PHE Class 11 and 12

Abdomen

Abdominal structures by quadrants:

1. Right upper quadrant (RUQ) – liver, gallbladder, pylorus (stomach), duodenum, hepatic flexure of colon and head of the pancreas, right kidney
2. Left upper quadrant (LUQ) – spleen, splenic flexure of colon, stomach (fundus and body), body and tail of pancreas and part of left lobe of liver, part of small intestine, left kidney
3. Left lower quadrant (LLQ) - sigmoid colon, descending colon, part of small intestine, left ovary, left fallopian tube, left ureter
4. Right lower quadrant (RLQ) – cecum, appendix vermiformis, ascending colon, part of small intestine (terminal ileum), right ovary, right fallopian tube and right ureter

Gastrointestinal presentation (disorders)

1. Abdominal pain, acute and chronic
    a. Associated symptoms with pain: indigestion, nausea, vomiting, hematemesis, loss of appetite (anorexia)
2. Difficulty swallowing (Dysphagia), and/or painful swallowing (Odynophagia)
3. Change in bowel function
4. Diarrhea
5. Constipation
6. Jaundice

Urinary and renal presentation (disorders)

a. Suprapubic pain, dysuria, urgency, frequency, nocturia, polyuria, urinary incontinence, hematuria
b. Flank pain and ureteral colic

Visceral pain

1. Caused by stretched hallow organ wall or stretched solid organ capsule
2. Typically palpable near midline
3. Nonspecific and difficult to localize
4. Quality: gnawing, cramping, aching

5. As the pain progresses – sweating, pallor, nausea, vomiting, and restlessness

Somatic pain

1. Originated from inflammation of the parietal peritoneum (**peritonitis**)
2. **Localized** or **diffused**
3. It steady, aching and more severe than visceral pain
4. More precisely localized over involved structure
5. It is aggravated by moving and coughing

Referred pain

1. Pain that is felt in more distant sites that is innervated approximately at the same spinal level as the disordered structure
2. Palpation at the site of referred pain often does not result in tenderness or pain
3. Gallbladder pain can refer to right shoulder, pancreas to lower back
4. Myocardial infarction can refer pain to epigastrium

Tips for examining abdomen

1. Patient in supine position with pillow under head and knee (Knees flexed)
2. Arms at side
3. Ask patient to show areas of pain
4. Only abdomen is uncovered
5. Warm up your hands
6. Visualize internal organs
7. Watch for patient facial expression of pain and discomfort
8. Inspection (observation), auscultation, percussion, palpation
    a. Chest (lung) – inspection, palpation, percussion, auscultation

Key components of the abdominal examination

1. Abdomen
    a. Inspect surfaces, contours of abdomen, look for scars, striae, masses
    b. Auscultation with diaphragm – listen for bowel sounds, bruits (large blood vessels)

    c. Percuss abdomen lightly in all four quadrants – listening tympany, dullness and areas of change of the sound
    d. Palpate lightly (superficially) in all four quadrants (one hand) – masses, skin lesion, lumps, muscle issues, guarding
    e. Palpate deeply (deep palpation) in all four quadrants
    f. Check for sings of peritonitis – guarding, rigidity, rebound tenderness
    g. (Percuss and palpate the painful area last)
2. Liver
    a. Estimate size of the liver with percussion – midclavicular line. Liver sound is dull. Percussion is towards the liver
    b. Palpate liver and characterize the liver edge (surface, consistency, tenderness)
3. Spleen
    a. Estimate the size of the spleen by percussion. Percuss for enlargement along Traube space
    b. Palpate for the spleen with patient in supine and in right decubitus position
4. Kidney
    a. Check for costovertebral angle (CVA) tenderness using fist percussion
5. Urinary bladder
    a. Percuss the urinary bladder (distension, tenderness)
6. Special techniques
    a. Ascites, appendicitis, cholecystitis, hernias, abdominal wall masses

Abdominal exam more in detail

Inspection

1. From the right side of the bed inspect the surface, contours and movements of abdomen (ask patient to take the deep breath with abdomen – watch for four quadrant symmetric movement). Watch for bulges or peristalsis. Try to lower your viewing point by stooping ore bending down.
2. Skin
    a. Color
    b. Scars

c. Stria – stretch marks. Pink-purple – Cushing syndrome. Silver stria (normal finding)
d. Dilated veins – caput medusa (liver disease)
e. Rashes and ecchymosis
    - Ecchymoses of abdominal wall – intraperitoneal and retroperitoneal hemorrhage
f. Umbilicus – bulges (hernia)

3. Contours of the abdomen
    a. Flat, rounded, protuberant or scaphoid (markedly concave)
    b. Bulging flanks of abdomen – ascites. Suprapubic bulge – distended bladder, pregnant uterus
    c. Is abdomen symmetrical
4. Pulsations
    a. Visible aortic pulsation can be normal in epigastrium in thin person
    b. AAA – abdominal aortic aneurysm
    c. Increased pulse pressure

Auscultation

1. Because percussion and palpation may alter the characteristics of the bowel sounds
2. Listen to bowel sounds for maximum of 5 minutes
3. Can listen in one location for sounds – RLQ
4. Frequency of 5 to 34 per minute = normoactive bowel sounds
    a. Clicks and/or gurgles
5. Auscultate over large arteries or pulsating masses for bruits
    a. 4-20% of healthy individuals have abdominal bruits
    b. Aorta, renal arteries, iliac arteries, femoral arteries

Which one of these are arteries that can be auscultated for bruits over abdomen?

a. Aorta
b. Aorta, renal artery, femoral artery
c. Aorta, femoral artery
d. Aorta, renal artery, iliac artery, femoral artery

Percussion

1. Percuss to determine amount and distribution of gas in the abdomen (tympany), to detect masses or fluid in the abdomen (Dullness)
2. Percuss the abdomen lightly and in all four quadrants
    a. Tympany predominates in norm
    b. Patient presents with 3 day history of constipation and feeling bloated. On observation abdomen is distended. On auscultation there less then 3 sounds per minute. On percussion there is tympany throughout – paralytic ileus
    c. Dullness – mass, fluid or enlarged solid organ

Palpation

1. LLQ -LUQ-RUQ-RLQ. If patient presents with pain in any quadrant palpate it last
2. Voluntary guarding. To reduce:
    a. Hip and knee flexion – relaxes abdominal wall
    b. Breathing through mouth
    c. Palpate after patient exhales
3. Involuntary guarding – persists despite any maneuvers – peritonitis
4. Light palpation – superficial tenderness, abdominal muscle resistance and superficial masses
5. Deep palpation
    a. Two hands, palmar surfaces of the fingers of hand below, press down in all 4 quadrants
    b. Masses (location, size, shape, consistency, tenderness, pulsation)
        - Solid -cancer
        - Pulsating – AAA
        - Diverticulitis (diverticulosis)
    c. Palpate large intestine segments found in each quadrant – sigmoid colon is easiest to palpate.
    d. Assessing possible peritonitis – inflammation of parietal peritoneum
        - Involuntary guarding, rigidity, rebound tenderness, percussion tenderness and cough test (can ask patient cough before palpation to identify the area)

e. Signs of Peritonitis
    - Guarding: contraction of the abdominal wall
    - Rigidity: involuntary reflex contraction of the abdominal wall
    - **Rebound tenderness**: pain produced by examiner pressing down and suddenly removing hand. Positive when withdrawal produce pain or increases the pain.

Liver

1. Most of the liver is behind rib cage – most of it is inaccessible to palpation
2. Percussion
    a. Percussion of the liver on midclavicular line – percuss from RLQ (tympany) upwards until sound changes to dullness (lower border). Percuss from thoracic cage (resonance) down to dullness (upper liver border)
    b. Vertical span of the liver – measurement between two point of percussion (upper and lower edge of the Liver)
        - Midclavicular – 6-12 cm
        - Midsternal line: 4-8 cm
        - Liver span increased – enlarged liver
        - Liver span is decreased – small liver
        - Displace liver – liver has dropped, lower edge is lower, but a span is normal. COPD
3. Palpation
    a. Palpate lower liver edge below the right costal margin
    b. Examiner places hands lateral to rectus abdominis and below the expected level of liver
    c. Ask the patient to take a deep breath and try to feel for liver edge approaching your fingers
        - Liver edge is soft, distinct in outline and smooth surface
        - After edge, relax your fingers little and at the next liver movement try feel anterior surface of the liver
        - On inspiration the liver lower edge can be palpable about 3 cm below the right costal margin in the midclavicular
        - Hooking technique – can be used in obese patient or thick abdominal wall. Place both hands side by side on the right abdomen below the

border of liver dullness, press in with your fingers and up towards the costal margin. Ask the patient to take the deep breath.

Spleen

1. When spleen enlarges it expands anteriorly, downward and medially
2. Percussion
   a. Left lower anterior chest wall from border of cardiac dullness (six intercostal space) to the anterior axillary line and down to the costal margin (Traube space)
      - Traube (Semilunar) space – lower edge of the left lung anterior border of the spleen and left costal margin
      - Traube space surface markings – left six rib (superiorly), left anterior axillary line (laterally), left costal margin (inferiorly)
   b. Dullness on percussion – splenomegaly. Stomach full with food and give dullness in Traube space
   c. Check for splenic percussion sing (Castell sign). Percuss the lowest interspace in the left anterior axillary line. This area is usually tympanic. Patient takes a deep breath – in norm still tympanic
      - A change from tympany to dullness on inspiration is positive Castel sign . Splenomegaly.
3. Palpation
   a. Palpate for lower splenic edge (in healthy person cannot palpate)
   b. Start below detected dullness and push towards spleen with right hand, the left hand supports the rib cage (to bring spleen closer to palpating hand). Ask the patient to take deep breath
   c. Palpation is done in supine and in right decubitus position (hips and knees partially flexed)

Kidneys

1. The kidneys are retroperitoneal organs and usually not palpable unless markedly enlarged
2. Percussion. Assess percussion tenderness over the CVA (costovertebral angle). In patient with pyelonephritis, renal colic or other kidney disease there will be tenderness.

a. Place palm of hand over CVA area and with other hands fist strike the hand on the body.
b. Sitting position – do this examination after examining posterior thorax and lung. Avoids need to reposition patient to frequently

Urinary bladder

1. Normally the urinary bladder is not palpable unless it is distended above the symphysis pubis
   a. Distended bladder – dome will feel smooth and round , non-tender
2. Percussion
   a. Percuss for dullness and height of the urinary bladder above the symphysis pubis. Bladder volume must be 400 to 600 mL before dullness appears.
3. Bladder infection (cystitis) – suprapubic tenderness on percussion and palpation

Aorta

1. Examiner auscultates for bruits in aorta and major arteries
2. Palpation – press firmly deep in the epigastrium, slightly left from the midline, and identify aortic pulsation.
   a. Starting age 50, asses the width of the aorta. In this age group aorta is not more than 3 cm wide, at average being 2.5 cm wide. Palpate with both hands on each side of the aorta
   b. Risk factors of AAA - >65, history of smoking, male, and does this person has any relative with AAA.
   c. Periumbilical or upper abdomen mass with expansile pulsation the >3 cm in diameter = AAA.
   d. Rupture. >4cm it is 15 times more likely to rupture, with mortality rate 85-90%
   e. Dissecting aneurysm – tearing, sharp pain

Special techniques

Assessing possible ascites

1. A protuberant abdomen with bulging flanks
2. Fluid sinks, bowels with gas rise

3. Percuss from area of central tympany to area of dullness on supine patient. Outward percussion in many directions. Map of border between tympany and dullness
4. Test for shifting dullness. After percussing supine examiner ask the patient to roll onto one side. Percuss and mark the borders again. In ascites dullness shifts to the more dependent side and tympany shift to the tope
5. Test for fluid wave – movement of water from one flank to another
6. Palpation of abdominal organs and masses in patient with ascites.
    a. Create brief jabbing movement directly towards anticipated structure – to try to displace the water in front

Assessing possible appendicitis

1. Assess for sings of McBurney point tenderness. McBurney point is 2 cm for ASIS on the line that runs from ASIS to umbilicus. (RLQ)
    a. Rebound tenderness – push in and quickly release
2. **Rovsing sign** (indirect tenderness) and referred rebound tenderness
    a. LLQ palpation and rebound causes pain in RLQ
3. Assess the psoas sign
    a. With the patient supine, place the hands just above the patients right knee and ask the patient to raise that thigh against your hand.
    b. Alternatively, ask the patient to turn to the left side and then extend the patient right thigh at the hip
    c. Pain on each technique is positive psoas sign – that there is irritation of right psoas muscle by an inflamed retrocecal appendix
4. The obturator sign
    a. Flex the patient's right thigh and the hip and flex the knee and perform internal rotation at the hip. This maneuver stretches obturator muscle. Right hypogastric pain – positive obturator sing, inflamed appendix has irritated obturator internus muscle
5. Rectal examination and women pelvic examination
    a. Used to try to detect atypical location of inflamed appendix

Assessing possible acute cholecystitis

1. Patient presents with complains of RUQ pain. Regular palpation produces no tenderness

2. Test for Murphy's sign
    a. Deeply palpate RUQ on expiration. Ask the patient to take the deep breath.
    b. A sharp halting in inspiration effort due to pain from palpation of the gallbladder is positive Murphy sign
3. 5F – female, >40, fair, fat, fertile (many children)
4. This test is only useful in patient who do note pain in RUQ on regular palpation
5. Cholesterol stones –acute cholecystitis

Assessing ventral hernias

1. Linea alba and umbilicus (exclusive of groin hernias)
2. Ask the patient to raise both legs of the table and perform a Valsalva maneuver to increase intraabdominal pressure.
    a. Bulge of a hernia that appear with this action
    b. Diastasis recti – benign 2-3 cm gap in the recuts muscle which can be seen in obese and postpartum patients

Abdominal wall mass

1. Is it abdominal wall or intraabdominal mass
2. Ask the patient raise the head and shoulders and tighten abdominal muscles.
    a. Abdominal wall mass remains and is palpable. If it is intraabdominal mass – cannot palpate

Upper abdominal pain, discomfort and heartburn

1. Acute upper abdominal pain
    a. SIQOR AAA
2. Chronic upper abdominal pain
    a. SIQOR AAA

Causes

1. GERD – epigastric, behind the sternum
    a. Endoscopy

    b. The best – 24 hr pH monitoring
    c. Of those with suspected GERD – 50-85% have no disease on endoscopy
2. PUD – epigastric
3. Gastric cancer – epigastric
4. Acute cholecystitis - RUQ
5. Biliary colic – RUQ
6. Acute pancreatitis – level of umbilicus and into epigastrium of the left
7. Chronic pancreatitis
8. Pancreatic cancer

Lower abdominal pain and discomfort

Causes

1. Acute appendicitis – RLQ
    a. WBC count – elevated (Order CBC)
2. Acute diverticulitis – LLQ
3. Acute bowel obstruction – any where
4. Mesenteric ischemia – in small intestine area

Combining clinical examination findings with laboratory inflammation markers and imaging (CT scan, ultrasound) – reduces misdiagnosis and unncesessary surgeries

Associated gastrointestinal symptoms

1. Indigestion – distress associated with eating with many meanings
2. Nausea and vomiting
    a. Regurgitation – GERD (cancer, Zenker diverticula)
    b. About material in R or V
3. Hematemesis
    a. Blood in the vomitus
    b. Gastric juice – clear and mucoid
    c. Greenish/yellow – bile
    d. Brownish or blackish with a coffee grounds = blood altered by gastric juice
    e. Fresh blood – hematemesis

f. >500 mlL

4. Anorexia
   a. intolerance to certain foods, food fear/fear of abdominal discomfort
   b. Early satiety or fulness – gastric cancer, gastric outlet obstruction, diabetic gastroparesis
5. Difficulty swallowing (dysphagia) and/or painful swallowing (odynophagia)
   a. Food sticks and does not go down well – motility disorder
   b. Xerostomia (insufficient saliva) – gives sensation of difficulty swallowing
   c. Indicators of oropharyngeal dysphagia – delay in initiating swallowing, postnasal regurgitation, cough from aspiration and repetitive swallowing
      - Esophageal d: rings, webs, strictures, cancer
      - Motor d: diffuse spasm, scleroderma, achalasia
      - Neurological issues – stroke, PD, MG
   d. Patient after taking NSAID's can present with dysphagia and odynophagia – ulceration. What else can be the cause – HIV, Herpes, CMV, Candidiasis
6. Changes in bowel function
   a. Gas (flatus)
   b. Diarrhea
      - Nosocomial diarrhea – diarrhea that start in the hospital, generally after 72 hours and is less than 2 weeks in duration. The most common cause – Clostridium difficile infection
   c. Constipation
   d. Melena – black tarry stool
      - Fecal blood test
      - Involves > 60 mL into GI tract , esophagus, stomach and duodenum with transit time 7-14 hrs
   e. Black stool
      a. Iron, bismuth salts, licorice, even chocolate
   f. Hematochezia – stool with red blood – rectum, colon, anus, (jejunum, ileum)
      - > 1L from Upper GI bleed