Making sense of abdominal assessment

By Mary C. O'Laughlen, RN, FNP-BC, PhD
Assistant Professor • University of Virginia School of Nursing • Charlottesville, Va.

With abdominal assessment, you inspect first, then auscultate, percuss, and palpate. This order is different from the rest of the body systems, for which you inspect, then percuss, palpate, and auscultate. The difference is based on the fact that physical handling of peritoneal contents may alter the frequency of bowel sounds.

What do you need to know about inspection, auscultation, percussion, and palpation of the abdomen? In this article, I'll help you make sense of abdominal assessment.

Inspection

First, take a look at the abdomen. You do most of the exam standing to the right of your supine patient. The abdomen is divided into four quadrants by drawing an imaginary vertical line down the middle of the sternum and a horizontal line through the umbilicus (see *Abdominal quadrants and their structures*).

Inspect for symmetry while standing at the side of your patient, then move to a position behind his head. Note the contour of the abdomen: Is it flat, scaphoid (concave), or protuberant (convex)? A flat contour is expected in well-muscled, athletic adults; thin adults may have a scaphoid abdomen. A rounded abdomen is commonly seen in young children, but in adults it's the result of poor muscle tone from inadequate exercise or being overweight. A localized enlargement may indicate a hernia, tumor, cysts, bowel obstruction, or enlargement of abdominal organs. Ask your patient to take a deep breath and hold it because this lowers the diaphragm and compresses the organs of the abdominal cavity, which may make previously unseen bulges or masses appear.

To assess the abdomen for herniation or diastasis recti (the separation of the rectus abdominis muscles often caused by pregnancy or obesity), or to differentiate a mass in the abdominal wall from one below it, ask your patient to raise his head. A bulge seen in the abdomen is a common symptom of a hernia. Abdominal hernias are caused by a combination of muscle weakness and strain that produces an opening in the abdominal musculature through which the abdominal contents move.

Next, inspect the abdomen for changes in pigmentation and color of the skin. Cullen's sign, a bluish color at the umbilicus, is a sign of bleeding in the peritoneum. Grey Turner's sign is bruising on the flanks indicating retroperitoneal bleeding, such as in pancreatitis. Jaundice is usually caused by liver disease or biliary tract obstruction.

Scars should be correlated with the patient's recollection of previous operations or injuries. An injury that caused a visible scar may have also caused adhesions (internal scarring) that may cause intestinal obstruction. Striae (stretch marks) on the abdomen may be a sign of past weight changes or pregnancy. Cushing's disease may cause purple striae. Also inspect for any lesions or nodules. They may or may not be related to gastrointestinal diseases. For example, an enlarged umbilical node may signal metastatic cancer. Liver disease may cause spider angiomas (spiderlike blood vessels that develop on the skin) or caput medusae (dilated superficial veins radiating from the umbilicus).

Peristalsis is the rhythmic contraction of smooth muscles to propel contents through the digestive tract that may be seen as a rippling movement across a section of the abdomen. However, peristaltic movement isn't normally seen on the surface of the abdomen. Visible peristalsis is usually

abnormal and may be a sign of an intestinal obstruction. Pulsation in the upper midline is often visible in thin adults. Marked pulsations may be the result of increased pulse pressure or an abdominal aortic aneurysm.

Auscultation

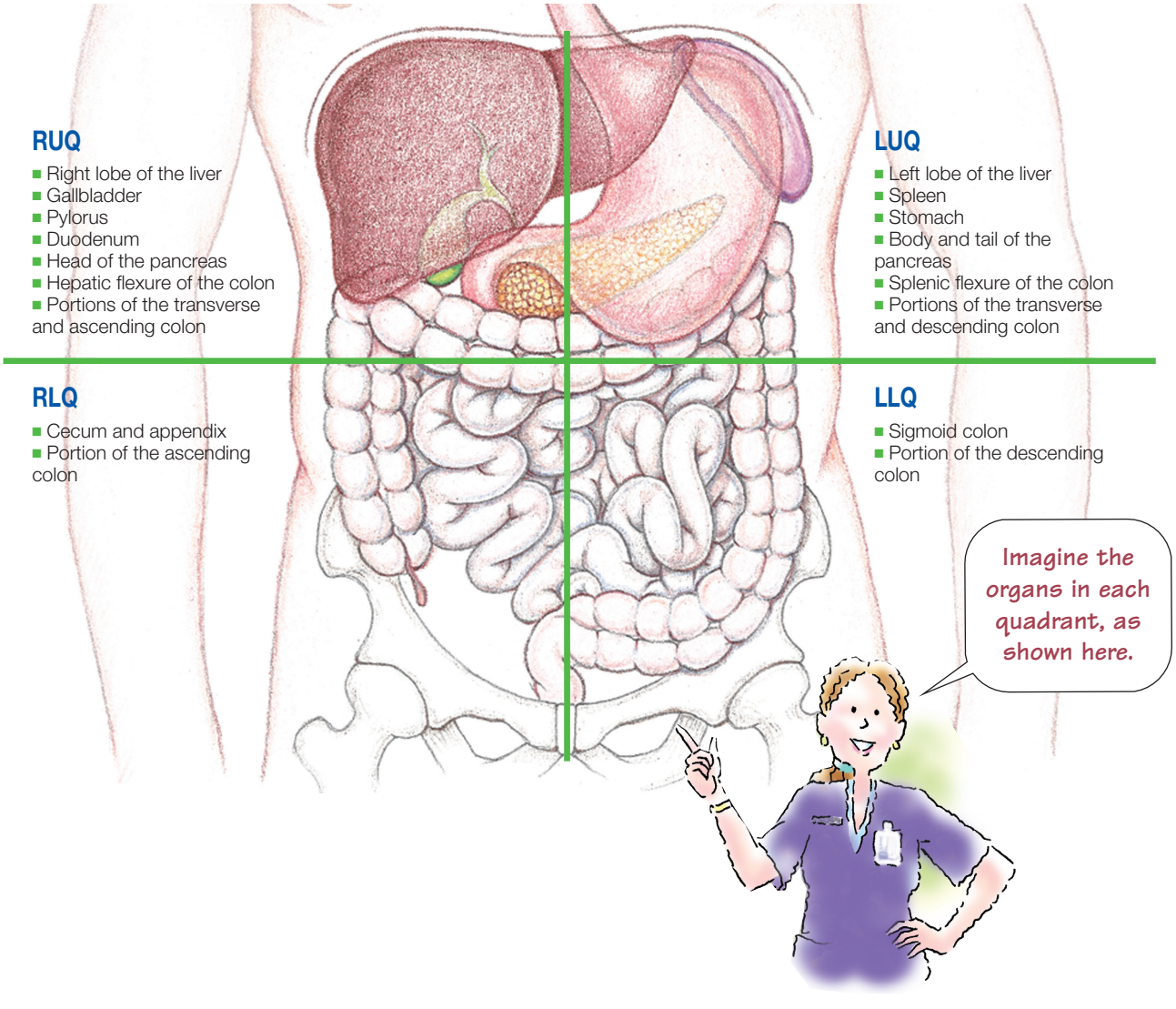
Normal gut sounds are gurgling sounds (usually occurring 5 to 35 per minute) that can be heard with the diaphragm of a stethoscope. Decreased sounds, such as no sounds for 1 minute, are a sign of decreased gut activity. Gut sounds may be markedly decreased after abdominal surgery, abdominal infection, or injury. Absent sounds (no sounds for 5 minutes) are an ominous sign. They can be caused by intestinal obstruction, intestinal perforation, or intestinal ischemia or infarction. See *What's that sound?* for other sounds you may hear.

Percussion

Percussing the body gives one of three results:

Abdominal quadrants and their structures

The abdomen can be divided into four areas: the right upper quadrant (RUQ), left upper quadrant (LUQ), right lower quadrant (RLQ), and left lower quadrant (LLQ).



• ***Tympany*** is usually present in most of the abdomen caused by air in the gut (a higher pitch than the lungs).
• ***Resonance*** is a lower-pitched and hollow sound (found in normal lungs).
• ***Dullness*** is a flat sound without echoes; the liver, spleen, and fluid in the peritoneum (ascites) give a dull note, but an unusual dullness may be a clue to an underlying abdominal mass.

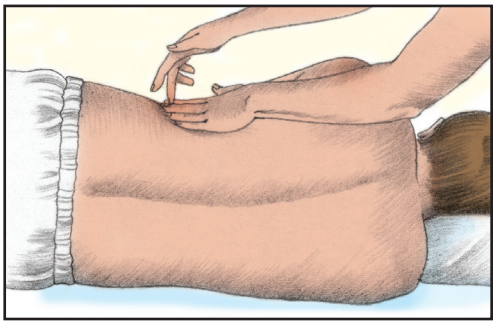
With your patient supine, percuss all four quadrants of the abdomen using proper technique. Hyperextend the middle finger of your nondominant hand and place this finger firmly against your patient's abdomen. With the end (not the pad) of your dominant middle finger, use a quick flick of your wrist to strike the finger on the abdomen. Categorize what you hear as tympanitic or dull.

You shouldn't be able to percuss the bladder unless it's distended above the symphysis pubis. Use percussion to check for dullness and to determine how high the bladder rises above the symphysis pubis.

To percuss the liver, begin at the right midclavicular line over an area of tympany, moving to an area of dullness. Percuss upward along the midclavicular line from the level of the umbilicus to determine the lower border of the liver; the area of liver dullness is usually heard at the costal margin or slightly below it. A lower liver border

that's greater than 3 cm below the costal margin may indicate organ enlargement. To determine the upper border of the liver, begin percussion on the right midclavicular line at an area of lung resonance and continue downward until the percussion tone changes to one of dullness; this marks the upper border of the liver. The usual span of the liver is approximately 6 to 12 cm. A vertical span greater than this may indicate liver enlargement; a lesser span suggests atrophy. The liver is proportionate to the height and weight of your patient.

Percuss the spleen at the lowest costal interspace in the left anterior axillary line. This area is normally tympanitic. Ask your



patient to take a deep breath and percuss again. Dullness with full inspiration may be a sign of an enlarged spleen or splenomegaly.

To percuss the kidneys, have your patient sit up on the exam table, place the palm of your nondominant hand over the right costovertebral angle, make a fist with your dominant hand, and use the ulnar surface to strike your nondominant hand. Repeat the maneuver over the left costovertebral angle. Compare the left and right sides. Costovertebral angle tenderness is often associated with renal disease, but

What's that sound?

Use the ***diaphragm*** of your stethoscope to listen for these sounds.
• ***Borborygmi*** (BOR-boh-RIG-mee) are normal, loud, and easily audible sounds.
• ***High-pitched***, tinkling sounds are a sign of early intestinal obstruction.
• A ***friction rub*** is a high-pitched sound heard in association with respiration. Although friction rubs in the abdomen are rare, they indicate inflammation of the peritoneal surface of the organ from tumor, infection, or infarct. Listen for them over the liver and spleen.

Use the ***bell*** of your stethoscope to listen for these sounds.
• ***Aortic bruits*** are heard in the epigastrium. They may be a sign of abdominal aortic aneurysm.
• ***Renal artery bruits*** are heard in each upper quadrant. They may be a sign of renal artery stenosis, which is a potentially treatable cause of hypertension.
• ***Iliac/femoral bruits*** are in the lower quadrants. They may be a sign of peripheral atherosclerosis.
• A ***venous hum*** is a soft, low-pitched, continuous sound heard in the epigastric region and around the umbilicus. It occurs with increased collateral circulation between the portal and systemic venous systems.

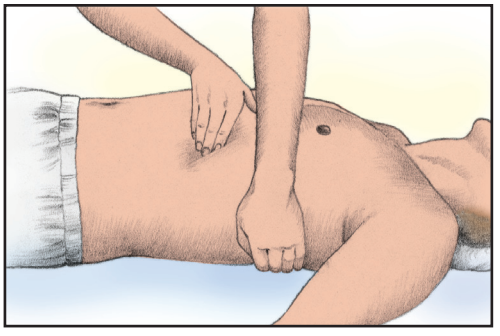
could be muscular in origin. You may want to percuss the kidneys later in the exam so as not to tire your patient.

Palpation

With your patient in the supine position, begin light palpation by depressing the abdominal wall no more than 1 cm. At this point, you're mostly looking for areas of tenderness. The most sensitive indicators of tenderness are your patient's facial expression. Also note any abdominal guarding that's present. Next, proceed to deep palpation, depressing 3.8 to 5 cm in an effort to identify abdominal masses or areas of deep tenderness. If your patient is ticklish, place your hand over his hand while palpating.

Palpate the liver by placing your left hand under your patient and your right hand lateral to the rectus muscle, with your fingertips below the liver border. Because the liver moves down on inspiration, press gently in and up as your patient takes a deep breath. The liver is considered enlarged if the edge extends more than 2 cm below the right costal margin. If your patient is obese, use the hooking technique. Stand by his chest, hook your fingers just below the costal margin, and press firmly. Ask him to take a deep breath. You may feel the edge of the liver press against your fingers as it descends on inspiration.

When palpating the spleen, stand on your patient's right side and reach over, using your left hand to lift his left lower rib cage and flank. Press down just below the left costal margin with your right hand and ask him to take a deep breath. If enlarged, the spleen will come down on inspiration and



you'll feel the tip. The spleen isn't normally palpable on most individuals.

To palpate the left kidney, stand on your patient's right side and reach across with your left hand. Place that hand over the left flank and your right hand at your patient's left costal margin. Have him take a deep breath, elevate the left flank with your left hand, and palpate deeply (because of the retroperitoneal position of the kidney) with your right hand. Kidneys move down with inspiration, so try to feel the lower edge of the kidney when your patient inhales. The left kidney is ordinarily not palpable unless enlarged.

To palpate the right kidney, place one hand under your patient's right flank and the other hand at the right costal margin. Because of the anatomic position of the right kidney (lower because of being pushed down by the liver), it's more easily palpable than the left kidney. If it's palpable, it should be smooth, firm, and nontender.

The importance of assessment

Performing an abdominal assessment will help you detect health problems in your patients earlier and prevent further complications from developing with existing disease. And now you've learned how to do a thorough physical assessment of the abdomen and the importance of systematically documenting your findings. ■

Learn more about it

Bickeley LS, Szilagyi PG. *Bates' Guide to Physical Examination and History Taking*. 10th ed. Philadelphia, Pa., Lippincott Williams & Wilkins; 2008: 434-451.

Health Assessment Made Incredibly Visual! Philadelphia, PA, Lippincott Williams & Wilkins; 2007:132-139.

University of Washington. Techniques: Liver and ascites. http://depts.washington.edu/physdx/liver/tech.html.