COMMON CASES IN CARDIOLOGY

For Medical Students & House Officers

BY

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ACKNOWLEDGEMENT

Foremost, we are thankful to God for the good health and wellbeing that were necessary to complete this Book and present a clear picture of what has been done during the book completion. After this we would like to express our sincere gratitude to **THE STETHO medical Publishing forum** to provide me with an opportunity to share my knowledge and add something meaningful to the medical literature.

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"William Osler"

" There are only two sorts of doctors: those who practice with their brains, and those who practice with their tongues"

CASE 1

A 40 YEARS OLD MAN WITH CHEST PAIN

Scenario: A 40 years old teacher visits your ED for complaints of acute chest pain. He has previous such episodes occurring on and off for the last 8 months but this time the pain is persistent for the last 5 hours. He is in the ED for further evaluation.

HISTORY

1. Evaluate Pain: As a physician your primary concern in this patient should be to identify the chest pain of cardiac origin.

- Site.
- Onset.
- Character.
- Radiation.
- Associated symptoms.
- Timing/duration.
- Exacerbating factors.
- Severity.

2. It is important to elicit a prior history of angina. Many patients will describe exertional chest pain in the weeks preceding presentation. With angina or an acute coronary syndrome (ACS) the pain usually builds to a maximum over a few minutes rather than reaching its maximal intensity instantaneously.

3. Pain due to myocardial infarction may be associated with one of following features:

- Sweating.
- Nausea.
- Vomiting.
- Breathlessness.
- Dizziness.

4. A Past Medical History of Stroke, Claudication, Angina or previous Myocardial Infarction.

5. Past history of Hypertension or Chronic Renal Failure.

PHYSICAL EXAM

The presence of a tachycardia and hypertension are not particularly helpful if the patient is in pain or anxious. The clinical examination in patients with angina or ACS is often normal. The following should be looked for:

- Arcus senilis – hypercholesterolemia (in patients under 50 years).

- Fundoscopy – hypertensive changes.

- Xanthelasma – hypercholesterolemia.

- Elevated JVP – heart failure.

- Carotid bruits – high probability of coexisting coronary disease.

- Cardiomegaly – heart failure.

- Hypertrophied apex beat – hypertension or aortic stenosis (AS). • Systolic murmur – AS or hypertrophic cardiomyopathy (HOCM) can give rise to angina.

- Diastolic murmur – aortic regurgitation (AR) associated with a type A dissection.

- Pericardial friction rub – pericarditis.

- Abdominal aorta – aortic bruit or aneurysm associated with generalised vascular disease.

- Femoral arteries/foot - pulses, evidence of peripheral vascular disease associated with coronary disease.

INVESTIGATIONS

1. Blood Tests: The following standard investigations would be helpful:

- Full Blood Count (FBC).
- Electrolytes.
- Blood Glucose.
- Renal Function.
- Thyroid Function.
- Troponin/Creatinine kinase.
- Fasting Lipid Profile and Glucose.

2. Radiological Investigations:

- ECG

- Chest X-ray
- Echocardiogram

DIFFERENTIALS

Angina pectoris

Acute myocardial infarction

Esophageal pain (reflux, spasm, inflammation)

Musculoskeletal

Pulmonary embolic disease

Cervical root compression

Aortic dissection

Chest wall pain

Pancreatitis

Cholecystitis

Anxiety disorders

MANAGEMENT

The treatment and management should be aimed relieving the symptoms of Cardiac Pain and preventing further Myocardial Injury.

- Oxygen.
- Aspirin 300 mg orally, followed by 75 mg daily.
- Sublingual or intravenous GTN if in pain.
- Clopidogrel 300 mg orally, followed by 75 mg daily.
- Low - molecular - weight heparin (weight adjusted).
- Beta blockade.
- IIb/IIIa antagonists.
- Statin therapy.
- Insulin infusion.


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CASE 2

A 52 YEARS OLD MAN WITH ATYPICAL CHEST PAIN

Scenario: A 52 Years old man that complains of chest pain related to meals and exertion. The General Practitioner (GP) referred him to a cardiologist to rule out angina. His ECG was normal. The Exercise Tolerance Test was negative for ischemia. He had a diagnostic angiogram with normal coronary arteries but the chest pain persists. A chest X-ray showed normal lung fields and no bony abnormalities. Thyroid function tests and an autoimmune screen were normal. He has been referred to you to exclude a gastrointestinal cause of his chest pain.

HISTORY

Describe the Chest Pain:

- Was the pain retrosternal burning sensation?
- Does the patient feel any acid or reflux in his mouth?
- Is there any bitter taste?
- Is there relief with antacids?
- What is the duration of his symptoms?
- Has he had similar symptoms in the past?
- Did they resolve spontaneously or require treatment?
- What is the frequency and severity of these symptoms?

- Are they getting progressively worse?

PHYSICAL EXAM

- Look for evidence of weight change, especially weight loss.
- Look for conjunctival pallor of anemia.
- Inspect the mouth for evidence of acid erosion on his teeth and smell of halitosis.
- Palpate for cervical lymphadenopathy and goiter of hyperthyroidism.
- Examine the chest for evidence of cardiovascular or respiratory disease.

INVESTIGATIONS

- ECG
- Investigation is only needed in the presence of alarm symptoms or if they are frequent and severe or progressive.

MANAGEMENT

1. General measures should be the 1st line of treatment followed by drugs.

2. Dietary Interventions:

- Small & Regular Meals
- Reduce Fatty Foods
- Eat early in the evening

3. Lifestyle Modifications:

- Avoid Coffees and hot beverages
- Raise the head during sleep
- Exercise regularly


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CASE 3

A 52 YEARS OLD WOMAN WITH UPPER ABDOMINAL DISCOMFORT

Scenario: A 57 Years Old banker presents with an 11-month history for on and off upper abdominal discomfort. It is progressively worsening in nature.

HISTORY

1. Take full history of Abdominal discomfort:
    - Character, Location, Intensity, Severity, Radiation, Frequency & Associated Factors.

2. Specific aggravating factors:
    - Eating, Nocturnal Symptoms (reflux), bending/stooping (reflux) and exertion (cardiac).

    - Specific relieving factors include food (peptic ulcer), milk and antacids (reflux, ulcer and non-ulcer dyspepsia).

PHYSICAL EXAM

- Check for anemia.
- Check for weight change.
- Feel for lymphadenopathy, especially supraclavicular lymph nodes of gastric carcinoma (Virchow's node).
- CVS Examination

INVESTIGATIONS

1. Blood Tests:
    - Complete Blood Count
    - Liver Function Tests

2. Radiological Investigations:
    - ECG
    - Abdominal Ultrasound
    - Barium meal
    - Upper endoscopy

MANAGEMENT

1. General measures should be the 1st line of treatment followed by drugs.
2. Dietary Interventions:
    - Small & Regular Meals
    - Reduce Fatty Foods
    - Eat early in the evening

3. Lifestyle Modifications:
    - Avoid Coffees and hot beverages
    - Raise the head during sleep
    - Exercise regularly


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CASE 4

A 40 YEARS OLD MAN WITH SUDDEN ONSET SEVERE CENTRAL CHEST PAIN

Scenario: A 40 Years old driver who comes to you complaining of sudden onset central chest pain. On examination pulse is 110 bpm, blood pressure is 200/130 mmHg, heart sounds are reported as normal, and there is evidence of mild left ventricular failure. Oxygen saturations are 100% on room air. The ECG shows left ventricular hypertrophy and strain. During the course of the clinical examination the patient reports increasingly severe pain, travelling through to the back. He is in the ED for further workup and evaluation.

HISTORY

Evaluate Pain: As a physician your primary concern in this patient should be to identify the chest pain of cardiac origin.

- Site.
- Onset.
- Character.
- Radiation.
- Associated symptoms.
- Timing/duration.
- Exacerbating factors.
- Severity.

PHYSICAL EXAM

The clinical examination findings that point specifically to an aortic dissection are:

Presence of a focal neurological deficit (due to involvement of the carotid vessels).

Pulse deficits.

A blood pressure difference of > 20 mmHg between the arms.

An aortic diastolic murmur indicating involvement of the aortic valve. (The patient is usually hypertensive; however, this feature does not appear to add to the diagnostic accuracy in the presence of other suggestive clinical features.)

It is important to look for features of Marfan' s syndrome, which is strongly associated with aortic dissection. These include:

- High arched palate.
- Anterior lens dislocation.
- Joint hypermobility.
- Increased height.
- Increased arm span.
- Arachnodactyly.

INVESTIGATIONS

1. Blood Tests: The following standard investigations would be helpful:

- Full Blood Count (FBC).
- Electrolytes.
- Blood Glucose.
- Renal Function.
- Thyroid Function.
- Troponin/Creatinine kinase.
- Fasting Lipid Profile and Glucose.

2. Radiological Investigations:
- ECG
- Chest X-ray
- Echocardiogram
- Contrast CT aortography
- MRI

DIFFERENTIALS

Angina pectoris

Acute myocardial infarction

Esophageal pain (reflux, spasm, inflammation)

Musculoskeletal

Pulmonary embolic disease

Cervical root compression

Aortic dissection

Chest wall pain

Pancreatitis

Cholecystitis

Anxiety disorders

MANAGEMENT

- Intravenous access.
- Analgesia.
- Blood pressure control.
- Transfer to ITU or CCU.
- Arterial line.

The mortality from aortic dissection is approximately 1% per hour. Patients should have two large - bore intravenous catheters inserted and analgesia given (usually morphine). For both type A and B dissections the key to the initial management is the control of blood pressure.

The systolic blood pressure should be maintained at between 100 and 120 mmHg. Intravenous beta blockade is particularly useful, since it reduces pulse pressure and wall stress.

Labetalol 20 mg, administered IV over a 2-minute period, followed by additional doses of 40 – 80 mg every 10 – 15 minutes (up to a maximum total dose of 300 mg) is a standard regimen. Alternatives are intravenous nitrates or sodium nitroprusside. An arterial line is usually inserted for blood pressure monitoring and the patient is transferred to ITU or CCU.


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CASE 5

A 40 YEARS OLD MAN WITH A MURMUR

HISTORY

Detailed history of Murmur.

Apply the ODIPARA (Onset, Duration, Intensity, Progression, Aggravating Factor, Relieving Factors & Anything Else???) Mnemonic.

PHYSICAL EXAM

Site – the location of the murmur in relation to the surface anatomy. Usually the point of maximal intensity, some murmurs are heard throughout the precordium.

Character:

- Ejection.
- Pan.
- Late.
- Mid.
- Intensity.

Radiation, e.g., carotids in aortic stenosis and axilla for mitral regurgitation (MR).
Heart sounds:

- second heart sound – soft in aortic stenosis (AS).

- third heart sound – present in MR due to increased ventricular filling in early diastole.
- fourth heart sound – in AS due to atrial filling of a hypertrophied non - compliant left ventricle.

General inspection – for features of endocarditis.

Pulse, e.g., slow rising in AS, equality of pulses and strength of femoral pulses in aortic coarctation.

Blood pressure, e.g., reduced pulse pressure in AS, or hypertension with coarctation of the aorta.

JVP – large 'V' waves associated with tricuspid regurgitation (TR).

Apex beat – displaced or hypertrophied.

Hepatomegaly – pulsatile in TR.

INVESTIGATIONS

1. Blood Tests: The following standard investigations would be helpful:

- Full Blood Count (FBC).
- Electrolytes.
- Blood Glucose.
- Renal Function.
- Thyroid Function.
- Troponin/Creatinine kinase.
- Fasting Lipid Profile and Glucose.

2. Radiological Investigations:
   - Chest X-ray
   - Echocardiogram
   - ECG

MANAGEMENT

The clinical features suggest that the MR is no longer well compensated. The patient therefore requires surgery The functional and long - term outcome for surgery in MR is better with valve repair than replacement. A transoesophageal echocardiogram is therefore performed to establish whether the valve is suitable for repair. Prolapse of the posterior leaflet of the mitral valve

is easier to repair than prolapse of the anterior leaflet. Rheumatic MR is seldom suitable for mitral valve repair. In all surgery for valvular heart disease the patient will need formal assessment of their dentition and, where necessary, extractions prior to surgery to minimize the risk of subsequent endocarditis. In the period before surgery the patient should be anticoagulated in view of the risk of thromboembolism started on digoxin and given diuretics and an ACE inhibitor. The results of mitral valve repair are excellent. However, once there is echocardiographic evidence of significant left ventricular impairment the long-term prognosis is poor and once the ejection fraction falls below 30%, or there is severe pulmonary hypertension


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CASE 6

A 30 YEARS OLD LADY WITH FAINTING EPISODES

HISTORY

1. Fainting: Apply the ODIPARA (Onset, Duration, Intensity, Progression, Aggravating Factor, Relieving Factors &Anything Else???) Mnemonic.

2. Frequency of spells

- Most blackouts, particularly in this young group, are very infrequent. Knowing how often they happen

3. Is there any warning?

- Epileptic seizures may be preceded by an aura. Events with no warning are more likely to result in injury.

4. Are there any particular triggers or situations that precede the blackouts?

- Syncope during exercise is worrying as it may represent a mechanical outflow obstruction to the left ventricle or an exercise - induced arrhythmia. Syncope

following pain or unpleasant stimuli may be neurally mediated faints. Orthostatic hypotension manifests after standing upright. Syncope after head rotation or neck pressure may be due to carotid sinus hypersensitivity.

5. Was there a prompt or gradual recovery?

- Short - lived arrhythmias usually result in prompt recovery whereas epileptic seizures or hypoglycaemic faints may be followed by periods with reduced conscious levels

6. Were there any additional symptoms?

- Rapid palpitations may indicate an arrhythmia. Nausea and sweating may be associated with neurally mediated faints or hypoglycaemia.

7. Is there an eye - witness account?

- Was there seizure - like tonic – clonic movements consistent with epilepsy? Was the patient very pale and cold consistent with low cardiac output?

8. Is the patient on any drugs?

- Drugs such as diuretics and antihypertensives may lead to excessive blood - pressure reduction. Hypoglycaemic medications may lower blood sugar too much. Antiarrhythmic drugs may cause bradycardia. Recreation drug use may also cause arrhythmias or hypotension.

PHYSICAL EXAM

Start with the General Physical Exam

Followed by a full Cardiovascular Examination with particular focus on the Heart sounds:

- second heart sound – soft in aortic stenosis (AS).
- third heart sound – present in MR due to increased ventricular filling in early diastole.
- fourth heart sound – in AS due to atrial filling of a hypertrophied non - compliant left ventricle.

General inspection – for features of endocarditis.

Pulse, e.g., slow rising in AS, equality of pulses and strength of femoral pulses in aortic coarctation.

Blood pressure, e.g., reduced pulse pressure in AS, or hypertension with coarctation of the aorta.

JVP – large 'V' waves associated with tricuspid regurgitation (TR).

Apex beat – displaced or hypertrophied.

Hepatomegaly – pulsatile in TR.

INVESTIGATIONS

1. Blood Tests: The following standard investigations would be helpful:

- Full Blood Count (FBC).
- Electrolytes.
- Blood Glucose.
- Renal Function.
- Thyroid Function.

- Troponin/Creatinine kinase.
- Fasting Lipid Profile and Glucose.

2. Radiological Investigations:
   - Chest X-ray
   - Echocardiogram
   - ECG

DIFFERENTIALS

Neurally mediated syncope.

Psychogenic syncope.

An arrhythmia.

Epilepsy.

MANAGEMENT

1. Lifestyle changes:
   - The most important action is to keep well hydrated at all times. This means drinking a lot more fluids than most people are used to, i.e., 500 ml every 4 hours, starting on

waking and carrying on through during the day (even more on hot days). Avoid potential diuretics such as caffeine and alcohol. Urine should be clear and the patient should never feel thirsty. Increase salt intake. Exercise to improve venous return through leg muscle action. Sometimes lower limb compression stockings to reduce venous pooling are advised. Avoid stimuli that provoke attacks and if a prodrome starts take immediate action by lying flat.

2. Medications:

- The most effective is the vasoconstrictor midodrine (an alpha agonist).
- Beta blockers are commonly prescribed (to suppress the sympathetic arm of the reflex) but are usually ineffective.
- Other drugs are fludrocortisone (a mineralocorticoid that retains salt and raises blood pressure)


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CASE 7

AN 80 YEARS OLD WOMAN WITH BLACKOUTS

HISTORY

1. Fainting: Apply the ODIPARA (Onset, Duration, Intensity, Progression, Aggravating Factor, Relieving Factors &Anything Else???) Mnemonic.

2. Frequency of blackouts

3. In what setting did the blackouts occur? Were they exertional or at rest? Were they postural?

4. What was she like on recovery? Groggy or alert?

5. Were there any associated symptoms, e.g. palpitations?

6. Does she have any other symptoms, e.g., angina? breathlessness, dizzy spells, etc.?

7. Was there any tongue - biting or incontinence to suggest a seizure?

8. Is there any warning?

9. Is the patient on any drugs?

PHYSICAL EXAM

Start with the General Physical Exam

Followed by a full Cardiovascular Examination with particular focus on the Heart sounds:

- second heart sound – soft in aortic stenosis (AS).
- third heart sound – present in MR due to increased ventricular filling in early diastole.
- fourth heart sound – in AS due to atrial filling of a hypertrophied non - compliant left ventricle.

General inspection – for features of endocarditis.

Pulse, e.g., slow rising in AS, equality of pulses and strength of femoral pulses in aortic coarctation.

Blood pressure, e.g., reduced pulse pressure in AS, or hypertension with coarctation of the aorta.

JVP – large 'V' waves associated with tricuspid regurgitation (TR).

Apex beat – displaced or hypertrophied.

INVESTIGATIONS

1. Blood Tests: The following standard investigations would be helpful:

- Full Blood Count (FBC).
- Electrolytes.

2. Radiological Investigations:

- Chest X-ray
- Echocardiogram
- ECG
- Lying & Standing Blood Pressure
- Carotid Sinus Massage
- 24-48 Hrs Holter Monitor
- Implantable Loop Recorder
- Electrophysiological Study
- Exercise Testing
- 7 Day Event Monitor

DIFFERENTIALS

Bradycardia

- Stokes Adams attack

Arrhythmia.

- Ventricular Tachycardia

Aortic Stenosis

Orthostatic Hypotension

MANAGEMENT

The presence of inducible haemodynamically compromising sustained monomorphic ventricular tachycardia in a patient with syncope of unknown origin, ischaemic heart disease and poor left ventricular function is a class I indication for ICD implantation.

Even if she had not suffered syncope as a presenting complaint, she would now satisfy primary prevention criteria as she has ischaemic heart disease, LVEF < 35%, non - sustained ventricular tachycardia on a Holter and inducible

VT with programmed stimulation (entry criteria for the original MADIT trial and an indication recognised by American, European and UK guidelines).


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CASE 8

A 26 YEARS OLD LADY WITH PALPITATIONS

HISTORY

1. Palpitations: Apply the ODIPARA (Onset, Duration, Intensity, Progression, Aggravating Factor, Relieving Factors &Anything Else???) Mnemonic.

2. Frequency?

3. What is the nature of the chest sensation? Is it a pain or discomfort (if so, what are its characteristics), or an awareness of her heart beat?

4. Where in the chest is it and does it spread/radiate?

5. Are the palpitations fast or slow, sustained or intermittent, regular or chaotic?

6. Do they have a gradual or sudden onset and offset?

7. Is the patient on any drugs?

8. Check stressors or emotional disturbances in at home or work

PHYSICAL EXAM

Start with the General Physical Exam

Followed by a full Cardiovascular Examination with particular focus on the Heart sounds:

- second heart sound – soft in aortic stenosis (AS).
- third heart sound – present in MR due to increased ventricular filling in early diastole.
- fourth heart sound – in AS due to atrial filling of a hypertrophied non - compliant left ventricle.

General inspection – for features of endocarditis.

Pulse, e.g., slow rising in AS, equality of pulses and strength of femoral pulses in aortic coarctation.

JVP – large 'V' waves associated with tricuspid regurgitation (TR).

Apex beat – displaced or hypertrophied.

INVESTIGATIONS

1. Blood Tests: The following standard investigations would be helpful:

- Full Blood Count (FBC).
- Electrolytes. (Potassium-K)

2. Radiological Investigations:

- Echocardiogram
- ECG
- 24-48 Hrs Holter Monitor
- Implantable Loop Recorder
- Electrophysiological Study
- Exercise Testing

DIFFERENTIALS

Ventricular Tachycardia

Atrial Fibrillation

Supraventricular Tachycardia

Atrial/Ventricular Ectopic beats

Intermittent Heart Block/Bradycardia

MANAGEMENT

In a structurally normal heart, reassurance is often all that is required and symptoms settle spontaneously. Rarely, beta blockers can be tried. In extreme examples (a very high burden and severe symptoms), radiofrequency ablation of the ectopic focus can be performed.


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MULTIPLE CHOICE QUESTIONS

1. A 65-year-old man presents with central crushing chest pain for the first time. He is transferred immediately to the closest cardiac unit to undergo a primary percutaneous coronary intervention. There is thrombosis of the left circumflex artery only. Angioplasty is carried out and a drug-eluding stent is inserted. What are the most likely changes to have occurred on ECG during admission?

    A. ST depression in leads V1–4
    B. ST elevation in leads V1–6
    C. ST depression in leads II, III and AVF
    D. ST elevation in leads V5–6
    E. ST elevation in leads II, III and AVF

2. A 78-year-old woman is admitted with heart failure. The underlying cause is determined to be aortic stenosis. Which sign is most likely to be present?

    A. Pleural effusion on chest x-ray
    B. Raised jugular venous pressure (JVP)
    C. Bilateral pedal oedema

D. Bibasal crepitations
E. Atrial fibrillation

3. A patient is admitted with pneumonia. A murmur is heard on examination. What finding points to mitral regurgitation?

    A. Murmur louder on inspiration
    B. Murmur louder with patient in left lateral position
    C. Murmur louder over the right 2nd intercostal space midclavicular line
    D. Corrigan's sign
    E. Narrow pulse pressure

4. A 79-year-old woman is admitted to the coronary care unit (CCU) with unstable angina. She is started on appropriate medication to reduce her cardiac risk. She is hypertensive, fasting glucose is normal and cholesterol is 5.2. She is found to be in atrial fibrillation. What is the most appropriate treatment?

    A. Aspirin and clopidogrel
    B. Digoxin
    C. Cardioversion
    D. Aspirin alone

E. Warfarin

5. A 55-year-old man has just arrived in accident and emergency complaining of 20 minutes of central crushing chest pain. Which feature is most indicative of myocardial infarction at this moment in time?

   A. Inverted T waves
   B. ST depression
   C. ST elevation
   D. Q waves
   E. Raised troponin

6. A 66-year-old woman presents to accident and emergency with a 2-day history of shortness of breath. The patient notes becoming progressively short of breath as well as a sharp pain in the right side of the chest which is most painful when taking a deep breath. The patient also complains of mild pain in the right leg, though there is nothing significant on full cardiovascular and respiratory examination. Heart rate is 96 and respiratory rate is 12. The patient denies any weight loss or long-haul flights but mentions undergoing a nasal

polypectomy 3 weeks ago. The most likely diagnosis is:

A. Muscular strain
B. Heart failure
C. Pneumothorax
D. Angina
E. Pulmonary embolism

7. A 59-year-old man presents for a well person check. A cardiovascular, respiratory, gastrointestinal and neurological examination is performed. No significant findings are found, except during auscultation a mid systolic click followed by a late systolic murmur is heard at the apex. The patient denies any symptoms. The most likely diagnosis is:

A. Barlow syndrome
B. Austin Flint murmur
C. Patent ductus arteriosus
D. Graham Steell murmur
E. Carey Coombs murmur

8. A 60-year-old man presents to accident and emergency with a 3-day history of increasingly severe chest pain. The patient

describes the pain as a sharp, tearing pain starting in the centre of his chest and radiating straight through to his back between his shoulder blades. The patient looks in pain but there is no pallor, heart rate is 95, respiratory rate is 20, temperature 37ÅãC and blood pressure is 155/95 mmHg. The most likely diagnosis is:

A. Myocardial infarction
B. Myocardial ischaemia
C. Aortic dissection
D. Pulmonary embolism
E. Pneumonia

9. A 49-year-old man is rushed to accident and emergency complaining of a 20-minute history of severe, crushing chest pain. After giving the patient glyceryl trinitrate (GTN) spray, he is able to tell you he suffers from hypertension and type 2 diabetes and is allergic to aspirin. The most appropriate management is:

A. Aspirin
B. Morphine
C. Heparin

D. Clopidogrel
E. Warfarin

10. While on call you are called by a nurse to a patient on the ward complaining of light headedness and palpitations. When you arrive, the patient is not conscious but has a patent airway and is breathing with oxygen saturation at 97 per cent. You try to palpate a pulse but are unable to find the radial or carotid. The registrar arrives and after hearing your report of the patient decides to shock the patient who recovers. What is the patient most likely to have been suffering?

    A. Torsades de Pointes
    B. Ventricular fibrillation
    C. Sustained ventricular tachycardia
    D. Non-sustained ventricular tachycardia
    E. Normal heart ventricular tachycardia

11. A 67-year-old man presents to accident and emergency with a 3-day history of shortness of breath. On examination you palpate the radial pulse and notice that the

patient has an irregular heart beat with an overall rate of 140 bpm. You request an electrocardiogram (ECG) which reveals that the patient is in atrial fibrillation. Which of the following would you expect to see when assessing the JVP?

A. Raised JVP with normal waveform
B. Large ‘v waves’
C. Cannon ‘a waves’
D. Absent ‘a waves’
E. Large ‘a waves’

12. A 78-year-old woman is admitted to your ward following a 3-day history of shortness of breath and a productive cough of white frothy sputum. On auscultation of the lungs, you hear bilateral basal coarse inspiratory crackles. You suspect that the patient is in congestive cardiac failure. You request a chest x-ray. Which of the following signs is not typically seen on chest x-ray in patients with congestive cardiac failure?

A. Lower lobe diversion
B. Cardiomegaly
C. Pleural effusions

D. Alveolar oedema
E. Kerley B lines

13. A 56-year-old man presents to your clinic with symptoms of exertional chest tightness which is relieved by rest. You request an ECG which reveals that the patient has first degree heart block. Which of the following ECG abnormalities is typically seen in first degree heart block?

A. PR interval >120 ms
B. PR interval >300 ms
C. PR interval <200 ms
D. PR interval >200 ms
E. PR interval <120 ms

14. You see a 57-year-old woman who presents with worsening shortness of breath coupled with decreased exercise tolerance. She had rheumatic fever in her adolescence and suffers from essential hypertension. On examination she has signs which point to a diagnosis of mitral stenosis. Which of the following is not a clinical sign associated with mitral stenosis?

A. Malar flush
B. Atrial fibrillation
C. Pan-systolic murmur which radiates to axilla
D. Tapping, undisplaced apex beat
E. Right ventricular heave

15. A 48-year-old woman has been diagnosed with essential hypertension and was commenced on treatment three months ago. She presents to you with a dry cough which has not been getting better despite taking cough linctus and antibiotics. You assess the patient's medication history. Which of the following antihypertensive medications is responsible for the patient's symptoms?
    A. Amlodipine
    B. Lisinopril
    C. Bendroflumethiazide
    D. Frusemide
    E. Atenolol

16. A 62-year-old male presents with palpitations, which are shown on ECG to be atrial fibrillation with a ventricular rate of approximately 130/minute. He has mild central chest discomfort but is not acutely

distressed. He first noticed these about 3 hours before coming to hospital. As far as is known this is his first episode of this kind. Which of the following would you prefer as first-line therapy?

A. Anticoagulated with heparin and start digoxin at standard daily dose
B. Attempt DC cardioversion
C. Administer bisoprolol and verapamil, and give warfarin
D. Attempt cardioversion with IV flecainide
E. Wait to see if there is spontaneous reversion to sinus rhythm

17. A 76-year-old male is brought to accident and emergency after collapsing at home. He has recovered within minutes and is fully alert and orientated. He says this is the first such episode that he has experienced, but describes some increasing shortness of breath in the previous six months and brief periods of central chest pain, often at the same time. On examination, blood pressure is 115/88 mmHg and there are a few rales at both bases. On ECG there are borderline

criteria for left ventricular hypertrophy. Which of the following might you expect to find on auscultation?

A. Mid-diastolic murmur best heard at the apex
B. Crescendo systolic murmur best heard at the right sternal edge
C. Diastolic murmur best heard at the left sternal edge
D. Pan-systolic murmur best heard at the apex
E. Pan-systolic murmur best heard at the left sternal edge

18. A 63-year-old male was admitted to accident and emergency 2 days after discharge following an apparently uncomplicated MI. He complained of rapidly worsening shortness of breath over the previous 48 hours but no further chest pain. He was tachypnoeic and had a regular pulse of 110/minute, which proved to be sinus tachycardia. The jugular venous pressure was raised and a pan-systolic murmur was noted, maximal at the left sternal edge. Which of the following is the most likely diagnosis?

A. Mitral incompetence
B. Ventricular septal defect
C. Aortic stenosis
D. Dressler's syndrome
E. Further myocardial infarction

19. A 57-year-old male is admitted complaining of headaches and blurring of vision. His blood pressure is found to be 240/150 mmHg and he has bilateral papilloedema, but is fully orientated and coherent. He had been known to be hypertensive for about five years and his blood pressure control had been good on three drugs. However, he had decided to stop all medication two months before this event. Which of the following would be your preferred parenteral medication at this point?

A. Glyceryl trinitrate
B. Hydralazine
C. Labetalol
D. Sodium nitroprusside
E. Phentolamine

20. A 16-year-old boy is diagnosed with a small ventricular septal defect, having been screened by echocardiography because of a family history of hypertrophic obstructive cardiomyopathy. He is entirely asymptomatic, plays several sports regularly and has no growth retardation. The echocardiogram also confirms a small left to right shunt, with pulmonary to systemic flow ratio only just above one. Which of the following is the most likely to be a significant complication of his condition?

    A. Pulmonary hypertension
    B. Heart failure
    C. Dysrhythmias
    D. Endocarditis
    E. Shunt reversal (right to left flow)

21. A 52 year-old woman has been treated for several years with amlodipine and lisinopril for what has been presumed to be primary hypertension. She is seen by her GP having complained of persistent left loin pain. Her BP is 150/95 mmHg. She is tender in the left loin and both kidneys appear to be enlarged. On urine

dipstick testing, there is microscopic haematuria. Which of the following is likely to be the most appropriate investigation at this point?

A. Urinary tract ultrasound
B. Abdominal and pelvic computed tomography (CT) scan
C. Microscopy of the urine (microbial and cytological)
D. Renal biopsy
E. Intravenous urogram

22. A 61-year-old man presents with a 2-hour history of moderately severe retrosternal chest pain, which does not radiate and is not affected by respiration or posture. He complains of general malaise and nausea, but has not vomited. His ECG shows ST segment depression and T wave inversion in the inferior leads. Troponin levels are not elevated. He has already been given oxygen, aspirin and intravenous GTN; he is an occasional user of sublingual GTN and takes regular bisoprolol for stable angina. What would be the most appropriate next step in his management?

A. IV low-molecular weight heparin
B. Thrombolysis with alteplase
C. IV nicardapine
D. Angiography with stenting
E. Oral clopidogrel

23. A 41-year-old woman is referred for assessment after suffering a second pulmonary embolus within a year. She has not been travelling recently, has not had any surgery, does not smoke and does not take the oral contraceptive pill. She is not currently on any medication as the diagnosis is retrospective and she is now asymptomatic. What should be the next step in her management?

A. Initiation of warfarin therapy
B. ECG
C. Thrombophilia screen
D. Insertion of inferior vena cava filter
E. Duplex scan of lower limb veins and pelvic ultrasound

24. A 32-year-old woman attends her GP for a routine medical examination and is noted to have a mid-diastolic murmur with an opening snap. Her blood pressure is

118/71 mmHg and the pulse is regular at 66 beats per minute. She is entirely asymptomatic and chest x-ray and ECG are normal. What would be the most appropriate investigation at this point?

A. ECG
B. Anti-streptolysin O titre
C. Cardiac catheterization
D. Thallium radionuclide scanning
E. Colour Doppler scanning

25. A 46-year-old man develops sudden severe central chest pain after lifting heavy cases while moving house. The pain radiates to the back and both shoulders but not to either arm. His BP is 155/90 mmHg, pulse rate is 92 beats per minute and the ECG is normal. He is distressed and sweaty, but not nauseated. What would you consider the most likely diagnosis?

A. Pneumothorax
B. MI
C. Pulmonary embolism
D. Aortic dissection
E. Musculoskeletal pain

26. A 49-year-old woman presents with increasing shortness of breath on exertion developing over the past three months. She has no chest pain or cough, and has noticed no ankle swelling. On examination, blood pressure is 158/61 mmHg, pulse is regular at 88 beats per minute and there are crackles at both lung bases. There is a decrescendo diastolic murmur at the left sternal edge. What is the most likely diagnosis?

    A. Aortic regurgitation
    B. Aortic stenosis
    C. Mitral regurgitation
    D. Mitral stenosis
    E. Tricuspid regurgitation

27. A 21-year-old man is on his way home from a party when he experiences the sudden onset of rapid palpitations. He feels uncomfortable but not short of breath and has no chest pain. He goes to the nearest accident and emergency department, where he is found to have a supraventricular tachycardia (SVT) at a rate of 170/minute. Carotid sinus massage

produced transient reversion to sinus rhythm, after which the tachycardia resumed. What would be the next step in your management?

A. Repeat carotid sinus massage
B. IV verapamil
C. IV propranolol
D. IV adenosine
E. Synchronized DC cardioversion

28. A 44-year-old woman attends her local accident and emergency department with a history of at least six months of frequent central chest pain in the early morning or during the night. She had no chest pain on exertion. This had been a particularly severe attack, lasting over 2 hours. Her pulse rate is 84/minute in sinus rhythm, and blood pressure is 134/86 mmHg. The ECG shows anterior ST segment elevation, but troponin levels do not rise. Subsequent coronary angiography is normal. What is the most likely diagnosis?

A. MI
B. Stable angina

C. Unstable angina
D. Anxiety
E. Variant angina

29. A previously fit 19-year-old man presents with unusual shortness of breath on exertion. At times, this is also associated with central chest pain. On examination there is a loud mid-systolic murmur at the left sternal edge. Heart rate and blood pressure are normal and there is no oedema. The ECG shows left axis deviation and the voltage criteria for left ventricular hypertrophy and the echocardiogram reveals a significant thickened interventricular septum, with delayed ventricular filling during diastole. There is a family history of sudden death below the age of 50. Which of the following would be your initial therapy?

A. Digoxin
B. Long-acting nitrates
C. Beta-blockers
D. Rate-limiting calcium channel blockers
E. Partial excision of the septum

30. A 56-year-old man presents to the accident and emergency department with a 2-hour history of central chest pain radiating to the left arm. He is anxious, nauseated and sweaty. His pulse rate is 120/minute in sinus rhythm and the ECG reveals ST elevation in leads II, III and aVF. The troponin level is significantly raised. This is certainly acute MI. Which is the most likely coronary vessel to be occluded?

    A. Circumflex artery
    B. Left anterior descending artery
    C. Right coronary artery
    D. Left main coronary artery
    E. Posterior descending artery

31. A 45-year-old woman complains of increasing shortness of breath on exertion, as well as orthopnoea, for the previous 3–4 months. She had apparently recovered from pericarditis about a year earlier. On ECG there is low voltage, especially in the limb leads, and the chest x-ray shows pericardial calcification. The presumptive diagnosis is constrictive pericarditis.

Which of the following physical signs would be consistent with this?

A. Increased jugular distention on inspiration
B. Third heart sound
C. Fourth heart sound
D. Rales at both lung bases
E. Loud first and second heart sounds

32. A 71-year-old man is being treated for congestive heart failure with a combination of drugs. He complains of nausea and anorexia, and has been puzzled by observing yellow rings around lights. His pulse rate is 53/minute and irregular and blood pressure is 128/61 mmHg. Which of the following medications is likely to be responsible for these symptoms?

A. Lisinopril
B. Spironolactone
C. Digoxin
D. Furosemide
E. Bisoprolol

33. A 29-year-old woman goes to see her GP complaining of fatigue and palpitations. She says she has also lost weight, though without dieting. On examination, her pulse rate is approximately 120/min and irregularly irregular. Her blood pressure is 142/89 mmHg and her body mass index is 19. There are no added cardiac sounds. The ECG confirms the diagnosis of atrial fibrillation. What would you suggest as the most useful next investigation?

    A. Thyroid function tests (TSH, free T4)
    B. ECG
    C. Chest x-ray
    D. Full blood count
    E. Fasting blood sugar

34. A 58-year-old man has made an excellent functional recovery after an anterior MI. He is entirely asymptomatic and there is no abnormality on physical examination. His blood pressure is 134/78 mmHg and he is undertaking a cardiac rehabilitation programme. Which of the following would you not recommend as part of his secondary prevention planning?

A. Aspirin
B. Lisinopril
C. Simvastatin
D. Bisoprolol
E. Omega-3 fatty acids

35. A 25-year-old woman with known mitral valve prolapse develops a low grade fever, malaise and night sweats within a couple of weeks of a major dental procedure. Examination reveals a pulse rate of 110/minute, which is regular, tender vasculitic lesions on the finger pulps and microscopic haematuria. Which investigation is most likely to provide a definitive diagnosis?

A. Full blood count
B. ECG
C. Autoantibody screen
D. Blood culture
E. Coronary angiography

36. An asymptomatic 31-year-old woman has been referred for cardiological assessment. After her ECG she was told that she had mitral valve prolapse and would like

further information on this condition. Which of the following statements is correct?

A. Beta-blocker therapy is indicated
B. Angiotensin-converting enzyme (ACE) inhibitor therapy is indicated
C. One or both leaflets of the mitral valve are pushed back into the left atrium during systole
D. Significant mitral regurgitation will eventually develop
E. Exercise should be restricted

37. A 69-year-old woman complains of intermittent palpitations, lasting several hours, which then stop spontaneously. She also suffers from asthma. Holter monitoring confirms paroxysmal atrial fibrillation. Which of the following statements is correct regarding the management of this patient?

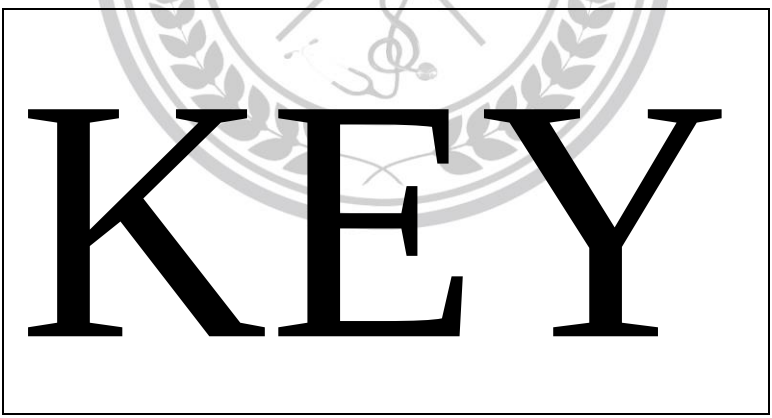
A. Digoxin effectively prevents recurrence of the arrhythmia
B. Anticoagulation is not necessary
C. Sotalol may be effective

D. Amiodarone should be avoided
E. Flecainide orally may be an effective as-needed treatment to abort an attack

38. You see a 46-year-old man who has presented to accident and emergency with an acute onset of shortness of breath. Your registrar has high clinical suspicion that the patient is suffering from a pulmonary embolism and tells you that the patient's ECG has changes pointing to the suspected diagnosis. From the list below, which of the following ECG changes are classically seen?

A. Inverted T-waves in lead I, tall/tented T-waves in lead III and flattened T-waves in lead III
B. Deep S-wave in lead I, pathological Q-wave in lead III and inverted T-waves in lead III
C. Flattened T-wave in lead I, inverted T-wave in lead III, and deep S-wave in lead III
D. No changes in lead I, deep S-wave in lead III

E. Deep S-wave in lead I with no changes in lead III



1. D
2. D
3. B
4. E
5. C
6. E
7. A
8. C
9. D
10. B
11. D
12. A
13. D
14. C
15. B
16. B
17. B
18. B
19. D
20. D
21. A
22. A
23. C
24. A
25. C
26. A
27. D
28. E
29. C
30. C
31. A
32. C
33. A
34. E
35. D
36. C
37. E
38. B