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Physical Examination of the Abdomen: Inspection and Auscultation

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Overview

~~In this video we will learn how to perform the first two parts of the physical examination of the abdomen: visual inspection and auscultation. As with the other parts of a physical examination, these~~Gastrointestinal disease accounts for millions of office visits and hospital admissions annually. Physical examination of the abdomen is a crucial tool in diagnosing diseases of the gastrointestinal tract, and in addition it can help identify pathological processes in cardiovascular, urinary, and other systems. As physical examination in general, the examination of the abdominal region is important for establishing physician-patient contact, for reaching the preliminary diagnosis and selecting subsequent laboratory and imaging tests, and determining the urgency of care.

As with the other parts of a physical examination, visual inspection and auscultation of the abdomen are done in a systematic fashion, so that no potential findings are missed. Special attention should be paid to potential problems already identified by the patient's history.

Here we assume that the patient has already been identified, history taken, symptoms discussed, and areas of potential concern identified. In this video we will not review the patient's history, instead going directly to the physical examination.

Before we get to the examination let's briefly review surface landmarks of the abdominal region, abdominal anatomy, and topography. Here is a list of useful landmarks: costal margins, xiphoid process, rectus abdominal muscle, linea alba, umbilicus, ileac crest, inguinal ligament, and symphysis pubis (Fig.1). The abdominal exam covers the area down from the xiphoid and costal margins superiorly to the symphysis pubis inferiorly.

For diagnostic and descriptive purposes the abdomen is subdivided into four quadrants: right and left upper quadrants and right and left lower quadrants (Fig.2). The more detailed topography of the abdomen divides it into 9 regions: right and left hypochondriac, right and left lumbar, right and left iliac, and also epigastric, umbilical, and hypogastric regions in the middle (Fig.3).

Remember which organs typically project into each abdominal region (Fig.4). It is essential to know the region's anatomy and topography well to adequately document and interpret a patient's complaints and symptoms, as well as physical findings during the examination.

Procedure and representative findings

1. Preparation for exam:

Comment [AK1]: This sounds like script language. Do we want that for these overview sections? Shouldn't they sound more academic in nature?

Comment [AK2]: Also, scientific literature typically starts off with describing the significance of the main topic before getting into what the paper specifically addresses.

Have a look at this example.

http://www.jove.com/science-education/5201/an-introduction-to-neurophysiology

Comment [AK3]: Very informal. This sounds like the language that we would include in a script. We need to decide if we want the text content to have the same tone. Our existing SciEd content has more formal sounding summaries.

Comment [DM4]: I tend to think this sort of wording is fine for our audience in this instance.

1.1. Positioning the patient.

1.1.1 Before you start the physical exam of the abdomen, make sure that the patient is comfortable and has emptied his/her bladder.
1.1.2 Comfortably place the patient in the supine position, possibly with a pillow under their head and their knees slightly flexed. The patient's arms should be at their side and not folded behind their head, as this tenses the abdominal wall.
1.1.3. Ask the patient for permission to expose their abdominal area ("Is it ok if I move the sheet to inspect your stomach?"). Drape the patient in a way that maintains their modesty on the one hand, but doesn't compromise the exam on the other. The abdomen is exposed from above the xiphoid to the suprapubic region and the groin exposed as well.

1.2. Getting ready.

1.2.1. Make sure there is enough light and that noise is minimized (by turning off TV or radio in the room).
1.2.2. Before approaching the patient determine if there is a need for contact precautions.
1.2.3. Wash your hands (or alternatively use topical antibacterial preparations) and then warm your hands and the stethoscope. As with other parts of a physical examination, position yourself on the patient's right side, and explain each step of the exam to them as it progresses.

2. Quick overview of abdominal examination procedure.
The examination should be performed in a structured fashion, following a particular procedure. The initial comprehensive exam is first and once some pathological findings are identified, a more detailed examination of those specific findings follows. The areas of pain or tenderness should be examined last. Once the patient is positioned and ready to be examined, the sequence of the procedure is: inspection, auscultation, palpation, percussion. The difference in sequence compared to other parts of examination is based on the fact that palpation can affect bowel sounds and therefore is done last. Let us go through these elements in details.

3. Inspection.

Start with a visual inspection of the abdomen.

3.1 Before starting the examination explain to the patient that their abdomen is going to be inspected. ("I need to inspect your stomach now").

3.2 Visually inspect the skin looking for rashes/ecchymoses, jaundice, dilated veins, striae, lesions, bruises, and scars. If scars are present, ask the patient about them and document them in the patient's history.

3.3 Examine the shape of the abdomen.

Comment [AK5]: I take it that the intention here is to record dialogue. I suppose that this might come up in future medical content. How important is it that we hear what the physician is saying.

Comment [AK6]: I take it that the intention here is to record dialogue. I suppose that this might come up in future medical content. How important is it that we hear what the physician is saying.

Comment [DM7]: It would be nice to have some voice over here, but to answer your question, I don't think it's of the utmost importance.

Comment [AK8]: I suppose that you mean stomach in this instance to refer to the entire abdomen. Perhaps we should just have the physician say "abdomen" as to not confuse the viewer that what follows is specifically intended to examine the patient's stomach with palpation, percussion, etc.

Comment [DM9]: I don't think this will lead to much confusion, and in actual practice, a doctor is more likely to say "belly". I think leaving "stomach" in is fine.

Is it flat, scaphoid, or protuberant? Scaphoid abdomen can be seen in cachectic patients. Global abdominal protuberance can result from gas, fluid, or fat.
Does the abdomen look symmetric or not? Asymmetry is a warning sign and can suggest masses or organomegaly.
Are parts of the abdomen bulging? Bulging flanks are a sign of accumulation of fluid in the abdomen (ascites).

3.4 Check for visible hernias and abdominal masses. ~~These findings are addressed in detail in other videos in the collection.~~

Comment [AK10]: I don't think this is necessary.

3.5 Pay attention to the presence of visible pulsation or peristalsis, which usually represent a serious problem. Sometimes visible peristalsis can be seen in intestinal obstruction.

3.6 Note the presence of tubes, catheters, and other devices.

3.7 Pay special attention to the umbilical area. Examine for protuberances, inflammation, hernias, shifts along the vertical line, and purplish skin discoloration. Purplish skin discoloration indicates a subcutaneous intraperitoneal bleed and is associated with acute hemorrhagic pancreatitis.

4. <u>Auscultation</u>.

Abdominal sounds are typically generated by peristalsis and blood flow, and sometimes friction rubs. Auscultation is performed in two or three cycles, each time listening for a particular sound, rather than trying to listen for all the sounds at the same time. Initially listen to bowel sounds, then focus on vascular sounds or bruits. Finally, while rare, check to see if there are any friction rubs.

4.1. Explain the procedure to the patient ("I am going to listen to your stomach/belly now")

4.2 Pre-warm the stethoscope.

4.3 Using the diaphragm of the stethoscope listen for bowel sounds over each of the four abdominal quadrants for 30-40 seconds: note their frequency and character. Gurgling sounds occurring at frequency of 5 to 34 per minute should be heard.

Bowel sounds are variable, so in an asymptomatic patient absence of bowel sounds requires listening longer. The absence of bowel sounds in a patient with abdominal pain is a warning sign and might indicate paralytic ileus. If bowel sounds appear to be absent – auscultate for up to 3 minutes in the right lower quadrant. Hyperactive bowel sounds are also abnormal. Increased and high pitched bowel sounds may be associated with initial stages of bowel obstruction.

4.4 Listen to different vascular structures at 7 different locations (above right renal artery, aorta, left renal artery, iliac arteries and femoral arteries) for at least 5 seconds each (Fig.5).

Audible vascular sounds are called bruits and are caused by turbulent flow in large arteries (e.g., aorta, iliac, renal arteries). During auscultation bruits produce a "swishing" sound. Their presence can indicate renal artery stenosis, abdominal aortic aneurism, and iliac and femoral artery stenosis. Vascular sounds can be heard in 4-20% of healthy individuals, but a systolic-diastolic bruit over renal arteries in a patient with hypertension strongly suggests renovascular disease.

4.5 Listen for friction rubs over the liver and spleen using the bell of the stethoscope. Friction rub is a rare finding that indicates inflammation of the peritoneal surface of the organ from infection, tumor, or infarct.

Comment [AK11]: Since a physician uses multiple senses to perform an examination, how do we best convey this in the video. I know there are resources for heart murmur sounds, but what about auscultation libraries:

http://www.easyauscultation.com/heart-murmur-sounds

Can we get permission to use any of this content.

Comment [DM12]: I found a bruit sound on a Youtube video and edited it. It's attached to the email if we want to use it.

Summary

In this video we reviewed the anatomy of the abdomen and learned how to perform the first two steps of the abdominal examination: inspection and auscultation.

Before starting the exam make sure that the patient is comfortable, well positioned, and adequately draped. Never examine a patient through a gown. Make sure that hands are washed and warm. Always ask a patient for a permission to perform the examination and explain every step of the procedure.

Start with a visual inspection of the abdomen. Make note of abdominal contour and symmetry, skin rashes, scars from previous surgeries and injuries, distended veins, and visible peristalsis and pulsations. If the presence of ascites, hernias, or masses are suspected confirm these findings via additional maneuvers that are addressed later on in this video collection.

Omitting visual inspection and/or auscultation steps are common mistakes during an abdominal examination, and can negatively affect a physician's ability to reach a correct diagnosis. Careful inspection of the abdominal area is especially important. Often times an experienced physician can make a preliminary diagnosis based on a patient's history and inspection alone. A combination of different pathological signs is of particular diagnostic value. For example, jaundice, ascites, spider angiomas, and caput medusae (distended veins surrounding the umbilicus) can be simultaneously present in a patient with liver cirrhosis.

Once visual inspection is completed, auscultation follows. Auscultate separately for bowel sounds and for bruits. Always perform auscultation before abdominal percussion and palpation. Abdominal auscultation is of clinical significance, especially in a symptomatic patient. The findings should be interpreted in the context of the patient's history: for example, the absence of bowel sounds in a patient with abdominal pain suggests an abdominal catastrophe, such as peritonitis or the later stages of an intestinal obstruction, but is normal in postoperative patients for a few days following abdominal surgery.

Figures and legends.

Figure 1. Surface anatomy of the abdomen. (possibly, motion graphics).
Visible and palpable landmarks of anterior abdominal wall are shown.

Figure 2. **Four abdominal quadrants.** (motion graphics)
Abdomen can be divided into four regions by two imaginary lines intersecting at umbilicus. Right upper quadrant (often designated as RUQ), left upper quadrant (LUQ), right lower quadrant (RLQ) and left lower quadrant (LLQ) are shown.

Figure 3. Nine abdominal regions. (motion graphics)
Midclavicular lines and subcostal and intertubercular planes separate abdomen into nine regions: epigastric region, eight hypochondriac region, left hypochondriac region, umbilical region, right lumbar region, left lumbar region, hypogastric region, right inguinal region, and left inguinal region . Terms for epigastric, umbilical, and hypogastric and suprapubic regions are the most commonly used in clinical practice.

Figure 4. Location of different organs in the four abdominal regions.

Organs in the abdominal cavity and their location with respect to four abdominal quadrants.

Comment [AK13]: Not sufficient description of the figure. We can probably infer how the author wants this content represented in the video, but it's better if they write a sentence or two for each figure.

Figure 5. Areas of auscultation for abdominal bruits. (motion graphics)

Auscultations for abdominal bruits should be performed over aorta, and bilaterally over renal, iliac and femoral arteries, as shown.

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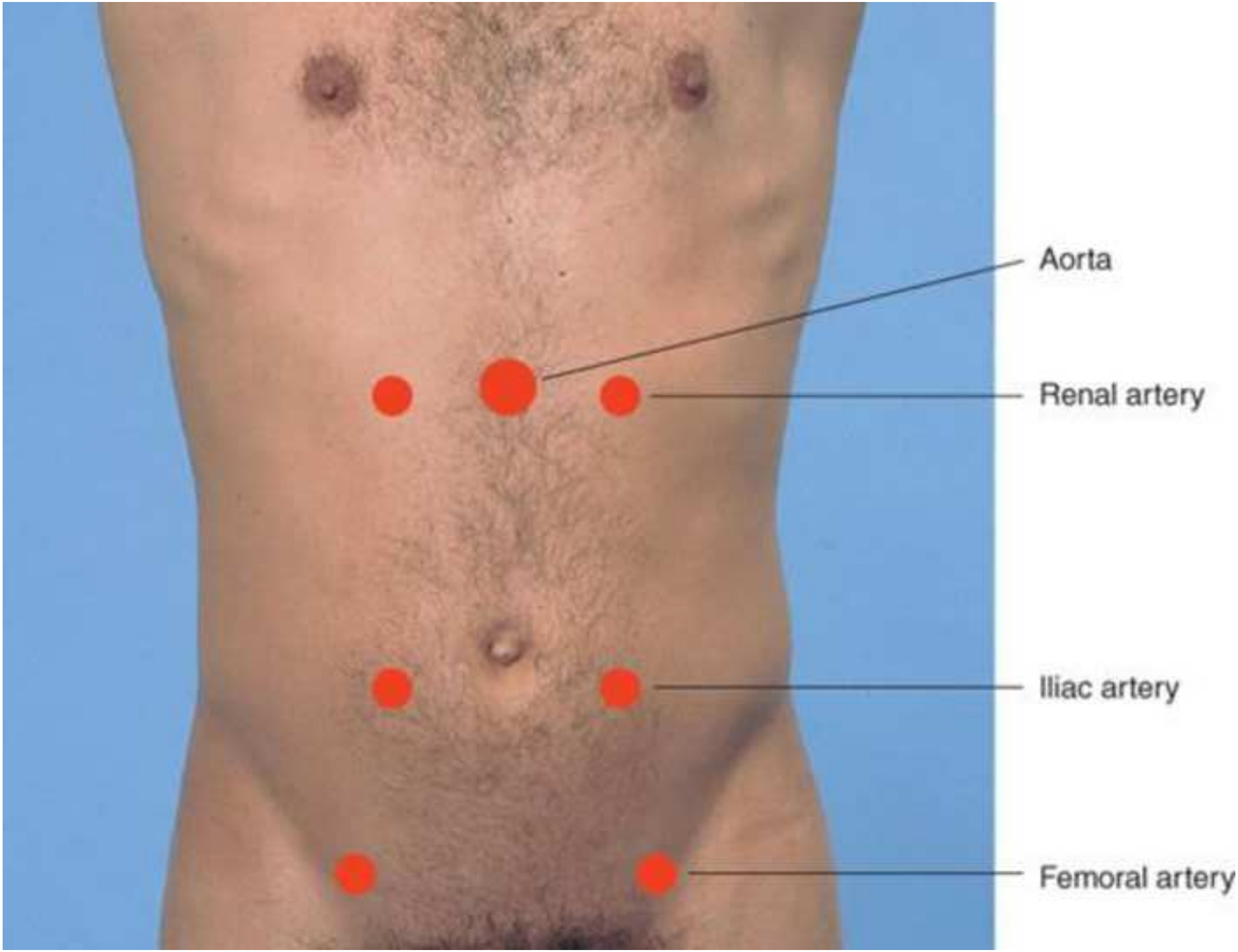

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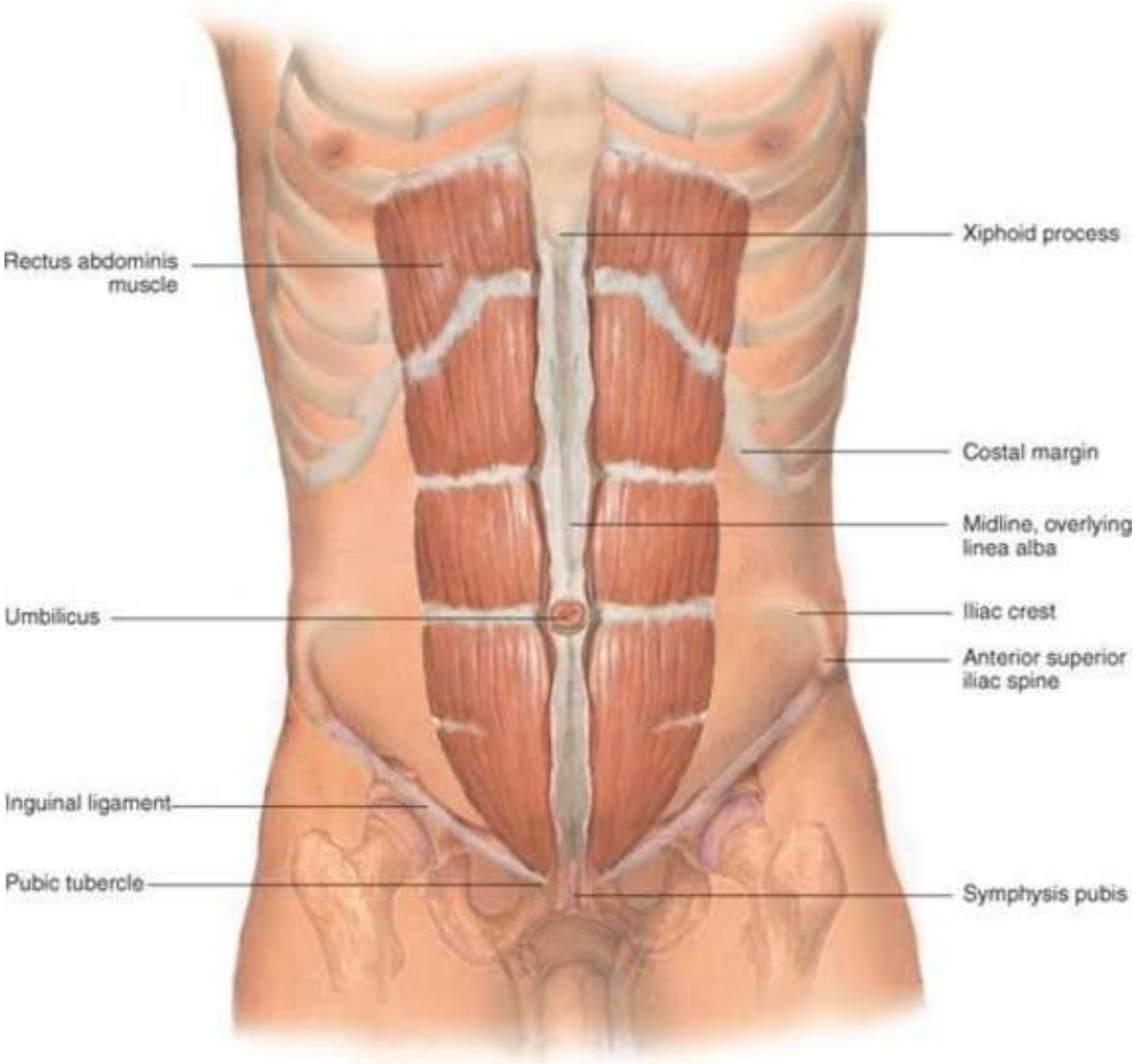

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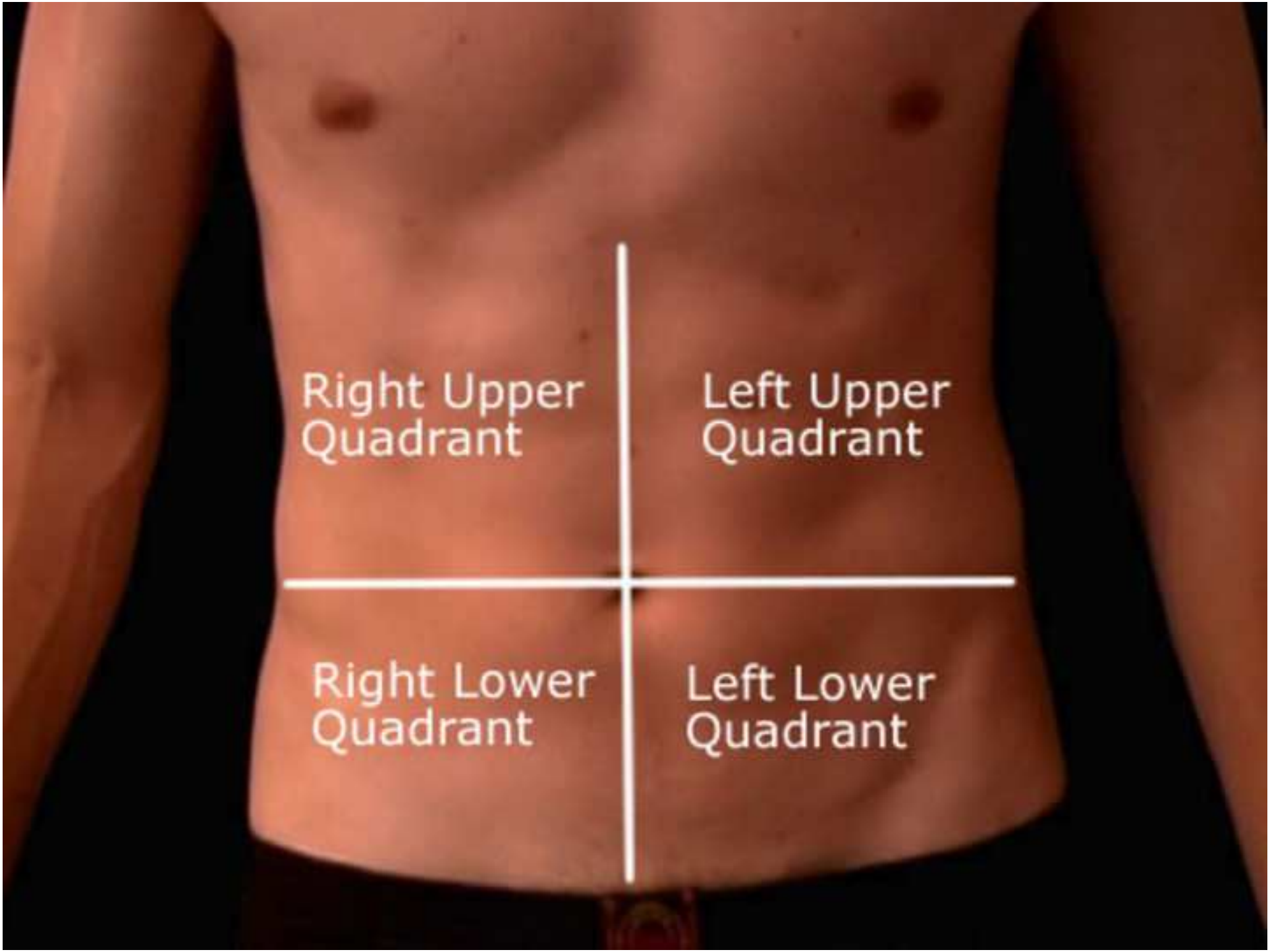

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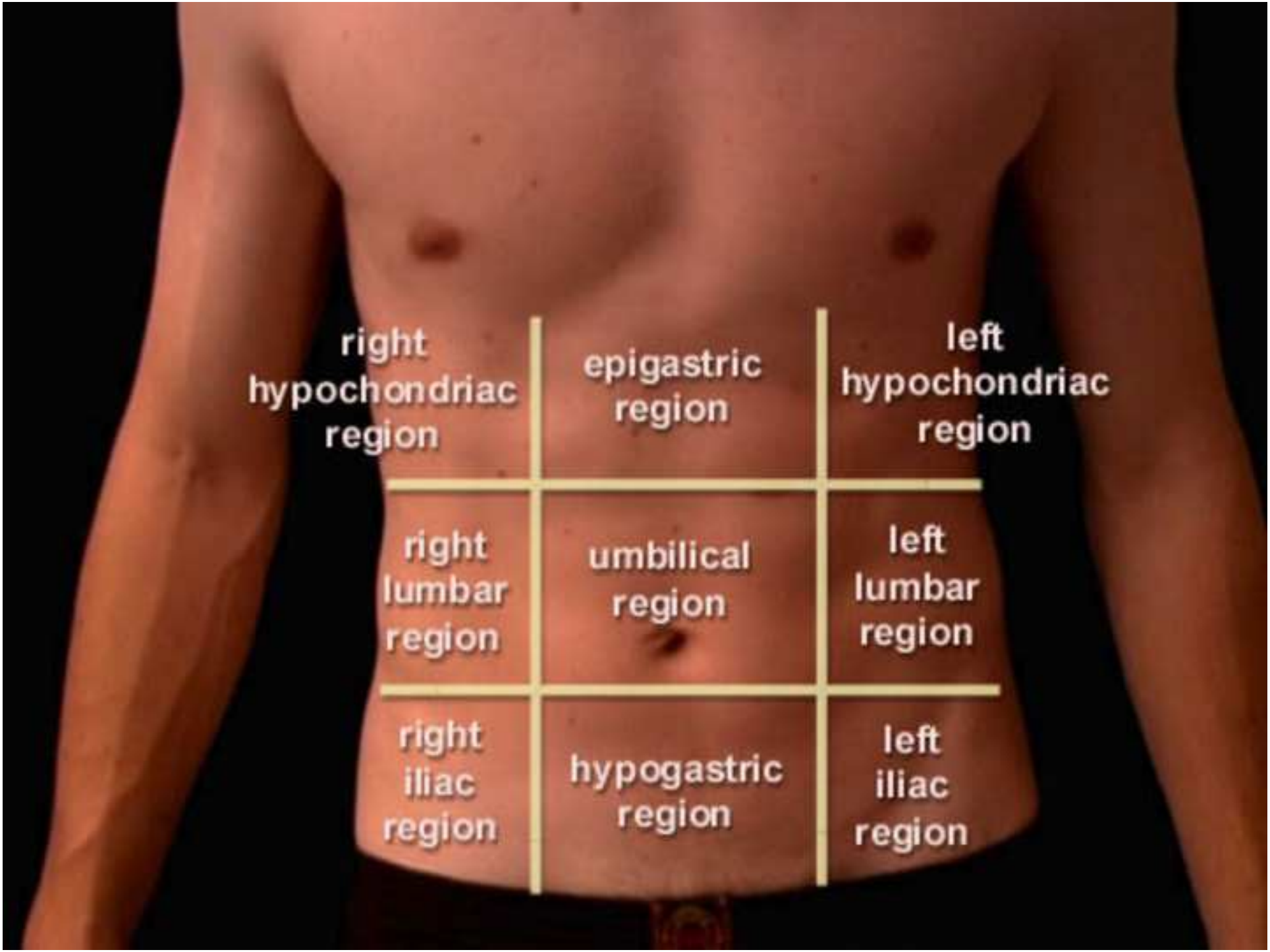

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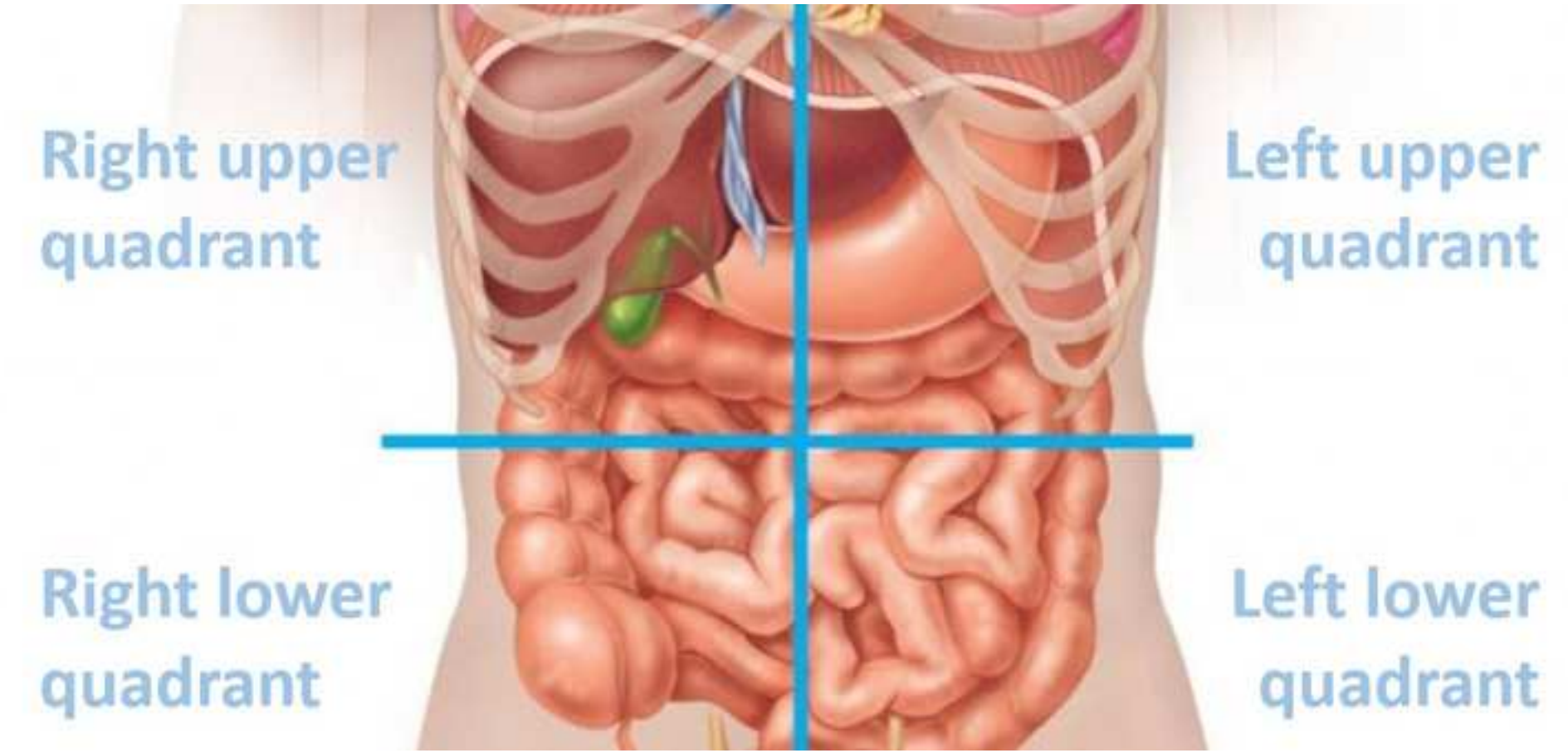

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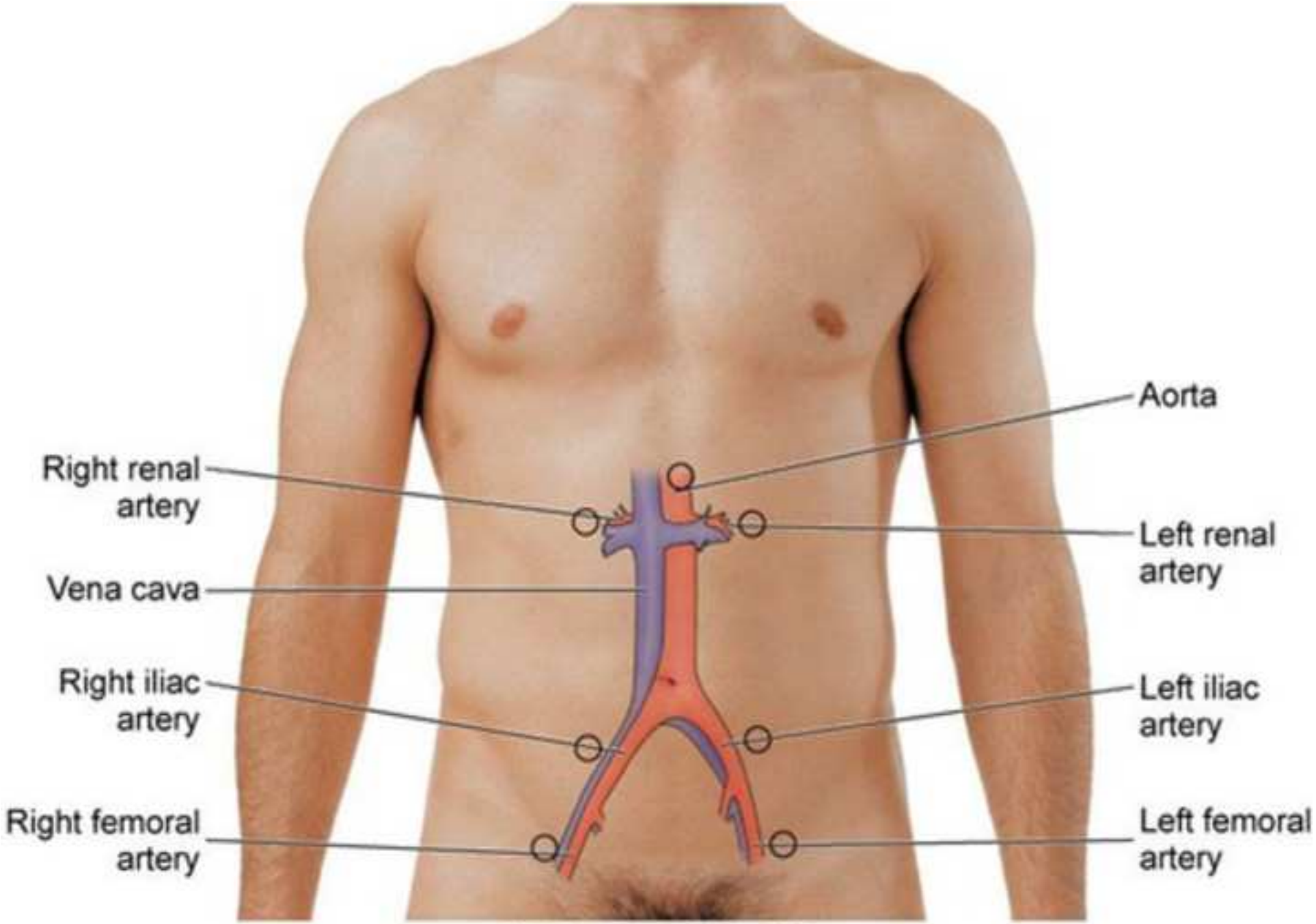

(Modified from Wilson and Giddens, 2009.)

Fig. 17-7. Sites to auscultate for bruits: renal arteries, iliac arteries, aorta, and femoral arteries.