

Abdomen

Examination Procedures

Preparing for the exam

- Firstly, make sure the patient is comfortable
- Warm hands
- Short fingernails
- Empty bladder (decreases guarding)
- Pillow under the head
- Arms at the sides
- Knees flexed (may need a pillow for support)
- Drape the patient for comfort (temperature)

Landmarks

- The abdomen can be divided into either:
- Four quadrants:
 - RUQ, LUQ, RLQ, LLQ
 - Dividing lines between the xiphoid and superior pubis, and through the umbilicus
- Nine regions:
 - 1. Epigastric, 2. Umbilical, 3. Hypogastric (pubic), 4. and 5. right and left hypochondriac, 6. and 7. right and left lumbar, 8. and 9. right and left inguinal
 - Dividing lines: the lowest edge of costal margin and the iliac crests and two at the midclavicular lines

Inspection of the Abdomen

- Surface characteristics
 - Skin color, skin lesions or moles, bruises, striae, ascites, umbilical hernia, scars (adhesions)
- Contour
 - Symmetry, surface motion, location of the umbilicus, distention, bulges
 - Ask the patient to breath in and hold; the contour should remain symmetrical, but could emphasize bulges or distention with the compression of tissue
 - Next, ask the patient to raise his head off the pillow (half sit-up); contraction of the rectus abdominus produces muscle prominence; hernias or masses may appear
- Hernias may appear at surgical incisions and at the umbilicus (protrusion of the navel)
- Common in pregnancy, obesity, ascites, or long-standing COPD

Inspection of the Abdomen

- Movement
 - With the patient's head back on the table, observe for movement
 - Smooth movement should occur with respiration
 - Limited abdominal movement may indicate respiratory problems, peritonitis, pain
 - Peristalsis may be seen, but is usually not visible
 - If peristalsis is seen as a rippling movement, it may indicate bowel obstruction
 - Observe for MARKED pulsations of the aorta

Auscultation for the Abdomen

- The next step after inspection is auscultation
- Why isn't palpation or percussion the next step?
- Listening for two types of sounds:
 - Bowel sounds
 - Vascular sounds

Bowel sounds

- **Place the warmed diaphragm** on the abdomen and hold in place with very light pressure
- A cold stethoscope may cause contraction of the abdominal muscles
- Listen for bowel sounds and note their frequency and character
- Normally, bowel sounds are heard at a frequency of 5 to 35 per minute

Bowel sounds

- Bowel sounds are usually heard as clicks and gurgles that occur irregularly
- Loud, prolonged gurgling is called borborygmi
- Increased bowel sounds may occur with gastroenteritis, early obstruction, or hunger
- High-pitched tinkling sounds occur with intestinal fluid and air under pressure of early obstruction
- Decreased bowel sounds occur with peritonitis and paralytic ileus
- The absence of bowel sounds can only be determined after 5 minutes of continuous listening
- Auscultate all 9 regions

Vascular sounds

- **Listen with the bell** for the low pitched sounds of the vascular system
- Listen for bruits in the aortic, renal, iliac, and femoral arteries
- Listen with the diaphragm for friction rubs over the liver and spleen (high-pitched heard with respiration); friction rubs are rare, but heard with inflammation of the peritoneum (tumor, infection, infarct) (**not a separate exam—perform with bowel sounds exam**)
- Auscultate with the bell over the umbilicus for a venous hum (soft, low-pitched, continuous; indicates portal hypertension and shunting)

Peritoneal irritation

- Inflammation of the peritoneum may be identified as cutaneous hypersensitivity
 - To evaluate, gently lift the skin over the hypersensitive area
- or
- Stimulate the skin with a pen or tongue depressor
 - True cutaneous hypersensitivity will have an exaggerated pain response to the stimulus

Percussion of the Abdomen

- Percussion of abdominal structures is used to assess the size and density of the organs and to detect the presence of fluid, air, or masses
- Percussion is used in combination with palpation and is used to confirm palpatory findings
- Tympany is the predominant sound in abdominal percussion because of the air in the stomach and intestines
- Dullness is heard over organs and solid masses

Percussion of the **intestines/bowel**

- Percussion of the intestines is best accomplished by systematically percussing in all 9 regions (2-3 sites per region)
- In interpreting the sounds, it helps to anticipate the expected sound from the structure
- For example, the small intestines (central) will have greater tympany than the large intestines
- The ascending and transverse colons typically have a mixture of fecal material and bowel gas
- The descending colon and sigmoid colon typically have more solid fecal material; therefore more dullness is expected

Gastric bubble percussion

- The gastric air bubble (meganblase) should percuss as a deeper tympany at the left anterior rib cage and the epigastric region
- (Performed with bowel percussion; not a separate examination)

Liver percussion

- Beginning in an area of tympany, percuss the liver at the right midclavicular line in the RUQ and move **superiorly**
- Remember that the posterior aspect of the lung field is quite low (T10), but the anterior aspect is high (5th-6th rib)
- You will **usually** percuss the lower border of the liver around the inferior costal margin or slightly below
- If the liver percusses more than 1 inch below the costal margin, consider hepatomegaly or downward displacement of the liver due to a depressed diaphragm

Liver percussion

- To find the superior border of the liver, start again at the midclavicular line, in an area of lung tympany (3rd-4th intercostal space)
- Percuss **inferiorly** until the note becomes dull
- The upper border usually begins at the 5th-7th intercostal space
- A superior liver border below this area may indicate liver atrophy or downward displacement of the liver by lung disease
- A superior liver border above this area may indicate upward displacement due to abdominal mass or hepatomegaly

Liver percussion

- To estimate the liver size, measure between the superior and inferior marks
- The usual size is 6 to 12 cm (2.5-4.5 inches)
- This is only a **gross estimate**
- Pleural effusion and lung consolidation can obscure the superior liver border
- Gas in the ascending and transverse colon can obscure the inferior liver border

Additional/alternate maneuvers

- Liver descent: ask the patient to take a deep breath and hold it while you again percuss upward from the abdomen; the inferior border should move 2 to 3 cm downward
- Axillary percussion: for females, or if enlargement is suspected, percuss in the right midaxillary line; dullness should be noted at the 5th-7th intercostal space (for superior border)

- If you suspect liver atrophy, hepatomegaly, or abdominal mass, you would next proceed to plain film imaging, followed by CT or US

Spleen percussion

- Percuss the spleen just posterior to the midaxillary line on the left, again beginning in an area of tympany
- Dullness should be heard at the 6th-10th intercostal spaces
- A larger area of dullness suggests splenomegaly; however, a full stomach or intestines could give false-positive findings
- Finally, percuss at the lowest costal margin with inspiration and with expiration
- The area should remain tympanic

Palpation

- Purpose:
 - Palpation is used to detect organomegaly, muscles spasm, fluid collection, painful areas, masses, adhesions
- Just like inspection, auscultation, and percussion, make sure the patient is relaxed with the knees flexed
- Caveat: Some people (especially children) are ticklish and the key is to use distraction; palpate and percuss over the patient's hands and/or place the non-palpating hand over a less sensitive body part

Light palpation

- You always begin with light palpation
- Never go right to deep palpation
- Begin with light, systemic palpation of all 9 regions
- Initially, you should avoid the areas that were identified in the history as problematic—why?
- Begin with your palm on the patient, fingers together
- Depress the abdominal wall no more than 1cm, using light smooth, consistent motions (don't jab at the patient)
- The abdomen should feel smooth and soft

Light palpation

- Light palpation helps identify muscular guarding and inflammation of the organ or peritoneum
- False-positive muscle guarding can occur with cold hands and ticklishness
- A large mass or distended structure may first be identified as an area of resistance
- If resistance is noted, palpate while the patient breathes slowly through the mouth
- If resistance remains, it is probably involuntary (indicating a mass or anomaly)

Moderate palpation

- Moderate palpation is mostly a transitional move to deeper palpation (2-3 cm depth)
- Tenderness not identified with light palpation may be evident with moderate palpation, saving the surprising pain response to deep palpation

Deep palpation

- Deep palpation is necessary to thoroughly evaluate the abdominal organs and to detect less obvious masses
- Again, use the palm of the hand with fingers together and palpate all 9 regions
- You often will be able to feel the borders of the rectus abdominus, colon, aorta
- **False-positive pain may occur in the healthy patient over the cecum, sigmoid, aorta, and xiphoid process (and other bony prominences, esp. floating ribs)**

Deep palpation of masses

- Palpate for masses and assess:
 - Location
 - Size
 - Shape
 - Consistency
 - Tenderness
 - Pulsation
 - Mobility
 - Movement with respiration

Masses

- **False-positive masses:**
 - Feces in the colon (should be soft, boggy, and eventually move through remaining colon)
 - Lateral borders of rectus abdominus
 - Uterus
 - Aorta
 - Common iliac arteries

Umbilical ring

- Palpate the umbilicus and surrounding area
- The umbilicus should be round, firm, and free of bulges and masses
- Softness of the center could indicate an umbilical hernia

Bimanual technique

- If adipose deposition or muscle mass prevents deep palpation, you can use bimanual palpation to exert pressure over the abdominal structures
- Okay to use bimanual palpation for all patients, just don't exert excessive pressure on thin patients or children

Liver palpation

- Stand to the right of the patient
- Place your left hand under the patient at the inferior costal margin (11th-12th ribs)
- Press the left hand upward in order to lift the liver anteriorly toward the abdominal wall
- Place your right hand on the abdomen, with fingers pointing towards the head at the right midclavicular line or pointing towards midline
- Press the right hand downward as the pt exhales
- Ask the patient to take a deep breath, which pushes the diaphragm downward (*alternate/option*)

Liver palpation

- **You may not be able to feel the liver in many individuals**
- In thinner individuals, you may feel the inferior margin
- If the liver is palpated, it should feel smooth, firm, regular (hotdog); should be nontender
- Palpate for nodules, tenderness, irregularity
- Repeat palpation across the medial to lateral margins

Liver palpation: **alternate**

- Stand at the patient's right side, positioned toward the head but facing the feet
- Hook the fingers of both hands under the costal margin, below the level of dullness percussed earlier
- Press in and up while the patient exhales
- Continue to press in and up as the patient breathes deeply

Liver palpation: fist (pain) percussion/liver punch

- **When tenderness cannot be palpated, you may use fist percussion (indirect)**
- Place the palm over the lower right rib cage
- Strike the hand with the fist of the other hand
- A healthy liver is not tender to fist percussion (but not all unhealthy livers are tender)
- This should be performed after palpation (even though it is a percussive force), as it is intended to evaluate for pain

Gallbladder palpation

- Palpate below the liver margin at the lateral border of the rectus abdominus (medial portion of the liver)
- **Most healthy gallbladders are not palpable**
- A tender gallbladder indicates cholecystitis
- A nontender but palpable gallbladder indicates obstruction of the duct (stones) or cholelithiasis

Murphy's sign

- If cholecystitis is suspected (gallbladder "attack"), you may perform Murphy's test
- During deep palpation of the gallbladder region, ask the patient to take in a deep breath
- As the inflamed gallbladder wall moves closer to the peritoneum and palpating hands, the patient will experience pain and **halt inspiration (positive sign)**

Spleen palpation

- Stand to the patient's right
- Reach across the patient to the left side with your left hand and place it beneath the patient at the left costovertebral margin, pressing upward (just like liver palpation, **but at the MIDAXILLARY LINE**)
- Place the palm of the right hand on the abdomen below the left costal margin
- Press your fingertips inward as the patient inhales deeply
- The spleen should move inferiorly, but is **usually not palpable in adults**

Spleen palpation (alternate)

- Repeat palpation of the spleen with the patient in a right lateral decubitus position with knees flexed
- This moves the spleen more anteriorly and to the right

Kidney palpation/kidney punch

- Kidney (percussion) is best accomplished first with the patient seated (do with lumbar exam)
- Place the palm of one hand at the posterior inferior costal margin
- Strike your hand with the fist of the other as you did for liver percussion
- Repeat at the opposite posterior inferior costal margin
- Normally, the patient feels a “thud” which does not produce pain
- Direct percussion may also be used

Left kidney palpation

- With the patient supine, stand on the right side
- Reach across the patient (as with spleen) with your left hand and place underneath the patient at the flank
- Place your right hand at the anterior costal margin and press deeply (retroperitoneal)
- As the patient inhales deeply, you may feel the lower pole of the kidney
- The left kidney is **usually** not palpable

Left kidney palpation (alternate)

- Move to the left side of the patient and position hands as before (better for shorter doctors)
- When the patient inhales deeply, press the two palms together to “capture” the kidney
- Ask the patient to exhale and hold while you slowly release your hands
- You may feel the kidney slip through your grasp
- This should not be painful to the healthy kidney

Right kidney palpation

- Stand on the right side of the patient, placing the one hand at the flank and the other at the anterior costal margin
- Perform the same moves as with the left kidney
- The right kidney tends to be more palpable than the left—why?
- If it is palpable, it should be firm, smooth, nontender
- By contrast, the liver margin is sharper than the renal margins

McBurney’s Point

- Approximately 2/3 distance from the navel to the ASIS (obliquely)
- Tender to palpation with appendicitis
- McBurney’s (**Rebound**) **Test**: Rebound test positive when appendix has irritated the peritoneum

Table 17-6: Abdominal Signs

- Rovsing’s: RLQ pain worsened by LLQ palpation; indicates peritonitis, appendicitis
- Blumberg’s: Rebound tenderness (anywhere); indicates peritonitis, appendicitis
- Iliopsoas muscle test: moving the psoas across the appendix, producing pain
- Obturator muscle test: rotation of the leg; appendix rupture can cause obturator muscle irritation
- Heel jar or heel strike tests (anvil test)