



Cardiovascular

Single Choice Questions (SCQ) and Extended Match Questions (EMQ)

Emergency Medicine Fellowship Program

1 Which of the following is NOT a treatment for torsades de pointes?

- A Magnesium
- B Isoprenaline
- C Defibrillation
- D Amiodarone

2 The following are true with regard to pacemakers EXCEPT

- A Pacemaker syndrome is more common in VVI pacemakers
- B Infections related to pacemakers occur in ~ 10% cases
- C Staphylococcal infections are most common
- D ICD discharge for non-shockable rhythms is ~10%

3 The following is diagnostic for LVH

- A R in V_5 + S in V_1 > 25mm
- B S in I + R in III > 35mm
- C R in V_6 + S in V_1 > 35mm
- D R in V_5 + S in V_1 > 35mm

4 The following may be useful in the treatment of Torsades EXCEPT

- A Isoprenaline
- B Potassium
- C Magnesium
- D Amiodarone

5 All of the following are TRUE regarding bradyarrhythmias except

- A Mobitz I block is more common than Mobitz II
- B Ventricular escape of 20 bpm may be seen in third degree heart block
- C Mobitz I block often deteriorates to complete AV block
- D QRS complexes are usually wide in Mobitz II

6 The following are relative contraindications to thrombolysis

- A Suspected Aortic Dissection
- B known intracranial neoplasm
- C CVA within last 3 months
- D Active peptic ulcer disease

7 Regarding thrombolytics, all of the following are true EXCEPT

- A Streptokinase is preferred over TPA in elderly patients
- B TPA is weight based infusion
- C Tenecteplase is weight based dose
- D Reteplase is weight based

8 All of the following conditions post myocardial infarction have an increased risk of sudden cardiac death from ventricular tachyarrhythmias EXCEPT

- A Episodes of non-sustained VT
- B Prolonged QTc
- C Ejection fraction <35%
- D Complete heart block

9 Regarding VVI pacemakers which is TRUE

- A They are dual chamber pacemakers
- B They have 2 electrodes
- C They have an atrial sensor
- D They can cardiovert VT

10 With regard to Wolff-Parkinson-White syndrome

- A 50% have a tachyarrhythmia secondary to atrial fibrillation / flutter
- B The refractory period of the accessory pathway is usually longer than the refractory period of the AV node
- C Diuresis can occur following reversion of the tachyarrhythmia
- D A refractory tachyarrhythmia may respond to digoxin IVI

11 In regard to Cardiac markers, which of the following is FALSE?

- A The specificity for Troponin I in patients with chronic renal impairment on hemodialysis is higher than for Troponin T
- B CK-MB isoenzymes are useful for detecting re-infarction
- C Myoglobin rises 2-4 hours after myocardial injury
- D The negative predictive value of myoglobin is high enough to exclude the diagnosis of ACS

12 Conditions associated with an elevated troponin include all of the following EXCEPT

- A pacing
- B sepsis
- C Acute liver impairment
- D Subarachnoid haemorrhage

13 Infective endocarditis (of native heart valves) in adults is MOST commonly caused by

- A Streptococcal species in healthy adults and Staphylococcal species in IVDU
- B Staphylococcus species in healthy adults and polymicrobial in IVDU
- C Enterococci in healthy adults and Staphylococcal species in IVDU
- D Staphylococcal species in healthy adults and IVDU

14 The following drugs prolong QT EXCEPT

- A moxifloxacin
- B trimethoprim
- C diphenhydramine
- D digoxin

15 The following are true of paroxysmal SVT EXCEPT

- A alcohol toxicity is associated with ectopic foci
- B Mahaim bundles are a cause of Wolff Parkinson White
- C Rate is 150 to 250 beats per minute
- D Supine Valsalva for 10 seconds is the most effective vagal manoeuvre

16 The following are indicators of VT in a broad complex tachycardia EXCEPT

- A Age > 55 years
- B Variable loud S1
- C Fusion beats
- D QRS > 140ms

17 A collapsing pulse is associated with

- A decreased PaCO₂
- B aortic stenosis, with or without aortic regurgitation
- C uncomplicated pregnancy
- D Hypothermia

18 In a patient who presents with syncope, which of the following features is NOT consistent with Brugada syndrome?

- A A family history of sudden death
- B Unusual J point elevation in V1 and V3
- C ECG changes when given procainamide
- D T wave inversion in V1 to V3.

19 In WPW syndrome, which of the following is FALSE?

- A B blocking agents and calcium channel blockers should be avoided.
- B AF or flutter with a rapid ventricular response can be treated with digoxin.
- C There is a high incidence of tachyarrhythmias with WPW.
- D In antidromic tachycardia, the patient is at risk of degeneration to VF

20 The differential diagnosis of ST elevation includes all of the following EXCEPT

- A Benign early repolarisation
- B Osborne waves of hypothermia
- C Hyperkalaemia
- D Left ventricular aneurysm

21 Regarding fibrinolysis, which is FALSE?

- A Bone pain occurs only with streptokinase therapy
- B Tenecteplase has a higher risk of ICH than streptokinase
- C Streptokinase is produced by group b haemolytic streptococci
- D Alteplase has the shortest half life of the TPAs

22 Regarding treatment of ACS, which of the following is FALSE

- A A 12 lead ECG involves the use of only 10 leads
- B Swallowed aspirin has better bioavailability than chewable ones
- C In the acute phase of ACS it is better not to change from one type of heparin to another
- D Abciximab is not recommended in patients receiving fibrinolysis for STEMI

23 Which of the following treatments is NOT a grade a recommendation for the long term management after control of myocardial ischaemia

- A Aspirin
- B BB
- C ACE Inhibitor
- D Ongoing prevention and cardiac rehabilitation programs

24 Regarding risk stratification for NSTEMI/ACS which of the following is FALSE?

- A DM and CRF are independent high risk factors for patients with atypical pain
- B Age > 65 y/o is an intermediate risk factor
- C Syncope is a high risk feature
- D LVEF<40% is a high risk feature

25 Which of the following is FALSE?

- A The most important initial requirement for acute management of chest pain is access to defibrillation
- B Coronary artery intervention with a raise in troponin level is part of the diagnostic criteria for AMI
- C New definitions for MI do influence indications for prevention therapies
- D CK-MB and CK can be used to confirm reinfarction

26 Regarding accessory cardiac conduction pathways, which is CORRECT?

- A Lack of a delta wave excludes an aberrant pathway
- B Polymorphic atrial complexes in A. Fib indicate a lower risk of V. fib
- C Procainamide may be used in antidromic SVT
- D Delta waves indicate an accessory AV nodal pathway

27 Which is NOT a moderate risk feature of IHD in setting of chest pain?

- A Left arm or central chest pain
- B Age >70y.o.
- C -ve troponin
- D T wave flattening

28 With regards to the JVP, all of the following are true EXCEPT:

- A Tricuspid regurgitation can cause a dominant v wave
- B Tricuspid stenosis can cause canon a waves
- C Kussmaul's sign is a rise in the JVP on inspiration
- D A hyperdynamic circulation causes an elevated JVP.

30 ECG features predictive of posterior infarct include all the following EXCEPT:

- A ST depression in V1-3
- B R/S ratio > 1.0 in lateral leads
- C Tall upright T waves V 1-3
- D ST elevation V 7-9

31 Features that make VT more likely than SVT includes all the following EXCEPT:

- A Age > 35
- B History of IHD
- C QRS less than 0.14s
- D Pulse < 200

32 With regard to syncope, which statement is TRUE?

- A The presence of orthostatic hypotension on examination diagnoses the cause of syncope.
- B A patient who has signs of cardiac failure after a syncopal episode is at high risk of early mortality including sudden cardiac death.
- C A Stokes-Adams attack is related to vertebro-basilar insufficiency.
- D Syncope is unlikely to occur while a patient is seated.

33 In the treatment of acute heart failure, which is TRUE?

- A Furosemide is beneficial due to its effect on afterload reduction.
- B The most important effect of GTN is vasodilation in pulmonary vessels
- C Digoxin has a proven important role in acutely decompensated heart failure associated with atrial fibrillation
- D Fluid challenge may be appropriate in cardiogenic shock due to heart failure.

34 Regarding treatment of AMI, which is TRUE?

- A 10 % of patients treated with PTCA will require a further procedure (PTCA or CABG) in the next 2 – 3 years.
- B Late administration of aspirin significantly reduces mortality in STEMI.
- C B-blockers are effective in reducing both symptomatic and silent ischaemia.
- D Magnesium administered early in AMI reduces reperfusion related injury and improves mortality.

35 When evaluating arrhythmias, which is TRUE?

- A Second degree AV block Mobitz type 1 is always benign and does not need further investigation.
- B Sick sinus syndrome often has tachycardia as a feature.
- C AMI is the most common cause of complete heart block.
- D In the ED 20% of all broad complex tachycardias are VT.

36 In the cardioversion of AF which of the following is FALSE

- A Amiodarone is a reasonable option
- B Synchronised DC cardioversion with 200J monophasic has the highest success rate

- C Elective electro cardioversion is contra-indicated if hypokalaemia present
- D Pre-treatment with amiodarone may enhance the success of electro cardioversion

37 With regard to syncope, which of the following is FALSE?

- A The commonest cause is idiopathic
- B Routine bloods (FBC, UEC & BSL) are not recommended
- C An ECG is recommended in almost all patients
- D The cause for the syncope is frequently made based on the ECG (>20%)

38 In the treatment of tachyarrhythmias in a conscious patient, which statement is TRUE?

- A Verapamil is the drug of choice for an irregular broad complex tachycardia
- B Flecainide is the drug of choice in AF with Wolf Parkinson White syndrome
- C Adenosine is safe in the treatment of all forms of SVT
- D Sotalol can rate control but not cardiovert rapid AF

39 The following ECG findings are known to be associated with sudden cardiac death EXCEPT

- A LBBB pattern with QRS concordance
- B Shortened PR interval in the absence of a delta wave
- C Partial RBBB and ST segment elevation in V1 – V3
- D RBBB and SVT

40 Causes of ST elevation include all of the following EXCEPT

- A Hypokalaemia
- B Subarachnoid haemorrhage
- C Left ventricular aneurysm
- D Post cardioversion

41 In the risk stratification of ACS, a feature associated with high risk is

- A Prior MI with ejection fraction > 0.4
- B Known diabetes with atypical pain
- C Age > 65 years

D Syncope

Answers 1. D

2. D (22% !)

3. D

4. D causes further prolongation of QT interval

5. C

6. D all the rest are absolute contraindications

7. D

8. D

9. B

10. C

11. D

12. C

13. A

14. D

15. B

16. A

17. C

18. D Tintinalli. P 190.

19. B – contraindicated. Should get procainamide/amiodarone or cardioversion. Tintinalli p 199

20. C Dunn p 67

21. C Dunn EMM Pages 79-82

22. B ILCOR ACS

23. C MJA supplement-Mx of ACS

24. A ACS guidelines 2006 MJA

25. C ACS guidelines 2006

26. A

27. D AHA guidelines on chest pain

28. B Clinical Examination, 2nd Edition, Talley and O'Connor

30. B should be V 2 only B – should be V 2 only
31. C should be $> 0.14s$
32. B
33. D
34. C
35. B
36. B AHA 2006 Guidelines for the management of Atrial Fibrillation
37. D Syncope review article – NEJM Dec 2000
38. B Dunn 4th Ed. Chapter 4: Cardiology, pages 122 – 127.
39. D Dunn 4th Ed. Chapter 4: Cardiology. Pages 127 – 131
40. A
41. D MJA. Guidelines for the management of ACS 2006
42. A
43. D Dunn, p119

CVS 2 MCQs

1 In a patient who experiences an episode of syncope, all of the following are associated with a worse prognosis EXCEPT

- A History of AMI
- B Structural cardiac defect Including cardiomyopathies
- C Left bundle branch block
- D Congestive cardiac failure

2 Oxygen delivery

- A By nasal prongs is 10 – 20% with flow of 1 – 4 l/min
- B By Hudson mask is 35 – 60% with flow of 0 – 6 l/min
- C By non-rebreather with reservoir is 100% with flow of 15 l/min
- D By nasal prongs is 25 - 40% with flow of 1 – 4 l/min

3 Which of the following is NOT a proven risk factor for PE.

- A Age
- B Homocysteinuria
- C Female
- D Obesity

4 A 40yo female on OCP presents with several hours of pleuritic chest pain, D-dimer positive, Chest X-ray minor changes, V/Q scan low probability. Your further management would be.

- A Analgesia, home, GP followup
- B ECG, ABG
- C CTPA
- D U/sound legs

5 All are signs of severe mitral stenosis EXCEPT

- A Loud S1
- B Early opening snap
- C Long diastolic murmur
- D Diastolic thrill

6 All are signs of severe mitral regurgitation EXCEPT

- A Small volume pulse
- B Soft S1
- C S3
- D S4

7 The following are true EXCEPT

- A A pericardial effusion of more than 250 mls is required to enlarge the cardiac silhouette in an adult on CXR
- B Beck's triad consists of muffled heart sounds, raised venous pressure and decreased arterial pressure
- C Pulsus Paradoxus is an important clue to the presence of pericardial effusion causing tamponade
- D Colchicine has no role in the treatment of recurrent pericarditis

8 Regarding hypertensive encephalopathy which is TRUE?

- A It does not occur until MAP > 180mmHg
- B It occurs due to cytotoxic oedema
- C Sodium nitroprusside should not be used in renal failure patients
- D Retinopathy is essential for the diagnosis

9 Regarding the treatment of hypertensive emergencies, which is TRUE?

- A Hypertension caused by pre-eclampsia can be treated with hydralazine or labetalol
- B The treatment of hypertension in the setting of intracranial bleeds improves outcome
- C Immediate reduction of mean arterial blood pressure in patients with hypertensive encephalopathy improves outcome
- D The treatment of hypertension in the setting of embolic stroke improves outcome

10 Which of the following therapies will work in a cardiac transplant patient?

- A Quinidine
- B Digoxin
- C Atropine
- D Aminophylline

11 With regard to the use of VQ scanning in suspected pulmonary embolism, which of the following is TRUE?

- A CXR is not always indicated before the VQ scan is performed
- B High pre-test probability mandates a further test even if the VQ scan is positive
- C An intermediate VQ scan requires further testing to be performed even if the PTP is low
- D A normal VQ scan requires further testing with a high PTP

12 Regarding PE which of the following is TRUE

- A The majority of patients have a normal CXR
- B The majority of patients have a normal ECG
- C V/Q may not detect large central emboli

D Pulmonary angiography detects directly PE

13 Regarding CXR in thoracic aortic dissection which of the following is FALSE?

- A Obliteration of the aortic knob suggests dissection
- B Localized prominence along aortic contour suggests dissection
- C Distortion of the left main bronchus suggests dissection
- D Effective screening tool in patients with ?AMI

14 Which of the following statements is FALSE regarding Congenital Heart defects

- A ASD requires prophylaxis for Infective Endocarditis
- B VSD is the most common defect with males and females equally affected
- C Ostium Secundum is the most common but least serious type of Atrial Septal Defect
- D Congenital heart disease has become the number 1 cause for heart disease in children in the developed world

15 Which of the following is TRUE with regard to congestive heart failure?

- A NSAID's, corticosteroids and the oral contraceptive pill are all precipitants.
- B Prophylactic anti-arrhythmics decrease the mortality from ventricular arrhythmias.
- C BNP comes from the cardiac ventricle
- D Nesiritide is a valuable drug for treatment of CHF in Australasia.

16 Which of the following is TRUE regarding cardiac valve disorders?

- A Ankylosing spondylitis is associated with development of third degree heart block mostly at the level of the SA node.
- B The murmur in HOCM is systolic and is decreased by squatting.
- C The murmur of MV prolapse is best distinguished from HOCM by the presence of a late systolic click.
- D Marfans, Ehlers-Danlos and Reiters are important connective tissue disorders in aetiology of valve disease.

17 Which of the following is TRUE in regard to Myocarditis ?

- A Circulating anti-cardiac antibodies are present.

- B Commoner in older adults than children.
- C Bacterial pathogens are never responsible.
- D There is no role for steroids in treatment.

18 In paediatric valvular heart disease, which of the following is CORRECT?

- A An innocent murmur disappears on lying flat.
- B There is a fixed and widely split second heart sound in VSD
- C In a PDA an infusion of prostaglandin is indicated if symptomatic
- D Transposition of the great arteries is a non-cyanotic heart disease.

19 With regards to rheumatic fever, which of the following is FALSE?

- A Sydenham's chorea is a major manifestation.
- B This remains the most important cause of heart disease in children worldwide.
- C Polyarthralgia is a major manifestation.
- D It is related to preceding group A streptococcal infection.

20 Regarding the diagnosis and management of PE, which is TRUE?

- A The sensitivity of multidetector, spiral CTPA is > 95%
- B BNP is useful in their risk stratification
- C IVC filters significantly increase overall survival in patients with recurrent PE
- D In a patient with low pre-test probability and normal CXR, VQ scan is more sensitive for PE detection than CTPA

21 Drugs which are known to precipitate a hypertensive emergency include the following, EXCEPT?

- A Steroids
- B Glucagon
- C NSAIDS
- D Tricyclic antidepressants

22 Regarding infective endocarditis, which of the following is FALSE

- A Mitral valve prolapse is the most common predisposing condition in young adults
- B Calcific aortic stenosis is the underlying defect in 50% infective endocarditis in the elderly
- C Janeway lesions are irregular erythematous painful macules representing an infectious vasculitis
- D "HACEK" organisms and *P.aeruginosa* are the most common gram negative organisms responsible for infective endocarditis in IVDUs

23 The following all produce a typical pansystolic murmur EXCEPT,

- A Aortic Stenosis
- B Mitral regurgitation
- C Ventricular septal defect
- D Tricuspid regurgitation

24 Antibiotic prophylaxis against endocarditis should be given to:

- A All patients with valvular heart disease prior to high risk procedures
- B Any heart transplant recipient prior to high risk procedures
- C All patients with rheumatic heart disease prior to high risk procedures
- D All high risk patients having an avulsed tooth replanted

25 Regarding congenital heart disease:

- A VSD is more common than ASD
- B Muscular portion of the septum is most commonly involved in VSD
- C ASD defects should be repaired if the patient has pulmonary hypertension
- D Pansystolic murmurs in a child are usually innocent

26 The following are true of pulmonary embolism EXCEPT

- A It is less common in Asia
- B ECG is abnormal in 70-85%
- C PIOPED 1 studied Chest radiography in patients with PEs
- D CTA had a sensitivity of 83% in PIOPED 2

27 Cardiomyopathies are

- A The second commonest cause of cardiac disease
- B Septal Q waves are found in dilated cardiomyopathy
- C Tako-tsubo cardiomyopathy is associated with gambling
- D Restrictive cardiomyopathy is associated with alcohol abuse

28 Which one of the following in regards to HOCM is TRUE

- A The chest xray in HOCM usually reveals mild cardiomegaly
- B The valsalva manoeuvre makes the murmur more difficult to hear
- C AF and WPW syndrome is less common in individuals with HOCM compared with the general population
- D Deep and narrow lateral q waves is a specific finding

29 With regard to PE which statement is FALSE

- A Pts with Well's criteria Intermediate PTP have a 20% incidence of PE
- B Prevalence of elevated Troponin is 20-40%
- C 85% have a Hx of dyspnoea
- D A-a gradient on ABG is Elevated in only 50% of pts with PE

30 Which of the following do NOT produce both Systolic and Diastolic murmurs

- A Patent Ductus Arteriosus
- B Hypertrophic Obstructive Cardiomyopathy
- C Atrial Septal Defect
- D Aortic Regurgitation

31 A D-Dimer IS indicated in the workup of which of the following situations when a diagnosis of PE is being considered:

- A PERC Rule negative
- B PE is most likely diagnosis
- C Symptoms have been present for greater than 1 week
- D Using Well's criteria low probability of PE

32 In regard to Myocarditis, which of the following is TRUE

A Can be reliably diagnosed on ECG

B Patients with worse heart failure on presentation are less likely to develop long term complications

C Elevated cardiac markers (Trop or CK) required for diagnosis

D Common cause of heart failure

Answers

1. C

2. D

3. C

4. D

5. A

6. D

7. D

8. C

9. A

10. D Dunn p168

11. C SCGH PE Initial Diagnostic Pathway

12. C Dunn

13. D Cameron

14. A

15. C

16. B

17. A

18. A B – this is ASD due to RV SV equal in both inspiration and expiration. C – want an inhibitor such as indomethacin in order to close the PDA. E – atrioventricular septal defect commonest, then VSD.
19. C this is a minor manifestation. Polyarthritis is a major manifestation.
20. D N Engl J Med 358;10 March 2008. Acute Pulmonary Embolism
21. B EM Practice July 2005. Distinguishing and managing hypertensive emergencies and urgencies.
22. C E Medicine Infective Endocarditis
23. A Clinical Examination Talley and O'Connor
24. D Therapeutic Guidelines 'Prevention of Endocarditis' 2008
25. A Dunn 4th ed p155-156
26. C PIOPED 1 and 2 Dunn
27. C
28. D (infarct q's are wider, deep and narrow lateral q's specific- Rosen)., CXR usually normal (septal hypertrophy), valsalva-louder, increased AF and WPW, ST elevation most commonly due to LV strain pattern
29. D Elevated in 85-95% Dunn, 4th Ed, pg 793-795
30. B Late Systolic murmur only Dunn, 4th Ed, pg 152
31. D Cameron et al Textbook of Emergency Med 3E + PERC Rule A – Rules out PE without need for Ix, B – Negative D-Dimer does not rule out Dx (Wells score 3.0), will not change need for further Ix C – Risk of false negative D-Dimer, need to use other tests. D – Correct, Role of D-Dimer here is to possibly rule out PE without further testing E – Absence of Imaging does not change utility of D-Dimer
32. B Cameron et al Textbook of emergency Medicine 3E A – ECG changes are not specific B – Correct, paradoxically the worse the initial heart failure, the better the long term survival (less incidence of developing DCM. C – Often elevated and can be used to track clinical course but not a requirement for Dx D – Not a common cause of heart failure overall. Estimated to cause approx 25% of DCM. E – Treatment is supportive, NSAIDS have no specific role
33. B Reduces response to dopamine Tintinalli Chap 57
34. C Tintinalli Chap 56.
35. C Cameron, p.234
36. B Cameron, p. 235
37. C Dunn - 2-3% only
38. C Dunn
39. B Tintinalli pg 397
40. D EM practice Aortic emergencies part 1 (Feb 2006)

(1) Which of the following is the most common ECG abnormality associated with mitral valve prolapse ?

(a) Paroxysmal supraventricular tachycardia

(b) QT prolongation

(c) Rapid atrial fibrillation

(d) ST-segment depression in leads II, III and aVF

(2) Regarding the treatment of heart failure in patients with diastolic rather than systolic dysfunction :

(a) Aggressive therapy with diuretics is more effective

(b) Beta-blocking agents might improve cardiac output

(c) Both are associated with impaired cardiac contractility

(d) Ventricular filling pressures are higher in systolic dysfunction than in diastolic dysfunction

(3) In a patient with an acute anterior wall MI, which of the following findings is an indication for placement of a temporary pacemaker ?

(a) Acute left bundle-branch block

(b) Heart rate of 50

(c) Mobitz second-degree heart block type 1

(d) New right bundle branch block with left anterior fascicular block.

(4) Which of the following statements comparing dilated cardiomyopathy and hypertrophic cardiomyopathy is correct ?

(a) Both are improved by digitalis and nitrate therapy

(b) Both involve four-chamber heart enlargement

(c) Dilated cardiomyopathy is associated with diastolic dysfunction

(d) Many cases of hypertrophic cardiomyopathy are hereditary

(5) Which of the following statements regarding posterior wall infarction is CORRECT ?

(a) Associated with ST-segment depression in V1

- (b) ECG shows an inverted T wave in V1
 - (c) ECG shows large S waves in V1
 - (d) Occurs in 5% of all acute MIs
- (6) In hypertensive emergencies :
- (a) Encephalopathy occurs due to cerebral hypoperfusion
 - (b) Pheochromocytoma typically presents with sustained unremitting symptoms of uncontrolled hypertension
 - (c) Sodium nitroprusside may cause a coronary steal syndrome and worsen left ventricular failure
 - (d) High renin states are associated with hypertension, hyperkalaemia and arrhythmias.
- (7) ST elevation due to early repolarisation is characterised by
- (a) Convex upwards ST elevation
 - (b) T wave amplitude less than 5mm
 - (c) QRS width at upper end of normal limits
 - (d) ST elevation greater than 5mm
- (8) A 72 yr old male patient presents with a myocardial infarction. ECG shows 3rd degree AV block and ST elevation in leads II, III and aVF. The patient experiences a brief non-sustained run of ventricular tachycardia. Which of the following is true ?
- (a) These are reperfusion dysrhythmias
 - (b) This patient needs a transvenous pacemaker placed immediately
 - (c) 3rd degree AV block is associated with a poor prognosis in anterior wall MIs
 - (d) 3rd degree AV block is associated with a poor prognosis in inferior wall MIs and anterior wall MIs
- (9) Exertional syncope, dysrhythmias, cardiac ischaemia and sudden death are all associated with which of the following ?
- (a) pericarditis
 - (b) restrictive cardiomyopathy
 - (c) hypertrophic cardiomyopathy
 - (d) Dilated cardiomyopathy

- A - Giant Cell Arteritis
- B - Thoracic outlet syndrome
- C - Proximal iliac DVT
- D - Leriche's Syndrome
- E - Takayasu Arteritis
- F - Polymyalgia Rheumatica
- G - Bacterial endocarditis
- H - Rutherford Classification Category 3
- I - Rutherford Classification Category 4
- J - Thrombangitis oliterans
- K - Raynaud's
- L - Popliteal aneurysm

1. 75 year old smoker with Hx of HTN presents complaining that he gets severe lower leg pain for the past 1/12 with limited exercise eg walking to the toilet in his house.

2. 42 year old factory worker complains of cold and painful hands which are made worse by working. PHx: asthma. SHx current smoker.

3. 37 year old Vietnamese woman with a history of malaise, myalgia, postural dizziness, chest pain and a new aortic regurgitant murmur. ESR = 22 and CRP = 13.

4. 40 year old Japanese concert violinist comes complaining of parasthesia and pain along the ulnar border of her L hand and forearm when playing her instrument. PHx: Hashimoto's thyroiditis.

5. 75 year old smoker with Hx of AAA under surveillance, presents with pain in his leg for the past 1/12. On examination he has a swollen calf and tenderness posteriorly.

- 1. H
- 2. J
- 3. E
- 4. B
- 5. L

cardiology

- 1) Which of the following is not a major criteria for rheumatic fever
 - a. Sydenham chorea
 - b. Migratory polyarthralgia
 - c. Carditis
 - d. Erythema marginatum
 - e. Sub-cutaneous nodules
- 2) Which of the following is incorrect in rheumatic fever
 - a. Rheumatic fever occurs 2-6 weeks post group A pharyngitis
 - b. Antibiotics decrease the risk of RF by 70%
 - c. Longer prophylaxis is needed in patients with MR
 - d. Steroids help control the pain from arthritis
 - e. Erythema marginatum starts with fever and lasts 6 to 12 weeks
- 3) Commonest congenital heart disease is
 - a. ASD
 - b. VSD
 - c. PDA
 - d. TOF
 - e. Coarctation of aorta
- 4) CCF in neonates, which is incorrect
 - a. Aim is to avoid pulmonary vasoconstriction
 - b. Is usually caused by L → R shunt
 - c. O₂ is required to maintain sats >95
 - d. Dose of furosemide is 1-2mg/kg
 - e. Usually presents in <3/12
- 5) Tetralogy of Fallot, which is false
 - a. Tet spells are precipitated by hypoxia which worsens R → L shunt
 - b. Knee bent posture may help
 - c. O₂ should be used with caution
 - d. Aim to increase afterload to prevent R → L shunt
 - e. Polycythemia is a complication
- 6) Cardiac tumours, which is correct
 - a. Atrial myxomas are common on R side
 - b. Common in males
 - c. ECG usually shows conduction defects
 - d. Operative mortality is >10%
 - e. Rhabdomyomas are associated with tuberous sclerosis in 50% cases
- 7) Commonest organism in IVDU in infective endocarditis
 - a. S. Aureus
 - b. S. Viridians
 - c. S. epidermidis
 - d. HACEK group
- 8) Most common valve involved in IVDU in infective endocarditis is
 - a. Mitral
 - b. Tricuspid
 - c. Aortic
 - d. Pulmonary

- 9) Which is false regarding a transplanted heart
- Graft includes SA node
 - There is lack of response to valsalva maneuver
 - Severe Diabetes is a contra-indication
 - NYHA class 3 and 4 are indications
 - Myocardial ischemia usually presents with chest pain
- 10) A denervated heart (as in a transplanted heart) will not respond to
- atropine
 - digitalis
 - quinidine
 - carotid sinus massage
 - adenosine
- 11) D-dimer testing in PE, which is incorrect
- Raised until 6 weeks post partum
 - 95% sensitive but very low PPV
 - qualitative assays are less sensitive than quantitative
 - useful if -ve and low risk pretest probability
- 12) VQ scanning in PE, which is true
- +ve VQ has 96% likelihood of PE
 - ve VQ will miss ~2% PE's
 - if VQ scan is intermediate, there is still 4-12% chance of PE
 - high pretest probability with a negative VQ mandates further investigation
 - predictive value of VQ scan is not affected by pre-test probability
 - in VQ, there is less risk of radiation to fetus than CTPA
- 13) investigations in PE, choose true and false
- S1Q3T3 is pathognomic of PE
 - TWI in inf+V1-V3 is the most specific ECG finding
 - CXR is normal in most cases
 - Presence of proximal vein DVT and hemodynamic instability constitute enough evidence for thrombolysis
 - Majority of patients with PE will have Spo2 >90% on room air
- 14) In PE which is true
- Trop and BNP has no value in risk stratification
 - Thrombolysis in PE improved mortality
 - MOPETT trial showed equal bleeding risk for "safe" dose tPa and heparin
 - RV dysfunction and injury with normal BP is not an indication for thrombolysis
 - Thrombolysis in cardiac arrest has no survival to discharge benefit
 - Embolectomy, if available, has better outcome than thrombolysis
- 15) False in DVT
- Dvt risk increases with age
 - 50% will progress to PE if untreated
 - smoking is not a risk factor
 - 1/3 patients are asymptomatic
 - d-dimer is 96% sensitive
- 16) investigations in DVT, which is false
- D-dimer has low specificity

- b. US is the gold standard test
- c. Clinical exam has low specificity and sensitivity
- d. D-dimer is contraindicated in high pre-test probability

17) In ischemic colitis, which is false

- a. Pts are usually afebrile
- b. Venous infarcts do not cause ischemic colitis
- c. CT angio is the investigation of choice
- d. Mortality is >50%
- e. Mostly occur in area of SMA

Answers

1B,2d,3b,4c,5c,6e,7a,8b,9e,10e,11c,12b,13FTFTF,14c,c15,16b,17b

CARDIAC MCQs

Q1 What is the MOST common ECG finding in a patient with PE?

A) <input type="radio"/>	S wave in lead I
B) <input type="radio"/>	T wave inversions
C) <input type="radio"/>	ST elevation
D) <input type="radio"/>	Sinus tachycardia
E) <input type="radio"/>	A normal ECG

Q2 A 52 year old man presents acutely with chest pain and pulmonary oedema. Which of the following is not consistent with acute mitral incompetence secondary to myocardial infarction:

A) <input type="radio"/>	A harsh apical systolic murmur
B) <input type="radio"/>	A prominent jugular venous a wave
C) <input type="radio"/>	A left parasternal lift

- D) A grossly dilated left atrium on CXR
- E) ECG changes indicative of acute inferior wall infarction

Q3 All of the following are components of tetralogy of Fallot EXCEPT

- A) overriding aorta
- B) ventricular septal defect (VSD)
- C) atrial septal defect (ASD)
- D) pulmonary stenosis
- E) right ventricular hypertrophy

Q4 In a patient who experiences an episode of syncope, all of the following are associated with a worse prognosis EXCEPT:

- A) History of AMI
- B) Structural cardiac defect including cardiomyopathies
- C) Left bundle branch block
- D) Congestive cardiac failure
- E) Age over 45 years

Q5 When compared with younger patients, all of the following regarding treatment with thrombolytics of elderly patients are true EXCEPT

- A) the absolute number of lives saved is greater
- B) they have more nondiagnostic ECGs due to baseline abnormalities
- C) they are at increased risk for hemorrhagic complications
- D) they have more underlying illnesses with corresponding contraindications
- E) none of the above

Q6 With regard to transcutaneous pacemakers

- A) Haemodynamic response to capture is less than that by transvenous pacing
- B) 50 of patients are unable to tolerate stimulation
- C) The posterior electrode should be placed over the left scapula
- D) Current output ranges from 30 – 200 mA
- E) Typically capture will occur at 120 mA

Q7 All of the following are findings associated with myocarditis EXCEPT

- A) precordial chest pain mimicking myocardial ischemia
- B) tachycardia out of proportion to the fever
- C) mitral or tricuspid stenosis
- D) pathologic Q wave formation
- E) high-grade AV block, ventricular arrhythmias

Q8 Which of the following is most likely to be associated with an acute coronary syndrome?

- A) Sharp stabbing chest pain
- B) Chest pain radiating into both arms
- C) Chest pain radiating into right shoulder
- D) Hypotension
- E) Pain reproducible by palpation parasternally

Q9 All of the following statements regarding properties of the anti-arrhythmic drug sotalol are true EXCEPT

- A) it is a non-cardioselective beta-adrenergic blocker
- B) it prolongs QT interval may induce torsade de pointes
- C) it decreases heart rate and slows conduction through the AV node
- D) it prolongs action potential duration and refractory period
- E) it tends to decrease cardiac contractility

Q10 With regard to WPW syndrome

- A) the bypass tract is septal in 75%

- B) In the presence of AF, cardioversion is treatment of choice
- C) the delta wave represents depolarisation in the septum
- D) In the presence of AF, digoxin is the drug of choice
- E) Amiodarone is effective because it inhibits anterograde conduction through the AV node

Q11 Regarding Aortic stenosis, which statement is correct?

- A) Occurs in 50% of patients with valvular disease
- B) Left ventricular pressure seldom exceeds 300 mmHG
- C) An Aortic orifice 50% of normal is critical stenosis
- D) A large 'c' wave is characteristic of Aortic Stenosis
- E) Fixed splitting of the second heart sound is pathognomonic

Q12 What are the classic auscultatory finding of mitral valve prolapse (MVP)?

- A) Holosystolic murmur
- B) Early diastolic murmur
- C) Mid-systolic click followed by late systolic murmur
- D) Early systolic murmur
- E) Increased S1

Q13 All of the following statements concerning the use of the ECG in the emergency department are true EXCEPT

- A) a normal or nonspecific ECG does not exclude ischemia nor obviate the need for hospital admission
- B) true posterior infarctions produce large R-waves and ST-segment elevations in V1 and V2
- C) lead V9 is placed in the left paraspinal region medial to the scapula and helps diagnose posterior acute MIs
- D) only about half of all acute MI patients have diagnostic changes on their initial ECG
- E) right ventricular infarctions produce ST-segment elevation in the right-sided chest leads

Q14 All of the following are normal physiologic change in the elderly EXCEPT

- A) drop in ejection fraction
- B) decreased inotropic response to catecholamines
- C) increased reliance on the atrial kick for left ventricular filling
- D) decreased chronotropic change in heart rate secondary to tilt
- E) decreased carotid baroreceptor response

Q15 With respect to arterial aneurysms all of the following are true EXCEPT

- A) Congenital aneurysms are more likely to rupture between 20 and 30 years of age
- B) Superior mesenteric artery aneurysms are associated with atherosclerosis
- C) Subclavian artery aneurysms are associated with trauma

- D) Renal artery aneurysms require urgent operative intervention
- E) Hepatic artery aneurysms commonly present with GIT bleeding and jaundice

Q16 The following are true EXCEPT

- A) Post Myocardial Infarction acute pericarditis may present with a normal ECG
- B) Colchicine has no role in the treatment of recurrent pericarditis
- C) Pulsus Paradoxus is an important clue to the presence of pericardial effusion causing tamponade
- D) Beck's triad consists of muffled heart sounds, raised venous pressure and decreased arterial pressure
- E) A pericardial effusion of more than 250 mls is required to enlarge the cardiac silhouette in an adult on CXR

Q17 A 78-year-old woman presents to the emergency department with acute onset of shortness of breath after recent hip surgery. You suspect PE and obtain a room air arterial blood gas before placing her on oxygen. Results are as follows:

What is the patient's A-a gradient?

pH	7.28	(7.38-7.42)
pCO ₂	24	(36-44) mmHg
pO ₂	70	(95-108) mmHg

- A) 10
- B) 20
- C) 30
- D) 40
- E) 50

Q18 All are signs of severe mitral stenosis except

- A) Loud S1
- B) Early opening snap
- C) Long diastolic murmur
- D) Diastolic thrill
- E) Presence of pulmonary hypertension

Q19 A woman presents with a BP of 200/110, which ONE of the following statements is FALSE

- A) The most likely cause is noncompliance with medication
- B) If pre-eclampsia is suspected, she should be commenced on magnesium sulphate infusion
- C) Red cell casts in the urine suggest glomerulonephritis may be the cause
- D) If she has confusion and hemiplegia, she should be commenced on nitroprusside infusion
- E) The presence of silver wiring in the retina suggests no immediate treatment is necessary

Q20 Decreased cardiac output should first be treated by which of the following?

- A) Dopamine infusion

B) <input type="radio"/>	Intra-aortic balloon pump
C) <input type="radio"/>	Optimising preload
D) <input type="radio"/>	Dobutamine infusion
E) <input type="radio"/>	Angioplasty

Q21 What percentage of the elderly population have classic angina pectoris?

A) <input type="radio"/>	40%
B) <input type="radio"/>	50%
C) <input type="radio"/>	10%
D) <input type="radio"/>	25%
E) <input type="radio"/>	70%

Q22 All the following are true with regards to acute aortic regurgitation EXCEPT

A) <input type="radio"/>	dyspnea, tachycardia, and tachypnea are commonly present
B) <input type="radio"/>	surgery is the treatment of choice
C) <input type="radio"/>	low cardiac output causes a state of hypoperfusion
D) <input type="radio"/>	an accentuated S1 is heard on auscultation
E) <input type="radio"/>	it is commonly caused by endocarditis, trauma, or dissection

Q23 Which of the following is true regarding mitral regurgitation (MR)?

- A) The papillary muscles are prone to ischemia
- B) It is generally only a chronic condition
- C) Afterload reduction is contraindicated
- D) It does not require endocarditis prophylaxis
- E) In chronic MR, atrial pressure rises dramatically

Q24 Which ONE of the following features of syncope would most likely suggest a cardiac cause

- A) Occurred after walking up a steep hill
- B) Prodromal symptoms of vertigo
- C) Cyanosis during the event
- D) Prodromal symptoms of tachypnoea
- E) Prolonged period of confusion after the syncopal episode

Q25 You have a high suspicion that a patient has a pulmonary embolus (PE). Which of the following signs and symptoms is LEAST likely to be present?

- A) Chest pain
- B) Heart rate > 100 bpm
- C) Respiratory rate > 16/min
- D) PCO₂ of 25 mm Hg
- E) Dyspnea

Q26 The following are treatment for torsades de pointes EXCEPT

- A) Magnesium
- B) Isoprenaline
- C) Defibrillation
- D) Amiodarone
- E) Overdrive pacing

Q27 All of the following statements regarding properties of the anti-arrhythmic drug sotalol are true EXCEPT

- A) it decreases heart rate and slows conduction through the AV node
- B) it tends to decrease cardiac contractility
- C) it is a non-cardioselective beta-adrenergic blocker
- D) it prolongs QT interval; may induce torsade de pointes
- E) it prolongs action potential duration and refractory period

Q28 All of the following findings are associated with chronic calcific constrictive pericarditis EXCEPT

- A) jugular venous distension
- B) Kussmaul's sign
- C) apical early diastolic pericardial knock
- D) systemic venous pressure decrease with inspiration
- E) visible pericardium on lateral chest radiograph

Q29 Beta-adrenergic antagonists have been shown to be MOST useful in patients with

- A) chronic stable angina

- B) variant angina
- C) rest angina
- D) unstable angina
- E) myocardial infarction

Q30 Which of the following statements regarding automatic implantable cardioverter-defibrillators (AICDs) is correct?

- A) Patients can be safely discharged from the emergency department if no more than three shocks occur in succession
- B) ECG changes due to AICD discharge are persistent
- C) Shivering or excess arm activity may trigger the device
- D) CPR and transthoracic defibrillation are harmful to the device
- E) Patient contact during AICD shock is dangerous

Q31 Which of the following patients requires the MOST immediate treatment for elevated blood pressure (BP)?

- A) A 29-year-old woman (BP 160/94 mm Hg) who is 30 weeks pregnant, complaining of headache and nausea
- B) A 35-year-old man (BP 200/110 mm Hg) who presents with anxiety after cocaine use

- C) A 55-year-old man (BP 210/130 mm Hg) who has a foot fracture but otherwise feels well
- D) A 55-year-old man (BP 180/100 mm Hg) who ran out of diuretic, but otherwise feels well
- E) An 85-year-old woman (BP 212/110 mm Hg) on no medication, complaining of nausea, with a history of old stroke

Q32 Which of the following manoeuvres will decrease the intensity of the murmur associated with hypertrophic cardiomyopathy (HCM)?

- A) Valsalva manoeuvre
- B) Standing
- C) Beta-agonists
- D) Squatting
- E) Amyl nitrate

Q33 Which of the following tests is LEAST helpful for evaluating syncope in the elderly?

- A) Complete blood count (CBC)
- B) Signal-averaged ECG
- C) Tilt-table testing with isoproterenol HCl
- D) Ambulatory ECG monitoring (Holter monitor)
- E) 12-lead ECG

Q34 Which of the following is true regarding syncope secondary to a cardiac aetiology?

A) <input type="radio"/>	A patient with it should be admitted to the hospital for further evaluation
B) <input type="radio"/>	It has no higher mortality than most non-cardiac syncope
C) <input type="radio"/>	It is usually secondary to myocardial ischemia
D) <input type="radio"/>	It is usually recurrent
E) <input type="radio"/>	It is benign in younger populations

ANSWERS

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

1. A 25 yr old man presents to ED having had 1 hr of central chest pain which has now ceased. An ECG is undertaken as part of his work up.

Which features on his ECG would help differentiate Benign Early repolarisation from Pericarditis?

- A. concave upwards ST elevation
- B. Have ST elevation > 5mm

- C. No Q waves
- D. ST/T ratio < 0.25

2. You are the Emergency Physician on duty at a rural hospital when a 65 yr old farmer presents with a STEMI. There is no facility to access PCI within 90 minutes. Which of the following would be an indication for thrombolysis in this man?

- a. The patient has a posterior STEMI
- b. The patient has an inferior STEMI
- c. The patient presents at 5 hours post commencement of pain
- d. The patient has florid pulmonary oedema.

3. What is not a cause of Left axis deviation?

- a. LAFB
- b. LVH
- c. lateral MI
- d. WPW

4. Premature atrial tachycardia with blocks is most commonly associated with

- a. digoxin toxicity
- b. TCA overdose
- c. Cholinergic OD
- d. Hyperkalaemia

5. In paediatric ECGs the QRS in a 1 year old should be less than

- a. < 85ms
- b. <80 ms
- c. <75 ms
- d. <70 ms

6. In paediatric ECGs, at what age do the T waves in V 1-3 become upright again (excluding those with a persistent juvenile T wave pattern)

- a. 3 years
- b. 7 yrs
- c. 10 yrs
- d. 15 yrs

7. The typical pattern for Na channel overdose is
- a. Broad QRS, terminal R in AVR <3mm,
 - b. Narrow QRS, terminal R in AVR >3mm,
 - c. Narrow QRS , terminal R in aVR <3mm
 - d. Broad QRS, terminal R in aVR >3mm
8. Which of the following is not a criteria for helping distinguish VT from SVT with aberrancy?
- a. QRS > 160ms
 - b. rSR' in V1
 - c. capture beats
 - d. switching axis
9. The Voltage criteria for LVH when adding V1 S and V5 R is
- a. >25
 - b. >30
 - c. >35
 - d. >40
10. The voltage criteria for low amplitude QRS is
- a. V1+V2+V3 <20mm
 - b. V2+V3+V4 <30mm
 - c. V4+V5+V6 <30mm
 - d. V1+V2+V3 <30mm

1. Question

Which one of the following statements regarding the ECG in patients with SVT is correct

- 1. Chest tightness during an episode of SVT usually indicates an acute coronary syndrome
- 2. ST elevation in aVR usually does not indicate a proximal left main occlusion

- 3. ST depression or T wave changes that persist > 10 minutes following SVT reversion are strongly suggestive of ACS
- 4. The presence of ST depression during SVT requires serial cardiac biomarkers to be tested to rule out ACS

2

ST depression during SVT is common and poorly predictive of IHD – further investigation with an ESST is usually recommended. Chest pain preceding or following an episode of SVT should be treated on its merits. ST – T wave changes may persist for days after reversion. ST elevation is present in 70% of SVT in patients with accessory pathways and does not usually indicate a proximal left main occlusion. ([link](#))

2. 2. Question

Which of the following statements regarding the treatment of SVT in pregnancy is correct

- 1. Verapamil is contra-indicated due to prolonged fetal bradycardia
- 2. Electrical cardioversion is the initial treatment of choice
- 3. Adenosine is safe in pregnancy
- 4. Valsalva is less effective than in the non pregnant patient

3

Both adenosine and verapamil are considered safe in pregnancy. There is no evidence that Valsalva is less effective in pregnancy and electrical cardioversion is not the treatment of choice for haemodynamically stable patients. ([link](#))

3. 3. Question

The percentage of ventricular tachycardia expected to be reverted to sinus rhythm in an adult by a single bolus dose of 100mg of lignocaine is

- 1. 70%
- 2. 50%
- 3. 90%
- 4. 20%

4

The percentage of ventricular tachycardia expected to be reverted to sinus rhythm in an adult by a single bolus dose of 100mg of lignocaine is only 20%. ([link](#))

4. 4. Question

Which of the following statements about ventricular tachycardia is incorrect

- 1. The ventricular rate in patients treated with antiarrhythmics may be < 150/min.
- 2. The ventricular rate in untreated patients is usually > 150/min.
- 3. A heart rate of < 150 reliably excludes SVT as the diagnosis
- 4. VT with a ventricular rate of < 100 is called AIVR

3

The ventricular rate in VT is usually > 150/min but may be < 150/min in patients taking anti-arrhythmics, but nearly always > 120/min. A rate of < 100 is called AIVR. Ventricular rate alone cannot be used to differentiate SVT from VT. ([link](#))

5. 5. Question

Which one of the following statements regarding Brugada syndrome is correct

- 1. It is responsible for approximately 10% of idiopathic VF
- 2. The average age at presentation is 30 years of age
- 3. 90% of patients with Brugada pattern on ECG have malignant arrhythmias
- 4. The ECG features in an individual rarely change from day to day

2

The average age of Brugada syndrome at presentation is 30 years of age. ([link](#))

6. 6. Question

Which one of the following clinical features is the most specific for ventricular tachycardia

- 1. Canon a waves in the JVP
- 2. A soft second heart sound
- 3. A ventricular rate > 150 bpm
- 4. Hypotension

1

The most specific clinical feature of ventricular tachycardia is canon a waves in the JVP as it implies A-V dissociation. ([link](#))

7. 7. Question

The preferred definitive treatment of SVT with a rate of 160/min. in a 22 year old patient with a BP of 150/90 mmHg who has just ingested 2 cans of a stimulant drink is

- 1. Adenosine

- 2. Verapamil
- 3. Valsalva manoeuvre
- 4. Electrical cardioversion

2

Verapamil is the most likely to revert the patient in this situation.

Adenosine is relatively contraindicated in stimulant ingestion (especially caffeine) and is less effective than verapamil at rates, 175/min., recurrence is also more likely due to its short duration of action.

Valsalva is unlikely to revert (30%), especially with sympathetic stimulation.

Cardioversion may be effective, but recurrence is likely in this situation. ([link](#))

8. 8. Question

The correct defibrillation emergency setting for synchronised cardioversion of SVT in a 2 year old boy is

- 1. 3J
- 2. 12J
- 3. 24J
- 4. 6J

2

The correct defibrillation emergency setting for synchronised cardioversion of SVT in a 2 year old boy is 12J (1J/kg). Previously the recommended energy setting was 0.5 J/kg). ([link](#))

9. 9. Question

Which one of the following is not associated with the presence of an accessory A-V pathway

- 1. HOCM
- 2. Lange Jervil Nielsen syndrome
- 3. Tuberous sclerosis
- 4. Ebstein's anomaly

2

Lange Jervil Nielsen syndrome is associated with prolonged QTc, not with an accessory pathway. Accessory pathways are associated with; Ebstein's anomaly 10%, HOCM, Tuberous sclerosis, Pompe disease and Leber's hereditary optic neuropathy (LHON). ([link](#))

10. 10. Question

Which one of the following statements regarding the various forms of ventricular tachycardia is correct:

- 1. Right ventricular outflow tachycardia usually responds to calcium channel antagonists
- 2. Fascicular tachycardia usually responds to calcium channel antagonists
- 3. Right ventricular outflow tachycardia has a RBBB pattern and right axis deviation
- 4. Fascicular tachycardia usually originates in the anterior fascicle

2

Fascicular tachycardia usually responds to calcium channel antagonists. ([link](#))

11. 11. Question

Features suggestive of SVT and an accessory pathway in an adult include all the following except

- 1. ST elevation in aVR
- 2. Rate of 220/min.
- 3. p waves in the latter part of the QRS complex in V1
- 4. Electrical alternans

4

Electrical alternans occurs in approximately 10-20% of cases of SVT and is not associated with either an accessory pathway or cardiac tamponade. ([link](#))

12. 12. Question

The most effective medication to terminate ventricular tachycardia in an adult is

- 1. Sotalol
- 2. Lignocaine
- 3. Amiodarone
- 4. Procainamide

4

The most effective medication to terminate ventricular tachycardia in an adult is probably procainamide, with a reversion rate of about 75%. ([link](#))

13. 13. Question

Which one of the following ECG features is the most specific for ventricular tachycardia

- 1. Absent RS complexes in any precordial lead
- 2. Concordance of QRS vectors in precordial leads
- 3. RS, QRS in V1
- 4. Presence of capture beats

1

The most specific ECG feature of ventricular tachycardia is absent RS complexes in any precordial lead. ([link](#))

14. 14. Question

The mean energy required to electrically cardiovert ventricular tachycardia in an adult using a biphasic defibrillator is

- 1. 20J
- 2. 100J
- 3. 50J
- 4. 200J

3

The mean energy required to electrically cardiovert ventricular tachycardia in an adult using a biphasic defibrillator is 50J. ([link](#))

15. 15. Question

The estimated correct dose of adenosine for a 2 year old boy with SVT is

- 1. 3.6mg
- 2. 4.8mg
- 3. 2.4mg
- 4. 1.2mg

4

The estimated correct dose of adenosine for a 2 year old boy with SVT is 1.2mg (0.1mg/kg). ([link](#))

1. Question

Factors that should increase the likelihood of using rate controlling medications instead of cardioversion in new onset atrial fibrillation include all of the following except

- 1. Sedentary lifestyle
- 2. Age > 75 years
- 3. Left atrial diameter > 5.5cm
- 4. A ventricular rate of 80 bpm

4

A ventricular rate of < 90bpm in new onset AFib suggests that there is significant disease of the cardiac conduction system. Rate control medications in this situation carry a significant risk of inducing high degrees of heart block and should usually be avoided. (link)

2. 2. Question

The desired ventricular rate in a patient with significant mitral regurgitation and chronic AF in whom rate control therapy has been chosen is

- 1. 80 - 90/min
- 2. <100 min
- 3. 70 – 80/ min
- 4. 60-70/ min

1

The aim is to have a relatively fast heart rate to shorten diastole and minimise the effects of regurgitation. This is balanced with the risk of shortening diastole too much and reducing ventricular filling. Patients with stenotic valvular and coronary artery disease are thought to benefit from a slower heart rate (and a longer diastole). (link)

3. 3. Question

Which one of the following is the most common cause of atrial fibrillation

- 1. Valvular heart disease
- 2. Hypokalaemia
- 3. IHD
- 4. "Lone fibrillators"

3

Ischaemic heart disease is thought to be responsible for approximately 40% of cases, with hypertension the next most common cause. Lone fibrillators comprise 5% of cases.

Clinical hyperthyroidism is only seen in 1% of cases, although approximately 5% of cases have an elevated TSH.

Hypokalaemia alone is a rare cause of atrial fibrillation. (link)

4. 4. Question

Which one of the statements regarding atrial fibrillation is most correct

- 1. The ventricular rate is usually > 120 bpm when of new onset
- 2. The ventricular rate usually spontaneously increases with time after onset
- 3. The ventricular rate becomes less regular in patients on digoxin therapy
- 4. The amplitude of the fibrillation waves increases with time after onset

1

The ventricular rate becomes slower and the amplitude of the fibrillation waves usually become finer with time after onset. Digoxin therapy makes the ventricular rate more regular. (link)

5. 5. Question

The overall yearly absolute risk reduction of stroke by long term anticoagulation in appropriate patients with atrial fibrillation is

- 1. 5%
- 2. 0.5%
- 3. 1%
- 4. 2.5%

1

This represents a relative reduction in stroke incidence of 60%. The baseline stroke incidence is 0.3% in patients in sinus rhythm. (link)

6. 6. Question

The INR target range to prevent stroke in a patient with atrial fibrillation who is 60 years of age and who has a structurally normal heart is

- 1. 2.0-3.0
- 2. 1.5-2.5
- 3. 2.5-3.5
- 4. 3.0-4.0

1

An INR of 2-3 is recommended in this age group, decreasing to 2.0 as the target for patients ≥ 75 years of age. (link)

7. 7. Question

The conversion rate from atrial fibrillation to sinus rhythm with a single 100J biphasic defibrillation is approximately

- 1. 85%
- 2. 70%
- 3. 50%
- 4. 40%

1

A biphasic 100J shock has an estimated reversion rate of 85% but a monophasic 100J shock reverts only 60%. (link)

8. 8. Question

What is the estimated absolute yearly risk reduction of stroke in patients with atrial fibrillation treated with aspirin alone

- 1. 2.5%
- 2. 1.5%
- 3. 5%
- 4. 0.5%

2

It is estimated that aspirin alone confers approximately 1/3 of the benefit of warfarin in all patients with atrial fibrillation, however the relative benefits of warfarin become greater in higher risk and older patients. (link)

9. 9. Question

The percentage of patients with new onset atrial fibrillation presenting to an ED that are likely to spontaneously revert to sinus rhythm by 24 hours is

- 1. 10%
- 2. 50%
- 3. 75%
- 4. 25%

2

Sometimes doing nothing works quite well too! (link)

10. 10. Question

Which one of the following is the weakest indication for long term anticoagulation in patients with atrial fibrillation

- 1. Age 65 years without other risk factors
- 2. Clinical evidence of heart failure
- 3. Clinical evidence of mitral valve disease
- 4. Previous TIA

1

Although a variety of recommendations regarding anticoagulation in atrial fibrillation exist, it is usually accepted that patients < 75 years of age without other risk factors for stroke can be managed with aspirin alone.

Patients who have had a previous stroke are the greatest potential beneficiaries of anticoagulation, with a number needed to treat of approximately 12. (link)

11. 11. Question

Which one of the following is not associated with a decreased likelihood of reversion to sinus rhythm in adult patients with atrial fibrillation

- 1. Left atrial diameter of 3.5cm
- 2. Atrial fibrillation > 48 hours duration
- 3. Previous episodes of AFib
- 4. Age > 65 years of age

1

A left atrial diameter of 3.5cm is normal, so is not associated with a decreased likelihood of reversion. (link)

12. 12. Question

Which of the following conditions places patients at the highest risk of stroke due to atrial fibrillation

- 1. Rheumatic heart disease
- 2. Mitral stenosis
- 3. Tricuspid regurgitation
- 4. Patent foramen ovale

2

Mitral stenosis has a 25% lifetime incidence of fatal embolism associated with atrial fibrillation and is the highest risk lesion. Patients with AFib and a structurally normal heart have an annual incidence of stroke of 5%, those with rheumatic heart disease have an incidence of 10%. (link)

13. 13. Question

Intravenous amiodarone at an initial dose of 4-5mg/kg increases the absolute reversion rate of atrial fibrillation to sinus rhythm within 48 hours to approximately

- 1. 90%
- 2. 30%
- 3. 70%
- 4. 50%

1

Spontaneous reversion by 48 hours would be expected in approximately 60% of patients, and in 90% of patients treated with amiodarone.

14. 14. Question

In patients with new onset atrial fibrillation without contraindications to any of the following treatments, which treatment is most likely to result in conversion to sinus rhythm within 24 hours

- 1. 70J biphasic cardioversion
- 2. Flecainide 100mg orally
- 3. Dofetilide 0.5 mg orally bd
- 4. Sotalol 160mg IV

3

Dofetilide at this dose is associated with a conversion rate of approximately 90%. A 70J biphasic cardioversion will work in 50% (same as waiting 24 hours) whilst sotalol is poorly effective. Flecaïnide at 200-300mg oral (or 2mg/kg IV) doses is as effective as Dofetilide, but not with a dose of only 100mg orally. (link)

15. 15. Question

Which one of the following conditions is likely to cause the greatest haemodynamic compromise in patients with new onset rapid atrial fibrillation

- 1. Aortic stenosis
- 2. Thyrotoxicosis

- 3. Pericarditis
- 4. Mitral regurgitation

1

Cardiac conditions with reduced left ventricular compliance (eg aortic stenosis, hypertension) are the most likely to be associated with haemodynamic compromise from atrial fibrillation. The reduction in ventricular filling is likely to be greater than the 25% that occurs in normally compliant hearts. ([link](#))

CHAPTER 3

Cardiology

DIRECTIONS: Each question below contains five suggested responses. Select the one best response to each question.

27. All of the following are major determinants of myocardial oxygen consumption (MVO₂) EXCEPT

- (A) systolic wall tension
- (B) heart rate
- (C) contractile state of the heart
- (D) hemoglobin
- (E) inotropic effects

28. With regards to intravenous magnesium as an antiarrhythmic agent, all the following are true EXCEPT

- (A) it can be used in the treatment of torsades de pointes
- (B) its major effect is on potassium exchange and calcium antagonism
- (C) it can attenuate catecholamine release
- (D) in high doses, it can lead to respiratory depression
- (E) it is contraindicated in digoxin-induced arrhythmias

29. Which of the following is true regarding syncope secondary to a cardiac etiology?
- (A) It has no higher mortality than most non-cardiac syncope
 - (B) It is usually secondary to myocardial ischemia
 - (C) A patient with it should be admitted to the hospital for further evaluation
 - (D) It is usually recurrent
 - (E) It is benign in younger populations
30. Which of the following tests is LEAST helpful for evaluating syncope in the elderly?
- (A) Signal-averaged ECG
 - (B) Tilt-table testing with isoproterenol HCl
 - (C) Ambulatory ECG monitoring (Holter monitor)
 - (D) Complete blood count (CBC)
 - (E) 12-lead ECG
31. All of the following are findings associated with myocarditis EXCEPT
- (A) precordial chest pain mimicking myocardial ischemia
 - (B) mitral or tricuspid stenosis
 - (C) tachycardia out of proportion to the fever
 - (D) pathologic Q wave formation
 - (E) high-grade AV block, ventricular arrhythmias
32. All of the following statements regarding mitral stenosis (MS) are true EXCEPT

- (A) it is usually caused by rheumatic heart disease
- (B) the murmur is usually detected in the third to fourth decade of life
- (C) the most common early symptom is near syncope
- (D) an early diastolic snap followed by a rumble is the hallmark of MS
- (E) the most common complications result from pulmonary hypertension

33. Which of the following is true regarding mitral regurgitation (MR)?

- (A) It is generally only a chronic condition
- (B) Afterload reduction is contraindicated
- (C) The papillary muscles are prone to ischemia
- (D) In chronic MR, atrial pressure rises dramatically
- (E) It does not require endocarditis prophylaxis

34. All the following are true with regards to acute aortic regurgitation EXCEPT

- (A) an accentuated S1 is heard on auscultation
- (B) dyspnea, tachycardia, and tachypnea are commonly present
- (C) it is commonly caused by endocarditis, trauma, or dissection
- (D) low cardiac output causes a state of hypoperfusion
- (E) surgery is the treatment of choice

35. Which of the following is the MOST appropriate statement regarding aortic stenosis (AS)?

- (A) It is most commonly caused by infective endocarditis
- (B) Impairment of forward flow occurs when the valve area reaches 3 cm²
- (C) Syncope at rest is a common finding
- (D) It results in widened pulse pressure
- (E) It is associated with sudden death

36. A 55-year-old man presents to the emergency department with an inferior wall myocardial infarction (MI). You are concerned that the patient may also have a right ventricular (RV) infarction. All the following are true regarding RV infarcts EXCEPT

- (A) they occur in 19–43% of inferior wall myocardial infarctions
- (B) the right coronary artery is usually occluded
- (C) they are associated with the clinical triad of hypotension, jugular venous distention, and clear lungs during an inferior wall MI
- (D) fluid replacement can help with the hypotension
- (E) inotropic agents such as dobutamine rarely work

37. Which of the following is one of the first signs of left-sided congestive heart failure (CHF)?

- (A) Exertional dyspnea
- (B) Nocturia
- (C) Orthopnea
- (D) Paroxysmal nocturnal dyspnea
- (E) Pedal edema

38. Which of the following is the MOST beneficial effect of digoxin in CHF?

- (A) It improves cardiac output
- (B) It slows the ventricular rate when atrial fibrillation is present
- (C) It promotes diuresis
- (D) It lowers filling pressure
- (E) decreases afterload

39. You have a high suspicion that a patient has a pulmonary embolus (PE). Which of the following signs and symptoms is LEAST likely to be present?

- (A) PCO₂ of 25 mm Hg
- (B) Chest pain
- (C) Dyspnea
- (D) Respiratory rate > 16/min
- (E) Heart rate > 100 bpm

40. Which of the following patients requires the MOST immediate treatment for elevated blood pressure (BP)?

- (A) A 55-year-old man (BP 180/100 mm Hg) who ran out of diuretic, but otherwise feels well
- (B) An 85-year-old woman (BP 212/110 mm Hg) on no medication, complaining of nausea, with a history of old stroke
- (C) A 35-year-old man (BP 200/110 mm Hg) who presents with anxiety after cocaine use
- (D) A 29-year-old woman (BP 160/94 mm Hg) who is 30 weeks pregnant, complaining of headache and nausea
- (E) A 55-year-old man (BP 210/130 mm Hg) who has a foot fracture but otherwise feels well

41. In otherwise healthy adults, what percentage of the pulmonary vasculature must be occluded for signs of pulmonary hypertension to develop?

- (A) 10–20%
- (B) 30%
- (C) 40–50%
- (D) 60%
- (E) Greater than 80%

42. What percentage of patients with a low probability ventilation-perfusion (V/Q) scan can be expected to have angiography positive for PE?

- (A) 0%
- (B) 5%
- (C) 12%
- (D) 25%
- (E) 33%

43. Which of the following agents would be an inappropriate choice for the pharmacologic management of a hypertensive emergency?

- (A) Nitroprusside
- (B) Intravenous labetalol
- (C) Trimethaphan
- (D) Intravenous nitroglycerin
- (E) Nifedipine

44. A 78-year-old woman presents to the emergency department with acute onset of shortness of breath after recent hip surgery. You suspect PE and obtain a room air arterial blood gas before placing her on oxygen. Results are as follows:

pH 7.28

PCO₂ 24 torr

PaO₂ 70 torr

What is the patient's A-a gradient?

- (A) 10 torr
- (B) 20 torr
- (C) 30 torr
- (D) 40 torr
- (E) 50 torr

45. All the following are considered true statements regarding the evaluation of syncope in the emergency department EXCEPT

- (A) cardiogenic syncope carries a higher 1-year mortality than non-cardiogenic syncope
- (B) syncope and near syncope should be evaluated in the same manner
- (C) stroke is a frequent cause of syncope
- (D) most syncope does not result from cardiac causes
- (E) a subarachnoid hemorrhage can result in true syncope

46. Which of the following ECG morphologic characteristics favors supraventricular tachycardia (SVT) over ventricular tachycardia (VT)?

- (A) QRS duration > 0.14 sec
- (B) Concordance
- (C) Extreme left axis deviation
- (D) Fusion beat
- (E) QRS pattern in V6

47. All of the following agents have roles in the acute management of CHF EXCEPT

- (A) diuretics
- (B) digoxin
- (C) nitrates
- (D) dobutamine
- (E) oxygen

48. What are the classic auscultatory finding of mitral valve prolapse (MVP)?

- (A) Holosystolic murmur
- (B) Early diastolic murmur
- (C) Mid-systolic click followed by late systolic murmur
- (D) Early systolic murmur
- (E) Increased S1

49. Acute aortic regurgitation is commonly due to trauma, dissecting aortic aneurysm, or infective endocarditis. Signs and symptoms consistent with acute aortic regurgitation include all the following EXCEPT

- (A) tachycardia
- (B) tachypnea
- (C) capillary pulsations in the nail bed
- (D) chest pain
- (E) dyspnea

50. Which of the following maneuvers will decrease the intensity of the murmur associated with hypertrophic cardiomyopathy (HCM)?

- (A) Valsalva maneuver
- (B) Standing
- (C) Beta-agonists
- (D) Squatting
- (E) Amyl nitrate

51. What percentage of the elderly population have classic angina pectoris?

- (A) 10%
- (B) 25%
- (C) 40%

- (D) 50%
- (E) 70%

52. Which of the following antihypertensive agents would be LEAST effective for an elderly patient?

- (A) Angiotensin Converting Enzyme (ACE) inhibitor
- (B) Diuretic
- (C) Beta-blocker
- (D) Alpha-blocker
- (E) Calcium channel-blocker

53. What is the MOST common ECG finding in a patient with PE?

- (A) S wave in lead I
- (B) T wave inversions
- (C) ST elevation
- (D) Sinus tachycardia
- (E) A normal ECG

54. All of the following are normal physiologic change in the elderly EXCEPT

- (A) increased reliance on the atrial kick for left ventricular filling
- (B) drop in ejection fraction
- (C) decreased chronotropic change in heart rate secondary to tilt
- (D) decreased inotropic response to catecholamines
- (E) decreased carotid baroreceptor response

55. In a patient with unstable angina, which of the following percent reductions in the lumen of at LEAST one coronary artery would be expected at angiography?

- (A) < 50%
- (B) 50–75%
- (C) 75–90%
- (D) > 90%
- (E) 100% occlusion

56. Unstable angina represents a clinical state between stable angina and acute MI, typified by all of the following EXCEPT

- (A) exertional angina of recent onset
- (B) angina of worsening character
- (C) angina at rest (angina decubitus)
- (D) new onset angina
- (E) chronic stable angina

57. The primary antianginal effect of nitrates is

- (A) increased venous capacitance
- (B) coronary vasodilation
- (C) improved collateral flow
- (D) afterload reduction
- (E) tolerance to nitrates

58. Beta-adrenergic antagonists have been shown to be MOST useful in patients with

- (A) unstable angina
- (B) myocardial infarction
- (C) chronic stable angina

- (D) variant angina
- (E) rest angina

59. All of the following pharmacologic agents have been found to be effective for the treatment of unstable angina or acute MI patients EXCEPT

- (A) aspirin
- (B) nitroglycerin
- (C) heparin
- (D) calcium-blockers
- (E) beta-blockers

60. Following acute MI, the infarcted area can undergo autolysis resulting in any of the following distinct clinical syndromes EXCEPT

- (A) ventricular free-wall rupture
- (B) pericarditis or Dressler's syndrome
- (C) ventricular septum rupture
- (D) papillary muscle rupture
- (E) papillary muscle dysfunction

61. Compared to those with Q-wave infarcts, patients with non-Q-wave infarcts

- (A) are more likely to reinfarct or develop angina
- (B) have a better long-term prognosis after 3 years
- (C) make up the majority of acute infarctions
- (D) more often have occlusion of a coronary artery
- (E) have larger infarctions with more myocardial damage

62. All of the following statements concerning the use of the ECG in the emergency department are true EXCEPT

(A) only about half of all acute MI patients have diagnostic changes on their initial ECG

(B) a normal or nonspecific ECG does not exclude ischemia nor obviate the need for hospital admission

(C) right ventricular infarctions produce ST-segment elevation in the right-sided chest leads

(D) true posterior infarctions produce large R-waves and ST-segment elevations in V1 and V2

(E) lead V9 is placed in the left paraspinal region medial to the scapula and helps diagnose posterior acute MIs

63. All of the following statements regarding the use of commonly measured cardiac markers to aid in the diagnosis of emergency department patients with chest pain are true EXCEPT

(A) the levels of cardiac markers should not be used as criteria for ruling out acute MI

(B) myoglobin is the serum marker with the earliest elevation following the onset of an acute MI

(C) CK-MB measured by electrophoresis is more sensitive than by immunoassay

(D) troponin is the serum marker with the longest duration of elevation following the onset of an acute MI

(E) of the immunoassays, monoclonal antibody assays are more sensitive than immunoinhibition

64. All of the following are true regarding echocardiography in the diagnostic workup of emergency department patients with chest pain EXCEPT

(A) it can detect infarct related wall motion abnormalities

(B) it is sensitive but not specific for emergency department patients

(C) it may predict patients at risk for acute MI complications

- (D) it can diagnose anatomical complications of acute MI
- (E) it has a high sensitivity for unstable angina

65. In the diagnostic work-up of emergency department patients with chest pain, all of the following are true regarding radionuclide scanning EXCEPT

- (A) is sensitive but nonspecific in detecting infarction
- (B) has a high specificity for myocardial ischemia
- (C) with technetium pyrophosphate produces a “hot spot”
- (D) with thallium sestamibi produces a “cold spot”
- (E) is less sensitive in unstable angina

66. All of the following statements are true regarding ventricular fibrillation in the setting of acute MI, EXCEPT

- (A) it is responsible for almost all out-of-hospital mortality
- (B) it is preventable with prophylactic lidocaine
- (C) prophylactic lidocaine does not improve mortality
- (D) warning arrhythmias predict ventricular fibrillation
- (E) premature ventricular contractions need not always be suppressed with lidocaine

67. Which of the following statements regarding sinus tachycardia and sinus bradycardia in the setting of an acute MI is true?

- (A) Sinus bradycardia is more common with anterior acute MIs
- (B) Sinus tachycardia is more common with inferior acute MIs
- (C) Sinus bradycardia is due to increased sympathetic activity
- (D) Sinus tachycardia is usually due to increased vagal tone
- (E) Treatment with atropine is usually not required for sinus bradycardia

68. Which of the following agents commonly used to treat pulmonary vascular congestion is MOST likely to be associated with the coronary artery steal syndrome?

- (A) Nitroglycerin
- (B) Nitroprusside
- (C) Morphine
- (D) Diuretics
- (E) Dobutamine

69. Depressed cardiac output should first be treated by which of the following?

- (A) Optimizing preload
- (B) Dobutamine infusion
- (C) Dopamine infusion
- (D) Intra-aortic balloon pump
- (E) Angioplasty

70. Which of the following treatments for chest pain is the LEAST physiologic in reducing or reversing ischemia?

- (A) Oxygen
- (B) Aspirin
- (C) Nitroglycerin
- (D) Morphine
- (E) Beta-blockers

71. Which of the following questions need NOT be answered affirmatively before administering thrombolytic therapy?

- (A) Is the patient symptomatic for acute MI?

- (B) Is the ECG diagnostic for acute MI?
- (C) Are there indications for thrombolytic therapy?
- (D) Are there absolute contraindications to thrombolytic therapy?
- (E) Can thrombolytic therapy be initiated immediately?

72. All of the following statements regarding streptokinase (SK) and anisoylated plasminogen SK activator complex (APSAC) are true EXCEPT

- (A) like urokinase (UK), they act on the inactive proenzyme plasminogen to produce the active enzyme plasmin
- (B) the standard dose of IV SK is 1.5 million units over 60 minutes
- (C) the standard dose of IV APSAC is 30 units over 5 minutes
- (D) specific side effects include hypotension and anaphylaxis
- (E) significant mortality difference favors APSAC over SK

73. All of the following statements regarding tissue plasminogen activator (TPA) are true EXCEPT

- (A) it is a naturally occurring serine protease protein
- (B) it activates the fibrinolytic system under physiologic conditions by catalyzing the conversion of plasminogen to plasmin
- (C) it is known as a clot-specific agent
- (D) it is associated with fewer bleeding complications than SK
- (E) the standard dose has been 100 mg over 3 hours

74. Most published results comparing SK and TPA have found little or no difference in which of the following parameters?

- (A) Mortality rates
- (B) Early recanalization rates
- (C) Intracranial hemorrhage

- (D) Allergic side effects
- (E) The cost of either medication

75. All of the following conclusions concerning thrombolytic therapy based upon the results from the most influential and larger clinical trials are true EXCEPT

- (A) both thrombolytic therapy and spontaneous reperfusion result in recanalization of infarct-related coronary arteries
- (B) some recanalized coronary arteries will reocclude despite anticoagulation and antiplatelet treatment with heparin and aspirin
- (C) thrombolytic agents differ more in the rapidity with which recanalization occurs than in the final rate of recanalization
- (D) there is no evidence that the degree of decrease in mortality is any different between each of the available thrombolytic agents
- (E) none of the above

76. Which of the following thrombolytic agents is LEAST expensive?

- (A) SK
- (B) TPA
- (C) APSAC
- (D) UK
- (E) Recombinant single-chain UK-type plasminogen activator

77. Every step necessary to the initiation of the administration of thrombolytic therapy can add to delays in patient care, EXCEPT

- (A) waiting for the EP to order the ECG
- (B) waiting for the EP to read the ECG
- (C) waiting for approval of treatment by a cardiologist
- (D) waiting for the drug to arrive from the pharmacy

- (E) waiting to initiate therapy in the cardiac care unit

78. Studies of thrombolytic agents in the prehospital setting reveal all of the following EXCEPT

- (A) thrombolytic therapy can be instituted safely
- (B) paramedics can transmit ECGs to the receiving emergency departments
- (C) paramedics spend more time on thrombolytic patients
- (D) a minority of chest pain patients qualify for thrombolytics
- (E) a majority of acute MI patients can be diagnosed by paramedics

79. Thrombolytic therapy is currently reserved for a select minority of acute MI patients, many of whom have the best prognosis among acute MI patients. All of the following are restrictive patient selection criteria in previously published series EXCEPT

- (A) symptoms longer than 6 hours
- (B) age > 75 years
- (C) history of hypertension
- (D) contraindications
- (E) nondiagnostic ECG

80. When compared with younger patients, all of the following regarding treatment with thrombolytics of elderly patients are true EXCEPT

- (A) they are at increased risk for hemorrhagic complications
- (B) they have more underlying illnesses with corresponding contraindications
- (C) they have more nondiagnostic ECGs due to baseline abnormalities
- (D) the absolute number of lives saved is greater
- (E) none of the above

81. All of the following statements regarding the duration of ischemic symptoms prior to the administration of thrombolytic therapy are true EXCEPT

- (A) the standard guideline is 6 hours of symptoms or less
- (B) the optimal goal is treatment within the first 2 hours of symptoms
- (C) a realistic goal is treatment within 4 hours of symptoms
- (D) studies have shown benefit from treatment within 5–12 hours
- (E) no studies have shown benefit from 12–24 hours

82. All of the following statements regarding thrombolytic therapy and the location of the acute MI on ECG are true EXCEPT

- (A) more benefit occurs in patients with larger infarcts
- (B) more benefit occurs in patients with anterior acute MIs
- (C) more benefit occurs in patients with cardiogenic shock
- (D) more benefit occurs in patients with large anterior acute MIs
- (E) more benefit occurs in patients with large inferior acute MIs

83. Which of the following statements regarding hypertension as a contraindication to thrombolytic therapy is true?

- (A) Elevated systolic hypertension is a relative contraindication
- (B) Patients on antihypertensive therapy should not receive thrombolytics
- (C) Well controlled hypertensive patients are at higher risk from thrombolytics
- (D) The higher the blood pressure, the higher the mortality from thrombolytics
- (E) Concomitant beta-blocker therapy does not protect against cerebral hemorrhage

84. All of the following statements regarding the role of the ECG in the selection of acute MI patients for thrombolytic therapy are true EXCEPT

- (A) in the GISSI-1 study, patients with ST-segment depression had a higher mortality rate when treated with SK
- (B) in the ISIS-2 study, there was no mortality difference and thus no benefit in patients with ST-segment depression
- (C) the initial ECG reveals classic ischemic changes in most acute MI patients
- (D) ST-segment elevation helps predict who will most likely benefit from coronary reperfusion
- (E) the ECG is most sensitive in patients with occlusion of the left anterior descending coronary artery

85. All of the following are considered noninvasive clinical markers of successful reperfusion with the administration of thrombolytic therapy EXCEPT

- (A) a reduction of at least 50% or complete resolution of ST-segment elevation on ECG
- (B) occurrence of reperfusion arrhythmias within the first 90 minutes after infusing thrombolytic therapy
- (C) complete resolution of chest pain
- (D) rapid rise and peak of cardiac enzymes
- (E) a patent coronary artery at angiography

86. Of the following life-threatening conditions that may present like acute MI, which would NOT be harmed, and might potentially benefit, from thrombolytic therapy?

- (A) Aortic dissection or rupture
- (B) Pericarditis or pericardial tamponade
- (C) Pulmonary embolus
- (D) Esophageal rupture
- (E) Perforated duodenal ulcer or gastrointestinal bleed

87. Which of the following adverse effects is associated with SK and APSAC rather than TPA?

- (A) Allergic reactions including urticaria, bronchospasm, hypotension, serum sickness, and anaphylactic reactions
- (B) Uncomplicated bleeding at vascular access sites
- (C) Life-threatening bleeding
- (D) Arrhythmias
- (E) Intracerebral bleeding

88. All of the following patient characteristics have been shown to increase the risk of intracranial hemorrhage with thrombolytic therapy EXCEPT

- (A) older, smaller women
- (B) uncontrolled hypertension
- (C) prior cerebrovascular accident
- (D) severity of CHF
- (E) SK therapy within prior 6–12 months

89. Which of the following would NOT be confused with right ventricular infarction?

- (A) Occult left ventricular failure
- (B) Constrictive pericarditis or pericardial tamponade
- (C) Restrictive cardiomyopathy
- (D) Pulmonary embolus
- (E) Simple pneumothorax

90. All of the following statements regarding properties of the anti-arrhythmic drug sotalol are true EXCEPT

- (A) it is a non-cardioselective beta-adrenergic blocker
- (B) it prolongs QT interval; may induce torsade de pointes

- (C) it decreases heart rate and slows conduction through the AV node
- (D) it prolongs action potential duration and refractory period
- (E) it tends to decrease cardiac contractility

91. All of the following congenital heart diseases are associated with cyanosis EXCEPT

- (A) transposition of the great arteries
- (B) tetralogy of Fallot
- (C) patent ductus arteriosus
- (D) tricuspid atresia
- (E) truncus arteriosus

92. All of the following are components of tetralogy of Fallot EXCEPT

- (A) ventricular septal defect (VSD)
- (B) atrial septal defect (ASD)
- (C) pulmonary stenosis
- (D) overriding aorta
- (E) right ventricular hypertrophy

93. All of the following statements regarding a tetralogy of Fallot "spell" are true EXCEPT

- (A) increased right-to-left shunt increases hypoxemia
- (B) exertion may cause prolonged or recurrent syncope
- (C) child may squat after exertion to obtain relief
- (D) pulmonary stenosis murmur may increase during a spell
- (E) treatment is with knee-chest position, oxygen and IV morphine

94. All of the following statements regarding aortic stenosis (AS) are true EXCEPT

(A) calcific degeneration is the most common acquired form in patients greater than 65 years of age

(B) bicuspid valve is the most common primary cause in patients less than 65 years of age

(C) rheumatic heart disease is the second most common primary cause in patients less than 65 years of age

(D) carotid upstroke in elderly patients is often severely diminished

(E) the following triad: dyspnea from left heart failure, syncope, and angina, heralds a decreased 5-year average life expectancy if untreated

95. A 65-year-old woman with documented AS presents to the emergency department with dyspnea of 2 hours duration. Vital signs are: BP 92/76 mm Hg; P 110 bpm and irregular; R 22/min; T 98.8 °F. The patient has rales half-way up both lung fields and an audible S3. ECG shows atrial fibrillation and left ventricular hypertrophy. What is the MOST appropriate intervention?

(A) Oxygen; IV morphine, 4 mg; IV furosemide, 40 mg

(B) Oxygen by positive end-expiratory pressure; IV digoxin, 0.25 mg

(C) Oxygen; IV digoxin, 0.25 mg; IV furosemide, 40 mg

(D) Oxygen; sedation; synchronized cardioversion

(E) Oxygen; immediate unsynchronized cardioversion

96. All of the following clinical findings of AS are true EXCEPT

(A) palpable systolic thrill at the base of the heart

(B) low-pitched systolic ejection murmur heard best at the right second intercostal space (ICS) with radiation to the carotids

(C) S2 split progressively widens until a paradoxical S2 split is heard

(D) left ventricular hypertrophy, but minimal enlargement of cardiac silhouette on chest radiograph

(E) opening snap of aortic valve is present in early disease but absent in late disease

97. All of the following findings are associated with chronic calcific constrictive pericarditis EXCEPT

- (A) Kussmaul's sign
- (B) jugular venous distension
- (C) visible pericardium on lateral chest radiograph
- (D) apical early diastolic pericardial knock
- (E) systemic venous pressure decrease with inspiration

98. A 24-year-old woman with a recent "flu-like" illness presents to the emergency department with dyspnea. Vital signs are: BP 88/74 mm Hg; P 120 bpm; R 28/min; T 99.9 °F. Cardiac monitor shows electrical alternans. What therapeutic intervention is indicated?

- (A) External cardiac pacing
- (B) Pericardiocentesis
- (C) Cardioversion
- (D) Intubation
- (E) IM ketorolac, 60 mg

99. All of the following statements regarding pericardial friction rub are true EXCEPT

- (A) it typically has three components
- (B) its sound may vary with respiration
- (C) it is heard best with patient leaning forward
- (D) it is heard best at left lower sternal border or apex
- (E) the amount of fluid determines the presence of sound

100. All of the following ECG features of acute pericarditis are true EXCEPT

- (A) vectors of the PR segment and ST segment are concordant
- (B) PR segment depression in V2 to V6
- (C) diffuse ST segment elevation in V2 to V6
- (D) upward concave ST segment morphology
- (E) ST-T elevation ratio > 0.25 in lead V6

101. Which of the following statements regarding automatic implantable cardioverter-defibrillators (AICDs) is correct?

- (A) CPR and transthoracic defibrillation are harmful to the device
- (B) Patient contact during AICD shock is dangerous
- (C) Patients can be safely discharged from the emergency department if no more than three shocks occur in succession
- (D) Shivering or excess arm activity may trigger the device
- (E) ECG changes due to AICD discharge are persistent

Cardiology

27	D	28	E	29	C	30	D
31	B	32	C	33	C	34	A
35	E	36	E	37	A	38	B
39	E	40	D	41	C	42	C
43	E	44	E	45	C	46	E
47	B	48	C	49	C	50	D
51	A	52	C	53	B	54	B
55	D	56	E	57	A	58	C
59	D	60	D	61	A	62	D
63	C	64	E	65	B	66	D

67	E	68	B	69	A	70	D
71	D	72	E	73	D	74	A
75	E	76	A	77	B	78	E
79	C	80	E	81	E	82	C
83	A	84	C	85	E	86	C
87	A	88	E	89	E	90	E
91	C	92	B	93	D	94	D
95	D	96	C	97	E	98	B
99	E	100	A	101	D		

MCQ Cardiovascular 2

- Which is true of dilated cardiomyopathy?
 - 80% are due to infective causes.
 - Chest pain in these patients is usually due to atherosclerosis of coronary arteries.
 - The ECG is almost always abnormal with LV hypertrophy, & L atrial enlargement being the most common abnormalities.
 - Use of digoxin has been shown to improve survival rates.
 - ECHO usually shows decreased diastolic and systolic volumes.
- Which is INCORRECT of hypertrophic cardiomyopathy?
 - 50% is familial with autosomal dominant inheritance.
 - Younger patients tend to have more severe symptoms.
 - The characteristic systolic murmur decreases with passive leg raising.
 - Syncope is a worrying symptom as often precedes sudden cardiac death.
 - Patients should be advised to avoid vigorous exercise.
- Which of the following is not a cause of restrictive cardiomyopathy?
 - Amyloidosis
 - Scleroderma

- c. Carcinoid heart disease
 - d. Tuberculosis
 - e. Sarcoidosis
4. A 28 year old man presents with fever, CHF and an episode of SVT. You suspect myocarditis. Which is true regarding the investigation of this man?
- a. Global wall motion abnormalities on ECHO are characteristic of myocarditis.
 - b. A positive Troponin I rules out myocarditis.
 - c. Nuclear Med scanning of heart is not helpful in the diagnosis of myocarditis.
 - d. The gold standard for diagnosis of myocarditis is endomyocardial biopsy.
 - e. The ESR is always elevated in myocarditis.
5. Which of the following is not a feature of pericarditis?
- a. Sharp chest pain worse on lying supine.
 - b. Pericardial friction rub
 - c. Dysphagia due to irritation of oesophagus.
 - d. Tachypnoea
 - e. Sinus tachycardia.

6. Which is true of cardiac tamponade?
 - a. The most common symptom of gradual tamponade is dizziness.
 - b. Clinical signs of pericardial effusion are easy to illicit.
 - c. During needle pericardiocentesis at least 50-100 mls needs to be removed to have an effect on hemodynamics.
 - d. CPR is ineffective during arrest.
 - e. The pericardial effusion needs to be at least 100 mls to see an enlarged cardiac silhouette on CXR

7. Which is true of ischaemic chest pain?
 - a. 6% of patient with AMI present with pleuritic chest pain.
 - b. Up to 10% of all AMI's are silent.
 - c. Men are more likely to have atypical presentations.
 - d. Chest wall tenderness is an exclusion for AMI.
 - e. Of all patients presenting with AMI 75% will have diagnostic changes on initial ECG. (I.e. ST elevation).

8. Which is true of cardiac markers?
 - a. Troponin I is more sensitive then Trop T at 10 hrs.
 - b. Trop I has sensitivity reaching 90% at 6hrs for AMI.
 - c. Trop I and T normalize on day 7.
 - d. Myoglobin is more specific than CKMB in AMI.
 - e. Size of troponin rise is not a predictor for mortality.

9. Which is true of right ventricular infarct?
 - a. Usually due to occlusion of dominant circumflex artery.
 - b. ST elevations of 1mm in V5R specific for right vent infarct.
 - c. There is a high risk of AV block.
 - d. Approx 20% will present with some hemodynamic compromise.
 - e. Isolated RV infarction is fairly common.

10. Which is true of complications of AMI?
 - a. Complete heart block in the setting of anterior AMI has a higher mortality than CHB in inferior MI.
 - b. Early VT in AMI is an indicator of poor prognosis.
 - c. Appox 40% of patients present with some degree of CHF in AMI.
 - d. There is a 50% mortality rate if the patient present in cardiogenic shock.
 - e. Free wall rupture usually occurs within the first 12 hours of AMI and is often fatal.

11. A 30 yr old man presents with crushing chest pain, with ECG criteria for anterior AMI. He volunteers that he uses cocaine on a regular basis. Which is true?
- AMI's secondary to cocaine only occur in chronic users due to accelerated atherosclerosis.
 - The one year prognosis is more favourable in cocaine users who suffer AMI compared with the general population who suffer AMI.
 - Thrombolysis is contraindicated.
 - He does not require evaluation of his coronary arteries.
 - The ECG is as sensitive and specific for AMI as in non-cocaine users.
12. Which statement is INCORRECT of fibrinolytics used in AMI?
- TPA has a higher risk of intracerebral haemorrhage compared with streptokinase.
 - ISIS -2 trial was a four arm trial comparing SK and aspirin alone and in combination and placebo and showed reduced mortality with combination SK and aspirin.
 - 0.2% of patients receiving streptokinase has anaphylaxis.
 - TPA may be advantageous over strep in patients under 75 years presenting within 4 hrs with ant AMI.
 - GUSTO 2b trial compared TPA and angioplasty and showed that TPA reduced mortality greater than angioplasty if presenting after 4 hrs of onset of symptoms.
13. Which is true of antiplatelet use in acute coronary syndromes?
- Aspirin used alone is as efficacious as strep used alone in AMI as shown in the ISIS-2 trial.
 - Aspirin has little effect in non Q wave MI.
 - Tirofiban has been shown in the PRISM plus trial to efficacious in patients not undergoing PTCA.
 - Clopidagrel was shown in the CURE trial to offer no advantage over aspirin alone in patients not undergoing PTCA.
 - Ticlopidine is an alternative to aspirin as it is a safe drug to use long term with no harmful side effects.
14. Which of the following is correct regarding the treatment of AMI?
- Nitrates offer advantage in reducing O2 demand through decreased venous return and especially helpful in inferior AMI's.
 - Beta blockers have been shown to reduce mortality in AMI due to coronary artery vasospasm.
 - ACE inhibitors have consistently been shown to reduce mortality if given to patients during or soon after AMI.
 - Calcium channel blockers while not shown to decrease mortality in AMI have no harmful effects in the acute setting.
 - The MIRACL study clearly demonstrated an advantage of using statins early in AMI, reducing mortality rates.

15. Which is INCORRECT of APO?
- Pancreatitis is a cause of non cardiogenic APO
 - Morphine has not shown to be effective in the treatment.
 - Use of CPAP will improve oxygenation through increasing functional residual capacity.
 - CPAP will not alter length of stay or mortality but will reduce the number of patients requiring intubation.
 - Furosemide has been shown in studies to improve outcome in APO.
16. Regarding valvular disease which is correct?
- Mitral incompetence can present as massive haemoptysis.
 - Mitral valve prolapse is the most common heart lesion in the community affecting 3% of the population.
 - Angina in patients with aortic stenosis is almost never due to coronary artery disease.
 - Corrigan's sign is often present in aortic stenosis.
 - Critical aortic stenosis requiring surgery is when the valve area is less than 1.0 cm².
17. Regarding endocarditis which is INCORRECT?
- Valve leaflets are most susceptible secondary to large surface area.
 - Haemodialysis or peritoneal dialysis is a risk factor.
 - Acute endocarditis is usually more severe and affects young people with normal valves.
 - Aortic and mitral valves are most commonly effected except for in IV drug users.
 - Staph aureus and strep pneumoniae are the most common organisms effecting tricuspid and pulmonary valves.
18. Which is not an absolute indication for surgery in endocarditis?
- Severe CHF as a result of valvular lesion.
 - Vegetations greater than 10 cm.
 - Uncontrolled infection despite optimal management.
 - Relapse after optimal therapy in prosthetic valve patient.
 - Unstable prosthesis.
19. Regarding prophylaxis against endocarditis which is true?
- Although widely accepted practice prophylaxis has not shown to be effective.
 - HOCM is a low risk lesion not requiring prophylaxis.
 - Patients with high risk valve lesions require prophylaxis for IDC insertion even in the absence of UTI.
 - Prior endocarditis is not a recognized indication for prophylaxis.
 - Oral antibiotics are inadequate in prophylaxis and should be replaced with IV.

20. Which is the most common presenting symptom in PE?
- Dyspnea
 - Pleuritic chest pain
 - Anxiety
 - Cough
 - Haemoptysis
21. Which statement is correct regarding PE?
- The CXR is abnormal in 50% of cases of PE.
 - Wester mark sign is a semicircular opacity that is pleural based.
 - The latex agglutination test for D-dimer is more sensitive than the ELISA test.
 - 40-50% of the pulmonary arterial circulation must be occluded for someone to present with massive PE i.e. hypotensive and hypoxic.
 - Pulmonary angiography is 100 % sensitive for PE and is the gold standard.
22. From results gathered for the PIOPED study which of the following probabilities matches VQ scan result.
- High probability – 90% chance of PE
 - Low probability – 15-30% chance of PE
 - Intermediate – 50% chance of PE
 - Normal scan – 0-5% chance of PE
 - None of the above is correct.
23. Which is true regarding treatment of PE?
- LMW heparin has been shown to be as effective as unfractionated heparin.
 - Thrombolytics have been shown to reduce mortality in massive PE.
 - Streptokinase appears to be the most effective thrombolytic agent.
 - The dose of streptokinase is 1500 000 units over 60 mins.
 - Surgical embolectomy without bypass facilities has a mortality rate of 90%.
24. Which of the following scenarios requires anticoagulation for treatment of PE without further investigation i.e USS or angiography?
- Intermediate probability scan with low clinical probability.
 - High prob VQ with low clinical probability.
 - Intermediate prob VQ with intermediate clinical probability.
 - Low prob VQ with intermediate clinical probability and positive leg USS.
 - Low prob VQ with high clinical probability.

25. Which of the following is incorrect regarding hypertensive encephalopathy?
- A diastolic BP of greater than 130 mmHg is pathognomic.
 - Is an emergency as left untreated can lead to coma and death.
 - Treatment should aim at reducing MAP by 25% in 2-4hrs.
 - Clonidine should be avoided in the treatment.
 - Sodium nitroprusside at does 0.5-10 micrograms/Kg/min is the treatment of choice.
26. Which statement if correct regarding the management of hypertensive emergencies?
- Treatment of severe hypertension in the setting of stroke is standard practice.
 - Pre-eclampsia can be treated with IV hydralazine and oral losarten.
 - Sodium nitroprusside alone is adequate treatment for HT in the setting of aortic dissection.
 - Beta blockers should be avoided in acute renal insufficiency.
 - Trimethaphan is used as first line in aortic dissection and has relatively minor side effect profile.
27. Which is true of aortic dissections?
- Male: Female ratio = 1:1
 - The site of intimal tear is in the ascending aorta in 35% of cases.
 - Stanford Type B dissections are distal to the left common carotid.
 - A difference in BP of greater than 15mmHg between arms is seen in 40-50% of cases.
 - Aortography remains the gold standard as sensitivity reaches 100%.
28. Regarding treatment and prognosis of aortic dissections which is true?
- Stanford type A dissections have mortality of 100% without surgery.
 - An indication for surgery in Stanford Type B dissection is Marfan's syndrome.
 - Ongoing chest pain with normal BP is not an indication for antihypertensives.
 - Percutaneous self expanding stents and intraluminal grafts are only indicated in Type B dissections.
 - Presence of pericardial tamponade in ED is an indication for Needle pericardiocentesis.
29. Which is INCORRECT regarding abdominal aortic aneurysms?
- 98% are infra-renal.
 - Risk of rupture outweighs elective surgical risk when greater than 5 cm in otherwise healthy people.
 - Cullen's sign signifies retroperitoneal haematoma, when associated with ruptured AAA.
 - Saccular aneurysms have a higher risk of rupture than Fusiform.
 - Presence of COAD is a risk factor for rupture.

30. Which statement regarding the ischaemic limb is true?
- Chronic critical limb ischaemia is defined as claudication occurring with minimal exertion.
 - Thrombosis of pre-existing atheroma is the commonest cause of acute limb ischaemia.
 - Irreversible changes start to occur at 4 hrs post acute limb ischaemia.
 - Systemic thrombolysis has been shown to be as effective as intra-arterial thrombolysis in acute limb ischaemia.
 - An arteriogram should be performed on all patients prior to embolectomy.
31. Which is not a risk factor for DVT?
- Old age
 - Blood grp A
 - Protein C deficiency
 - Diabetes
 - Factor XII deficiency.
32. Which is true of DVT?
- Symptomatic DVT will be in popliteal or more proximal veins 80% of time.
 - Wells criteria states that patients with a low probability score of 0 or lower have an incidence of DVT of 5-10%.
 - D-dimer sensitivity is increased if DVT is present for greater than one week.
 - Anticoagulation will decrease the risk of post phlebotic syndrome.
 - Below knee DVTs have a 5% chance of propagation to the deep system so require surveillance scans or anticoagulation.
33. A 55 year old woman who is a cardiac transplant patient presents to ED. Which statement about this woman is true?
- Atropine is the first line agent for use of symptomatic bradycardia.
 - Reduction in limb lead voltages on ECG is fairly specific for rejection.
 - CMV infection is unlikely to occur if previous exposure prior to transplant.
 - She will have to stay on corticosteroids for life.
 - Chronic rejection will usually present as CHF secondary to AMI or sudden death.

1= C 2=B 3=D 4=A 5=D 6=D

7=A 8=A 9=C 10=A 11=B

12=E 13=A 14=C 15=E 16=B 17=A 18=B 19=A

20=A 21=D 22=B 23=A 24=D

25=A 26=D 27=D 28=B 29=D

30=C 31=D 32=A 33=E

Cardiologic Emergencies

Each question below contains five suggested responses. Select the ONE BEST response to each question.

03-25 Stable angina is characterized by all of the following EXCEPT

- (A) episodic chest pain lasting 30 to 45 min
- (B) may be accompanied by light-headedness, palpitations, diaphoresis, dyspnea, nausea, or vomiting
- (C) auscultation may reveal transient S4 or apical systolic murmur indicative of mitral regurgitation
- (D) provoked by exertion or stress
- (E) an ECG taken during an acute attack may show ST-segment depression or T-wave inversion

[Show Answer](#)

03-26 Unstable (crescendo or preinfarction) angina is characterized by all of the following EXCEPT

- (A) exertional angina of recent onset, usually defined as within 4 to 8 weeks
- (B) elevated troponin and new Q waves
- (C) angina of worsening character, characterized by increasing severity and duration
- (D) angina at rest (angina decubitus)
- (E) increased requirement for nitroglycerin to control angina

[Show Answer](#)

03-27 What percentage of AMI patients have diagnostic changes on their *initial* ECG?

- (A) 20
- (B) 35
- (C) 50
- (D) 65
- (E) 80

[Show Answer](#)

03-28 An ECG with abnormal Q waves and ST-segment elevation in I, aVL, and V₄-V₆ would represent infarction in which area of the myocardium?

- (A) Inferior
- (B) Anteroseptal
- (C) Lateral

(D) Anterolateral

(E) Posterior

[Show Answer](#)

03-29 What percentage of unstable angina patients can be identified by positive troponin assays?

(A) 10

(B) 25

(C) 33

(D) 50

(E) 75

[Show Answer](#)

03-30 How long after coronary artery occlusion can echocardiography detect wall-motion abnormalities?

(A) Within a few heartbeats

(B) 5 to 10 min

(C) 30 min

(D) 1 h

(E) 2 to 4 h

[Show Answer](#)

03-31 Rupture of a papillary muscle is usually associated with an infarction of which area of myocardium?

(A) Inferior

(B) Inferior-posterior

(C) Lateral

(D) Anterior

(E) Anteroseptal

[Show Answer](#)

03-32 Postmyocardial infarction (Dressler's) syndrome is characterized by all of the following EXCEPT

(A) chest pain

(B) fever

(C) pleuropericarditis

(D) mediastinitis

(E) pleural effusion

[Show Answer](#)

03-33 All of the following should be used in the initial management of AMI EXCEPT

- (A) nifedipine
- (B) nitroglycerin
- (C) oxygen
- (D) aspirin
- (E) heparin or low-molecular-weight heparin (LMWH)

[Show Answer](#)

03-34 The Global Utilization of Streptokinase and Tissue Plasminogen Activator for Occluded Coronary Arteries (GUSTO) trial found a reduced mortality rate in groups taking heparin intravenously with tPA rather than streptokinase. For which of the following subgroups of patients were these relatively small benefits of tPA over streptokinase fewer or nonexistent?

- (A) Patients younger than 75 years
- (B) Patients with anterior MI
- (C) Patients with inferior MI
- (D) Patients with posterior MI
- (E) Patients in whom thrombolysis was not initiated within 2 h of symptom onset

[Show Answer](#)

03-35 Of the following criteria, which is the BEST for thrombolytic therapy?

- (A) ≥ 1 -mm ST-segment depression in a single limb lead
- (B) ≥ 2 -mm ST-segment elevation in two or more contiguous limb leads in a patient with signs of cardiogenic shock
- (C) ≥ 2 -mm ST-segment elevation in two or more contiguous precordial leads
- (D) New right bundle branch block
- (E) New left bundle branch block with evidence of cardiogenic shock

[Show Answer](#)

03-36 Absolute contraindications to thrombolytic therapy include all of the following EXCEPT

- (A) recent head trauma
- (B) stroke within the past 6 months or any history of hemorrhagic stroke
- (C) suspected aortic dissection
- (D) initial BP $> 240/140$
- (E) suspected pericarditis

[Show Answer](#)

03-37 By which percentage does aspirin (by itself) reduce cardiovascular mortality when given in the early stages of coronary occlusion?

- (A) 5
- (B) 10

- (C) 20
- (D) 30
- (E) 40

[Show Answer](#)

03-38 Nitrates have all of the following effects EXCEPT

- (A) reducing cardiac preload
- (B) reducing cardiac afterload
- (C) dilating major capacitance vessels of the coronary system thereby improving collateral flow
- (D) inhibiting vasospasm
- (E) improving clinical outcome when used orally during AMI

[Show Answer](#)

03-39 Contraindications to β blockade include all of the following EXCEPT

- (A) heart rate < 60 beats per minute
- (B) first-degree AV block
- (C) severe left ventricular dysfunction
- (D) severe chronic obstructive pulmonary disease
- (E) systolic blood pressure < 100 with signs of hypoperfusion

[Show Answer](#)

03-40 Which of the following is the MOST appropriate intravenous heparin dose in the setting of AMI?

- (A) loading dose: 75 U/kg, maintenance infusion: 13 U/kg per hour
- (B) loading dose: 7.5 U/kg, maintenance infusion: 13 U/kg per hour
- (C) no loading dose, maintenance infusion: 1100 U/h
- (D) loading dose: 10,000 U, maintenance infusion: 1000 U/h
- (E) loading dose: 1000 U, maintenance infusion: 1200 U/h

[Show Answer](#)

03-41 A 70-year-old man presents to the ED after a 1-min episode of loss of consciousness while eating dinner. Potential cardiac causes of this syncopal episode include all of the following EXCEPT

- (A) bradycardia
- (B) tachycardia
- (C) aortic stenosis
- (D) aortic regurgitation
- (E) ischemia

[Show Answer](#)

03-42 All of the following drugs may contribute to syncope EXCEPT

- (A) spironolactone
- (B) digitalis
- (C) metoprolol
- (D) nitrates
- (E) synthroid

[Show Answer](#)

03-43 Which artery is MOST likely to be diseased in a patient who suffers a syncopal episode secondary to cerebral ischemia?

- (A) Carotid
- (B) Vertebrobasilar
- (C) Anterior communicating artery
- (D) Anterior cerebral artery
- (E) Posterior communicating artery

[Show Answer](#)

03-44 A 44-year-old man complains of recurrent syncope associated with upper extremity exercise. What is the MOST likely cause?

- (A) Trigeminal neuralgia
- (B) Hypoglycemia
- (C) Carotid sinus hypersensitivity
- (D) Subclavian steal syndrome
- (E) Vasovagal syncope

[Show Answer](#)

03-45 What diagnosis should be suspected in an elderly patient who experiences a syncopal episode after head turning or shaving?

- (A) vasovagal syncope
- (B) carotid sinus hypersensitivity
- (C) orthostatic syncope
- (D) cardiomyopathy
- (E) seizure disorder

[Show Answer](#)

03-46 Which of the following conditions is NOT associated with a risk of aortic dissection?

- (A) Aortic regurgitation
- (B) Aortic stenosis

- (C) Bicuspid aortic valve
- (D) Marfan's syndrome
- (E) Coarctation of the aorta

[Show Answer](#)

03-47 All of the following findings support the diagnosis of pericarditis EXCEPT

- (A) pain relieved by sitting up and leaning forward
- (B) presence of a pericardial friction rub
- (C) ECG with diffuse ST segment depression
- (D) ECG with PR segment depression
- (E) pericardial effusion

[Show Answer](#)

03-48 Which of the following statements regarding chest pain is FALSE?

- (A) Burning or gnawing pain may be present with AMI
- (B) An acid or foul taste in the mouth suggests dyspepsia is more likely than angina
- (C) Tenderness to palpation in the epigastric region may be elicited with AMI
- (D) Relief of pain with antacids strongly suggests a gastrointestinal etiology
- (E) Epigastric or lower chest discomfort may be described with both cardiac and noncardiac causes

[Show Answer](#)

03-49 Risk factors for coronary artery disease include all of the following EXCEPT

- (A) male sex
- (B) hypercholesterolemia
- (C) estrogen replacement medications
- (D) diabetes
- (E) cigarette smoking

[Show Answer](#)

03-50 Physical examination and laboratory findings that may be present in AMI include all of the following EXCEPT

- (A) chest wall tenderness
- (B) sinus tachycardia or bradycardia
- (C) hypertension or hypotension
- (D) crackles on pulmonary examination
- (E) non-anion-gap metabolic acidosis

[Show Answer](#)

03-51 A patient has a blood pressure of 210/140 accompanied by severe headache, nausea, and vomiting. Which category of hypertension BEST describes this presentation?

- (A) Hypertensive emergency
- (B) Hypertensive urgency
- (C) Uncomplicated hypertension
- (D) Transient hypertension
- (E) Chronic hypertension

[Show Answer](#)

03-52 How quickly and to what level should the blood pressure be lowered in a patient with a hypertensive emergency?

- (A) 120/80 as quickly as possible
- (B) 180/90 within 12 h
- (C) 120/80 within 30 to 60 min
- (D) A level that is "normal" for that patient within 30 to 60 min
- (E) A level that is "normal" for that patient within 4 h

[Show Answer](#)

03-53 A patient, 8 months' pregnant, with no medical history presents with a BP of 160/100 and seizures. Which of the following is the BEST drug for lowering BP in this setting?

- (A) Sodium nitroprusside
- (B) Hydralazine
- (C) Intravenous nitroglycerin
- (D) Nifedipine
- (E) Furosemide

[Show Answer](#)

03-54 Sodium nitroprusside has all of the following actions EXCEPT

- (A) arteriolar dilator
- (B) venodilator
- (C) decreasing preload and afterload
- (D) near immediate onset of action
- (E) duration of action of 1 to 2 h

[Show Answer](#)

03-55 Labetalol is an excellent drug for lowering blood pressure in all of the following conditions EXCEPT

- (A) pheochromocytoma
- (B) MAO inhibitor-induced hypertensive emergencies

- (C) clonidine withdrawal
- (D) dissecting aortic aneurysm
- (E) in patients with congestive heart failure and hypertension after AMI

[Show Answer](#)

03-56 Each of the following is a risk factor for venous thrombosis EXCEPT

- (A) hormone replacement therapy
- (B) CHF
- (C) central line placement
- (D) blood type O
- (E) extensive burns

[Show Answer](#)

03-57 A 50-year-old man presents with a painful, swollen leg that occurred over 2 days. He smokes two packs of cigarettes per day, and he is moderately overweight. He recalls striking his calf against a coffee table 3 days before and suffered an abrasion. His temperature is 100.5°F, and the leg is visibly swollen to the groin with moderate erythema. Pulses are normal. Which of the following statements is correct?

- (A) Absence of palpable cords and a negative Homans' sign make DVT unlikely
- (B) The fever and erythema make a diagnosis of DVT very unlikely
- (C) The patient may be started on heparin anticoagulation immediately
- (D) Because there is no evidence of pulmonary embolism, the patient may be started on coumadin alone
- (E) A venogram must be performed within 24 h

[Show Answer](#)

03-58 An elderly man with a history of smoking complains of sudden, severe pain in the left leg beginning 2 h previously. The leg is cool, pale, and mottled from the mid-thigh distally, and sensation is decreased. All of the following are true EXCEPT

- (A) the patient likely had an embolus that originated in the heart
the patient should immediately receive thrombolytic therapy with streptokinase or recombinant tPA because there is only a 4-h window during which reperfusion must be achieved to preserve limb function
- (B) a vascular surgeon should be consulted immediately
- (C) the patient has an overall mortality rate of about 15 percent
- (D) intravenous heparin is indicated

[Show Answer](#)

03-59 In a heart transplant recipient, each of the following statements is true EXCEPT

- (A) Sinus tachycardia at rest can be normal
- (B) The effect of atropine is exaggerated in the denervated heart

- (C) The response to β -adrenergic drugs is normal or increased
- (D) The ECG is often read as atrial fibrillation or flutter
- (E) The patient will be immunosuppressed for life

[Show Answer](#)

03-60 A 55-year-old man is 2 years post-heart transplantation for dilated cardiomyopathy. He presents with 1 day of fatigue, nausea, vomiting, and diarrhea. He is currently taking cyclosporine, prednisone, and azathioprine. All of the following statements are true EXCEPT

- (A) The patient may have a cytomegalovirus infection
- (B) The patient must be evaluated for possible acute rejection
- (C) The patient should immediately receive 1 g intravenous methylprednisolone
- (D) This illness may cause an episode of rejection
- (E) The patient must receive antibiotics before endoscopic procedures

[Show Answer](#)

03-61 Regarding abdominal aortic aneurysms, all of the following statements are true EXCEPT

- (A) Aneurysms larger than 5 cm should be treated surgically
- (B) Fusiform aneurysms smaller than 4 cm can be managed conservatively
- (C) Tenderness of an aneurysm may be an indication for surgery
- (D) Most patients complain of back pain
- (E) The most common presentation of an aneurysm is as an incidental finding

[Show Answer](#)

03-62 A 67-year-old man is brought to the ED by ambulance after a syncopal episode. He was well before the event, except for mild chronic hypertension. He fell on pavement, striking his head, so paramedics placed him in a cervical collar and strapped him to a spine board. He complains of low back pain, which he attributes to the spine board. BP is 100/50, and heart rate (HR) is 80 beats per minute. Which of the following is the best course of action?

- (A) Analgesia, ECG, and outpatient referral to cardiologist
- (B) ECG, cardiac enzymes, admit for telemetry monitoring
- (C) Lateral abdominal x-ray, with aortogram if inconclusive
- (D) Intravenous fluids, morphine, computed tomography (CT) of the abdomen
- (E) Immediate surgical consultation, multiple large-bore intravenous lines, type and cross-match blood

[Show Answer](#)

03-63 A 60-year-old man presents with 1 h of chest and upper back pain "like I'm being ripped apart!" BP is 170/110 in the right arm and 110/50 in the left arm. ECG shows sinus rhythm with left ventricular hypertrophy. Chest x-ray is unremarkable. Which of the following is the most appropriate intervention?

- (A) Nitroglycerin sublingual * 3, cardiac enzymes, admit

- (B) Intravenous r-tPA or streptokinase, admit to cardiac care unit
- (C) Intravenous heparin 80 U/kg bolus and 18 U/kg per hour as continuous infusion, ventilation/perfusion lung scan, admit
- (D) Intravenous nitroprusside to keep systolic BP < 110, intravenous propranolol to keep HR < 60, contrast-enhanced CT of the thorax
- (E) Intravenous morphine sulfate, emergency gastrointestinal consultation for endoscopy

[Show Answer](#)

03-64 All of the following are acceptable strategies for diagnosis of DVT EXCEPT

- (A) duplex ultrasonography
- (B) IPG
- (C) contrast venography
- (D) elevated D-dimer fragments
- (E) MRI

[Show Answer](#)

03-65 Each of the following may be a manifestation of rejection in a cardiac transplant patient EXCEPT

- (A) dysrhythmias
- (B) myocardial infarction
- (C) ascites
- (D) renal insufficiency
- (E) hypotension

[Show Answer](#)

03-66 All of the following statements are true of geriatric trauma patients EXCEPT

- (A) Symptoms of intracranial hemorrhage may be delayed compared with symptoms in younger patients
- (B) A normal heart rate is a good prognostic sign
- (C) Cervical spine fractures are less common with increasing age
- (D) Elderly patients have decreased pulmonary reserve
- (E) Orthopedic injuries alone may cause significant hypovolemia

[Show Answer](#)

03-67 All of the following statements are TRUE with regard to mitral valve stenosis (MVS) EXCEPT

- (A) Rheumatic heart disease is the most common cause
- (B) Symptoms may be precipitated by atrial fibrillation, pregnancy, and anemia
- (C) Syncope is the most common presenting symptom
- (D) Hemoptysis is the second most common presenting symptom
- (E) If the defect is not corrected, atrial fibrillation almost always develops

[Show Answer](#)

03-68 All of the following statements are TRUE regarding mitral valve prolapse (MVP) EXCEPT

- (A) There is an increased incidence of sudden death and dysrhythmias
- (B) In patients younger than 45 years, there is an increased incidence of TIAs
- (C) Approximately 1 percent of the population has MVP
- (D) A mid-systolic snap is a classic auscultatory finding
- (E) Most patients are asymptomatic

[Show Answer](#)

03-69 Which of the following statements is FALSE with respect to aortic stenosis (AS)?

- (A) Congenital heart disease is the most common cause
- (B) Left ventricular hypertrophy (LVH) is the most common ECG finding
- (C) Sudden death occurs in 25 percent of patients
- (D) Endocarditis occurs in 15 percent of patients
- (E) Exertional angina is a common presenting symptom

[Show Answer](#)

03-70 For which of the following procedures should patients with valvular heart disease receive prophylactic antibiotics?

- (A) Incision and drainage of an abscess
- (B) Anoscopy
- (C) Endotracheal intubation
- (D) A and B only
- (E) All of the above

[Show Answer](#)

03-71 Which valvular disease is MOST commonly associated with sudden death in younger patients?

- (A) Aortic stenosis
- (B) Mitral stenosis
- (C) IHSS
- (D) Tetralogy of Fallot
- (E) Mitral valve prolapse

[Show Answer](#)

03-72 Afterload reduction is an important therapeutic modality in all of the following patients with symptomatic valvular disease EXCEPT

- (A) a patient with BP of 125/70, with acute mitral incontinence secondary to an inferior MI

- (B) a patient with aortic insufficiency (AI) with BP of 135/55 with pulmonary edema
- (C) a patient with AS with a BP of 135/70 and angina
- (D) a patient with mitral stenosis (MS) with a BP of 135/65 and pink frothy sputum
- (E) a patient with chronic mitral and aortic insufficiency, a BP of 130/80 and CHF

[Show Answer](#)

03-73 A 25-year-old runner is brought to the ED by ambulance after experiencing witnessed syncope on the track. Paramedics arrived within 3 min and found the patient in ventricular fibrillation. A 200-J shock converted the rhythm to sinus tachycardia, and the patient has remained stable. He complains of some chest discomfort and tells you he has a familial heart problem and was told he should not run. BP is 100/80, respiratory rate (RR) is 20 breaths per minute, and pulse oximetry is 93 percent. The ECG shows sinus tachycardia at 115 beats per minute with septal Q and upright T waves. In addition to oxygen administration, which of the following is the MOST important therapeutic intervention?

- (A) Aspirin and nitroglycerin
- (B) Intravenous fluids and 5 mg intravenous labetalol
- (C) Nitroglycerin and a lidocaine drip
- (D) CPAP, nitroglycerin, and furosemide
- (E) Aspirin, nitroglycerin, and dopamine

[Show Answer](#)

03-74 All of the following statements are TRUE regarding emergent pericardiocentesis EXCEPT

- (A) Complications include pneumothorax, dysrhythmias, laceration of coronary arteries, and liver lacerations
- (B) Associated mortality with a blind approach is 6 percent
- (C) The technique of choice is the left paraxiphoid approach aiming toward the right shoulder
- (D) An ECG unipolar electrode attached to V₁ is the guidance technique of choice
- (E) There is a 7 to 15 percent complication rate with a blind approach

[Show Answer](#)

03-75 A 62-year-old man is brought to the ED by ambulance with confusion and dyspnea. BP is 80/60. With inspiration, SBP decreases to 55. The monitor shows a HR of 121 beats per minute, with vacillating amplitude of the QRS complex. RR is 26 breaths per minute, and oximetry saturation is 91 percent. Physical examination shows jugular venous distention (JVD), distant heart sounds, cool extremities, and diaphoresis. Chest x-ray is grossly normal. Which of the following would be the MOST effective therapeutic intervention?

- (A) Large-volume resuscitation with crystalloid, oxygen, and emergent diagnostic spiral CT
- (B) Large-volume resuscitation with crystalloid, oxygen, and dopamine
- (C) Immediate intubation, large-volume resuscitation, and dopamine
- (D) Large-volume resuscitation, oxygen, and immediate involvement of cardiology consult for placement of an intraaortic balloon pump
- (E) Large-volume resuscitation, oxygen, and pericardiocentesis

[Show Answer](#)

03-76 Which of the following statements is FALSE with regard to cardiomyopathy (CM)?

- (A) Hypertrophic CM is a familial disease associated with decreased compliance, outflow obstruction, and septal Q waves
- (B) The work-up of a newly diagnosed dilated CM patient should include a check of thyroid-stimulating hormone (TSH), phosphate, and iron, HIV status, and an endocardial biopsy
- (C) Patients with restrictive CM secondary to amyloidosis should be started on a triple regimen of diuretics, afterload reduction agents, and digoxin
- (D) Fever and myalgias are not part of the presenting symptoms of CM
- (E) Most CM patients are best treated with diuretics, afterload reduction agents, and digoxin

[Show Answer](#)

03-77 Which of the following statements is FALSE with regard to myocarditis?

- (A) Most patients with myocarditis return to their baseline cardiac function within several months of initial presentation
- (B) Up to 60 percent of patients with chronic cardiomyopathy have histologic evidence of myocarditis
- (C) On polymerase chain reaction analysis of endocardial biopsy, adenovirus is found to be the most frequent etiologic agent of acute myocarditis
- (D) Forty percent of patients with acute cardiomyopathy have histologic evidence of myocarditis
- (E) Cocksackie, influenza B, and Epstein-Barr (EBV) viruses have all been implicated in acute myocarditis

[Show Answer](#)

03-78 A previously healthy 25-year-old woman with no medical history presents to the ED complaining of 4 h of substernal chest pain, shortness of breath, dyspnea on exertion, and "not feeling well" during the past few days. She denies illicit drug use or alcoholism. Vital signs are remarkable for a BP of 92/60, HR of 135, RR of 30, and temperature of 101.5°F. ECG shows normal sinus rhythm with nonspecific T-wave changes. Chest x-ray is normal. In addition to oxygen, which one of the following represents the BEST initial treatment regimen?

- (A) Aspirin, nitroglycerin, check troponin and myoglobin levels
- (B) Aspirin, β blocker, check TSH
- (C) Intravenous fluids, analgesia, emergent echocardiogram
- (D) Aspirin, nitroglycerin, emergent ventilation perfusion (V./Q.) scan
- (E) Intravenous fluids, lorazepam, antacids

[Show Answer](#)

03-79 All of the following statements are TRUE with regard to acute pericarditis EXCEPT

- (A) Acute pericarditis is associated with transient dysrhythmias that are usually clinically insignificant
- (B) Aspirin, 650 mg every 4 h for 7 days, should be initiated if the diagnosis is suspected, so long as no contraindications are present
- (C) Electrical alternans or low-voltage ECG suggests the presence of pericardial effusion

- (D) Concomitant pericardial effusion is common
- (E) Sixty percent of patients have complete recovery within a week

[Show Answer](#)

03-80 All of the following statements are TRUE about uremic pericarditis EXCEPT

- (A) Uremic pericarditis is one of most common causes of cardiac tamponade
- (B) Pericarditis is detected clinically in 20 percent of uremic patients
- (C) ECG changes of pericarditis are more common in uremic patients
- (D) Hemodialysis daily for 2 to 6 weeks is the treatment of choice for uremic pericarditis
- (E) Hemodialysis-associated pericarditis requires a diligent work-up for infectious causes

[Show Answer](#)

03-81 A 32-year-old man presents with 1 week of flulike symptoms and 2 days of sharp intermittent substernal chest and left shoulder pain that wakes him at night. The pain is partly relieved by sitting up. BP is 130/65, HR is 100, RR is 16, and temperature is 100.6°F. On physical examination, you hear a triphasic whispering heart sound over the precordium. All of the following are TRUE with regard to ECG findings associated with this condition EXCEPT

- (A) Diffuse concave ST elevation and PR depression may be present
- (B) ST-segment elevation of less than one-fourth of the T-wave amplitude is more consistent with this patient's condition than with early repolarization
- (C) ST-segment elevation is most prominent in the limb leads and lateral precordial leads
- (D) ST-segment elevation in this condition can be distinguished from that seen in AMI because there are no associated T-wave inversions
- (E) The PR depression seen with this condition does not occur with early repolarization

[Show Answer](#)

03-82 Which represents the BEST matches of valvular diseases from the left column with ECG findings in the right column?

- | | |
|--------------------------|------------------------------------|
| 1. MS | 6. acute inferior ischemia |
| 2. AS | 7. LVH and bundle branch block |
| 3. mitral valve prolapse | 8. biphasic P waves and right axis |
| 4. mitral insufficiency | 9. normal sinus rhythm |
| 5. IHSS | 10. pseudoinfarction pattern |

- (A) 1 + 8; 3 + 10
- (B) 5 + 7; 2 + 10
- (C) 4 + 6; 2 + 7
- (D) 3 + 9; 1 + 6
- (E) 2 + 9; 5 + 8

[Show Answer](#)

03-83 All of the following statements are TRUE regarding the treatment of valvular emergencies EXCEPT

- (A) An intraaortic counterpulsation balloon is contraindicated in AI
- (B) Thrombolytic agents may be helpful in acute mitral insufficiency
- (C) Emergent surgery is usually indicated in acute aortic and mitral insufficiency
- (D) Patients with AS and syncope require urgent surgical intervention
- (E) Patients with decompensated MS and atrial fibrillation should be considered for cardioversion

[Show Answer](#)

03-84 A 28-year-old intravenous drug user presents with dyspnea, agitation, diaphoresis, cool extremities, and cough productive of pink frothy sputum. He has had fevers and chills for 2 days but suddenly became short of breath 1 h before. Vital signs are BP of 105/40, HR of 126, RR of 38 with oximetry saturation of 88 percent, and temperature of 103.5°F. He has quick, upswEEPing pulses and a diastolic murmur. In addition to emergent intubation and intravenous furosemide administration, what is the MOST important immediate action?

- (A) Administer naloxone and nitrates
- (B) Call for a cardiac surgeon
- (C) Perform emergent echocardiography
- (D) Draw blood cultures and give intravenous antibiotics
- (E) Administer naloxone and intravenous antibiotics and place an intraaortic counterpulsation balloon

[Show Answer](#)

03-85 All of the following statements are TRUE about infectious endocarditis EXCEPT

- (A) Cardiac valve leaflets are susceptible to infection because of their limited blood supply
- (B) Fatality rates for right-sided disease are greater than those for left-sided disease
- (C) *Streptococcus viridans* is the most common organism implicated in left-sided disease
- (D) More than three-fourths of cases of right-sided endocarditis are caused by *Staphylococcus aureus*
- (E) Murmurs are detected in fewer than 50 percent of patients with right-sided disease

[Show Answer](#)

03-86 All of the following statements are TRUE concerning subacute infectious endocarditis EXCEPT

- (A) The diagnosis is frequently missed
- (B) Ten percent of patients have evidence of peripheral vasculitic embolic lesions
- (C) Splenomegaly is present in 25 percent of patients
- (D) Subacute presentations are unusual in right-sided disease
- (E) Neurologic signs from septic emboli are seen in up to 40 percent of patients

[Show Answer](#)

03-87 All of the following statements are TRUE about CHF EXCEPT

- (A) Patients with CHF have a 50 percent mortality risk within 5 years

- (B) Ventricular ejection fraction is the best predictor of mortality
- (C) Sudden death occurs in 40 percent of CHF patients
- (D) ACE inhibitors have decreased the incidence of sudden death
- (E) β Blockers have been shown to be a useful treatment adjunct

Show Answer

03-88 A 59-year-old man presents to the ED by ambulance with a 1-h history of severe substernal chest pain and diaphoresis 12 h before presentation. Several hours after initial resolution of the pain, he developed increasing shortness of breath and chest heaviness. The patient is pale, cyanotic, and dyspneic, puffing out one to two words at a time. Vital signs are BP 102/60, HR 121 (sinus tachycardia), and RR 36 with pulse oximetry showing 87 percent saturation. ECG shows deep Q waves in leads V_1 through V_4 and no ST-segment changes. The chest x-ray shows normal heart size, Kerly B lines, and bilateral perihilar infiltrates. All of the following statements are CORRECT with regard to this patient EXCEPT

- (A) He should be placed on positive pressure ventilation by face mask and given intravenous furosemide and nitroglycerin
- (B) On insertion of a pulmonary artery catheter, wedge pressure would be at least 20 mm Hg
- (C) The principal role of morphine is to calm the patient
- (D) Dopamine should be started to keep the SBP between 90 and 100 mm Hg
- (E) The patient should receive aspirin and metoprolol

Show Answer

03-89 All of the following statements are TRUE with regard to the treatment of pulmonary edema EXCEPT

- (A) Higher doses of nitroglycerin are needed to alleviate the symptoms of APE than to relieve stable angina
- (B) An appropriate estimate of intravenous furosemide dose is 1 mg/kg
- (C) Dopamine produces a more favorable balance between myocardial oxygen supply and demand than does dobutamine
- (D) Nitroprusside may induce ischemia in patients with coronary artery disease
- (E) Digoxin has no role in the acute management of CHF

Show Answer

03-90 You respond to a "code blue" on the labor-and-delivery ward. The nurse tells you that the patient is a previously healthy 41-year-old African-American woman, 4 days status post normal spontaneous vaginal delivery. She complained of chest pain and dyspnea and then fell to the floor unconscious. No seizure activity was noted. Although initially pulseless, vital signs returned with assisted ventilations. You find the patient confused, grunting, and cyanotic. Vital signs are BP 68/50 mm Hg, HR 121 beats per minute (sinus tachycardia), and RR 28, with pulse oximetry of 78 percent on high-flow oxygen. Physical examination shows distended neck veins, normal heart sounds with a prominent S_2 , a thready pulse with cool, cyanotic extremities, and adequate tidal volume with no rales or wheezes. Chest x-ray is normal. Bedside ultrasound of the heart shows a dilated right ventricle with paradoxical septal wall motion. In addition to immediate intubation and fluid resuscitation, what is the MOST appropriate therapeutic intervention?

- (A) Emergent diagnostic spiral CT
- (B) Heparin bolus of 80 U/kg intravenously followed by 18 U/kg infusion
- (C) LMWH 1 U/kg every 12 h
- (D) r-tPA at a dose of 100 mg over 2 h
- (E) Emergent transfer to the angiography suite for pulmonary arteriography and local infusion of urokinase

[Show Answer](#)

03-91 All of the following statements are TRUE about diagnostic tests for PE EXCEPT

- (A) The V./Q. scan is 98 percent sensitive and 35 percent specific for PE
- (B) Duplex ultrasound is 95 percent sensitive and 95 percent specific for DVT
- (C) The difficulty in using V./Q. scan findings for the diagnosis of PE is the lack of a standardized definition for "clinical suspicion"
- (D) A D-dimer of less than 500 U/mL has a negative predictive value of 90 percent
- (E) Spiral CT is up to 90 percent sensitive and 96 percent specific for PE

[Show Answer](#)

03-92 A 29-year-old man presents to the ED complaining of the acute onset of shortness of breath and chest discomfort. He was discharged from the ICU 2 weeks before, after surgical correction of a perforated viscus secondary to blunt trauma. Vital signs are BP of 120/60 mm Hg, HR of 100 beats per minute, and RR of 17, with a room air pulse oximetry of 97 percent. Chest x-ray is normal, as are initial electrolytes and hematocrit. A Doppler duplex scan of the lower extremities is normal. All of the following statements are TRUE with regard to this presentation EXCEPT

- (A) PE is more common in men than in women before age 50 years
- (B) If the patient has a low-probability V./Q. scan, no further work-up is warranted
- (C) A normal chest x-ray in the setting of acute dyspnea and hypoxemia is suggestive of PE
- (D) Intravenous heparin administration should be strongly considered if the V./Q. scan is "intermediate probability"
- (E) Diffuse wheezing on examination would not reduce clinical suspicion for PE

[Show Answer](#)

03-93 All of the following statements are TRUE about PE EXCEPT

- (A) The risk for embolism from proximal DVT is highest in the first week
- (B) The majority of the patients with PE have at least one risk factor
- (C) Tachypnea is defined as a RR of greater than 16 breaths per minute
- (D) Syncope is the presenting complaint in up to 5 percent of cases
- (E) The right lower lobe is the most common part of the lung involved

[Show Answer](#)

03-94 All of the following statements are TRUE about PE EXCEPT

- (A) Seventy percent of the pulmonary vasculature must be occluded to produce hypoxia and hypotension
- (B) Massive PE presenting with hypotension and hypoxemia accounts for 5 percent of all cases
- (C) The most common ECG abnormality is nonspecific ST and T-wave changes
- (D) ECG changes are seen in about 40 percent of patients with PE
- (E) New right bundle branch block should raise the clinical suspicion for PE

Show Answer

03-95 Match the items in the left column with their MOST appropriate counterparts in the right column.

- | | |
|-------------------------------|--|
| 1. ankle brachial index = 0.6 | 6. vascular emergency |
| 2. ankle brachial index = 1.0 | 7. triphasic wave over tibialis pedis |
| 3. arteriovenous fistula | 8. Doppler flow sound in diastole |
| 4. ankle brachial index = 0.3 | 9. monophasic wave over dorsalis pedis |
| 5. monophasic wave every 3 s | 10. venous flow |

- (A) 1 + 9; 2 + 10
- (B) 2 + 7; 3 + 10
- (C) 4 + 6; 5 + 8
- (D) 1 + 9; 4 + 6
- (E) 2 + 9; 3 + 8

Show Answer

03-96 All of the following statements are TRUE about the use of nuclear medicine in cardiac disease EXCEPT

- (A) Thallium 201 is a potassium cation analog that is taken up by active well-perfused myocytes during exercise and redistributes to less well-perfused myocardium during rest
- (B) Technetium-99m sestamibi accumulates in well-perfused myocytes and does not redistribute at rest
- (C) Thallium 201 has a stronger signal and shows better contrast on positron emission tomography than does technetium-99m sestamibi
- (D) Nuclear stress tests for coronary ischemia are more sensitive than ECG stress tests
- (E) The role of nuclear cardiac stress tests in the ED is to evaluate for coronary ischemia

Show Answer

03-97 A 56-year-old man with a history of hypertension and tobacco use complains of intermittent substernal chest pain without radiation or associated shortness of breath, nausea, or diaphoresis. Chest pain occurs both with exertion and at rest and lasts 5 to 10 min at a time. He is currently pain free, but his ECG shows LVH and inverted T waves in leads V₄ to V₆. Two sets of cardiac enzymes are negative. Which of the following diagnostic tests would be MOST appropriate?

- (A) An ECG exercise stress test

- (B) A T99 exercise stress test
- (C) Echocardiography for evaluation of wall motion abnormalities
- (D) Coronary angiography
- (E) A 24-h Holter monitor

[Show Answer](#)

03-98 All of the following statements are TRUE regarding the role of echocardiography in the ED EXCEPT

- (A) Normal left ventricular wall motion during chest pain suggests noncardiac chest pain
- (B) Among patients with nonspecific ECG abnormalities and chest pain, echocardiography changes the admission diagnosis in up to 40 percent of cases
- (C) The presence of thin hyperechoic myocardium implies an area of infarct more than 2 weeks before presentation
- (D) Cardiac ultrasound is superior to clinical assessment of Killip classification and superior to ECG in predicting death and major complications
- (E) Localized or small wall motion abnormalities may be apparent on echocardiogram, even in the presence of nonspecific ECG changes

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(25) The answer is A

Stable angina is characterized by episodic chest pain that lasts minutes (usually 5 to 15), is provoked by exertion or stress, and is relieved by rest or sublingual nitroglycerin. Other symptoms may accompany angina. In addition, transient electrocardiogram (ECG) changes and heart auscultation changes may exist.

(Chapter 47)

(26) The answer is B

Unstable angina is defined as (1) exertional angina of recent onset; (2) angina of worsening character, including an increased nitroglycerin requirement; and (3) angina at rest. In unstable angina, ST-segment or T-wave changes may persist up to several hours after the pain episode but without ECG evidence of new transmural infarction (new Q waves). Troponin is elevated in as many as one-third of unstable angina episodes, indicating the presence of a microinfarct.

(Chapter 47)

(27) The answer is C

Although the ECG is the most important diagnostic test in patients with chest pain, only about half of all patients with acute myocardial infarction (AMI) have diagnostic changes on their initial ECG. A normal or nonspecific ECG does not exclude ischemia or negate the need for hospital admission. History and clinical assessment should guide treatment decisions. Additional ECGs increase diagnostic yield.

(Chapter 47)

(28) The answer is C

When one area of the myocardium dies, electrical conduction detected by the ECG is characteristically affected. ST-segment elevation in leads II, III, and aVF represents inferior infarction. Elevations in leads V₁-V₃ occur with anteroseptal infarctions. Elevations in leads I, aVL, and V₄-V₆ suggest lateral infarction, whereas elevations in leads V₁-V₆ suggest anterolateral infarction. ST depression in V₁ and V₂ represents true posterior infarction. A right-sided ECG should be performed when inferior ischemia or infarction is detected to assess for right ventricular involvement. If present, extension to the right heart portends a worse prognosis.

(Chapter 47)

(29) The answer is C

With a monoclonal antibody assay, troponin I can be measured down to levels as low as 1 ng/mL. Advantages to measuring troponin I include more specificity than CK-MB in the setting of skeletal muscle damage (e.g., postoperative patients), more sensitivity in detecting unstable angina patients, and the ability to detect myocardial damage up to 1 week after the event.

(Chapter 47)

(30) The answer is A

Soon after the onset of myocardial ischemia, muscle contraction is impaired. This may manifest on echocardiography as a wall-motion abnormality. Experimentally, hypokinesis, akinesis, or dyskinesis can be seen within a few heartbeats after coronary occlusion. In selected patients in the critical care unit, echocardiography has a sensitivity greater than 70 percent in AMI. In studies of ED patients, where prevalence of AMI is lower and prevalence of coronary artery disease is higher, echo has been shown to be sensitive but not specific. Echocardiography is most useful in patients with cardiogenic shock to diagnose anatomic complications that may be amenable to surgical correction (i.e., septal or mitral ruptures).

(Chapter 57)

(31) The answer is B

Papillary muscle rupture is usually associated with an inferior-posterior infarction and involves the posterior papillary muscle. Outcome depends on whether the entire muscle body or only the head is ruptured. Rupture of an entire muscle body is associated with a high mortality rate (up to 50 percent within 24 h). Diagnosis of papillary muscle dysfunction or rupture may be made on echocardiography or by measuring large V waves in the pulmonary artery wedge pressure with a Swan-Ganz catheter.

(Chapter 47)

(32) The answer is D

Dressler's syndrome is characterized by chest pain, fever, pleuropericarditis, and pleural effusion. An immunologic reaction that occurs 2 to 6 weeks after AMI is responsible for this syndrome. Aspirin or indomethacin is standard initial therapy. Refractory cases are treated with steroids, but it is difficult to wean patients from this class of drugs, and recurrences are common. In addition to Dressler's syndrome, an acute form of pericarditis, manifested by pain and a friction rub, can develop during the first 7 days after infarction.

(Chapter 47)

(33) The answer is A

Currently available calcium channel antagonists are not recommended for early management of AMI patients. Nifedipine increases mortality in unstable angina and AMI patients. Verapamil is not recommended in the peri-infarct period but can be beneficial in the postinfarct phase for patients without heart failure.

(Chapter 47)

(34) The answer is C

The GUSTO investigators studied 41,021 patients with AMI from 1081 centers in 15 countries. They reported that front-loaded tissue plasminogen activator (tPA) with intravenous heparin resulted in a reduced mortality rate at 30 days after treatment (6.3 percent) compared with streptokinase and subcutaneous heparin (7.2 percent) or streptokinase and intravenous heparin (7.4 percent). However, subgroup analysis showed that the relatively small benefits of tPA over streptokinase were fewer or nonexistent for patients with inferior myocardial infarction (MI), age older than 75 years, or in whom thrombolysis was not initiated until more than 4 h after symptom onset.

(Chapter 48)

(35) The answer is C

For patients who are not in cardiogenic shock, ECG criteria for thrombolytic therapy include one or more of the following: (1) ≥ 1 -mm ST segment elevation in two or more contiguous limb leads, (2) ≥ 2 -mm ST segment elevation in two or more contiguous precordial leads, and (3) new left bundle branch block. Patients in cardiogenic shock should undergo emergent angiography and mechanical reperfusion, if available. If angioplasty cannot be performed within 60 min, "front-loaded" tPA is indicated.

(Chapter 48)

(36) The answer is D

Absolute contraindications to thrombolytic therapy include active internal bleeding; altered consciousness; stroke in the past 6 months or any history of hemorrhagic stroke; intracranial surgery within the past 2 months; known arteriovenous malformation (AVM), aneurysm, or intracranial neoplasm; known bleeding disorder; persistent hypertension greater than 200/120; recent head trauma; suspected aortic dissection; suspected pericarditis; and trauma or surgery within the past 2 weeks that could result in bleeding into a closed space.

(Chapter 48)

(37) The answer is C

During the early stages of acute coronary occlusion, platelets form the bulk of the clot. Aspirin is a cyclooxygenase inhibitor that binds irreversibly and thereby inhibits platelet aggregation. The ISIS-2 study randomized 18,000 patients to receive a placebo, low-dose aspirin (160 mg), streptokinase, or a combination of both aspirin and streptokinase. Administration of aspirin alone led to a significant reduction in cardiovascular deaths (20 percent). This mortality benefit increased to 40 percent when aspirin was combined with streptokinase.

(Chapter 48)

(38) The answer is E

Nitrates are vasodilators that reduce cardiac preload and, to a lesser extent, afterload. The result is a lower cardiac volume, reduced wall stress, and decreased myocardial oxygen consumption. Nitrates dilate the major capacitance vessels of the coronary system and improve collateral blood flow in the myocardium. In addition, they inhibit vasospasm. The largest trial evaluating oral nitrates to date (ISIS-4) showed no improved outcome with nitrates versus placebo in the setting of AMI. Although there is no proven outcomes benefit, nitrates are useful in providing pain relief, an important component of treating AMI.

(Chapter 48)

(39) The answer is B

β -Blocker administration reduces both the short- and long-term mortality in patients with AMI. More than 28 randomized studies involving more than 27,000 patients have demonstrated a 14 percent reduction in mortality when acute β blockade was used during AMI. Contraindications to β blockade include type I and II second-degree atrioventricular (AV) block, severe chronic obstructive pulmonary disease, heart rate slower than 60 beats per minute, and hypotension. Because of the impressive mortality reduction, β blockers are now being used in patients with mild heart failure. First-degree AV block is a relative contraindication.

(Chapter 48)

(40) The answer is A

The protective benefits of heparin are dependent on appropriate dosing. In one study, more than 25 percent of patients' partial thromboplastin times (PTTs) were not within the therapeutic range during the first 24 h of therapy. Adherence to weight-based dosing significantly reduced this number to 8.8 percent. Many practitioners

are now switching to a LMWH such as enoxaparin (dose, 1 mg/kg) given its ease of administration and the lack of need to follow PTTs.

(Chapter 48)

(41) The answer is D

Cardiac causes of syncope fall into three groups: rhythm disturbances, ventricular outflow obstructive processes, and myocardial ischemia. To be considered the cause of syncope, the heart rate should be more than 150 or fewer than 40 beats per minute. Any process causing acute or chronic obstruction to ventricular inflow or outflow may cause syncope. For the left ventricle, obstructions include aortic stenosis, atrial myxoma, or mitral stenosis. Syncope associated with cardiac ischemia is usually secondary to dysrhythmia.

(Chapter 46)

(42) The answer is E

Drugs may cause or contribute to syncope by several mechanisms. They may precipitate dysrhythmias, aggravate orthostatic hypotension (antihypertensives), or cause volume depletion (diuretics). The drugs most commonly associated with syncope are nitrates, diuretics, and antidysrhythmics. Synthroid is not associated with syncope.

(Chapter 46)

(43) The answer is B

Syncope is caused by disease affecting either (1) the bilateral cerebral hemispheres or (2) the reticular activating system (RAS). A vertebrobasilar transient ischemic attack (TIA) may result in a "drop attack" by causing ischemia to the RAS. An anterior circulation TIA would be unlikely to result in syncope because it would have to involve both cerebral hemispheres.

(Chapter 46)

(44) The answer is D

An association between upper extremity exercise and syncope suggests the presence of subclavian steal syndrome. If blood pressure is measured on each arm, a difference of at least 20 mm Hg is often noted. Obstruction of the brachiocephalic or subclavian artery causes shunting of blood through the vertebrobasilar

system from the normal side past the obstruction, resulting in brain stem ischemia.
(Chapter 46)

(45) The answer is B

Although rare, carotid sinus hypersensitivity should be suspected in an elderly patient whose immediate presyncopal state is suggestive of carotid sinus stimulation, e.g., wearing a tight collar, shaving, or head turning. If carotid sinus hypersensitivity is suspected, confirmatory carotid sinus massage may be performed at the bedside. A positive response is asystole of 3 s or greater or a drop in systolic blood pressure of at least 50 mm Hg.

(Chapter 46)

(46) The answer is A

Aortic dissection is an uncommon cause of chest pain. Although it may present in all age groups, the majority of cases are seen in hypertensive men in the fifth to seventh decades. Patients with Marfan's syndrome, coarctation of the aorta, bicuspid aortic valves, and aortic stenosis are all predisposed to aortic dissection.

(Chapter 45)

(47) The answer is C

The pain of pericarditis is generally pleuritic, retrosternal in location, and may radiate to the back, neck, or jaw. Classically, pain is relieved when the patient sits up and leans forward. Pericardial effusion is often present and can be detected by echocardiogram. The presence of a pericardial friction rub supports the diagnosis. The ECG may show diffuse ST-segment elevation or T-wave inversions. PR segment depression is a highly specific finding.

(Chapter 51)

(48) The answer is D

Although various gastrointestinal syndromes may present with epigastric burning or gnawing pain, this description of pain may also represent angina. Pain associated with an acid or foul taste in the mouth and eructation is more suggestive of dyspepsia. Tenderness to palpation in the epigastric or upper quadrants suggests a gastrointestinal etiology, but AMI patients may also complain of tenderness on chest palpation.

Chest discomfort relieved by antacids may be both cardiac and noncardiac in origin. Nitroglycerin is a smooth muscle dilator that may afford relief in cases of lower esophageal spasm or biliary colic. Diagnostic decisions should not be influenced by response to a therapeutic trial.

(Chapter 45)

(49) The answer is C

Risk factors include being a male or a postmenopausal female, hypertension, tobacco use, hypercholesterolemia, diabetes, obesity, and family history. Cocaine use has also been associated with AMI, even in young people with minimal or no coronary artery disease. Estrogen replacement therapy may be protective against heart disease.

(Chapter 45)

(50) The answer is E

Although patients with myocardial ischemia can present with almost any vital sign abnormality, a normal physical examination does not preclude the diagnosis of AMI. Sinus tachycardia may be reflective of increased sympathetic stimulation resulting from ischemia or of decreased left ventricular stroke volume. Patients with acute ischemia have a slightly higher incidence of abnormal heart sounds, and crackles on pulmonary examination are twice as common in patients with AMI as in those with nonischemic chest pain. In one study, chest wall tenderness was present in 36 percent of chest pain patients without myocardial infarction and in 15 percent of those with acute infarction. Non-anion-gap metabolic acidosis should not be attributed to AMI.

(Chapter 47)

(51) The answer is A

Category of hypertension is based on clinical presentation and the level of aggression required for treatment, not on the absolute number of the blood pressure. A hypertensive emergency is defined as elevated blood pressure with evidence of end-organ damage or dysfunction. A hypertensive urgency is an elevation of blood pressure to a level that may be potentially harmful, usually sustained at greater than 115 mm Hg diastolic without signs, symptoms, or other evidence of end-organ dysfunction. Mild, uncomplicated hypertension is defined as a blood pressure less than 115 mm Hg diastolic without symptoms of end-organ damage. Transient hypertension can be seen in many conditions such as pain states, anxiety, pancreatitis, thrombotic stroke, early dehydration, alcohol-withdrawal syndromes, epistaxis, and some overdoses. Treatment of the underlying condition rather than administration of antihypertensive medications is the rule.

(Chapter 53)

(52) The answer is D

The goal of treatment during a hypertensive emergency is to lower the blood pressure within 30 to 60 min to a level that is "normal" for the patient. A 30 percent reduction within the first 30 min is a useful guideline. Resolution of signs and symptoms is a helpful endpoint, but in elderly patients improvements may lag behind the pressure drop. Absolute numbers for blood pressure are less important than the patient's baseline. For example, a young woman with a normal blood pressure (BP) of 90/60 may be suffering from a hypertensive emergency with a BP of only 120/80 if she has ingested phenylpropanolamine and complains of severe headache suggestive of intracranial bleed.

(Chapter 53)

(53) The answer is B

During pregnancy-induced hypertension (PIH), uterine blood flow decreases, placing the fetus at risk. Blood pressure reduction is best accomplished with magnesium sulfate and hydralazine. Hydralazine should be administered in 10- to 20-mg intravenous boluses every 30 min until the desired effect is achieved. Sodium nitroprusside can be used, but the infusion should be brief and thiocyanate levels must be monitored. Labetalol is another second-line agent in this setting. Diuretics are contraindicated because the patient with PIH is already volume-contracted. Angiotensin-converting enzyme (ACE) inhibitors should not be used because they cross the placenta and may depress angiotensin II levels in the fetus. The definitive treatment of PIH is delivery of the baby.

(Chapter 101)

(54) The answer is E

Sodium nitroprusside, a rapidly acting arteriolar and venous dilator, is useful for treating hypertensive emergencies. It causes both arterial and venous smooth muscles to dilate, decreasing preload and afterload and resulting in decreased myocardial oxygen demand. Nitroprusside has a rapid onset and short duration of action (plasma half-life of 3 to 4 min). It is initially metabolized to cyanide by sulfhydryl groups in the blood and then converted to thiocyanate in the liver by rhodanase.

(Chapter 53)

(55) The answer is E

In the setting of a hypertensive emergency, intravenous labetalol provides a steady, consistent drop in BP. Labetalol does not change cerebral blood flow and, therefore, is safe for use in patients with cerebral vascular

disease. It is an ideal choice for conditions characterized by excessive catecholamine stimulation such as pheochromocytoma, monoamine oxidase (MAO) inhibitor-induced emergencies, and abrupt clonidine withdrawal. After an intravenous bolus, blood pressure falls in 5 min, with a maximum response in 10 min. BP control is maintained for up to 6 h after a single injection. Labetalol is the agent of choice in thoracic aortic dissection. Because labetalol is a nonselective β blocker, it can exacerbate heart failure and induce bronchospasm.

(Chapter 53)

(56) The answer is D

There are many risk factors for deep venous thrombosis. Blood group A is associated with an increased risk; type O is not. Common risks include trauma, hormonal and hypercoagulable states, injected drugs, being older than 40 years, obesity, pregnancy, surgery, smoking, immobilization, and a variety of medical illnesses including congestive heart failure (CHF), CVA, stroke, and nephrotic syndrome.

(Chapter 55)

(57) The answer is C

A patient with four or more risk factors has a high probability for deep venous thrombosis (DVT). It is reasonable to start anticoagulation with heparin or LMWH pending confirmation with diagnostic studies. Coumadin should never be started alone because it can cause a transient hypercoagulable state that promotes thrombus propagation and embolization. Homans' sign has no clinical predictive value. A mild fever is consistent with DVT, as is redness. Although venography was once the gold standard test, duplex ultrasonography is currently favored.

(Chapter 55)

(58) The answer is B

Systemic thrombolytics produce inferior results compared with either catheter embolectomy or intraarterial thrombolysis. If there are no contraindications, heparin should be administered immediately pending additional treatment. The heart is by far the most common source of peripheral arterial emboli, and mortality is usually related to underlying heart disease.

(Chapter 55)

(59) The answer is B

Atropine has no effect on the denervated heart because it acts by blocking actions of the vagus nerve. The response to catecholamines may be increased by upregulation of receptors in the denervated heart. The resting heart rate is usually between 90 and 100 beats per minute. The ECG often displays multiple P waves, from both the new heart and a residual portion of the original atria. Lifelong immunosuppression is mandatory to prevent rejection.

(Chapter 56)

(60) The answer is C

Although intravenous methylprednisolone is standard treatment for acute rejection, it should not be started without consulting the patient's transplant center. Every effort must be made to confirm rejection by endomyocardial biopsy because the severe immunosuppression of antirejection therapy may worsen infectious illnesses, including cytomegalovirus (CMV). Gastroenteritis and other illnesses may precipitate an episode of rejection by decreasing absorption of medications against rejection. The patient should receive antibiotic prophylaxis for any invasive procedure.

(Chapter 56)

(61) The answer is D

Most patients with intact aneurysms are asymptomatic. Even grossly obvious aneurysms are usually painless and nontender unless they are acutely or chronically ruptured. Tenderness is an indication for urgent surgical evaluation. Aneurysms larger than 5 cm are at risk for rupture, whereas aneurysms smaller than 4 cm rarely rupture unless they are saccular.

(Chapter 54)

(62) The answer is E

Unheralded syncope in an elderly patient, with new back or abdominal pain, is suspicious for acute rupture of an abdominal aortic aneurysm. Because the patient may suddenly become hypotensive, immediate surgical consultation and preparation for surgery is indicated. Aortography may be falsely negative, and the associated delay may be fatal. Likewise, delay for CT scanning may also result in death.

(Chapter 54)

(63) The answer is D

Tearing pain, pulse disparity, and hypertension make aortic dissection the most likely diagnosis. Emergency management includes reducing BP (with vasodilators such as nitroprusside), reducing shear forces of the aorta with β blockers, and testing to determine the extent of dissection. CT, aortography, magnetic resonance imaging (MRI), and transesophageal echocardiography have all been used successfully. Although testing protocols differ by institution and test availability, the goal is to determine the need for surgery. Dissections that involve the ascending aorta (Stanford type A) are usually best treated surgically, whereas dissections that involve only the descending aorta (type B) are managed medically unless major vessels or organs are seriously compromised.

(Chapter 54)

(64) The answer is D

Low levels of D-dimer can exclude DVT, but many other disorders can lead to elevation, including surgery, trauma, infection, and malignancy. An elevated D-dimer level should be further evaluated with one of the other tests. A single duplex ultrasound has a positive predictive value for DVT of 94 percent, and a positive impedance plethysmography (IPG) has 83 percent positive predictive value. Contrast venography is the traditional gold standard test, but it is invasive, painful, and sometimes causes iatrogenic venous thrombus. MRI is highly accurate and can visualize parts of the venous system not usually accessible, such as the calves and the pelvic veins. However, it is expensive, lacks portability, and many patients are excluded because of prosthetic implants.

(Chapter 55)

(65) The answer is D

Renal insufficiency is a common side effect of cyclosporine immunosuppressive therapy. Although rejection can be entirely asymptomatic, a variety of symptoms are possible. They include all of the classic signs and symptoms of CHF, nausea, vomiting, ascites, any type of dysrhythmia, and even circulatory collapse. Accelerated coronary artery disease in the transplanted heart is also thought to represent rejection, and it frequently leads to ischemia or infarction. Chest pain is an extremely uncommon symptom and does not correlate with myocardial ischemia.

(Chapter 56)

(66) The answer is B

Although an increased pulse is worrisome, a "normal" HR does not rule out a serious disease process. The normal tachycardic response to pain and hypovolemia may be blunted or absent due to medications such as β

blockers. Also, the heart becomes less sensitive to catecholamines with advancing age. Due to cerebral atrophy, increased space within the skull may delay presentation of intracranial hemorrhages. Although overall cervical spine fractures are less common with age, the incidence of C1 and C2 fractures increases. (Chapter 245)

(67) The answer is C

Despite widespread treatment of streptococcal pharyngitis with antibiotics, rheumatic heart disease remains the most common cause of MVS. As in most valvular diseases, symptoms present in the fourth and fifth decades, and dyspnea on exertion is the most frequent presenting complaint. Associated syncope is uncommon, although it can be the presenting symptom for aortic stenosis or idiopathic hypertrophic subaortic stenosis (IHSS). Hemoptysis is the second most common presenting symptom for MVS, and usually manifests as pink frothy sputum, but sometimes as frank blood from dilated bronchial veins that rupture as back pressure from the stenosis increases. Longstanding MVS leads to a dilated left atrium and almost inevitably to atrial fibrillation if the stenosis is not corrected.

(Chapter 50)

(68) The answer is C

The increased incidence of TIA in patients younger than 45 years who have MVP is thought to be secondary to sterile emboli from platelet and fibrin deposits on the defective valve. Sudden death is very rare in MVP, but is more likely if the patient presents with syncope or near syncope and ECG abnormalities. Only about 20 percent of patients with MVP have the classic mid-systolic click. Although most patients are asymptomatic, the incidence of MVP in the general population is 3 to 10 percent.

(Chapter 50)

(69) The answer is D

The incidence of endocarditis in patients with isolated AS is only about 2 percent. Congenital bicuspid valve is the leading cause of AS, with rheumatic heart disease being the second, followed by degenerative calcification in patients older than 70 years. Dyspnea is the most common presenting symptom, followed by paroxysmal nocturnal dyspnea, syncope on exertion, angina, and MI. The angina experienced with AS is often due to a perfusion pressure phenomenon, with inadequate perfusion from the coronary vessels across the myocardium to the endocardium. LVH is the most common ECG finding.

(Chapter 50)

(70) The answer is D

Patients with valvular heart disease are at increased risk for developing endocarditis. Prophylactic antibiotics should be administered before abscess drainage, urethral catheter placement (if there is a suspicion of infected urine), dental procedures, nasal packing, rigid bronchoscopy, cystoscopy, anoscopy, vaginal delivery, and abortion. Endotracheal intubation does not require prophylaxis.

(Chapter 50)

(71) The answer is C

IHSS presents clinically about 10 years earlier than other valvular diseases and is a cause of sudden death among young athletes. Symptoms of IHSS may be decreased with squatting. MVP is a rare cause of sudden death.

(Chapter 50)

(72) The answer is C

Afterload reduction is an important therapeutic intervention for most valvular emergencies. Its effect is to optimize forward-moving pressure gradients. In AS, however, vasodilating agents must be used with caution because they can decrease perfusion pressure across the thickened myocardium. Rate control is more important in these patients to maximize ventricular outflow and diastolic perfusion time.

(Chapter 50)

(73) The answer is B

This is the typical presentation of a patient with hypertrophic cardiomyopathy: a familial disorder with asymmetric hypertrophy of the left ventricle, in particular the septal wall. The ECG shows Q waves with upright septal T waves, typical of the "pseudo-infarction" pattern. Chest pain is usually due to an imbalance between the oxygen demand of the hypertrophied myocardium and the available blood flow. Tachycardia worsens the symptoms by decreasing diastolic coronary perfusion time, increasing the end diastolic intraventricular pressure. β Blockers are the intervention of choice. Nitroglycerin and CPAP would not be indicated because they decrease venous return and further compromise filling of the noncompliant ventricle. Dopamine would increase the incidence of dysrhythmias after a ventricular fibrillatory arrest.

(Chapter 50)

(74) The answer is D

Blind or ECG-guided percardiocentesis is associated with a 7 to 15 percent incidence of complications. These include tension pneumothorax, liver laceration, AV fistula, and laceration of the coronary or internal mammary vessels leading to MI or hemopericardium. Echocardiography is the guidance technique of choice in performing emergent percardiocentesis because it helps identify the largest pocket of effusion. Left-to-right subxyphoid approach lowers the incidence of coronary artery laceration.

(Chapter 51)

(75) The answer is E

The patient's presentation is classic for acute percardial tamponade. He displays Beck's triad (hypotension, JVD, and muffled heart sounds), and electrical alternans, created by the heart swinging in the pericardial fluid. Differential diagnosis includes pulmonary embolism (PE), tension pneumothorax, AMI, myocardial contusion, and air embolism. Echocardiography is the diagnostic modality of choice because it can rule out constricting pericardial effusion, show increased right-sided pressures suggestive of PE, and detect wall-motion abnormalities associated with myocardial compromise. Treatment of pericardial tamponade includes intravenous fluids, oxygen, and percardiocentesis. Dopamine may be helpful as a temporizing measure to elevate BP. Intubation and other forms of positive pressure ventilation are not recommended because they decrease venous return.

(Chapter 51)

(76) The answer is C

Although most cases of CM are idiopathic, patients should have a thorough work-up for all known causes. A history of hypertension, alcohol use, valvular disease, chemotherapy, or heavy metal exposure should be elicited. Treatment for dilated and restrictive CM is the same, but caution should be used in patients with amyloidosis because they may be prone to digoxin toxicity due to amyloid fibril binding of digoxin. The presence of fever and myalgias supports a diagnosis of myocarditis rather than CM.

(Chapter 51)

(77) The answer is C

Enteroviruses, especially cocksackie B, predominate as the causal agent in acute myocarditis. Adenovirus, influenza B, parainfluenza, mumps, CMV, hepatitis B, herpes, varicella, EBV, and HIV have also been implicated. Myocarditis is detected in 10 percent of routine autopsies and in up to 50 percent of AIDS patients'

autopsies. Up to 40 percent of patients with acute cardiomyopathy and up to 63 percent of patients with chronic cardiomyopathy have histologic evidence of myocarditis. Histologic evidence includes myocardial necrosis, vacuolization, and lymphocytic infiltration. Cardiac function returns to baseline level in the majority of patients within weeks to months of the acute illness. Long-term prognosis is variable.

(Chapter 51)

(78) The answer is C

Acute myocarditis presents in previously healthy patients as a viral prodrome followed by dyspnea and tachycardia out of proportion to the fever. Other possible diagnoses in the described setting include PE, hyperthyroidism, toxins, and myocardial ischemia. Anxiety is a diagnosis of exclusion. Although all of the listed interventions should be considered, nitroglycerin is contraindicated in PE because it decreases needed preload, and β blockers or lorazepam could precipitate hypotension in a patient with acute myocarditis. Echocardiography would be the next diagnostic modality of choice in the work-up of this patient.

(Chapter 51)

(79) The answer is A

Acute pericarditis is not associated with dysrhythmias. If dysrhythmias are present, the patient should be assessed for underlying heart disease. Aspirin or nonsteroidal anti-inflammatory medications at high doses are the treatments of choice for pericarditis, except in cases of uremic pericarditis with co-existing coagulopathy. Steroids and colchicine may also be used, but not as first-line agents. Echocardiogram should be performed in patients with evidence of pericardial effusion (electrical alternans or low-voltage ECG) to rule out impending tamponade or underlying myocarditis. Sixty percent of all patients experience complete recovery within 1 week and another 18 percent within 3 weeks. Pericarditis recurs in 20 percent of patients.

(Chapter 51)

(80) The answer is C

The ECG changes suggestive of acute pericarditis are uncommon in uremic patients because the epicardium is rarely involved. Pericardial friction rubs and pericardial effusions occur frequently. Uremic pericarditis is one of the most common causes of cardiac tamponade. Treatment consists of daily hemodialysis for 2 to 6 weeks. Hemodialysis-associated pericarditis requires a work-up for viral, bacterial, and tubercular causes. Aspirin and nonsteroidal anti-inflammatory medications should be used with caution.

(Chapter 51)

(81) The answer is B

ECG changes in acute pericarditis classically occur in three phases. In the first few days, diffuse concave ST elevation predominates, usually no greater than 5 mm, and is most prominent in the limb leads and in leads V₅ and V₆. In contrast to the changes seen with early repolarization, with acute pericarditis, the ST segments are usually greater than or equal to one-fourth of the amplitude of the T wave. PR segment depression is not associated with early repolarization. The ST elevations seen in acute pericarditis can be distinguished from those seen with AMI in that they are usually diffuse, concave, less than 5 mm, and unassociated with T-wave inversions. The second and third phases of ECG changes consist of normalization of the ECG followed by T-wave inversion with normal ST segments. In some cases, T-wave inversions persist indefinitely.

(Chapter 51)

(82) The answer is C

The correct combinations are 1 + 8, 2 + 7, 3 + 9, 4 + 6, and 5 + 10. MS spares the left ventricle, but inevitably causes left atrial enlargement, seen on ECG as biphasic P waves, especially in leads II and V₁. As disease progresses, pulmonary hypertension and right-sided failure develop and manifest as right-axis deviation. AS leads to LVH, often with left or right bundle branch blocks. Mitral valve prolapse is usually associated with a normal ECG. Acute inferior MI can cause ischemia of the papillary muscle and thus acute mitral insufficiency. Flash pulmonary edema in a patient with acute inferior MI should raise the suspicion of mitral insufficiency. IHSS usually involves asymmetric hypertrophy of the left ventricle and can show septal Q waves, with upright T waves and poor R-wave progression across the precordium on ECG. These changes are not related to coronary insufficiency and are known as a "pseudoinfarction" pattern.

(Chapter 50)

(83) The answer is E

Intraaortic balloon pumps are contraindicated in AI because they force blood back down into the open ventricle and cause further cardiac decompensation. Thrombolytics may be helpful in acute mitral insufficiency secondary to papillary muscle ischemia, as can be seen in inferior MI secondary to right coronary occlusion. Emergent surgery is the appropriate therapeutic intervention for acute left-sided valve insufficiency causing cardiac failure. Syncope secondary to aortic stenosis with minimal exertion usually indicates a critical valve stenosis (diameter < 0.5 cm) and merits recommendation for urgent surgical correction. Cardioversion should not be attempted for atrial fibrillation with MS because the dysrhythmia is usually longstanding and associated with a high thromboembolic risk.

(Chapter 50)

(84) The answer is B

This patient has pulmonary edema secondary to acute aortic insufficiency with the characteristic clinical findings of a wide pulse pressure and short upswEEPing pulses. The most likely cause for acute cardiac failure in this febrile intravenous drug user is infective endocarditis leading to valve rupture. Concurrent with resuscitation, the most important action is to call a cardiac surgeon to perform emergency valve repair. Furosemide and nitrates are helpful temporizing measures to reduce afterload and improve cardiac output. Blood cultures and empiric antibiotics are also indicated. Emergent echocardiography would be helpful to confirm the diagnosis while preparations for surgery are underway. Naloxone has no role, and an intraaortic counterpulsation balloon is contraindicated.

(Chapter 50)

(85) The answer is B

Fatality rates for left-sided disease are greater than those for right-sided disease because of the increased incidence of cardiac failure and neurologic complications. *Streptococcus viridans* is the most common organism implicated in left-sided endocarditis, with *Staphylococcus aureus* increasing in incidence. Enterococcal and fungal infections are also seen. Right-sided endocarditis is caused by *S. aureus* in more than 75 percent of cases, followed by *S. viridans* and gram-negative rods. Blood cultures should be drawn from three different venous sites and sent for aerobic, anaerobic, and fungal cultures. Antifungal agents should be considered in patients with HIV or other immunocompromised states or in patients with indwelling catheters. Murmurs are heard in only 35 to 50 percent of patients with right-sided disease but in up to 80 percent of patients with left-sided disease.

(Chapter 50)

(86) The answer is B

Because patients frequently present with nonspecific complaints, the diagnosis of subacute bacterial endocarditis is often missed. Malaise (95 percent) and intermittent fever (80 percent) are the most common complaints, followed by anorexia, weakness, and weight loss. Neurologic symptoms such as headache, personality change, altered level of consciousness, and focal deficits are seen in 35 to 40 percent of cases. Peripheral vascular lesions (e.g., splinter hemorrhages, Osler nodes, Roth spots, Janeway lesions, or petechia) are found in more than 50 percent of patients. Splenomegaly is seen in 25 percent of patients. Almost all patients have a murmur at some point during the disease. Subacute endocarditis is predominantly left sided.

(Chapter 50)

(87) The answer is D

The Framingham heart study reported a 50 percent mortality in 5 years for CHF patients, with half the population dying within the first year. ACE inhibitors have been shown to slow the progression of disease and improve function in CHF patients, but they have not decreased the frequency of sudden death. β Blockers are a useful adjunct in selected patients because they counteract the hyperadrenergic neurohumoral feedback seen in congestive failure.

(Chapter 49)

(88) The answer is E

This patient's most likely diagnosis is acute pulmonary edema (APE) status post anterior MI. He should receive aspirin, but β blockers should be avoided because the patient is in cardiogenic shock. Positive pressure ventilation by face mask (CPAP or BiPAP) or by endotracheal intubation enhances oxygenation of the compromised myocardium and helps decrease preload. Too much positive pressure must be avoided to not compromise cardiac output. Nitroglycerin decreases preload, relaxes the pulmonary vasculature, and augments coronary perfusion. Furosemide also helps decrease preload and afterload. Dopamine may be needed to maintain adequate SBP. Historically, morphine was thought to decrease afterload and pulmonary hypertension (through central sympatholytic mechanisms) but is now thought to work primarily through its sedative and anxiolytic effects to decrease cardiac demand. APE showing cephalization on chest x-ray is associated with a pulmonary wedge pressure (PWP) greater than 15 mm Hg; the presence of interstitial edema (Kerly B lines) correlates with a PWP of 19 to 25 mm Hg; and alveolar edema is associated with a PWP greater than 25 mm Hg.

(Chapter 49)

(89) The answer is C

Dobutamine produces a more favorable balance between myocardial oxygen supply and demand than does dopamine and is the drug of choice in normotensive patients with APE. Dopamine may be more useful in hypotensive patients. Nitroglycerin sublingual for the relief of APE symptoms is usually given at twice the dose of that given for angina (0.8 vs. 0.4 mg). Loop diuretics at doses of 1 mg/kg should be administered to hypertensive patients with APE. Nitroprusside can induce ischemia in patients with coronary artery disease, and thus nitroglycerin is the vasodilator of choice, having both veno- and vasodilatory effects.

(Chapter 49)

(90) The answer is D

Pregnancy is considered a hypercoagulable state and thus a risk factor for DVT and PE. PE is the most common cause of nonsurgical maternal death in the peripartum period. Women older than age 40 years and of

African descent are at highest risk. Thrombolytic therapy is indicated for treatment of massive PE with refractory hypoxemia and circulatory collapse. The use of thrombolytic agents has largely replaced thrombectomy, except in cases in which thrombolytic therapy is contraindicated. This patient is at risk for uterine bleeding because she is 4 days postpartum. Urokinase and streptokinase are less effective than r-tPA in improving symptoms. Heparin and LMWH are possible treatments for hemodynamically stable PE patients but would not be indicated in this scenario. Intrapulmonary artery infusion is no more effective than peripheral intravenous administration, and the risk of bleeding at the pulmonary catheter placement site is high. (Chapter 52)

(91) The answer is A

Overall, V./Q. scanning is 98 percent sensitive but only 10 percent specific for the diagnosis of PE. A normal V./Q. can reliably rule out the diagnosis of PE. A low-probability scan with a low clinical suspicion has a predictive value of 96 percent for exclusion of PE, whereas a high-probability scan with a high clinical suspicion has a 96 percent positive predictive value. The difficulty in using V./Q. scan findings for the diagnosis of PE is the lack of a universal definition of "clinical suspicion." D-dimers are highly dependent on the assay used to measure them; some clinical trials have shown a high negative predictive value, but they have not yet become the standard of care.

(Chapter 52)

(92) The answer is B

PE is more common in men than in women before the age of 50 years, but this sex difference disappears with age. An intermediate V./Q. scan in conjunction with this high index of suspicion would merit anticoagulation. Risk of bleeding in this postsurgical trauma patient would need to be weighed against the benefits of heparinization. With this clinical presentation, a low-probability V./Q. scan does not obviate the need for further work-up. In addition to surgery as a PE risk factor, if the patient had an indwelling central venous catheter in the intensive care unit, he is at risk for upper extremity DVT. The next diagnostic test would be spiral CT, magnetic resonance angiography, or pulmonary arteriography. PE can induce the release of chemical mediators that cause bronchoconstriction.

(Chapter 52)

(93) The answer is D

PE presents with a syncopal episode up to 15 percent of the time. Altered mental status and generalized seizures may also be the presenting complaint, especially in the elderly. The most common presenting symptoms are chest pain and dyspnea (up to 85 percent); anxiety occurs in more than 50 percent of PE patients. Tachypnea (RR > 16) is seen in more than 98 percent of all cases, and tachycardia (resting HR > 100)

is seen in up to 44 percent of all patients. Other signs are variable. The risk for embolism from proximal DVT is highest in the first week of its formation.

(Chapter 52)

(94) The answer is A

PE can be categorized as "massive" or "submassive." Massive PE presents with hypotension and hypoxemia, accounts for 5 percent of all cases, and is associated with a 40 percent mortality rate. Submassive PE presents with normal hemodynamics and hypoxemia. It carries a 2 percent mortality rate if treated appropriately; mortality rates increase to 20 percent if untreated. Only 40 to 50 percent of the pulmonary vasculature must be occluded for hypoxia and hypotension to manifest. However, patients with preexisting cardiac or pulmonary disease show signs of massive PE with lesser degrees of occlusion. ECG changes are seen in about 40 percent of patients with PE, most commonly nonspecific ST and T-wave changes. Other ECG changes include inverted T waves in the precordial leads, mimicking subendocardial infarct, new right-axis deviation or right bundle branch block, and an $S_1Q_3T_3$ pattern.

(Chapter 52)

(95) The answer is D

The correct combinations are: 1 + 9, 2 + 7, 3 + 8, 4 + 6, and 5 + 10. Doppler flow studies are a useful adjunct for ED evaluation of peripheral vascular integrity and disease. Normal arteries have a biphasic or triphasic waveform. Monophasic waveforms with each pulse indicate poor arterial flow and probable proximal arterial stenosis. These patients present clinically with a history of claudication. Monophasic flow that changes with respiration suggests detection of venous flow, and the probe should be repositioned to assess arterial flow. Flow during diastole heralds an arteriovenous fistula. Normal ankle brachial indices (ABIs) are greater than or equal to 1.0. ABIs less than 0.9 indicate arterial injury. With rest ischemia, ABIs are less than 0.5 and a vascular surgeon should be consulted. If the ABI is less than 0.3, a vascular emergency exists.

(Chapter 255)

(96) The answer is C

The role of nuclear imaging in risk stratification of patients with equivocal presentations is evolving. The two radioisotopes most widely used are thallium 201 and technetium-99m sestamibi (T99). Thallium 201 is a potassium cation analog that is taken up by active well-perfused myocytes during exercise. It redistributes to less well-perfused myocardium during rest and shows "cold spots" on imaging. T99 has higher energy photon emission and shows better contrast than does thallium, but does not redistribute and requires a second injection for the rest study. A nuclear study is an excellent diagnostic modality for patients with ECG changes that limit the usefulness of an ECG stress test (e.g., left bundle branch block, LVH, and concurrent digitalis

therapy). The sensitivity of nuclear stress testing for coronary ischemia is greater than 85 percent versus only 60 to 70 percent for the ECG stress test.

(Chapter 57)

(97) The answer is B

Despite two sets of negative cardiac enzymes and a prolonged pain-free period, this patient needs to be risk-stratified for evidence of coronary ischemia. In patients with LVH and a possible strain pattern, ECG stress tests can be nondiagnostic. An echocardiogram can show wall-motion abnormalities in patients with nonspecific ECG changes but is unlikely to show a wall-motion abnormality in this patient in the absence of chest pain. A Holter monitor might pick up dysrhythmias but would not be the best test to evaluate for ischemia. Angiography is invasive and not generally used as the first line to evaluate for coronary ischemia in a pain-free patient.

(Chapter 57)

(98) The answer is B

Echocardiography is a useful adjunct in evaluating patients presenting to the ED with chest pain. The echocardiogram can detect wall-motion abnormalities indicative of ischemia or infarct, even in the presence of nonspecific ECG changes. Echo findings change the diagnosis of up to 18 percent of patients with nonspecific ECG changes. Normal left ventricular wall motion during chest pain suggests a noncardiac origin of the chest pain. Cardiac ultrasound is superior to clinical assessment of Killip classification and more accurate than ECG in predicting death and major complications. It may also detect areas of prior infarct, valvular abnormalities, intraventricular thrombi, signs of right-heart strain, and pericardial effusion.

(Chapter 57)