	➢ Parotid enlargement (alcohol) ➢ Hypothyroidism (autoimmune hepatitis)
Chest	➢ Gynaecomastia ➢ Signs of obstructive airway disease (α-1 antitrypsin deficiency)
Abdomen	➢ Hepatomegaly (alcohol, acute inflammation) ➢ Splenomegaly (portal hypertension) ➢ ***Ascites*** ➢ Caput medusa (portal hypertension)
Back	➢ Spider naevi
Genital	➢ Testicular atrophy

CAUSES OF LIVER CIRRHOSIS, HEPATOMEGALY, HEPATOSPLENOMEGALY

Liver cirrhosis	Hepatomegaly	Hepatosplenomegaly
Alcohol (most common in UK) **Hepatitis B or C** (most common worldwide) **Immune** hepatitis (Lupoid hepatitis, PBC) **Metabolic** (Haemochromatosis, Wilson's, α-1 antitrypsin deficiency) **Drugs** (methyldopa, amiodarone, methotrexate) **Cryptogenic**	**Cirrhosis** **Cancer** **CCF** **Infection** (EBV,CMV, hepatitis A) **Infiltrative** (sarcoidosis, amyloidosis) **Lymphoproliferative** disorders **Pyogenic** liver abscess **Amoebic** liver abscess **Hydatid** cysts **Budd-Chiari** syndrome **Polycystic** liver disease **Riedel's** lobe **Emphysema** (apparent hepatomegaly)	**Cirrhosis** with portal hypertension **Budd-Chiari** (hepatic vein thrombosis) **Infection** (malaria, schistosomiasis, leishmaniasis, toxoplasmosis, brucellosis, TB) **Lymphoproliferative** disorders (Hodgkin's, non-Hodgkin's, CLL, ALL, myeloma, paraproteinaemia) **Myeloproliferative** disorders (CML, myelofibrosis, PRV,ET, **Infiltrative** (sarcoidosis, amyloidosis) **Storage** diseases (Gaucher's and other sphingolipidosis, glycogen storage diseases) Pernicious anaemia and other megaloblastic anaemias **Haemolytic anaemias**

CAUSES OF SPLENOMEGALY

- All causes of **hepatosplenomegaly**
- **Infective endocarditis**
- **Felty's syndrome**

CHARACTERISTIC FEATURES TO DIFFERENTIATE KIDNEY FROM SPLEEN

Kidney	Spleen
Bimanually palpable	Not bimanually palpable
You can get above the enlarged kidney and separate it from the costal edge	Not possible to feel its upper border
Percussion note over it is usually resonant because of overlying bowel	Has a medial notch