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# What they don't teach you in medical school: helping the patient with chest pain of unknown cause

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## Abstract

Chest pain is a common presenting complaint with a broad differential diagnosis. Even after the full array of special investigations, a cause cannot be found in some patients. Psychological factors can play a significant role in the perception of chest pain. Patients with such a psychological disturbance may not meet the full criteria for a diagnosable psychiatric illness, and thus cannot be assigned a specific diagnosis. Not knowing how to manage this situation can lead to poor rapport between doctor and patient. Through their clinical acumen, judicious use of special investigations and by forming a therapeutic alliance, clinicians can identify and help these patients.

Key words: Chest pain; Clinical approach; Functional disorder; Psychogenic pain

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## Introduction

Chest pain is a common presenting complaint in both the primary care and hospital setting. Ample attention is given to teaching the diagnosis and management of most clearly definable causes of chest pain, and most physicians will feel confident in managing these conditions. However, there is a group of patients who experience pain for which a cause cannot be found or clearly explained. Not knowing how to relate to this situation can leave clinicians and their patients feeling frustrated and hostile toward one another. The clinician, not knowing how to help, may be dismissive of the patient's complaint, while the patient may be left questioning their doctor's medical ability. This article suggests an approach to helping these patients.

## Assessing the scale of the problem

Approximately 1% of all ambulatory visits in the USA are for chest pain (Rui and Okeyode, 2016). In the UK, according to Ruigómez et al (2006), more than 5% of emergency department visits and more than 40% of emergency admissions were for this problem. Furthermore, between 20 and 40% of the general population will likely experience chest pain in their lifetime (Ruigómez et al, 2006).

Fair emphasis in medical education is given to the management of time-dependent life-threatening conditions that cause chest pain, such as acute coronary syndrome or tension pneumothorax. Many other causes of chest pain are also adequately addressed (Table 1). Previous studies on the definitive diagnosis of patients presenting with chest pain reveal that the pain is often not caused by these well taught conditions. Klinkman et al (1994) found that 16.1% of patients were diagnosed with 'non-specific chest pain' and 7.5% with 'psychogenic chest pain', whereas Verdon et al (2008) documented 11.5% of patients being diagnosed with 'psychogenic chest pain' and 5% receiving 'no (or other) diagnosis'. The diagnostic categories 'psychogenic pain', 'non-specific chest pain,' and 'no diagnosis' allude to the same problem. In some patients the precise cause of the pain cannot be found nor explained.

While its precise pathophysiology is unknown, the term 'psychogenic pain' can be used to describe pain that is believed to be sustained predominantly by psychological factors (Portenoy and Dhingra, 2020).

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**Table 1. Causes of chest pain**

| Condition | | Cause |
|---|---|---|
| Immediate life-threatening conditions | | ■ Acute coronary syndrome<br>■ Aortic dissection<br>■ Pulmonary embolism<br>■ Tension pneumothorax<br>■ Oesophageal perforation<br>■ Cardiac tamponade<br>■ Sarcoidosis-associated arrhythmias |
| Other conditions | Cardiac | ■ Stable myocardial ischaemia<br>■ Heart failure<br>■ Pericarditis<br>■ Myocarditis<br>■ Stress (Takutsubo) cardiomyopathy<br>■ Aortic valve disease<br>■ Mitral valve disease |
| | Pulmonary | ■ Pneumothorax<br>■ Pneumonia<br>■ Malignancy<br>■ Asthma and chronic obstructive pulmonary disease<br>■ Sarcoidosis<br>■ Acute chest syndrome (sickle cell anaemia)<br>■ Pulmonary hypertension |
| | Gastrointestinal | ■ Gastro-oesophageal reflux disease<br>■ Peptic ulcer disease<br>■ Oesophageal pain (motility disorders)<br>■ Oesophagitis<br>■ Hiatus hernia<br>■ Cholecystitis<br>■ Biliary colic<br>■ Pancreatitis |
| | Musculoskeletal or dermatological | ■ Costochondritis<br>■ Rheumatoid arthritis<br>■ Rib fractures<br>■ Cervical disc disease<br>■ Herpes zoster |
| | Psychiatric | ■ Panic disorder<br>■ Depressive disorders (major depressive disorder)<br>■ Somatic symptom disorder |

*Derived from McConaghy (2021)*

## The difficulty of diagnosing psychogenic chest pain

A fundamental problem with the term psychogenic pain is the nature of pain itself. The International Association for the Study of Pain (IASP) has revised its definition of pain. Pain is defined as '…an unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage' (Raja et al, 2020). Pain is deemed an 'experience'. Because all experiences are psychological phenomena, the term psychogenic pain could be seen as meaningless tautology, similar to 'psychogenic joy' (Covington, 2000). Therefore, pain is an inherently subjective experience which indicates that something is wrong. When it is accompanied by outward signs of disease it is medically easier to identify what should be done about it. When these signs are absent,

even the open-minded doctor, viewing the patient from a strict biomedical basis, may be left wondering whether the pain could truly exist. The clinician may be tempted to dismiss the complaint as 'in the patient's head'. In such an instance the clinician need only refer to their own subjective experience to know that such pain is possible.

## Subjective experiences of psychogenic chest pain

The English language alludes to the conscious experience of psychological realities perceived in the chest in many ways. Losing a loved one, the sting of betrayal, not achieving a goal can all produce a sensation colloquially described as 'heartache'. To illustrate this, if an Olympic athlete – a sprinter – injured their leg at the games and was unable to run and reduced to tears, they might be described as 'broken hearted', but this does not imply that their interventricular septum was cleaved in two. Specifically, the word heart is chosen as a representative of that psychological reality, because the perceptions of the anatomical heart and the 'psychological heart' seem to overlap. Importantly it would be odd to describe the athlete as 'broken legged', 'broken minded' or even 'broken headed'. Yet, many doctors are beset by the tendency to dismiss a patient's psychogenic pain as 'all in their head', not acknowledging the pain as in their 'heart', or the validity of the experience.

While it may be easy to identify with this experience subjectively, objectively explaining it is significantly more difficult. When faced with a healthy patient who is complaining of chest pain but denying any subjective emotional disturbance, it may be impossible to give them a diagnosis.

## Why psychogenic chest pain is difficult to explain

Pain is an experience related to consciousness (Venturella and Balconi, 2016). Human consciousness and the nervous system are currently partially understood and so difficult to explain, therefore pain (particularly in the absence of physical signs) is also difficult to explain. This is not to say that such pain is inherently inexplicable, nor is it to create a false dichotomy between that which is 'organic' and that which is 'psychological'. Simply put, the organic basis of the mind is currently not fully understood. In the future, the neurochemical basis of such experience may well be delineated, but until that time, the available knowledge needs to be used to diminish patient suffering.

## How the concept of psychogenic chest pain can be used to diminish suffering

While it may be impossible to currently delineate the biochemical basis of the term psychogenic pain or explain its pathophysiology, it is nevertheless a useful concept (Covington, 2000). It can be used to limit unnecessary expensive or risky invasive procedures, it can help the clinician express a more compassionate approach toward the patient's situation, and it can comfort the patient, knowing that their pain is not a sign of a life-threatening disease. Ultimately, it can also direct the patient suffering significant psychological distress toward some much needed introspection and healing.

## How to identify a patient suffering from psychogenic chest pain

The role of primary care and hospital-based doctors is to identify and manage all medical, surgical or psychiatric causes of chest pain. If after clinical assessment and special investigations the condition does not fulfil any diagnostic criteria, psychogenic chest pain can safely be considered (Figure 1) as a descriptive term of exclusion. Used like this, there will be little risk to the patient or doctor of missing a diagnosis.

While this is true, it may not be necessary to subject a patient to the full gamut of investigations to arrive at this conclusion, although the risk of missing a diagnosis in these instances is higher. Singh et al (2013) demonstrated that errors involving the patient–practitioner clinical encounter were the most frequent type of process breakdown associated

with diagnostic errors (78.9%). Of these encounters, problems with ordering diagnostic tests occurred in 57.4% of cases.

## A useful clinical tool that may limit unnecessary investigation

Ruigómez et al (2006) have shown that 'while life-threatening cardiac disease is of the greatest immediate concern to both patient and physician, cardiac disease is estimated to account for only a minority (8–18%) of all cases of chest pain (in the UK)'. While many manifestations of cardiac disease are easily recognised by physical signs, patients with significant coronary artery disease, particularly if chronic, may have an unrevealing physical examination (Cassar et al, 2009). In this instance the clinician may only have the patient's history and investigations to diagnose coronary artery disease. This may be a concern to both doctors and patients alike, as coronary artery disease is the second leading cause of death in England and Wales (Sacks, 2018), but not every patient that presents with chest pain needs to be investigated for coronary artery disease to rule it out. A useful coronary artery disease prediction tool has been developed by Bosner et al (2010). It considers the following clinical features:

- Chest pain is worse during physical exertion
- The patient is known to have cerebrovascular or coronary artery disease
- The patient assumes that the pain is cardiogenic
- The patient is a man 55 years or older or a woman 65 years or older
- The pain is not reproducible on palpation.

If a patient has only one (or none) of the above features, they can be considered to be suffering from a non-ischaemic cause of chest pain (Ebell, 2011).

## Overlap with definable psychiatric conditions

Several psychiatric conditions are associated with chest pain. Conditions such as panic disorder, depression, somatisation or factitious disorders have clearly defined diagnostic

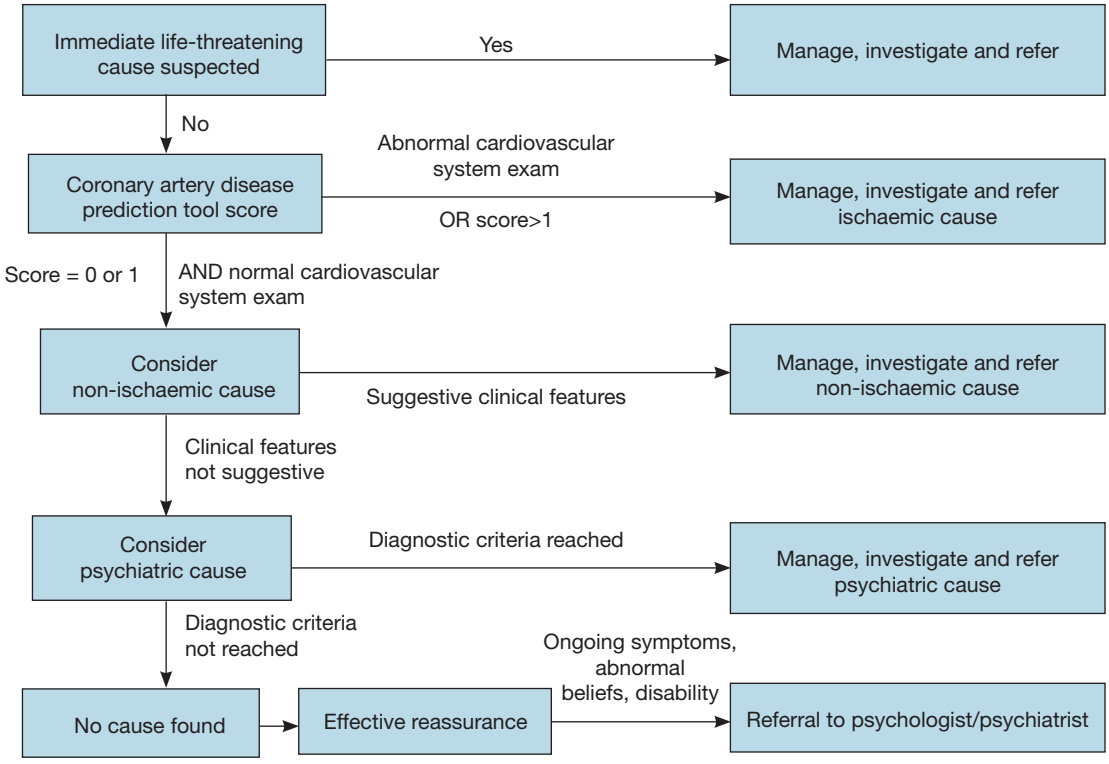


**Figure 1.** Suggested algorithm for the clinical assessment of the patient with chest pain.

criteria (American Psychiatric Association, 2013). While they have significant psychological components the term psychogenic chest pain as a diagnostic term should not be applied to them when they are encountered. They are entities and diagnoses in their own right, and have specific treatments. The patient with psychogenic chest pain may have several features of a psychiatric illness, but not enough to fulfil the full criteria to be diagnosed with one of them.

Because psychogenic chest pain is not truly a diagnosis, it could be considered a functional term, denoting how the physician may best relate to the patient and their condition.

## Clinical settings in which this problem may be encountered

Ultimately, special investigations need to be done to rule out all known causes of chest pain. Therefore, the patient with psychogenic chest pain will most likely be seen in the hospital setting. They will have undergone numerous special investigations, all of which will have normal results.

The problem may also be encountered in the primary care setting. The patient may be at low risk for coronary artery disease, with a description of pain that does not fit any cardiac or non-cardiac cause.

## How to manage a patient with chest pain of unknown cause

To avoid poor rapport, frustration and hostility, the physician should aim to develop a therapeutic alliance with the patient. This is created by demonstrating interest, empathy and understanding for the patient (Douglas et al, 2016). Through this alliance, the doctor should provide effective reassurance (Bass, 2002):

- Accept the reality of the symptoms – pain is an inherently subjective experience
- Give an explanation of the causes of chest pain, their clinical features and the investigation results – explain that the patient's condition does not have these features and so the patient does not have a life-threatening disease
- Explain that stressful, emotionally disturbing life events can cause significant chest pain
- Enquire if the patient has experienced any such event
- Try to understand the patient's worries and beliefs
- Plan and agree on simple self-help, encouraging introspection (eg journaling, speaking with a trusted friend)
- Provide written information and plans if needed
- Offer to see the patient's partner or other close relative
- Offer follow up if required.

## When to refer the patient for psychological evaluation and assistance

Patients with persistent symptoms, disability or abnormal health beliefs may benefit from referral to a psychologist or a psychiatrist (Bass, 2002), particularly those that have several features of a psychiatric disorder but do not meet their full criteria for diagnosis.

## Conclusions

Encountering a patient with chest pain of unspecified cause need not be a frustrating event for the patient or the clinician. These patients can be managed by ruling out other pathology, providing effective reassurance and referring select patients.

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## Key points

- Chest pain is a common presenting complaint.
- A certain proportion of patients will have chest pain of unspecified cause.
- Psychological factors can lead to the experience of chest pain.
- Patients in whom psychological factors predominate can be managed with effective reassurance.
- Certain patients will need referral to a psychologist or psychiatrist.

**Conflicts of interest**
The authors declare that they have no conflicts of interest.

## References

American Psychiatric Association. Diagnostic and statistical manual of mental disorders (DSM-5®). 5th edn. Washington DC: American Psychiatric Association; 2013

Bass C. ABC of psychological medicine: chest pain. BMJ. 2002;325(7364):588–591. https://doi.org/10.1136/bmj.325.7364.588

Bosner S, Haasenritter J, Becker A et al. Ruling out coronary artery disease in primary care: development and validation of a simple prediction rule. Can Med Assoc J. 2010;182(12):1295–1300. https://doi.org/10.1503/cmaj.100212

Cassar A, Holmes DR, Rihal CS, Gersh BJ. Chronic coronary artery disease: diagnosis and management. Mayo Clin Proc. 2009;84(12):1130–1146. https://doi.org/10.4065/mcp.2009.0391

Covington EC. Psychogenic pain—what it means, why it does not exist, and how to diagnose it. Pain Med. 2000;1(4):287–294. https://doi.org/10.1046/j.1526-4637.2000.00049.x

Douglas CJ, Cabaniss DL, Cherry S, Schwartz A. Developing a therapeutic alliance. Chichester: John Wiley & Sons Ltd; 2016:94–102

Ebell MH. Evaluation of chest pain in primary care patients. Am Fam Physician. 2011;83(5):603–605

Klinkman M, Stevens D, Gorenflo D. Episodes of care for chest pain: a preliminary report from MIRNET. J Fam Pract. 1994;38(4):345–352

McConaghy J. Outpatient evaluation of the adult with chest pain. 2021. https://www.uptodate.com/contents/outpatient-evaluation-of-the-adult-with-chest-pain (accessed 11 January 2022)

Portenoy R, Dhingra L. Assessment of cancer pain. 2020. https://www.uptodate.com/contents/assessment-of-cancer-pain (accessed 11 January 2022)

Raja SN, Carr DB, Cohen M et al. The revised International Association for the study of pain definition of pain: concepts, challenges, and compromises. Pain. 2020;161(9):1976–1982. https://doi.org/10.1097/j.pain.0000000000001939

Rui P, Okeyode T. National ambulatory medical care survey: 2016 national summary tables. 2016. https://www.cdc.gov/nchs/data/ahcd/namcs_summary/2016_namcs_web_tables.pdf (accessed 11 January 2022)

Ruigómez A, Rodríguez LAG, Wallander M-A, Johansson S, Jones R. Chest pain in general practice: Incidence, comorbidity and mortality. Fam Pract. 2006;23(2):167–174. https://doi.org/10.1093/fampra/cmi124

## Curriculum checklist

This article addresses the following requirements from the general internal medicine curriculum:

- Is focused on patient safety and delivers effective quality improvement in patient care
- Managing an acute unselected take
- Managing an acute specialty-related take
- Managing patients in an outpatient clinic, ambulatory or community setting, including management of long-term conditions.

Sacks R. Coronary heart disease remains second leading cause of death in England and Wales. 2018. https://www.bhf.org.uk/what-we-do/news-from-the-bhf/news-archive/2018/october/coronary-heart-disease-remains-second-leading-cause-of-death-in-england-and-wales (accessed 24 November 2021)

Singh H, Giardina TD, Meyer AND et al. Types and origins of diagnostic errors in primary care settings. JAMA Intern Med. 2013;173(6):418–425. https://doi.org/10.1001/jamainternmed.2013.2777

Venturella I, Balconi M. Pain and consciousness in humans. Or why pain subserves the identity and self-representation. Rivista Internazionale di Filosofia e Psicologia. 2016;7(2):166–179. https://doi.org/10.4453/rifp.2016.0018

Verdon F, Herzig L, Burnand B et al. Chest pain in daily practice: occurrence, causes and management. Swiss Med Wkly. 2008;138(23–24):340–347