

Chest pain: An approach for family practice

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Abstract

Chest pain is a common symptom in clinical practice and has many aetiological factors. A rapid but systematic assessment of patients in a primary care setting is essential to identify those with potential life-threatening aetiologies of chest pain. Once a life-threatening aetiology has been excluded, a correct diagnosis can be derived from a careful history, physical examination and a few selected investigations. A patient can then be referred to a hospital or a specialist for further evaluation. Not every patient needs to be referred.

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Introduction

Chest pain is a common symptom in clinical practice and has many aetiological factors, which range from life threatening to non-life threatening conditions. Its evaluation remains a diagnostic challenge, as it could variously be described as a feeling, pressure or a disagreeable sensation. A rapid but systematic assessment of patients in a primary care setting is therefore essential in identifying those with potentially life-threatening aetiologies of chest pain.¹⁻⁵

Causes of chest pain

Tables I and II show some of the causes of chest pain classified as life threatening and non-life threatening.^{4,6}

Table I: Life-threatening causes of chest pain

Acute coronary syndromes (acute myocardial infarction, unstable angina)
Pulmonary embolism
Aortic dissection
Tension pneumothorax
Ruptured aortic aneurysm

Goals and considerations in evaluating chest pain

The goals of evaluating chest pain are:

- Excluding life-threatening

Table II: Non-life-threatening causes of chest pain

Cardiovascular Valvular disease (aortic or mitral) Pericarditis Pericardial tamponade Hypertrophic cardiomyopathy Myocardial ischaemia Aortitis Myocarditis	Gastrointestinal Reflux oesophagitis Oesophageal tear or spasm Hiatus hernia Cholecystitis Biliary colic Peptic ulcer disease Pancreatitis Hepatitis
Pulmonary Pleuritis Pneumonia Pneumothorax Tracheobronchitis Pulmonary hypertension Tumour Mediastinitis	Musculoskeletal Costochondritis Cervical disc syndrome Bone tumour Rib fractures Intercostal muscle cramps Fibromyalgia Subacromial bursitis Shoulder or spinal arthritis
Neurological Herpes zoster Intercostal neuralgia Cervical radiculopathy	Psychiatric/Psychogenic Anxiety Depression Hyperventilation syndrome Panic attacks
Other Disorders of breast Chest-wall tumours	

- conditions
- Determining the diagnosis

- serious complications?
- Is the chest pain due to a chronic condition?

Ask yourself these questions as you evaluate the patient

- Is the chest pain associated with a life-threatening condition?
- Is the chest pain not life threatening, but may lead to

Approach to acute/new or ongoing chest pain

- First assess the patients' respiratory and haemodynamic status.
- If either is compromised, stabilise

the patient with the help of emergency ambulance services.

- If emergency intervention is not required, a focused history and physical examination should be performed to assess the patient's risk of life-threatening conditions.
- Patients with myocardial infarction should be given aspirin and sublingual nitroglycerin if there are no contraindications.
- Patients with tension pneumothorax (may be in respiratory distress, shocked, cyanosed with trachea deviated away from affected side), should have the pressure relieved immediately by inserting a wide-bore intravenous canula through the second intercostal space in the mid-clavicular line on the affected side. If possible, insert the canula through the open end of a glove or condom to allow air to escape through the open end (one-way-valve effect). Air rushes out, confirming the tension pneumothorax. Withdraw the needle, but keep the canula in place until a formal intercostal drain has been inserted.
- Consider acute pulmonary embolism in a patient with respiratory symptoms, pleuritic chest pain, haemoptysis and a history or risk factors of venous thrombo-embolism.
- Call an ambulance immediately and transport the patient to an emergency department or directly to an intensive care unit. Call the respective doctor(s) and notify them of the transfer immediately.

Approach to non-life-threatening chest pain

Once a life-threatening aetiology has been excluded, a correct diagnosis can be derived from a careful history, physical examinations and a few selected tests.¹⁻⁹

A. History

Obtain a comprehensive history, including the characteristics of the chest pain.

i) Quality of chest pain

- Ischaemic pain – is variously described as a pressure, squeezing, tightness, or crushing sensation. Also as a burn-like sensation, fullness in the chest, knot in the chest, heavy weight in the chest, heartburn, lump in the throat. In other cases, the patient places a fist on the chest. Others typically present with fatigue, epigastric discomfort or dyspnoea.
- Aortic dissection – typically sudden onset of persistent, severe, ripping or tearing or knife-like chest pain (up to 15% of dissections may be painless).
- Other disorders, such as gastro-oesophageal disorders and pulmonary hypertension may mimic ischaemic chest pain.

ii) Radiation

- Enquire about initial localisation of pain and its radiation. Myocardial ischaemia is typically retrosternal or substernal and may radiate to neck, lower jaw, teeth, upper limbs (especially the medial left arm) or shoulders.
- Aortic dissection may radiate to the back.

iii) Timing

- Abrupt explosive chest pain may suggest aortic dissection, pneumothorax, pulmonary embolism or oesophageal perforation.
- Ischaemic pain is usually gradual with increased intensity, although acute myocardial infarction is more intense and lasts longer. Pain constant for months or years may be functional.

iv) Precipitating factors

Enquire about factors that make pain worse or that induce pain. Pain provoked by physical or emotional exertion is classically angina, while that invoked by eating or swallowing is suggestive of gastrointestinal disease. Pleuritic pain is usually worsened with deep inspiration or cough.

v) Relieving factors

Pain that improves with rest and/or cessation of activity is suggestive of ischaemia. Equally, pain relieved by sublingual nitroglycerin may also suggest ischaemia. Pain relieved by antacids or food is likely of gastro-oesophageal origin. The pain from pericarditis is relieved by sitting up and leaning forward.

vi) Severity

Pain is a subjective feeling influenced by many factors and therefore its perception varies greatly between individuals. The commonly-used 10-point scale (with 0 being no pain and 10 worst pain) has significant flaws since, for example, up to 30% of patients with myocardial infarction have no chest pain. Nonetheless, aortic dissection, acute myocardial infarction, pericarditis, pulmonary embolism, perforated oesophagus and pneumothorax usually present as severe chest pains.

vii) Associated symptoms

Exertional dyspnoea is common with ischaemic pain. It may be the only manifestation of angina, especially in the elderly and in diabetics. Acute-onset dyspnoea may suggest pulmonary embolism, pulmonary oedema, pneumothorax or pneumonia.

- Cough may suggest pneumonia, pulmonary embolism, pulmonary oedema or gastro-oesophageal reflux.
- Nausea or vomiting may occur in ischaemic and gastrointestinal disorders. Chest pain following prolonged vomiting may be due to oesophageal tear or rupture.
- Palpitations may result from arrhythmias associated with myocardial ischaemia, but may also occur with normal heart rhythm.
- Syncope may suggest aortic dissection, pulmonary embolism or severe aortic stenosis. Myocardial ischaemia may present with pre-syncope.
- Sweating is frequently associated

with myocardial ischaemia or pulmonary embolism.

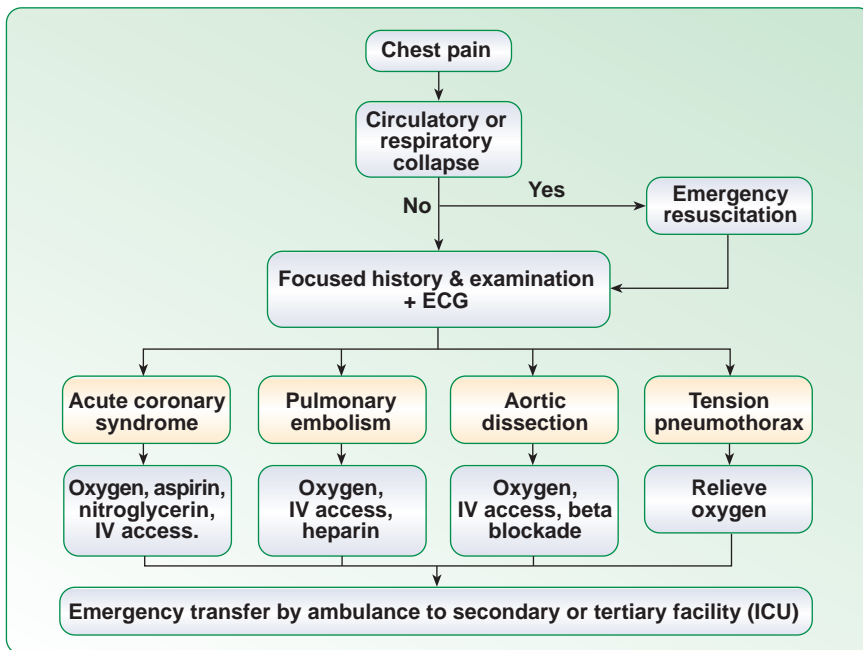
- Other symptoms, such as anxiety, fear, panic state, depression, fatigue or generally being unwell, may be associated with chest pain.

viii) Risk factors

- Various aetiologies of chest pains have associated risk factors, for example cigarette smoking, diabetes mellitus, hypertension, dyslipidaemia and age increase the risk of myocardial disease.

- Recent surgery, immobilisation, childbirth, cigarette smoking and a family history may be associated with thrombo-embolism.
- Hypertension and cigarette smoking may be factors in aortic dissection. Pericarditis/myocarditis may be associated with trauma, recent surgery, infections, autoimmune disease.

Figure 1: Approach to new or acute chest pain



Question the patient about previous medical entities. Establish if the presenting symptoms are similar in nature to previous presentations.

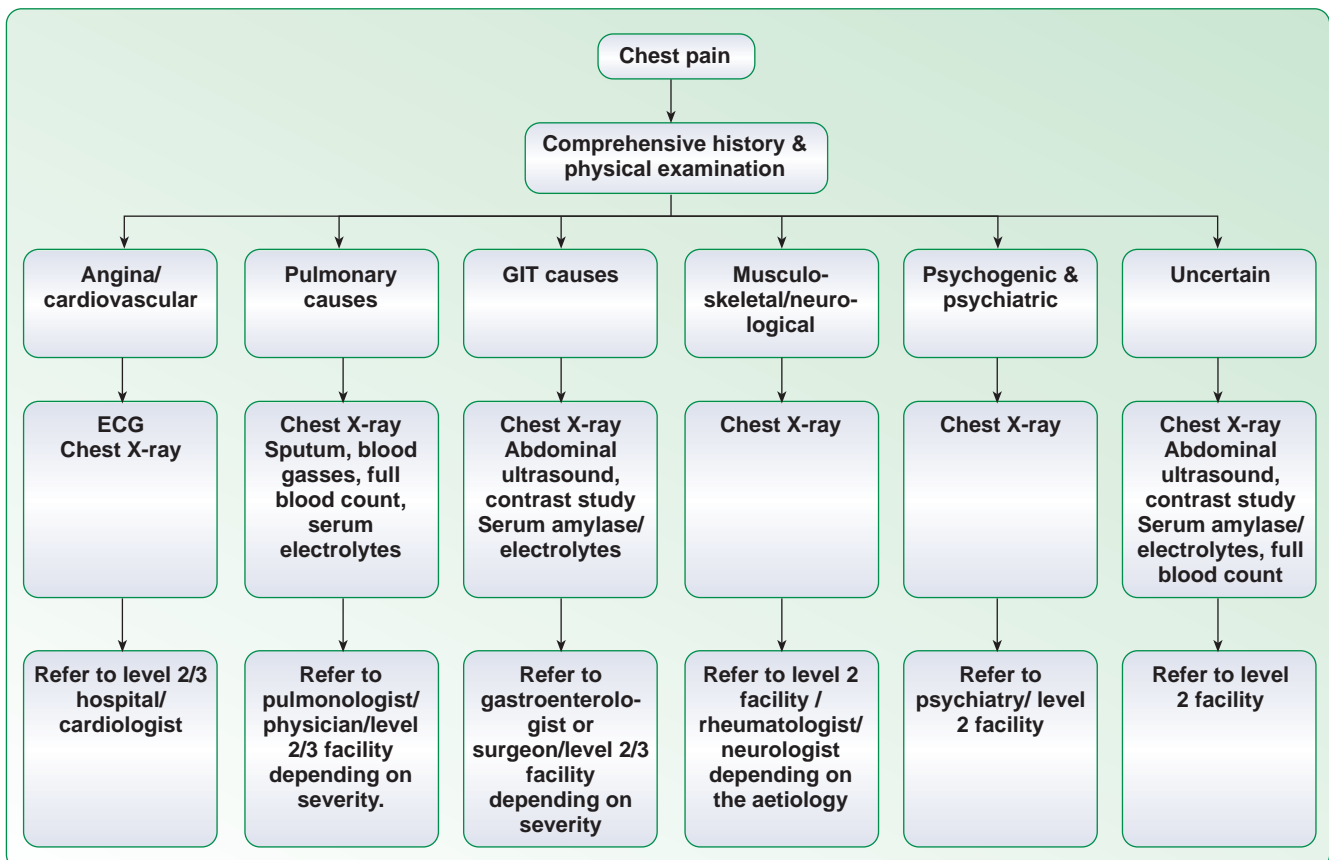
B. Physical examination

The extent of physical examination is determined by the urgency of the diagnosis and the initial focus should be on the possibility of acute, life-threatening conditions, although the examination may even be normal in these conditions.

i) General

Check and record vital signs, and check if all pulses are present and equal (if unequal, this may suggest

Figure 2: Approach to non-life-threatening chest pain



aortic dissection). Check for perfusion, cyanosis and jugular venous pressure. Look for pallor.

ii) Chest auscultation

This may reveal diminished breath sounds, pleural rub, or evidence of pneumonia, pneumothorax, etc. Palpate the chest wall. Pressure on the chest wall may reproduce symptoms in patients with musculoskeletal pain.

iii) Cardiac evaluations

May reveal heart failure, valve involvement or pericardial collection.

iv) Neurological and abdominal evaluation

These are mandatory.

C. Investigations

Which investigations to perform depend on the individual patient and should be considered with reference to the patient's history and the findings of the physical examination.¹⁰⁻¹² Investigations may include the following:

- 12-lead ECG
- Chest X- ray
- Laboratory: complete blood count, serum chemistry, lipids, cardiac enzymes, trop T, blood gasses, amylase.
- Other: abdominal ultrasound, flow volume loop, sputum for tuberculosis, microscopy and cytology, V/Q scan and echocardiogram

Figures 1 and 2 illustrate the different approaches to chest pain.

In acute or new onset of pain, determine first whether there is evidence of circulatory collapse or respiratory failure. If any of these are present, stabilise, treat urgently and refer to the appropriate centre.

In patients with chest pain that is not life threatening, a comprehensive history, physical examinations and a few selected investigational studies may provide the diagnosis.

Summary

The evaluation of patients with chest pains involves:

- Assessing haemodynamic and respiratory stability; if compromised, they should first be stabilised.
- Assessing patients with life-threatening conditions and referring them urgently to appropriate centres.
- Triaging other patients, depending on history, physical examinations and test, and referring to an appropriate centre.
- Bear in mind, however, that chest pain is a common symptom and not every patient needs to be referred to a hospital or specialist. ✎

See CPD Questionnaire, page 52

P This article has been peer reviewed

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