

# Taking a history and the examination of the cardiovascular system

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## Abstract

A full history and physical examination remain an integral part of assessment of the cardiac patient in the 21st century. It is profoundly unwise to rely solely on the results of imaging and other investigations. Total reappraisal is necessary when the history, examination and investigations are discordant – no investigation is infallible, and the clinical assessment should never be ignored. The four main symptoms of cardiac disease (chest pain/discomfort, breathlessness, palpitations, light headedness/syncope) are summarized, and their presentation in the history discussed. Appropriate sections of the cardiac examination are described.

**Keywords** Chest pain; clinical assessment; dyspnoea; examination; heart murmurs; history; MRCP; palpitations; syncope

“It is a truth universally acknowledged that a person in possession of a cardiac problem must be in want of a first class history and examination.”

Considering the enormous advances that have occurred in medical imaging and technology, do we really need to continue to place emphasis on the history, which is inevitably subjective, and physical examination, which can be imperfect and unskilled? Despite the advance and possible dominance of technocrats in cardiology, this is certainly still the case. Patients who have coronary artery disease revealed by angiography may have chest pain that is non-cardiac, and this inevitably changes the way they are managed. Similarly, the patient with important valvular disease may have breathlessness for another reason. Furthermore, interpretation of any investigations can be erroneous, and biological tests inevitably have false-positive and false-negative results. If the patient is to be treated as an individual, a careful history and examination are absolutely essential.

Full accounts of basic history-taking and examination of the cardiovascular system are available in all textbooks of clinical methods. This article does not attempt to cover the entire field but highlights areas where emphasis is considered particularly appropriate.

## The history

As Braunwald has emphasized, ‘the history remains the richest source of information concerning the patient’s illness, and any

## Key points

- A careful history is vital in assessing the cardiac patient
- A meticulous examination of every cardiac patient is essential for correct diagnosis and treatment
- Investigative techniques in cardiology augment rather than replace clinical assessment in most patients
- Some of the more common and most important clinical features are outlined

practice that might diminish the quality or quantity of information provided by the history is likely ultimately to impair the quality of care’.<sup>1</sup> It is only by taking a careful history that the good rapport essential for satisfactory management of any patient with any medical problem is achieved.<sup>2</sup>

A cardiac problem is likely to give rise to one or more of four main symptoms:

- chest pain/discomfort
- breathlessness/dyspnoea
- ‘palpitations’
- lightheadedness and/or blackouts.

## Chest pain/discomfort

Angina can be defined as ‘an abnormal feeling in the upper body caused by relative ischaemia of the myocardium’. The original description of angina by Heberden is difficult to improve upon for the classical presentation, but ischaemic pain does not always present in typical form. Furthermore, the patient is often clear that they are not experiencing ‘pain’. Although they may perceive a problem in the chest, it may not even be a discomfort and may sometimes occur principally in the adjoining areas. Thus, angina can present as discomfort in the arms, teeth, hand, wrist, back, throat or epigastrium.

The character of the pain is usually described as heavy, tight, gripping or crushing, or even ‘like an elephant standing on my chest’. The terms ‘pricking’, ‘burning’ and ‘pinching’ are not usually used by patients whose first language is English. Left submammary pain is extremely unlikely to be anginal. The relationship to exercise is of paramount importance, although, of course, unstable angina will occur at rest. In general, the main differential diagnosis is often of oesophageal pain, from which it can be totally indistinguishable (Table 1).

## Dyspnoea

Cardiac breathlessness usually occurs initially on exercise, although acute pulmonary oedema clearly causes very severe breathlessness at rest.<sup>3</sup> Breathlessness that is totally episodic with no precipitating factors, which comes and goes without any clear reason, is not usually cardiac, although paroxysmal arrhythmias may be confounding. It is useful to ask the patient to mimic the pattern of their breathlessness: sometimes ‘breathlessness’ can be how they describe deep sighing. The patient who complains of ‘difficulty taking a big breath’, ‘not being satisfied’ by their breathing or ‘not getting enough oxygen’, or who

### Main differential diagnoses of angina

#### Cardiac

- Pericarditis
- Myocarditis
- Myocardial infarction
- Pulmonary embolism
- Pulmonary hypertension

#### Non-cardiac

- Oesophageal pain
- Peptic ulcer pain
- Biliary colic
- Musculoskeletal pain
- Anxiety

**Table 1**

demonstrates that they take large deep breaths without any tachypnoea, rarely has a cardiac or respiratory problem. Paroxysmal nocturnal dyspnoea is usually recognized as cardiac in origin, but nocturnal coughing may not be.

### Palpitations

Most patients who complain of 'palpitations' describe an increased awareness of the heartbeat. A clear description of the nature of the palpitations often gives the diagnosis. A 'missed beat', 'heavy beat' or 'big beat', followed by a short period of rapid heart-beating, is often the description of an extra systole followed by sinus tachycardia. The rate and rhythm of the palpitations should be estimated from the history, and it is useful if the patient can tap out the rhythm. At rapid speeds, patients cannot discern the irregularity of atrial fibrillation and may describe it as regular. Accompanying symptoms, such as breathlessness or lightheadedness, must also be solicited.

It is important to note that patients can feel perfectly well with ventricular tachycardia and, conversely, extremely unwell with supraventricular tachycardia; severity of symptoms is a poor indicator of the exact diagnosis.

### Lightheadedness and blackouts

Lightheadedness (presyncope) and/or blackouts (syncope) are usually either cardiac or neurological in origin.<sup>4</sup> Patients with lightheadedness resulting from cardiac problems frequently have other cardiac symptoms. 'Cardiac lightheadedness' can be accompanied by nausea, sweating, breathlessness or chest pain. The patient does not usually complain of vertiginous symptoms, but may find that sitting down stops the attack or subsequently relieves it. Patients may recall having been able to abort some episodes whereas others (when they have not had the opportunity to sit down) have progressed and led to a blackout.

Patients sometimes present with 'blackouts', but a carefully taken history reveals that they have not completely lost consciousness. Conversely, if a patient does lose consciousness, the clearest possible account of prodromal symptoms is valuable. A sudden and immediate blackout causes the patient to say that the first thing that they remember is waking up on the floor. Clearly, the statement and observations of a witness can be of enormous value. A classical epileptic fit usually presents no diagnostic

difficulty, although it is important to recognize that reduced blood supply to the brain because of a reduction in cardiac output can cause a generalized seizure. Equally, it is important to know that the patient with a cardiac problem who loses consciousness very transiently can be incontinent of urine if they have an unstable urethral sphincter.

In patients with severe left ventricular outflow tract obstruction resulting, for example, from valvular aortic stenosis, syncope can occur with exertion. Unprovoked loss of consciousness is very rare in severe aortic stenosis, but can occasionally occur as a result of ventricular arrhythmias, or bradycardia resulting from aortic calcification extending into the conducting system.

### Cardiovascular examination

Major genetic abnormalities associated with characteristic facial appearance or body habitus are usually detected well before adulthood in most patients. Conditions including Down's, Noonan's and Turner's syndromes are usually detected in early childhood, but their recognition in the emergency department can be vital. Marfan's syndrome is often not diagnosed until adulthood.

General examination and assessment is always important and begins as soon as the physician sees the patient. Breathlessness, signs of anxiety or discomfort, cyanosis, jaundice and anaemia are clearly important and need no further description. Traditional examination of the cardiovascular system begins with the hands, where evidence of finger clubbing, splinter haemorrhages, the rare Janeway's lesions and the vanishingly rare Osler's nodes can be sought. Cyanosis in the hands can be central or peripheral. The face should be examined, paying particular attention to xanthelasma, telangiectasia, high facial colouring, central cyanosis and corneal arcus (abnormal <50 years of age). The conjunctiva should be examined bilaterally for anaemia, jaundice and conjunctival haemorrhages, and the tongue for cyanosis.

### Examination of the pulse

The radial pulses should be examined to confirm both are present. It is also important to feel for radiofemoral delay as evidence of coarctation of the aorta. At the wrist, the radial pulse gives information about cardiac rate and rhythm. Assessing the character and volume of the pulse require examination of the carotid or brachial artery; the one exception is the collapsing pulse, which is detected with the palm of the examiner's hand around the wrist of the patient's raised arm. A *water-hammer (collapsing)* pulse has a number of causes (Table 2); the most common is severe aortic regurgitation, which also causes a variety of interesting eponymous physical signs of mainly limited value. The *bisferiens pulse*, with a double peak, is usually attributed to a combination of aortic stenosis and aortic regurgitation. However, it can also occur in hypertrophic cardiomyopathy and, occasionally, in pure aortic regurgitation. The *'jerky pulse'*, with its sharp, low-amplitude upstroke, is characteristic of hypertrophic obstructive cardiomyopathy.

Severe fixed left ventricular outflow tract obstruction, which most commonly results from severe valvular aortic stenosis, gives rise to a slow-rising or *'anacrotic'* pulse, characterized by a 'notch' on the upstroke of the pulse wave. This is one of the most important physical signs in cardiology, one of the most difficult

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