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                         │            Chest pain            │
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                         ┌─────────────────────────────────┐
                         │ Clinical history, physical       │
                         │ examination, blood tests         │
                         │ (troponin T), ECG, CXR           │
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Chest pain

Clinical history, physical examination, blood tests (troponin T), ECG, CXR

Clinically stable chest pain

Clinically unstable chest pain

Cardiac origin

Non-cardiac origin

Cardiac origin

Non-cardiac origin

Choice of investigation to be guided by clinical assessment, options include:
• CTCA
• Functional imaging (stress echo, stress MR, myocardial perfusion scintigraphy)
• Cardiac catheterization

Investigation guided by clinical picture e.g. GERD (clinical referrals to Medical GI team)

Acute coronary syndrome ACS (STEMI, NSTEMI, unstable angina)

Causes other than ACS

Subsequent investigation guided by clinical presentation, e.g.
• CTPA for PE
• CTA for acute aortic dissection

Urgent cardiologist referral and care

Role of radiologists limited, radiologists may help in subsequent management plan e.g. cardiac MRI for tissue viability for revascularization potential
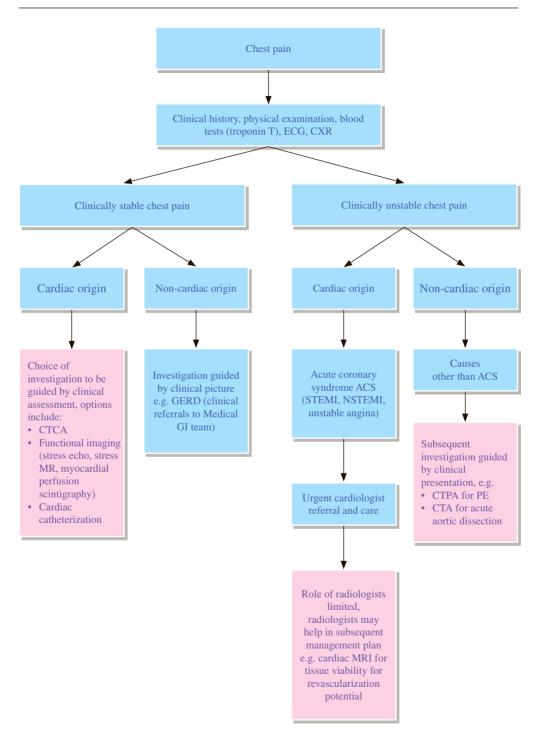
REMARKS

1. There are many aetiologies of chest pain.
    1.1 ***Cardiac origin*** such as acute coronary syndrome (ACS) [including ST-segment-elevation myocardial infarction (STEMI), non-ST-segment-elevation myocardial infarction (NSTEMI), unstable angina], myocarditis, pericarditis.
    1.2 ***Non-cardiac origin*** such as pneumothorax, pulmonary embolism, acute aortic dissection, pneumonia, pulmonary carcinoma.
    Gastroesophageal reflux disease (GERD) is the commonest cause of non-cardiac cause of chronic chest pain.

2 Initial clinical assessment [history, physical examination, electrocardiogram (ECG), blood test - troponin, chest X-ray (CXR)] is mandatory to distinguish clinically stable and clinically unstable patients presenting with chest pain.

3 For clinically stable chest pain; approaches are as discussed below:
    3.1 National Institute for Health and Care Excellence (NICE) guideline (CG 95): Chest pain of recent onset: assessment and diagnosis
        3.1.1 Clinical assessment (based on clinical history and physical examination) is important.
        3.1.2 64-slice (or above) CT coronary angiography (CTCA) if clinical assessment indicates typical or atypical angina; or clinical assessment indicates non-anginal chest pain but 12-lead resting ECG indicates ST-T changes or Q waves.
        3.1.3 Non-invasive functional testing for patients with confirmed / known coronary artery disease (CAD) (such as previous myocardial infarction, revascularization, previous angiography) when uncertain whether chest pain is caused by myocardial ischaemia.
    3.2 American College of Radiology (ACR) Appropriateness Criteria: Chronic chest pain
        3.2.1. Low to Intermediate probabilities of CAD (2012)
        3.2.2. Stress studies (myocardial perfusion scintigraphy, stress cardiac MRI, stress echo); CTCA
    3.3 American College of Radiology (ACR) Appropriateness Criteria: Chronic chest pain
        3.3.1. High probability of CAD (2016)
        3.3.2. Myocardial perfusion scintigraphy, stress echocardiography, stress cardiac MRI

4 For clinically unstable chest pain, if initial clinical assessment indicates clear ACS (STEMI, NSTEMI, unstable angina), patients should be urgently taken care of by cardiologists.
    4.1 Roles of radiologists are limited in this scenario.
    4.2 Radiologists may have a role in subsequent management plan such as,
        4.2.1 Assessment of tissue viability for revascularization potential (cardiac MRI).
        4.2.2 Assessment of coronary artery anatomy (CTCA), in cases of complex vessel anatomy (chronic total occlusion, anomalies) found in invasive cardiac catheterization, and planning of percutaneous coronary intervention (PCI) / coronary artery bypass graft (CABG).
    4.3 For a certain subset of patients who present with clinically stable ACS (unstable angina/NSTEMI) and not selected for urgent catheter catheterization, a number of imaging modalities can be considered for evaluation, e.g. myocardial perfusion scintigraphy, CTCA, cardiac MRI, stress echocardiography.

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5   For clinically unstable chest pain, if initial clinical assessment suggests conditions other than ACS, subsequent imaging investigations shall be guided by the individual clinical presentation.

   5.1   CXR is routinely/universally performed and may give clues to the causes of chest pain (such as pneumothorax, widened mediastinum indicating possibility of aortic dissection).

   5.2   Normal CXR cannot rule out significant pathology.

   5.3   Computed tomography pulmonary angiogram (CTPA) for suspected pulmonary embolism.

   5.4   CT aortogram for suspected intramural haematoma, aortic dissection.

   5.5   Cardiac MRI for suspected myocarditis.

   5.6   Echocardiography for pericardial effusion, infective endocarditis.

   5.7   US abdomen for acute cholecystitis or acute pancreatitis which may be the cause of chest pain; CT abdomen for suspected perforated hollow viscus which may cause excruciating chest pain.

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