Cardiac-type Chest Pain Presenting in Primary Care

It is often difficult to be certain as to whether chest pain is of cardiac or non-cardiac cause. A full history should be taken from the patient to assess the need for either immediate hospital admission or urgent hospital referral. Any doubt should lead to referral to secondary care for further assessment, either to the local chest pain clinic or urgent hospital admission. See also the separate article on Chest Pain.

Rapid access chest pain clinics have improved diagnosis of incident angina in those with high risk of cardiovascular disease, but misdiagnosis rates are high and a recent study showed that a third of all cardiac events in subsequent follow-up occurred in those diagnosed with non-cardiac chest pain. GPs tend to use their previous experience of a patient's behaviour in comparison with the current consultation as well as textbook criteria to diagnose chest pain.

Assessment for possible acute coronary syndrome (ACS)

- Consider the history of the pain, any cardiovascular risk factors, history of ischaemic heart disease and any previous treatment, and previous investigations for chest pain.
- Symptoms that may indicate ACS include:
  - Pain in the chest and/or other areas (eg, the arms, back or jaw) lasting longer than 15 minutes.
  - Chest pain with nausea and vomiting, marked sweating and/or breathlessness, or haemodynamic instability.
  - New-onset chest pain, or abrupt deterioration in stable angina, with recurrent pain occurring frequently with little or no exertion and often lasting longer than 15 minutes.
  - The response to glyceryl trinitrate (GTN) should not be used to make a diagnosis and symptoms should not be assessed differently in men and women or among different ethnic groups.
- Patients with pre-existing angina should be advised that when an attack of angina occurs, they should:
  - Stop what they are doing and rest.
  - Use GTN spray or tablets as instructed.
  - Take a second dose of GTN after 5 minutes if the pain has not eased.
  - Take a third dose of GTN after a further 5 minutes if the pain has still not eased.
  - Call 999/112/911 for an ambulance if the pain has not eased after another 5 minutes (ie 15 minutes after onset of pain), or earlier if the pain is intensifying or the person is unwell.

Epidemiology

- Coronary heart disease remains the principal cause of death in the UK and a fifth of these deaths occurs below retirement age.
- The main risk factors are smoking, hypertension, hyperlipidaemia, diabetes and obesity.

Presentation

A full cardiovascular assessment is essential (see the separate article on Cardiovascular History and Examination).

- Chest pain due to cardiac ischaemia typically tends to be retrosternal or epigastric, tight and crushing in quality, and may radiate to the arms, shoulders, neck or jaw.
- Aortic dissection tends to cause pain with a tearing quality; pericarditis and pulmonary pain tend to be worse on inspiration (pleuritic) and oesophageal reflux pain has a burning quality.
- Cardiac ischaemia pain tends to be retrosternal.
- Stable angina is likely if chest discomfort or breathlessness is associated with effort, emotion, food or cold weather, symptoms are relieved by rest and/or GTN and one or more risk factors for coronary artery disease are present.
- In patients with ACS:
  - Chest pain may be associated with sweating, nausea, vomiting, dyspnoea, fatigue, and/or palpitations.
  - Shortness of breath may be the main symptom of cardiac ischaemia, associated with angina pain, or a symptom of heart failure.
  - Atypical presentations are common (especially in women, older men, people with diabetes, and people from ethnic minorities) - eg, abdominal discomfort or jaw pain; elderly patients may present with altered mental state.

- The assessment of any patient with possible cardiac chest pain should include smoking history, past history of cardiovascular disease and comorbidities, especially diabetes, hypertension and hyperlipidaemia.

Examination
Many patients will have entirely normal examination findings. However, a thorough cardiovascular examination is essential. Always check pulse rate and rhythm, blood pressure, auscultate heart sounds (ensure no murmurs - eg, aortic stenosis can present with angina) and chest (to exclude signs of heart failure). Consider findings suggesting non-cardiac chest pain - eg, tenderness of the chest wall, epigastric tenderness due to a peptic ulcer, and focal lung signs associated with pneumonia.

**Differential diagnosis of chest pain**

The main causes of chest pain include:

- **Angina, ACS** (including myocardial infarction).
- **Acute pericarditis**.
- **Pneumonia, pulmonary embolism, pneumothorax**.
- **Gastro-oesophageal reflux, oesophageal spasm**.
- **Peptic ulcer disease**.
- **Gallstones, cholecystitis**.
- **Acute pancreatitis**.
- **Chest wall pain** - eg, Tietze's syndrome, trauma, shingles, rib secondaries, osteoporosis.
- **Aortic dissection**.
- **Anxiety, depression**.

**Investigations**

Depending on the clinical state of the patient and any suspicion of myocardial infarction, the patient may require immediate transfer to hospital before any investigations are performed.

Investigations may be required to exclude non-cardiac causes of chest pain - eg, CXR (pneumonia), abdominal ultrasound (gallstones), serum amylase (acute pancreatitis).

- Initial blood investigations include cardiac enzymes, fasting lipids, fasting glucose and FBC (to exclude anaemia, and high white cell count may suggest pneumonia).
- Resting ECG - a resting ECG is of limited value in the evaluation of coronary heart disease but can be highly specific for acute myocardial infarction.[5]
- CXR - this may be useful in evaluating the presence of heart failure or an alternative diagnosis - eg, aortic aneurysm, pneumonia, rib fractures, rib secondaries or osteoporosis.
- Exercise ECG testing should not be used to diagnose or exclude stable angina for people without known coronary artery disease.[3] See the separate article on **Stable Angina** for further discussion on diagnosis of angina.
- Depending on the presentation, further investigations may include echocardiogram, coronary angiography, V/Q scan or pulmonary angiography (pulmonary embolus), CT aortography (aortic dissection) or upper gastrointestinal endoscopy (gastro-oesophageal reflux disease, peptic ulcer).

National Institute for Health and Care Excellence (NICE) guidance recommends that the sequence of imaging tests be determined by the patient's risk of coronary artery disease. The pre-test probability of coronary artery disease uses age, sex, risk factors and symptom characteristics.[8]

- Patients with a pre-test probability of 10-29% for coronary artery disease are initially investigated with the coronary artery calcium scoring using CT.
- CT coronary angiography is performed in patients with a calcium score of 1-400 to determine whether there are any coronary stenoses.
- Patients with a 30-60% risk are initially investigated with functional cardiac imaging to diagnose flow limiting coronary disease.
- Invasive coronary angiography, as a first-line investigation, is reserved for symptomatic patients with a 61-90% pre-test probability of coronary artery disease when revascularisation is a treatment option.

**Referral to chest pain clinics**

- For those patients not requiring immediate hospital admission, chest pain clinics enable rapid confirmation of the diagnosis, initiation of treatment, and, where considered appropriate, further investigation and intervention.
- Patients should understand that further assessment may lead to a recommendation for more invasive treatment.

**Further reading & references**
