

Remarks on the examination of the chest, abdomen and limbs

6

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The examination of the organs of the chest and abdomen are described in detail in the relevant sections. In this chapter we will focus only on the basic predispositions necessary for high quality examination and topographic divisions of the chest and abdomen.

1 Examination of the chest

In addition to the general appearance of the chest (sunken/inverted chest, scoliosis, etc.), we examine the heart (see chapter 7), the lungs (chapter 10) and the breasts (chapter 11).

Topography of the chest

For orientation we use the points of reference (sternum, collarbone, ribs, intercostal spaces, spinous processes) and imaginary vertical lines (Fig. 6.1 and Fig. 6.2). We use the ribs for horizontal orientation, and on the back we use the spinous processes. The most prominent spinous process is that of C7. The nipple, usually located in the 4th intercostal space in men, can also help with orientation. Fig. 6.3 shows the projection of the lung lobes on the chest wall.

2 Examination of the abdomen

The examination of individual organs of the abdominal cavity is described in chapters 13 (liver, gallbladder, stomach, small and large intestines, digital rectal examination), 15 (kidneys), and 17 (examination of the spleen). The examination of a patient with suspected acute abdomen is given in a special chapter.

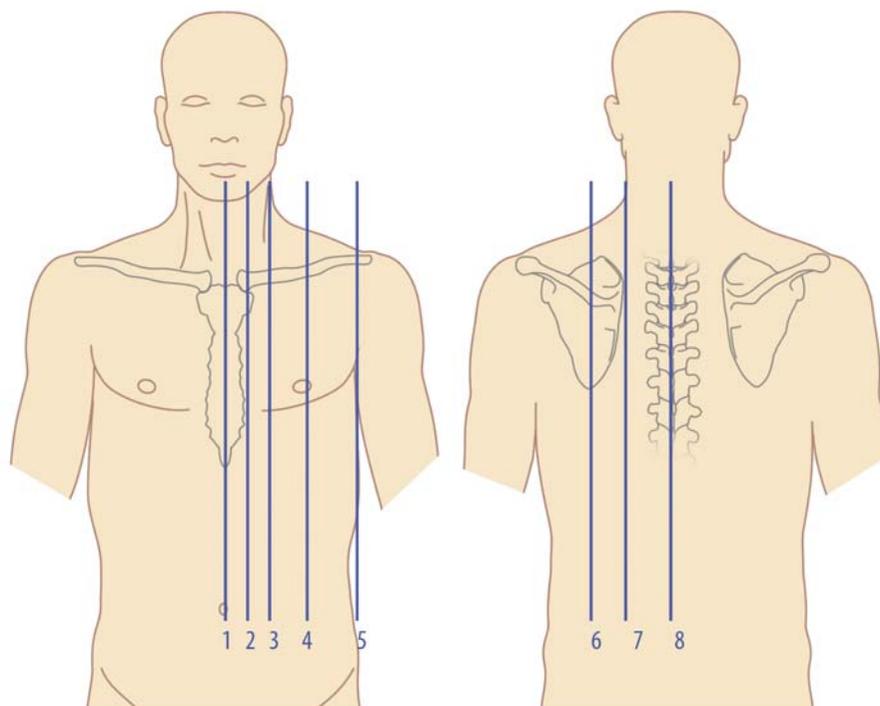


Fig. 6.1 Surface lines - thorax

1 = midsternal line, 2 = left sternal line, 3 = left parasternal line, 4 = left midclavicular line, 5 = left anterior axillary line, 6 = left scapular line, 7 = paravertebral line, 8 = vertebral line

Topographic division of the abdomen

In order to describe the location of abdominal viscera, we divide the abdomen into nine regions using two vertical and two horizontal reference lines: right and left hypochondriac regions, epigastric region, right and left lumbar regions, umbilical region, right and left inguinal regions and hypogastric (pubic) region (Fig. 6.4). An alternative is to divide the abdomen into four quadrants by two perpendicular lines that intersect at the umbilicus: right upper quadrant, right lower quadrant, left upper quadrant, left lower quadrant.

Requirements for abdominal examination

The basis for a good quality examination of the abdomen is a relaxed patient (with relaxed abdominal muscles). Therefore, it is necessary to calm the patient: introduce yourself, explain what you are going to do and make sure the patient is comfortable during the examination. Your hands should be warm, but if they are cold, warn the patient in

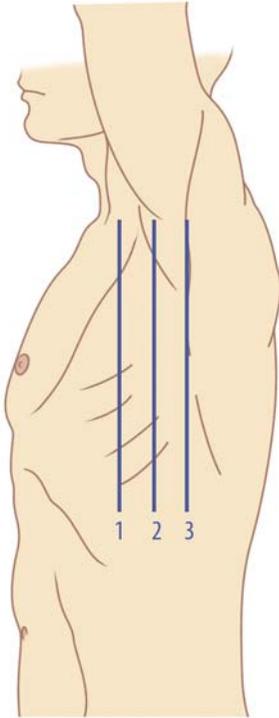


Fig. 6.2 Axillary lines

1 = anterior axillary line, 2 = midaxillary line,
3 = posterior axillary line

advance. If the patient repeatedly contracts their abdominal muscles during the examination, try to divert their attention (by polite conversation) to something else.

When examining the abdomen, the patient usually lies on their back with their knees bent and arms loosely lying along their body, but sometimes also on their right or left side. Some pathologies become apparent only when standing (hernia), or when changing position (when sitting up from a supine position, or when lifting their head from a mat, such as diastasis of direct abdominal muscles) or when coughing (hernia).

During the examination the patient should be undressed from the nipples to the middle of the thighs.

Inspection

We note the general appearance of the patient, any asymmetry, scars (the position of the scars may indicate the type of operation undertaken), stretch marks (pale for obese and pregnant patients, purple in Cushing's syndrome, dilation of subcutaneous veins (portal hypertension), hernias (Fig. 6.5), tumours, bleeding manifestations (often after subcutaneous injections). We note breathing movements (symmetrical, progressing to the inguinal ligaments); in acute abdomen breathing movements may not be apparent at all, or may be shallow or asymmetrical. Seen from the side, the abdomen should be at

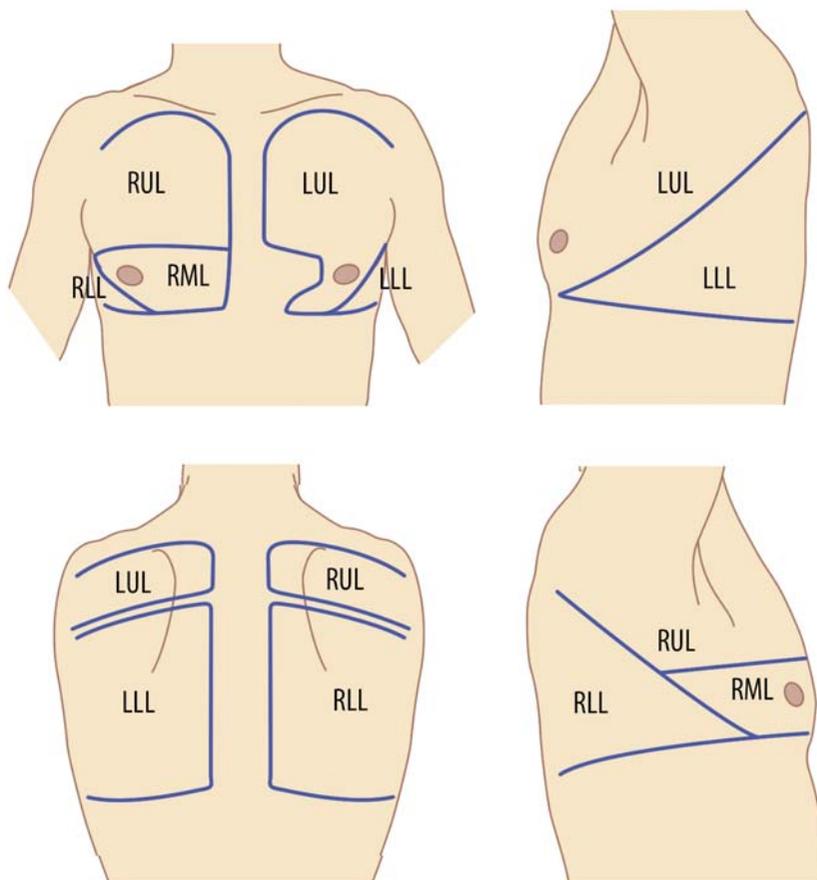


Fig. 6.3 Surface anatomy of the lungs

RUL = right upper (superior) lobe; RML = right middle lobe; RLL = right lower (inferior) lobe;
LUL = left upper (superior) lobe; LLL = left lower (inferior) lobe

or slightly below the level of the xiphoid process; if the abdomen is above the xiphoid process it is an indication of obesity, pregnancy, the presence of large amounts of ascites or air in the abdominal cavity (meteorism, pneumoperitoneum), or is due to the enlargement of one of the organs. Visible peristalsis (contraction of intestinal loops) can sometimes be seen in very thin patients, but mainly in pyloric stenosis.

Palpation

We always start palpation in the non-painful area. We start with superficial palpation, later we move on to deep palpation. The patient's reaction is monitored throughout the

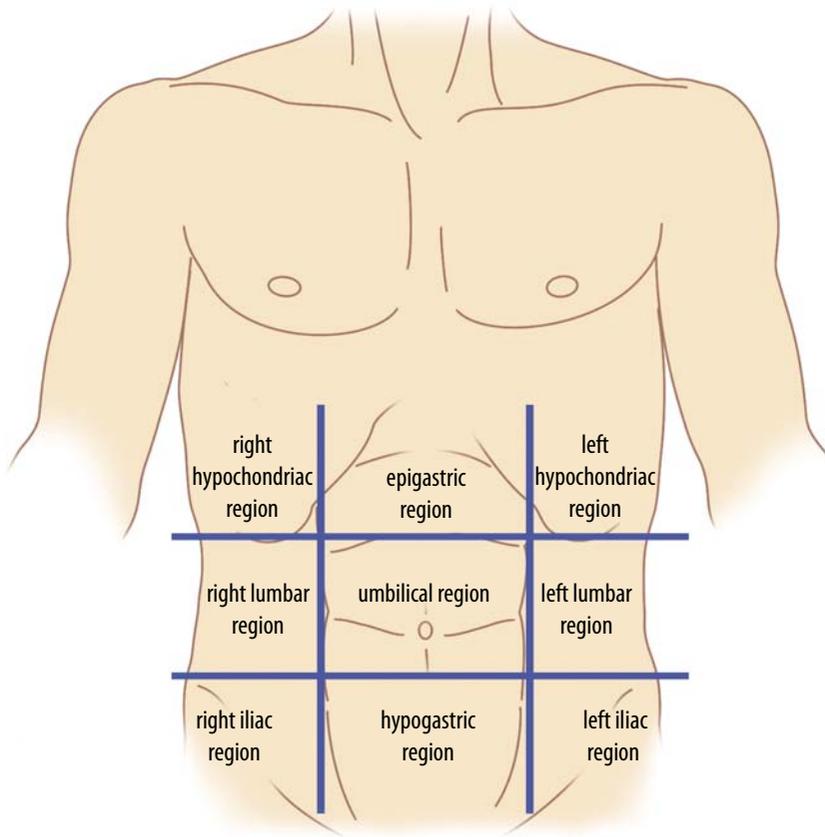


Fig. 6.4 Abdominopelvic regions

Upper horizontal line connects the lowest bony point of the rib cage, lower horizontal line connects the two tubercles of the iliac crest. Vertical lines follow a line joining the mid clavicular point to the mid inguinal point. They roughly correspond to the lateral borders of the rectus abdominis muscle.

examination. We search for palpable resistances (as always we describe size, pain, relationship to the environment, etc.), investigate the liver, gallbladder, spleen, kidneys, look for signs of an acute abdomen (pain in palpation or decompression at certain locations, see chapter 14), ascites (undulation). An integral part is digital rectal examination.

Auscultation

We notice bowel sounds (normally every 5 –10 seconds), any increase in frequency or its weakening or disappearing. We examine the large arteries (renal, pelvic, femoral – audible murmur is a sign of stenosis or rarely abdominal aortic dissection).



Fig. 6.5 Large ventral hernia

Percussion

We examine the entire abdomen, physiologically there is dull to flat percussion sound over fluid-filled or solid organs and ascites, resonant to hyperresonant over areas filled with air). We also notice whether percussion causes pain. Percussion also helps in examining the size of the liver and spleen.

3 Examining the limbs

During the examination of the upper limbs we monitor their mobility and joint changes (see chapter 18), any swelling, bleeding manifestations, resistance and defects.

In the lower limbs we examine their mobility and any joint changes, lymph nodes (predominantly in the groin), any swelling (describe its character), venous system (varices, signs of chronic venous insufficiency), signs of deep venous thrombosis, palpate artery pulsation and auscultate femoral arteries. We note trophic or other skin alterations and skin temperature.

Examination of the heart

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Key facts

- Detailed identification and description of the patient's current condition (presenting complaint) and medical history are the essentials for cardiologic examination.
- Chest pain is a warning symptom which may be a sign of a life-threatening disease such as acute myocardial infarction, severe tachycardia or aortic dissection.
- Other signs of heart disease are dyspnoea (shortness of breath) – usually exertional at first, palpitations, syncope, swelling of the lower limbs, cyanosis (usually peripheral) and increased fatigue.
- As part of the medical history, it is necessary to look for cardiovascular risk factors.
- Physical examination includes not only examination of the heart but also measurement of blood pressure, examination of the carotid artery pulsations, examination of cervical veins and the liver, auscultation of the lungs and examination of any swelling of (especially) lower limbs.
- The basic cardiologic examination includes ECG and echocardiography.

1 The role of medical history and physical examination when examining the heart

The significance of physical examination is currently different from when the procedures were first developed, in that there are a number of special methods available that can be used to specify the state of the disease, if found, much more accurately. However, the use of these methods must be targeted at a particular problem, as for the primary detection of a disease state they would be impractical and uneconomical. Therefore, the medical history and physical examination still play a fundamental role and set the course for further procedures. Some details of the physical findings that were significant in the past

because it was impossible to obtain a more specific picture in another way, are losing their importance in favour of today's more accurate methods. We present them in order to have the full picture, but as for rarer findings, they are distinguished by a smaller font size.

2 Presenting complaint and medical history of heart disease

When taking a medical history from patients with suspected heart disease, in addition to general questions, it is necessary to ask specific questions about certain symptoms of heart (and other) diseases, which the patient does not spontaneously mention. This will help refine the overall picture. Here are noted the most important.

One of the key cardiac presenting symptoms is **dyspnoea**. It refers to shortness of breath, which may occur only during physical exertion (heavy, moderate or even light), or even at rest. The feeling of dyspnoea at rest after lying down is called **orthopnoea**. Patients suffering from this symptom use several pillows to prop up their upper body when sleeping, quite typical is waking up in the night gasping for air, forced to get up, walk, or breathe fresh air. Conditions with these symptoms are called **paroxysmal nocturnal dyspnoea** or **cardiac asthma**. They are the result of impaired left heart function with blood redistribution when lying down with increased venous return and thus increased pulmonary capillary pressure. Patients with left-sided heart failure assume an **orthopnoeic position**, which is a sitting position (the patient may be bent forward slightly), with their hands resting on a mat to use the auxiliary respiratory muscles for breathing. To better express the degree of dyspnoea (and hence left ventricular dysfunction) we use the internationally accepted New York Heart Association (NYHA) classification; dyspnoea is referred to as NYHA class I-IV (Table 7.1).

Table 7.1 Classification of dyspnoea according to the New York Heart Association (NYHA)

Class	Symptoms
I	No symptoms and no limitation in ordinary physical activity, e.g. shortness of breath when walking, climbing stairs etc.
II	Mild symptoms (mild shortness of breath and/or angina) and slight limitation during ordinary activity.
III	Marked limitation in activity due to symptoms, even during less-than-ordinary activity, e.g. walking short distances (20–100 m). Comfortable only at rest.
IV	Severe limitations. Experiences symptoms even while at rest. Mostly bedbound patients.

Chest pain is an important and frequent symptom. One of the very common types of chest pain caused by heart disease is **angina pectoris** (Table 7.2). It is caused by a disproportion between the actual blood supply and the needs of the myocardium. This disproportion is usually due to the narrowing of one or more coronary arteries, other causes are aortic stenosis or hypertrophic cardiomyopathy. The immediate triggering factor is an increase in the metabolic demands of the heart at increased heart rate due to physical activity or emotional stimuli. Thus, typical angina occurs under these circumstances and subsides at rest; sometimes it can be caused by going out into very cold weather. It is localised behind the sternum, and is often described as squeezing, tightness or pressure in the chest. It often radiates towards the neck, left shoulder or left upper limb. Pain of a similar nature but occurring at rest may be an indication of **unstable angina** or **myocardial infarction**. Infarction pain is persistent, often very intense and frequently accompanied by other symptoms, such as nausea, bradycardia, restlessness and fear of death.

Table 7.2 Classification of angina pectoris according to the Canadian Cardiovascular Society (CCS)

Grade	Description of symptoms
I	Ordinary physical activity does not cause angina. Angina is present with strenuous or rapid or prolonged physical exertion.
II	Slight limitation of ordinary activity. Angina occurs when walking rapidly on a level surface or climbing stairs, walking uphill, when cold or emotionally stressed. Walking on a level surface or slowly up one flight of stairs does not usually cause pain.
III	Marked limitation of ordinary physical activity. Pain occurs even when walking slowly on a level surface or slowly climbing one flight of stairs.
IV	Inability to carry on any physical activity without discomfort. Angina may be present at rest.

Patients with chest pain arising at rest or not ceasing after the patient has stopped physical activity must be given immediate care, as this condition can be life-threatening. The fundamentals are: monitoring of the vital functions, ECG registration and measurement of myocardial biomarkers (especially troponin).

Another type of chest pain is **pericardial** pain caused by inflammation or irritation of the pericardium. Patients describe it as a persistent painful feeling behind the sternum, often worsening with deep breathing. Pericardial pain may also respond to the patient's position in bed, but is not dependent on physical exercise.

Aortic dissection is a very serious disease causing chest pain. The character of the pain here depends on the site of the aortic affection. It is very intense, persistent, and the

patients often perceive it as if something is “tearing” in their chest. This pain can spread to the back between the shoulder blades, possibly to the neck and lower jaw.

There may be many other types of pain in the chest due to conditions affecting structures other than the heart and blood vessels. These other conditions are presented in other chapters and for the needs of differential diagnosis they are briefly summarized in Table 7.3.

Table 7.3 Possible causes of chest pain

System	Complaint
cardiovascular	ischaemia (angina pectoris, unstable angina, myocardial infarction)
	acute pericarditis
	pulmonary embolism
respiratory tract	severe pulmonary hypertension
	pleural pain
	tracheitis
other	Tietze syndrome
	oesophageal problems (gastroesophageal reflux, motility disorders)
	biliary colic
	musculoskeletal disorders of the chest wall

Palpitations are another cardiac symptom. They are defined as abnormal awareness of cardiac action. The patient should be asked whether the cardiac action is unusually rapid or irregular, or whether it is perceived for unusually strong cardiac contractions. Also important is the duration of the palpitations, whether they start and end suddenly or gradually, if they are related to any activity, body posture or other triggering factors. Sometimes it helps when the patient tries to tap out the rhythm of the palpitations. This gives us an idea of the frequency, the premature contractions lead to a typical irregular rhythm with pauses, etc. In some cases, the patient might inform us that they can stop palpitation by a specific manoeuvre (e.g. based on the principle of the Valsalva manoeuvre).

Syncope may be one of the symptoms. It is a short-term transient loss of consciousness and postural tone (that is, accompanied by a fall if the patient is in an upright position) due cerebral hypoxia with a short-term impaired blood flow. Syncope has a short duration and there tends to be amnesia for the course of an event.