Work Smart

Question 1 of 200

Which of the following antimicrobials is associated with prolongation of the QT interval?

(Please select 1 option)

○	Cefuroxime
○	Co-amoxiclav
◉	Erythromycin Correct
○	Gentamicin
○	Isoniazid

The macrolides are associated with a prolongation of the QT interval.

Other antimicrobials associated with prolonged QT include quinine and levofloxacin.

Next question | Go to summary

Answer Statistics

Work Smart

Question 2 of 200

Which of the following antiarrhythmic drugs may be used in the treatment of long QT syndrome?

(Please select 1 option)

○	Amiodarone
○	Atenolol This is the correct answer
◉	Flecainide Incorrect answer selected
○	Propafenone
○	Sotalol

Beta blockers are the mainstay of treatment in long QT syndrome.

The most commonly used drugs are propranolol and nadolol, but metoprolol and atenolol are also used.

Sotalol is a complex drug, and although it is classified as a beta blocker it is in fact a mix of the d and l isomers which have quite different effects. The d isomer prolongs repolarisation, resulting in a class III anti-arrhythmic effect. The l isomer acts to both prolong repolarisation and also as a beta blocker. The beta blocker effect is dose-dependent and is not cardio-selective. The overall action of sotalol is to prolong the QT interval, and therefore it is not used in this situation.

Implantable cardioverter defibrillators are the most effective treatment in high risk cases.

The others drugs may produce a prolongation of the QT interval, exacerbating risk of polymorphic ventricular tachycardia (VT) and torsades de pointes.

Work Smart

Question 3 of 200

Which of the following infections is least likely to cause myocarditis?

(Please select 1 option)

○	Chagas disease
○	Coxsackie virus
○	Diphtheria
◉	Syphilis Correct
○	Toxoplasmosis

Quaternary syphilis involves the cardiovascular system, commonly in the form of ascending aortic aneurysm and aortic regurgitation.

Diphtheria, coxsackie virus, Chagas disease, and toxoplasmosis are all associated with myocarditis.

Next question | Go to summary

Answer Statistics

1 10%

2 10%

Work Smart

Question 4 of 200

A 52-year-old sales representative is admitted with an inferior myocardial infarction (MI). He receives thrombolysis and makes an uneventful recovery.

He is discharged on atenolol, aspirin and atorvastatin.

He enquires how long after his MI must he wait before he is able to drive?

(Please select 1 option)

○	One week
○	Two weeks
◉	Four weeks Correct
○	Three months
○	Six months

The DVLA is quite clear on this issue. He must wait at least four weeks after his MI before he is able to drive.

Similarly, patients undergoing surgical revascularisation must also wait four weeks.

If he was admitted with angina and underwent percutaneous transluminal coronary angioplasty (PTCA) then he should wait one week.

Reference:

1. Gov.uk. Medical conditions, disabilities and driving.

Work Smart

Question 6 of 200

Which of the following is currently recommended as the drug of choice in treating refractory ventricular fibrillation or pulseless ventricular tachycardia?

(Please select 1 option)

◉	Adenosine Incorrect answer selected
○	Amiodarone This is the correct answer
○	Bretylium
○	Lidocaine
○	Magnesium

300 mg of amiodarone made up to 20 ml with 5% dextrose given as an intravenous bolus is the drug of choice.

100 mg of lidocaine may be given intravenously when amiodarone is unavailable.

Historically 5 mg/Kg of bretylium was given, but it is no longer recommended.

Next question | Go to summary

Answer Statistics

Work Smart

Question 7 of 200

Deficiency of which one of the following trace elements is implicated as a cause of cardiomyopathy?

(Please select 1 option)

○	Chromium
◉	Copper — Incorrect answer selected
○	Manganese
○	Selenium — This is the correct answer
○	Zinc

Selenium deficiency is one of the reversible causes of dilated cardiomyopathy.

Next question | Go to summary

Answer Statistics

Work Smart

Question 8 of 200

A 65-year-old man was advised to start oral digoxin at a dose of 250 µg daily. His physician explained that the full effect of this treatment would not be apparent for at least a week.

Which one of the following pharmacokinetic variables did the physician use to give this explanation?

(Please select 1 option)

○	Bioavailablity
○	Half life This is the correct answer
○	Plasma protein binding
◉	Renal clearance Incorrect answer selected
○	Volume of distribution

Digoxin follows first order kinetics and has a half life of 1.6 days in a patient with normal renal function.

Sixty five per cent of the drug absorbed remains in the system after one day.

Subsequent doses gradually accumulate until a steady state is achieved after four to five days.

Next question | Go to summary

Work Smart

Question 9 of 200

A 68-year-old woman was admitted to hospital with severe acute dyspnoea. She denied having any chest pain but said that she had become progressively breathless over the past three months.

On examination, her pulse was 120 beats per minute and regular. Her blood pressure was 95/55 mmHg and her jugular venous pressure was elevated to the angle of the jaw. Her heart sounds were normal. Auscultation of her chest revealed bilateral fine inspiratory crackles to the mid zones. She had haemorrhages in both fundi.

Investigations revealed:

Haemoglobin	56 g/L	(115-165)
Haematocrit	0.19	(0.36-0.47)
MCV	118 fL	(80-96)
MCH	33.0 pg	(28-32)
White cell count	3.4 $\times 10^9$/L	(4-11)
Platelets	95 $\times 10^9$/L	(150-400)
Serum vitamin B12	Result pending	
Serum folate	Result pending	

The ECG showed left bundle branch block, which had been documented previously.

She is given 80 mg of intravenous furosemide which results in an excellent diuresis.

Which of the following is the next most appropriate immediate step in her management?

(Please select 1 option)

○	Blood transfusion This is the correct answer
○	Bone marrow aspiration
○	Start intramuscular vitamin B12 and oral folic acid
○	Start oral ferrous sulphate
◉	Thrombolyse with t-PA Incorrect answer selected

The clinical picture represents severe megaloblastic anaemia with cardiac failure.

The question asks about immediate management. Although the anaemia has been developing slowly, she has become acutely haemodynamically compromised. In such circumstances, it would be most appropriate to transfuse the patient. This would need to be done very cautiously with diuretic cover.

She will clearly need to start an intensive course of intramuscular vitamin B12 and oral folic acid as well, but this is less important in the hyperacute situation where there is a risk of the patient dying from anaemia.

Giving oral folic acid without vitamin B12 would be hazardous and could precipitate subacute combined degeneration of the spinal cord.

Transfusion may also be hazardous in a patient with severe congestive cardiac failure (CCF).

Next question | Go to summary

Answer Statistics

Times answered: 9605

Test Analysis

Work Smart

Exam Themes May 2007

Question 10 of 200

Which of the following is true regarding the action of clopidogrel?

(Please select 1 option)

○	It inhibits cyclo-oxygenase
○	It is a glycoprotein IIb/IIIa inhibitor
○	It is a hydroxymethyl co-enzyme A inhibitor
○	It is a selective factor Xa inhibitor
◉	It is an ADP receptor antagonist Correct

Clopidogrel prevents platelet aggregation through antagonism of the adenosine diphosphate (ADP) receptor.

It has been shown to reduce mortality from stroke and ischaemic heart disease (IHD) in primary prevention studies.

Next question | Go to summary

Answer Statistics

1 5%

Work Smart

Question 11 of 200

A 56-year-old male with left ventricular systolic dysfunction was dyspnoeic on climbing stairs but not at rest. The patient was commenced on ramipril and furosemide.

Which one of the following drugs would improve the patient's prognosis?

(Please select 1 option)

○	Amiodarone
○	Amlodipine
○	Bisoprolol — This is the correct answer
○	Digoxin
◉	Nitrate therapy — Incorrect answer selected

This patient has NYHA stage II heart failure.

Studies such as CIBIS-II and MERIT-HF reveal that beta blockers significantly reduce morbidity and mortality in heart failure.

Next question | Go to summary

Answer Statistics

Work Smart

Question 12 of 200

A 67-year-old man presents with sudden onset atrial fibrillation (ventricular rate of 150/minute). His serum creatinine concentration was 250 µmol/L (70-110).

Which is the main factor that determines the choice of loading dose of digoxin in this patient?

(Please select 1 option)

○	Absorption
○	Apparent volume of distribution
◉	Lipid solubility Incorrect answer selected
○	Plasma half life
○	Renal clearance This is the correct answer

The pharmacokinetics of digoxin are complex and best explained by a two compartment model.

The loading dose is mainly dependent on the volume of distribution of a drug but this patient has moderate renal failure.

The loading dose is calculated (using various models) by taking into account age, creatinine clearance, body surface area, etc.

Volume of distribution becomes important particularly when body weight is 40 kg or less.

On balance it is the renal failure that is the most important factor in this patient in determining the loading dose.

Work Smart

Question 14 of 200

A 70-year-old male was receiving amiodarone 200 mg daily for intermittent atrial fibrillation. However, he was aware of tiredness and lethargy. He appeared clinically euthyroid with no palpable goitre.

Investigations revealed:

Serum free T4	23pmol/L	(9-26)
Serum total T3	0.8 nmol/L	(0.9-2.8)
Serum TSH	8.2 mU/L	(<5)

Which of the following statements would explain these results?

(Please select 1 option)

○	Abnormal thyroxine binding globulin
◉	Amiodarone induced hypothyroidism Correct
○	'Sick euthyroid' syndrome
○	Spontaneous hypothyroidism
○	TSH secreting pituitary adenoma

The results show normal thyroxine (T4), low triiodothyronine (T3), with elevated thyroid-stimulating hormone (TSH).

These results are typical of amiodarone induced hypothyroidism which inhibits the peripheral

Work Smart

Question 15 of 200

A 75-year-old lady presents with sudden breathlessness and palpitations.

On examination, she was observed to have an irregular heart beat with rate of 140 bpm, BP 85/40 mmHg and normal heart sounds. On auscultation of the chest, fine basal crepitations are heard.

An ECG confirms atrial fibrillation (AF) and an old inferior myocardial infarction. She is anticoagulated with heparin and given diuretics. Her heart rate remains rapid.

Which of the following is the most appropriate management of the lady's AF?

(Please select 1 option)

○	DCCV This is the correct answer
○	IV amiodarone
○	IV beta blocker
◉	IV digoxin Incorrect answer selected
○	Oral quinidine therapy

The key to this question is that the patient has clinical signs of pulmonary oedema with fast AF and hypotension.

In this age group AF is poorly tolerated and often leads to pulmonary oedema even in the presence of a relatively normal left ventricle (LV).

NICE have published guidance on the management of Atrial fibrillation (CG180).

The primary aim here should be rate control which is best achieved with direct current cardioversion (DCCV) in this situation.

Digoxin, even when used intravenously, is suggested to have too slow an onset of action to merit its use.

Beta blockers can also be used but due to the fact that they are negatively inotropic may complicate the acute pulmonary oedema.

Emergency DCCV is required as there is haemodynamic compromise (low BP).

Reference:

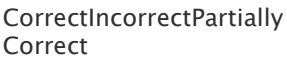
Iqbal MB, Taneja AK, Lip GY, et al. Recent developments in atrial fibrillation. *BMJ.* 2005;330:238.

Next question | Go to summary

Answer Statistics

Times answered: 8920

Test Analysis



Work Smart

Question 17 of 200

A 21-year-old woman has a history of palpitations and light headedness. ECG shows short PR interval and inferior Q waves.

Her symptoms improve with atenolol 25 mg/day but she has had two short episodes of similar symptoms in the previous 24 hours.

Which of the following is the long term management of choice?

(Please select 1 option)

○	Anticoagulation
○	Increase the dose of atenolol
○	Oral amiodarone
◉	Oral digoxin Incorrect answer selected
○	Radiofrequency ablation This is the correct answer

Wolff-Parkinson-White (WPW) syndrome can be associated with negative delta waves in II, III and aVF.

The long term management of choice is ablation of the accessory pathway.

Next question | Go to summary

Work Smart

Question 18 of 200

A 54-year-old man presents with central crushing chest pain. Examination is normal.

12-lead ECG shows ST segment elevation in leads II, III, aVF, and ST depression in V1, V2 and V3.

Which coronary artery is occluded?

(Please select 1 option)

◉	Circumflex Incorrect answer selected
○	Left anterior descending
○	Left main stem
○	Obtuse marginal
○	Right coronary artery This is the correct answer

The ECG describes an infero-posterior myocardial infarction (MI). This territory is supplied by a dominant right coronary artery. The concept of coronary dominance refers to which coronary artery supplies the posterior descending coronary artery.

In the case of approximately 85% of patients this is the right coronary artery with about 15% of patients having a dominant left circumflex.

The territories supplied by the arteries are as follows:

- Circumflex: lateral
- Left anterior descending: anterior and septum

- Left main stem: branches into the left anterior descending artery and circumflex and supplies most of the left ventricle. Complete left main stem occlusion is invariably fatal
- Obtuse marginal: one of the branches of the circumflex and supplies the 'high lateral' region of the left ventricle (ECG leads I and aVL).

Basic understanding of coronary anatomy is important as this is predictive of problems following MI.

For example, the right coronary artery supplies the AV node, so heart block following inferior MI is common. However, heart block following anterior MI is a grave prognostic marker as this indicates a large anterior wall infarct.

The right coronary system also supplies the right ventricle, hence problems relating to a right ventricular infarct are commonly associated with an inferior MI.

Further Reading:

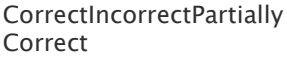
Medscape. Gross anatomy of the heart.

Next question | Go to summary

Answer Statistics

Times answered: 9221

Test Analysis



Work Smart

Question 19 of 200

A 21-year-old man with hypertrophic cardiomyopathy presents in clinic with dizzy spells but has not had any syncopal episodes.

Which of the following, if present, would indicate an increased risk of sudden cardiac death?

(Please select 1 option)

○	A significant blood pressure drop during exercise This is the correct answer
○	Asymmetric septal hypertrophy with maximum wall thickness of 2.1 cm
○	Left ventricular outflow tract gradient of 80 mmHg
○	Systolic anterior movement of the mitral valve on echocardiography
◉	Worsening exertional angina Incorrect answer selected

Patients with hypertrophic cardiomyopathy (HCM) are at increased risk of sudden cardiac death due to ventricular fibrillation/tachycardia (VF/VT).

The five poor prognostic markers which are predictive of sudden cardiac death are:

- Syncope
- Family history of HCM and sudden cardiac death
- Maximum left ventricular wall thickness greater than 3 cm
- Blood pressure drop during peak exercise on stress testing, and
- Documented runs of non-sustained VT on 24 hour tape.

Left ventricular outflow tract (LVOT) obstruction causes symptoms and can lead to deterioration of LV function but does not predict sudden cardiac death.

Asymmetric septal hypertrophy is a feature of HCM. In order to assess the risk for sudden cardiac death a detailed echocardiogram with measurements of the maximum left ventricular wall thickness is required.

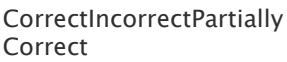
Systolic anterior movement of the mitral valve is often seen on echocardiogram and is thought to be the mechanism behind the left ventricular outflow tract obstruction.

Next question | Go to summary

Answer Statistics

Times answered: 8360

Test Analysis



Score: 22.22%

Work Smart

Question 20 of 200

A 73-year-old woman with atrial fibrillation due to ischaemic heart disease is well controlled with digoxin and amiodarone. She presents with a two month history of weight loss and palpitations.

Examination reveals an irregular pulse of 110 bpm.

Investigations show:

Serum TSH	<0.05 mU/L	(0.2-5.5)
Serum total T4	140 nmol/L	(58-174)

Which of the following would be the most useful investigation in establishing the diagnosis of thyrotoxicosis?

(Please select 1 option)

○	Antithyroglobulin antibody titre
◉	Antithyroid peroxidase antibody titre Incorrect answer selected
○	Serum free T4 concentration This is the correct answer
○	Serum reverse T3 concentration
○	Serum total T3 concentration

Amiodarone may cause both hypo- and hyperthyroidism.

It also interferes in the peripheral conversion of T4 to T3.

Work Smart

Question 21 of 200

An 18-year-old man had repeated episodes of breathlessness and palpitations lasting about 20 minutes and resolving gradually. There were no abnormal physical signs.

Which of the following is the most likely cause of these features?

(Please select 1 option)

◉	Drug abuse — Incorrect answer selected
○	Panic attacks — This is the correct answer
○	Paroxysmal supraventricular tachycardia
○	Personality disorder
○	Thyrotoxicosis

Drug abuse is unlikely, since the symptoms are quite short lived. We would expect other symptoms such as GI disturbance, headaches, or hypertension to accompany a variety of drug abuse causes.

Paroxysmal SVT would start and stop suddenly, not gradually.

Personality disorder and thyrotoxicosis would both be expected to lead to symptoms of longer duration with other associated symptoms.

This leaves 'panic disorder' as the most likely diagnosis.

Work Smart

Question 22 of 200

Which of the following statements concerning the treatment of acute myocardial infarction (MI) is correct?

(Please select 1 option)

◉	A pansystolic murmur developing within the first 24 hours does not require further investigation Incorrect answer selected
○	Dipyridamole therapy reduces reinfarction within the first year
○	Heparin is beneficial if given with streptokinase
○	Prophylactic lidocaine given in the first 48 hours is effective in preventing ventricular fibrillation
○	Treatment with a dihydropyridine short acting calcium antagonist nifedipine is associated with increased cardiovascular mortality This is the correct answer

GISSI II revealed no survival advantage of heparin plus streptokinase in acute MI compared with streptokinase alone.

ISIS II revealed that short acting dihydropyridine calcium antagonist nifedipine was associated with increased cardiovascular risk after MI.

Dipyridamole does not reduce risk.

A newly discovered pansystolic murmur may signify acquired mitral regurgitation (MR) or ventricular septal defect (VSD).

Work Smart

Question 23 of 200

A 26-year-old man is noted to have cyanosis of the lower limbs and clubbing of the toes, but not the fingers.

Which of the following statements is true?

(Please select 1 option)

○	He has coarctation of the aorta
○	He has Eisenmenger's syndrome This is the correct answer
○	He has had a Blalock shunt operation
○	He is likely to have a loud continuous 'machinery' murmur below the left clavicle
◉	He is likely to need urgent surgery Incorrect answer selected

This is the differential cyanosis of a reversed patent ductus arteriosus (PDA). There is a right-left shunt from the pulmonary artery to the aorta just distal to the left subclavian artery.

Coarctation causes radiofemoral delay. It may be associated with PDA but there is no suggestion in this patient.

Continuous machinery murmur is the classic murmur of PDA, but when the shunt reverses (as in patients with a large PDA and/or pulmonary disease) the murmur becomes softer and shorter.

When Eisenmenger's syndrome has developed, surgery is associated with a very high mortality.

A Blalock shunt (anastomosis of subclavian artery to pulmonary artery) used to be performed for Fallot's tetralogy and leads to a weak left radial pulse.

Work Smart

Question 26 of 200

In the diagnosis of rheumatic fever, which of the following may be helpful?

(Please select 1 option)

○	A generalised macular-papular rash
◉	ASO titre of less than 1:200 Incorrect answer selected
○	Polyarthritis This is the correct answer
○	*Staphylococcus aureus* grown on throat culture
○	Splinter haemorrhages

Of the following Jones criteria, two major or one major and two minor, and evidence of recent streptococcal infection, is required for the diagnosis of rheumatic fever (RF).

Major:

- Pancarditis
- Polyarthritis
- Erythema marginatum
- Chorea
- Subcutaneous nodules
- Macular rash.

Minor:

- Fever
- Polyarthralgia
- History of RF
- Raised erythrocyte sedimentation rate/c-reactive protein (ESR/CRP)
- Prolonged PR interval on electrocardiogram (ECG).

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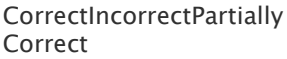
Next question | Go to summary

Answer Statistics

Times answered: 9277

Test Analysis



Score: 16%

Work Smart

Question 27 of 200

A 14-year-old boy presents with fever.

Which of the following might contribute to a diagnosis of rheumatic fever?

(Please select 1 option)

○	A CRP of 10
○	A prolonged PR interval on ECG This is the correct answer
○	Finding target lesions on the hands
○	Finding tender nodules in the fingertips
◉	Positive Romberg's sign Incorrect answer selected

The modified Jones criteria include:

- Finding of preceding streptococcal infection (recent scarlet fever, raised ASOT or other streptococcal antibodies)
- Positive throat swab for Group A *Strep*.

Plus:

(a) Major Criteria:

- Carditis
- Polyarthritis
- Chorea

- Subcutaneous nodules
- Erythema marginatum.

(b) Minor Criteria:

- Fever
- Arthralgia
- Previous history of rheumatic fever
- Elevated acute phase reactions
- Prolonged PR interval.

Erythema marginatum involves red circular lesions which gradually enlarge with central clearing.

Sydenham's chorea consists of choreoathetoid movements with increased clumsiness, for example, deteriorating handwriting. This is often associated with emotional lability.

Target lesions suggest erythema multiforme.

A C reactive protein (CRP) of 10 is not elevated much beyond the normal range.

Erythema marginatum initially manifests as non-specific pink macules seen over the trunk, with later blanching in the middle of the lesions and sometimes fusing of the borders resulting in a serpiginous (serpent-like) looking lesion. The rash is worsened with heat, but is characteristically evanescent. It does not itch and can be mistaken for the rash of Lyme disease.

Subcutaneous nodules are pea-sized, firm and non-tender. There is no associated inflammation and they are characteristically seen on the extensor surfaces of joints such as knees and elbows and also over the spine.

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Next question

Go to summary

Answer Statistics

Times answered: 9323

Work Smart

Question 28 of 200

Which of the following compounds has a vasodilating effect?

(Please select 1 option)

○	Antidiuretic hormone (ADH)
○	Calcitonin gene related peptide This is the correct answer
○	Endothelin
○	Renin
◉	Somatostatin Incorrect answer selected

Calcitonin gene related peptide causes vasodilatation.

ADH acts on the vasopressor receptors to cause vasoconstriction.

Endothelin is also a vasoconstrictor as is renin.

Somatostatin is also recognised to produce vasoconstriction of the splanchnic system.

Next question | Go to summary

Answer Statistics

Work Smart

Question 29 of 200

A 70-year-old male is referred by his GP for management of recently diagnosed congestive heart failure.

The patient has a history of poorly controlled hypertension. Over the last three months he has been aware of deteriorating shortness of breath, fatigue, and orthopnea. Over the last month he had been commenced on digoxin (62.5 µg daily), furosemide (80 mg daily), and amiloride 10 mg.

On examination he has a pulse of 96 bpm regular, a blood pressure of 132/88 mmHg. His JVP was not raised, he had some scattered bibasal crackles on auscultation with a displaced apex beat in the anterior axillary line, sixth intercostal space. Auscultation of the heart revealed no murmurs and he had peripheral oedema to the mid tibia.

Investigations showed:

Serum sodium	144 mmol/L	(137-144)
Serum potassium	3.5 mmol/L	(3.5-4.9)
Serum urea	13 mmol/L	(2.5-7.5)
Serum creatinine	135 µmol/L	(60-110)
Serum digoxin	1.0 ng/mL	(1.0-2.0)

One month previously his urea had been 11 mmol/L and creatinine 110 mol/L. An ECG reveals left ventricular hypertrophy and chest x ray shows cardiomegaly and calcified aorta.

Which is the most appropriate next step in management?

(Please select 1 option)

○

	Add an ACE inhibitor to the current regimen	This is the correct answer
◉	Add atenolol at a dose of 25 mg daily	Incorrect answer selected
○	Increase digoxin to 0.25 mg daily	
○	Increase furosemide to 80 mg twice daily	
○	Maintain on current therapy.	

This patient would be classified as probably NYHA grade III - IV heart failure (dyspnoeic on minimal exertion - rest).

With the persisting symptoms despite 80 mg of furosemide, guidelines would initially suggest the addition of an ACE inhibitor. Although there has been a mild decline in his urea and electrolytes since the introduction of therapy this would not be a contraindication to the use of ACEis.

There is no evidence that increasing a dose of digoxin above 62.5 µg in a patient in sinus rhythm would have any added benefit.

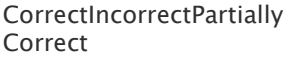
Although beta blockers would be of further benefit in this patient, it is important first to establish him on ACEi and then introduce beta blockers such as carvedilol, metoprolol, or bisoprolol in a small dose and gradually increase.

Next question | Go to summary

Answer Statistics

Times answered: 9173

Test Analysis



Work Smart

Question 30 of 200

Whilst attending the cardiology clinic, the staff nurse measures the blood pressure of a 61-year-old man, and finds that it is 183/100 mmHg sitting and 190/105 mmHg standing.

He has a heart rate of 81/minute, with an irregularly irregular rhythm.

On auscultation of the heart, there are no murmurs, but he has bibasilar crackles on chest examination.

Which of the following pathological findings is most likely to be present?

(Please select 1 option)

○	Cor pulmonale
○	Left atrial myxoma
○	Left ventricular hypertrophy (LVH) This is the correct answer
○	Mitral regurgitation
◉	Occlusive coronary atherosclerosis Incorrect answer selected

This gentleman is likely to have a hypertensive cardiomyopathy with a left ventricle hypertrophy.

The LVH is secondary to increased afterload, as a result of chronic hypertension. The atrial fibrillation suggested by an irregularly irregular pulse, is an indicator of diastolic dysfunction and poor ventricular filling.

This in turn indicates the pulmonary congestion, as evidenced by the bibasal crackles.

Work Smart

Question 31 of 200

A 51-year-old businessman complains of dyspnoea on exertion. He recently returned from a business trip to the USA.

He has distant heart sounds on auscultation of the chest. A chest radiograph reveals that there is a thin rim of calcification surrounding the cardiac outline.

Which of the following conditions is most likely responsible for these findings?

(Please select 1 option)

○	Group B coxsackie virus
○	Metastatic carcinoma
○	Sarcoidosis
○	Tuberculosis This is the correct answer
◉	Uraemia Incorrect answer selected

The most likely diagnosis is a constrictive pericarditis.

The most probable cause for this is prior tuberculous (TB) infection which may have occurred many years previously. Acute TB would usually cause a constrictive pericarditis secondary to a pericardial effusion, but is not normally associated with calcification.

Uraemia can cause a constrictive pericarditis, as can a pericardial malignancy and coxsackie virus (secondary to a pericarditis), but calcification would be unusual.

Sarcoid can cause both pericardial as well as restrictive cardiomyopathy but calcification would be

Work Smart

Question 33 of 200

A randomised, double-blind, placebo controlled trial of a cholesterol-lowering drug in the primary prevention of coronary heart disease is reported.

1000 subjects are treated with the active drug, and 1000 are given placebo. They are followed up over a five year period and 100 individuals in the placebo group and 80 in the treatment group suffer a myocardial infarction (MI).

Which of the following is the annual percentage risk of myocardial infarction in the group treated with placebo?

(Please select 1 option)

○	0.5%
○	2% This is the correct answer
○	5%
○	8%
◉	10% Incorrect answer selected

In the five years, 100 patients in the placebo group develop an MI.

Assuming this is spread evenly across the years this means that 20 patients (out of 1000) suffer an MI each year.

The annual risk is therefore 20/1000 = 0.02 which, expressed as a percentage is 2.

Work Smart

Question 34 of 200

A new antihypertensive drug needs to be investigated to establish its relative potency.

Which of the following techniques is most appropriate for this purpose?

(Please select 1 option)

○	Bioassay This is the correct answer
○	Case-control study
○	Double blind, randomised, placebo controlled study
○	Postmarketing surveillance
◉	Sequential trial Incorrect answer selected

Biological assays are designed to measure the relative potency of different preparations.

Blood pressure is highly variable and is subject to variability because of the patient's level of anxiety and the method used by the observer to measure it.

In a test of efficacy of an antihypertensive drug, a double blind, randomised design would be favourable.

A sequential trial (a trial in which the data are analysed after each participant's results become available and the trial continues until a clear benefit is seen in one of the comparison groups) could also be used to assess efficacy, but there would have to be a large expected difference from placebo.

Work Smart

Question 37 of 200

A 25-year-old, previously healthy, woman has worsening fatigue with dyspnoea, palpitations, and fever over the past one week.

Her vital signs on admission to the hospital show temperature 38.9°C, respiratory rate 30/min, pulse 105 bpm, and BP 95/65 mmHg. Her heart rate is irregular.

An ECG shows diffuse ST-T segment changes. A chest x ray shows mild cardiomegaly. An echocardiogram shows slight mitral and tricuspid regurgitation, but no valvular vegetations. Her troponin I is 12 ng/mL (<0.04).

She recovers over the next two weeks with no apparent sequelae.

Which of the following laboratory test findings best explains the underlying aetiology for these events?

(Please select 1 option)

○	ANCA titre of 1:80
○	Anti-streptolysin O titre of 1:512
○	Blood culture positive for streptococcus, viridans group
○	Coxsackie B serologic titre of 1:160 This is the correct answer
◉	Total serum cholesterol of 9.6 mmol/l Incorrect answer selected

She has findings that suggest myocarditis, and this is supported by the temperature, echo findings, and markedly raised troponin.

Myocarditis can have features similar to cardiomyopathy and the mild valvular disease is quite

compatible.

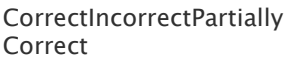
One of the most likely organisms is Coxsackie B virus.

Next question | Go to summary

Answer Statistics

Times answered: 8798

Test Analysis



Score: 11.11%

Total Answered: 36

Feedback

Work Smart

Question 38 of 200

A 44-year-old man has had no major medical problems throughout his life, except for arthritis pain involving all extremities for the past couple of years.

He has had worsening orthopnoea and ankle oedema in the past six months. He is afebrile. There is no chest pain. A chest x ray shows cardiomegaly with both enlarged left and right heart borders, along with pulmonary oedema.

Laboratory test findings include:

Sodium	139 mmol/L	(137-144)
Potassium	4.3 mmol/L	(3.5-4.9)
Urea	7 mmol/L	(2.5-7.5)
Creatinine	95 µmol/L	(60-110)
Glucose	8.6 mmol/L	(3.0-6.0)

Which of the following additional laboratory test findings is he most likely to have?

(Please select 1 option)

◉	Anti-centromere antibody titre of 1:320	Incorrect answer selected
○	Erythrocyte sedimentation rate of 79 mm/hr	
○	Haemoglobin of 107 g/L with MCV of 72 fL	
○	Serum ferritin of 3400 pmol/L	This is the correct answer

○ Spherocytes in his peripheral blood smear

He has findings of a cardiomyopathy with right and left heart failure. Hereditary haemochromatosis (HHC) is suspected with a serum ferritin greater than 1000 and confirmed by genetic testing.

Hereditary haemochromatosis is characterised by diabetes, congestive cardiac failure (CCF), pseudogout, and slate-grey skin.

> "HHC is an autosomal recessive condition and in 90% of cases in the United Kingdom (UK) the condition is owing to homozygosity for the C282Y mutation in the HFE gene. A second mutation in the HFE gene, H63D, can cause the disease when in the presence of a single C282Y mutation (the so-called 'compound heterozygote' state). These mutations are common in people of Northern European origin with a carrier frequency of the C282Y mutation of one in 10-17, in the UK, suggesting a prevalence of people homozygous for the C282Y mutation of between one in 100 and one in 280.
>
> If HHC becomes symptomatic by mid-life, a general practitioner (GP) with a list size of 2,000 patients should have approximately four cases. In our experience most GPs claim to have never seen a case. Herein lies the conundrum: is HHC far more common than is currently recorded in clinical records and death registers because it is not being diagnosed, or does significant disease not develop in a large proportion of C282Y homozygotes and compound heterozygotes?"[1]

Reference:

1. Emery J, Rose P. Hereditary haemochromatosis: never seen a case? *Br J Gen Pract.* 2001;51:347-8.

Next question | Go to summary

Answer Statistics

Work Smart

Question 39 of 200

A 74-year-old man has had increasingly severe, throbbing headaches for several months, centred on the right. There is a palpable tender cord-like area over his right temple.

His heart rate is regular with no murmurs, gallops, or rubs. Pulses are equal and full in all extremities, BP is 110/85 mmHg. A biopsy of this lesion is obtained, and histologic examination reveals a muscular artery with lumenal narrowing and medial inflammation with lymphocytes, macrophages, and occasional giant cells. He improves with a course of high-dose corticosteroid therapy.

Which of the following laboratory test findings is most likely to be present with this disease?

(Please select 1 option)

○	Anti-double stranded DNA titre of 1:1024
○	Erythrocyte sedimentation rate of 50 mm/hr This is the correct answer
○	HDL cholesterol of 0.6 mmol/L
○	pANCA titre of 1:160
◉	Rheumatoid factor titre of 80 IU/mL Incorrect answer selected

These are classic findings for temporal arteritis, the most typical involvement with giant cell arteritis.

Corticosteroid therapy typically produces a reduction of symptoms.

Not treating this condition puts the patient at risk for involvement of other branches of the external carotid artery, the worst of which would be the ophthalmic branch.

Work Smart

Question 40 of 200

A 66-year-old man has developed chronic renal failure with a serum urea of 60 mmol/L (2.5-7.5) and creatinine of 650 mol/L (60-110).

Auscultation of the chest reveals a friction rub over the cardiac apex.

Which of the following types of pericarditis is he likely to have?

(Please select 1 option)

○	Constrictive
○	Fibrinous This is the correct answer
○	Haemorrhagic
○	Purulent
◉	Serous Incorrect answer selected

The uraemia leads to exudation of fibrin onto the epicardial and pericardial surfaces.

Haemorrhagic pericarditis is more typical of tuberculosis or metastatic tumour.

Serous pericarditis is more typical of collagen vascular diseases.

Next question | Go to summary

Work Smart

Question 42 of 200

A 68-year-old man has been very ill for months following the onset of chronic liver disease with hepatitis C infection.

He experiences a sudden loss of consciousness and then exhibits hemiplegia on the right. A cerebral angiogram reveals lack of perfusion in the left middle cerebral artery distribution.

Which of the following is the most likely cardiac lesion to be associated with this finding?

(Please select 1 option)

○	Acute rheumatic fever
◉	Left atrial myxoma Incorrect answer selected
○	Libman-Sacks endocarditis
○	Non-bacterial thrombotic endocarditis This is the correct answer
○	Paradoxical thromboembolus

Non-bacterial thrombotic endocarditis (marantic endocarditis) is due to platelet-fibrin thrombi that are prone to embolising.

This form of non-infective endocarditis can be seen in persons who are very debilitated or who have a hypercoagulable state.

The deposition of fibrin on valve leaflets causes sterile vegetations that can embolise.

Work Smart

Question 43 of 200

A 78-year-old female is referred by her GP with high blood pressure. Over the last three months her blood pressure is noted to be around 180/80 mmHg. She has a body mass index of 25.5 kg/m^2 and is a non-smoker.

There are no features to suggest a secondary cause for her hypertension.

Which of the following is the most appropriate treatment for her blood pressure?

(Please select 1 option)

○	Alpha-blocker
○	Angiotensin blocker
○	Angiotensin converting enzyme (ACE) inhibitor
○	Beta-blocker
◉	Calcium channel blocker Correct

This patient has isolated systolic hypertension (systolic BP >160 and diastolic BP <90 mmHg) which is the typical hypertension in the elderly population and is associated with a greater risk than combined systolic/diastolic hypertension.

Based upon studies such as SHEP and Syst-Eur, guidelines suggest treatment with either calcium antagonists or diuretics.

Work Smart

Question 44 of 200

A previously well 27-year-old woman presents with a history of transient ischaemic attack affecting her right side and speech.

She had returned to the United Kingdom from a holiday in New Zealand two days previously.

On examination there was nothing abnormal to find. An ECG, chest x ray, CT brain scan, and routine haematology and biochemistry were all normal.

Which is the most likely underlying abnormality?

(Please select 1 option)

○	Atrial myxoma
○	Carotid artery stenosis
○	Embolus from paroxysmal atrial fibrillation
○	Patent foramen ovale This is the correct answer
◉	Subarachnoid haemorrhage Incorrect answer selected

Whilst you would expect to find leg swelling with a DVT, its absence does not preclude the diagnosis. There is no evidence of subarachnoid haemorrhage here, and carotid artery stenosis is rare in someone so young. Paroxysmal AF is a possibility, but you are given no history of palpitations. Whilst data from autopsy shows atrial myxoma to be present in 1 to 30 in 100,000, in clinical practice they are incredibly rare.

Therefore DVT with PFO (resulting in paradoxical embolus) is the most likely diagnosis, especially in

Work Smart

Question 46 of 200

A 72-year-old man presents with an episode of sudden collapse.

He has had two similar episodes recently, each lasting about one minute. Four years ago he suffered an anterior myocardial infarction.

On examination he was orientated and symptom-free with a regular pulse rate of 80 bpm, BP 140/80 mmHg, and the apex beat was displaced to the left. There was an apical systolic murmur.

There were no signs of trauma. ECG showed sinus rhythm, Q waves, and ST segment elevation anteriorly without reciprocal depression.

Which of the following is the diagnosis?

(Please select 1 option)

○	Acute anterior myocardial infarction
○	Cerebrovascular accident
○	Epileptic seizure
○	Pulmonary embolism
◉	Ventricular tachycardia Correct

The electrocardiogram is suggestive of a left ventricular (LV) aneurysm, which has a tendency for both a malignant arrhythmogenic focus and also for left ventricular thrombus.

The brief episode of loss of consciousness with no residual neurology makes the diagnosis for cerebral embolism unlikely.

The story is more suggestive of a ventricular tachycardia (VT) and would suggest further investigations. Prolonged heart rhythm monitoring and an echo are recommended.

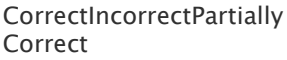
If VT is proven then he should be on amiodarone and the indication for an automated implantable cardioverter/defibrillator strongly considered if the overall LV function is reduced.

Next question | Go to summary

Answer Statistics

Times answered: 9344

Test Analysis



Score: 15.56%

Total Answered: 45

Work Smart

Question 47 of 200

The pulmonary vascular system is different from the systemic circulation in that the pulmonary system demonstrates which of the following?

(Please select 1 option)

○	High pressures, high flow rates, highly compliant vessels
○	High pressures, high flow rates, low compliance vessels
◉	Low pressures, high flow rates, high compliance vessels — Incorrect answer selected
○	Low pressures, low flow rates, high compliance vessels — This is the correct answer
○	Low pressures, low flow rates, low compliance vessels

The normal pulmonary circulation is characterised by low pressures, low flow rates, high compliance vessels.

Next question | Go to summary

Answer Statistics

1 6%
2 10%
3 43%

Work Smart

Question 48 of 200

A 70-year-old man is admitted with an acute Q wave inferior myocardial infarction (MI).

On day five, he suddenly develops pulmonary oedema and a loud systolic murmur.

Which of the following would be the most useful in establishing a diagnosis?

(Please select 1 option)

○	Chest x ray
○	Coronary arteriography
○	ECG
○	Right heart catheterisation and oximetry This is the correct answer
◉	Serum cardiac enzymes Incorrect answer selected

This patient has developed acute left ventricular failure (LVF) five days after an inferior MI.

Things to think about include mitral valve (MV) prolapse, ventricular septal defect (VSD), or acute pericardial effusion/haemorrhage.

Right heart studies would provide information on left atrium (LA) pressures and suggestive information on the most likely diagnosis: MV prolapse.

Next question | Go to summary

Work Smart

Question 49 of 200

Which of the following findings is the most specific for a diagnosis of myocardial infarction?

(Please select 1 option)

○	An akinetic area of LV wall motion on ECHO
○	Elevated cardiac enzymes
○	Evolution of Q waves on ECG This is the correct answer
○	History of severe chest pain
◉	ST elevation on ECG Incorrect answer selected

Cardiac enzymes may be elevated in pulmonary embolism (PE), renal failure, and sepsis. It is increasingly recognised that raised troponin is not specific to myocardial ischaemia, and therefore must be interpreted in the context of the clinical history. Raised ST segments can be associated with conditions such as pericarditis, and is again not specific for myocardial ischaemia.

As any medical doctor on call knows, severe chest pain has a vast number of differential diagnoses.

Akinetic wall motion on the echo may occur with any regional disease process like amyloid, etc.

The evolution of Q waves is the most suggestive of an infarct. A Q wave is any negative deflection that precedes an R wave on the ECG. Small Q waves are normal in most leads, and they can be prominent in leads III and aVR as a normal variant, but should not be seen in leads V1-V3. They are considered pathological if they are more than 1 mm wide, more than 2 mm deep, more than 25% of the depth of the QRS complex, or seen in leads V1-V3. Such pathological Q waves usually indicate

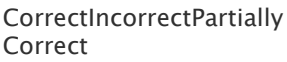
prior full thickness myocardial infarct.

Next question | Go to summary

Answer Statistics

Times answered: 8695

Test Analysis



Score: 14.58%

Total Answered: 48

Feedback

Work Smart

Question 51 of 200

In a normal heart, the oxygen saturation of a sample of blood taken from a catheter in the pulmonary capillary wedge position should be equal to a sample from which of the following?

(Please select 1 option)

○	Coronary sinus
○	Femoral artery This is the correct answer
○	Pulmonary artery
◉	Right atrium Incorrect answer selected
○	Right ventricle

This is a tricky question, but hopefully the following explanation will aid your understanding.

Catheters placed in the pulmonary capillary wedge position are used to provide an indirect estimate of left atrial pressure. Left ventricular pressure can be directly measured with a catheter within the left ventricle, but this cannot be advanced into the left atrium. Left atrial pressure can be measured directly by punching through the interatrial septum from the right septum, but the potential for harm with this method is high.

Pulmonary capillary wedge pressure is therefore measured by inserting a balloon-tipped, multilumen Swan-Ganz cathter into a peripheral vein which is then advanced into the right atrium, right ventricle, pulmonary artery, and then a branch of the pulmonary artery. There is a small balloon just behind the tip of the catheter, which is inflated with air. There are two openings in the catheter: one distal to the balloon and one several centimetres proximal to the balloon. These can be connected to pressure

transducers, or used to measure the oxygen saturations of blood.

When properly positioned, the distal port measures pulmonary artery pressure (~25/10 mmHg) and the proximal port measures right atrial pressure (~0-3 mmHg). The balloon is then inflated, which occludes the branch of the pulmonary artery. When this occurs, the pressure in the distal port rapidly falls, and after several seconds reaches a stable lower value that is very similar to left atrial pressure (normally ~8-10 mmHg). This is because the occluded vessel and its distal branches that eventually form the pulmonary veins act as a long catheter that measures the blood pressures within the pulmonary veins and left atrium.

After aspirating enough volume (5-7 ml) to clear the blood from the pulmonary artery distal to the inflated balloon, the oxygen saturation should be similar to that measured by arterial blood gas (e.g. of femoral artery) or pulse oximetry.

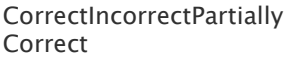
Next question

Go to summary

Answer Statistics

Times answered: 8981

Test Analysis



Work Smart

Question 53 of 200

You are asked to see a patient in the intensive care unit who is short of breath and tachycardic, to rule out a cardiac cause of her symptoms.

A right heart catheter reveals that the mixed venous O2 saturation is 70%; the pulmonary capillary wedge O2 saturation is 97%. The haemoglobin is normal and the patient is afebrile.

Which of the following is the most appropriate statement that could be applied to her features?

(Please select 1 option)

○	Her cardiac output is decreased
○	Her cardiac output is normal This is the correct answer
○	Her heart is normal
○	She has high-output failure
◉	She is in shock due to a non-cardiac cause Incorrect answer selected

The right heart and wedge catheters show normal saturations, the latter suggesting that she has good pulmonary oxygenation and so these features would argue against any failure.

Decreased or high output failure would certainly argue against shock of any sort; therefore, one cannot go as far as to say that she has a normal heart, so the best response (by a process of elimination) is that she has a normal output.

Work Smart

Question 54 of 200

Which one of the following statements is true concerning complete atrioventricular septal defects?

(Please select 1 option)

○	Are seen frequently in patients with trisomy 21 — This is the correct answer
○	Frequently have aortic valve (AV) insufficiency
○	Have a normal mitral valve structure
○	Include a coronary sinus atrial septal defect (ASD)
◉	Include a perimembranous ventricular septal defect — Incorrect answer selected

Partial AV canal defects or ostium primum ASDs are seen in Down's syndrome.

Sinus venous defects seem to be rare in Down's syndrome.

Possibly 50% of children with Down's syndrome have a cardiac defect.

Further Reading:

National Association for Child Development. Congenital Heart Disease in Children with Down Syndrome.

Next question | Go to summary

Work Smart

Question 55 of 200

A 74-year-old man presented with acute pain, pallor, and absent pulses in his right leg.

Investigations revealed an embolus in his femoral artery.

Which of the following is the most likely source of this embolus?

(Please select 1 option)

○	Marantic endocarditis
◉	Paradoxical emboli Incorrect answer selected
○	Rheumatic endocardial vegetations
○	Right ventricular thrombi
○	Thrombi from an atheromatous aorta This is the correct answer

Ulceration of an atheromatous plaque of the abdominal aorta is the most common source of emboli in this situation.

Right ventricular thrombi would embolise to the lung.

The others are possible but less likely causes.

Next question | Go to summary

Work Smart

Question 56 of 200

A 62-year-old male undergoes cardioversion for idiopathic atrial fibrillation (AF). Post-procedure he was shown to be in sinus rhythm.

Medication at admission included warfarin, digoxin and atenolol, which he had been taking for the last six weeks.

Which of the following agents should he continue to take until he is seen in clinic in six weeks time?

(Please select 1 option)

○	Aspirin
◉	Atenolol ✗ Incorrect answer selected
○	Digoxin
○	Sotalol
○	Warfarin ✓ This is the correct answer

This patient has undergone successful cardioversion for idiopathic AF and needs to remain on warfarin as his risk of further thromboembolism, due to the fact that his atria are now contracting, normally remains high up until six weeks after achieving sinus rhythm.

Digoxin is not required post-procedure as neither it, nor atenolol, maintains sinus rhythm.

Aspirin is not as good as warfarin in preventing thromboembolic disease.

Sotalol, like amiodarone, is good at chemical cardioversion and maintaining SR but its role post-cardioversion is uncertain.

Work Smart

Question 57 of 200

A 50-year-old male is admitted with a three hour history of central chest pain, sweating, and nausea.

He has no relevant past medical history although his father died of an MI at the age of 48 and he is a smoker of five cigarettes per day. He currently takes no medication. He is seen in the morning on the consultant ward round 12 hours after admission and his pain has now settled.

Examination reveals no specific abnormality and his ECG is normal.

Which of the following investigations would be most appropriate at this point for this patient?

(Please select 1 option)

○	Coronary angiography
○	Echocardiography
◉	Endoscopy Incorrect answer selected
○	Exercise ECG
○	Troponin T This is the correct answer

This question tests your knowledge of the initial management and investigation of chest pain, which is something you will need to be fully aware of for the exam and clinical practice.

This gentleman has a number of risk factors for acute coronary syndrome: he is a smoker and has a strong family history of ischaemic heart disease (IHD). The history he gives would be consistent with cardiac chest pain.

As you will all know, acute coronary syndrome and angina have a poor prognosis and it is therefore

important to diagnose it accurately and in a prompt fashion. It is important to distinguish between suspected acute coronary syndrome (ACS) and stable angina as the management differs markedly. 'Acute coronary syndrome' includes unstable angina, ST-segment elevation myocardial infarction (STEMI) and non-ST-segment elevation myocardial infarction (NSTEMI).

Symptoms which may indicate ACS include:

- Pain in the chest and/or other areas (e.g. arms, back, or jaw) lasting longer than 15 minutes
- Chest pain associated with nausea and vomiting, marked sweating, breathlessness, haemodynamic instability, or particularly a combination of these
- New onset chest pain, or abrupt deterioration in previously stable angina, with recurrent chest pain occurring frequently and with little or no exertion, and with episodes often lasting longer than 15 minutes.

Response to glyceryl trinitrate (GTN) should not be used to make the diagnosis. Symptoms do not present differently between sexes, or ethnic groups.

Patients who present with acute chest pain should have a 12-lead ECG as soon as possible. A normal ECG does not exclude acute coronary syndrome.

If the resting 12-lead ECG shows regional ST-segment elevation or presumed new left bundle block, local protocols should be followed, which will often be to send these patients for immediate primary percutaneous coronary intervention (PCI).

Patients whose ECG shows regional ST-segment depression, deep T-wave inversion, or Q waves (known or presumed to be new) suggestive of an NSTEMI or unstable angina should be treated as acute coronary syndrome immediately and a 12 hour troponin carried out for diagnostic and prognostic purposes.

If the resting 12-lead ECG is normal ACS should not be excluded. Serial resting ECGs should be taken and any new changes acted upon.

Management of ACS should be started as soon as suspected. Pain relief should be given in the form of GTN (sublingual or buccal) and/or intravenous opioids. 300 mg aspirin should be given to all, unless there is clear evidence of an allergy. Other antiplatelet agents are given dependent on local policy, and the presence of ECG changes.

Supplemental oxygen should only be given to those with saturations of less than 94%, who are not at risk of hypercapnic respiratory failure (target saturations 94-98%, 88-92% in those with COPD who are at risk of hypercapnic respiratory failure).

Full bloods should be done on admission to hospital, including a baseline troponin (I or T). This troponin is not used immediately for interpretation of the cause of chest pain, but can be used to show a rise in patients who have an elevated baseline troponin (for example those with renal impairment).

A second blood sample is taken for troponin I or T 10-12 hours after the onset of symptoms. A

myocardial infarct can be diagnosed when there is a rise and/or fall of troponin (with at least one value abouve the 99th percentile of the upper reference limit) together with evidence of myocardial ischaemia (symptoms, new ST changes/LBBB/new Q waves, imaging demonstrating new loss of myocardium or regional wall motion abnormality).

You should be aware that there are other causes of raised troponin, including myositis, aortic dissection, and pulmonary embolism.

Patients who give a good history for cardiac chest pain, but their troponin is negative, should be investigated for stable chest pain. It is in these patients where an exercise test is useful to determine the presence of ischaemia on exertion.

Cardiac angiography is indicated in those patients who have a positive exercise test, or who have had a NSTEMI, or unstable angina. The timing is determined by individual risk factors, but a troponin is always determined prior to considering angiography (except of course with STEMIs).

Reference:

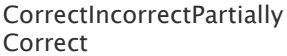
NICE. Chest pain of recent onset: assessment and diagnosis (CG95).

Next question | Go to summary

Answer Statistics

Times answered: 11095

Test Analysis



Work Smart

Question 58 of 200

A 55-year-old female who received radioactive iodine over five years ago presents for annual thyroid function assessment. She is well and takes no medication.

Her results reveal:

Free Thyroxine	13.2 pmol/L	(10-22)
TSH	16 mU/L	(0.4-5)
Total cholesterol	6.8 mmol/L	(<5.2)
Plasma triglycerides	2.2 mmol/L	(0.45-1.69)

Which is the most appropriate treatment for this patient's dyslipidaemia?

(Please select 1 option)

○	Cholestyramine
◉	Fibrate therapy Incorrect answer selected
○	Hormone replacement therapy
○	Statin therapy
○	Thyroxine This is the correct answer

This patient has subclinical hypothyroidism as reflected by the normal thyroxine (T_4) but elevated

thyroid stimulating hormone (TSH).

A hypercholesterolaemia with hypertriglyceridaemia is frequently associated due to impaired lipoprotein lipase function.

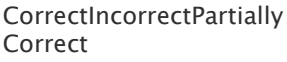
The dyslipidaemia may well resolve following the appropriate replacement with thyroxine.

Next question | Go to summary

Answer Statistics

Times answered: 8644

Test Analysis



Score: 14.04%

Total Answered: 57

Work Smart

Question 59 of 200

A 68-year-old woman with atrial fibrillation (AF) is admitted for DC cardioversion.

The procedure resulted in successful restoration of sinus rhythm.

Which one of the following drugs would be most likely to maintain sinus rhythm following this procedure?

(Please select 1 option)

○	Amiodarone This is the correct answer
○	Digoxin
○	Diltiazem
◉	Sotalol Incorrect answer selected
○	Verapamil

Amiodarone has been shown to be superior in maintaining sinus rhythm following DC cardioversion of AF, however, it is associated with more toxic side effects than the other agents mentioned.

Neither verapamil, diltiazem nor digoxin would be expected to maintain sinus rhythm to any significant extent.

Sotalol may be considered as a possible therapy but is less effective than amiodarone.

Work Smart

Question 60 of 200

A paper describes a new diagnostic test for myocardial infarction (MI).

You want to know what proportion of patients who are classified as not having had a myocardial infarction by the test, will actually not have had a myocardial infarction.

Which one of the following measurements would indicate this?

(Please select 1 option)

○	Accuracy
◉	Negative predictive value Correct
○	Positive predictive value
○	Sensitivity
○	Specificity

The proportion of 'true negatives' not having had a MI correctly identified by this test is called the negative predictive value; it refers to the number accurately identified to not have MI by the new test, over the number without MI identified by the test + those wrongly identified as not having had an MI.

Specificity is the number without MI accurately identified.

Sensitivity refers to the number correctly identified with MI by the new test.

A positive predictive value refers to the number accurately identified with MI by the test over the number accurately identified with MI + those wrongly identified with MI.

Candidates are often confused about the differences between sensitivity/specificity and positive/negative predictive values. We have had a lot of queries from candidates, asking us why the answer is negative predictive value and not specificity, since the definition of both seems to be similar. There is, however, a difference and you may wish to read further into this if you are having similar difficulties.

If you consider the example of a condition for which there is a test, essentially a knowledge of the sensitivity/specificity is based on the *disease state* itself, whereas predictive values are based on the *test result*.

Further Reading:

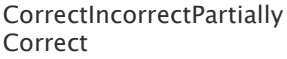
1. Altman DG, Bland JM. Diagnostic tests 1: Sensitivity and specificity. *BMJ.* 1994;308(6943):1552.
2. Altman DG, Bland JM. Diagnostic tests 2: Predictive values. *BMJ.* 1994;309(6947):102.

Next question | Go to summary

Answer Statistics

Times answered: 10832

Test Analysis



Work Smart

Question 62 of 200

A 60-year-old man with diabetes presents to clinic for advice on prevention of a further heart attack after having sustained a myocardial infarction five years previously.

He takes metformin 500 mg tds, bendroflumethiazide 2.5 mg daily, and aspirin 150 mg daily. His body mass index was 33.5 kg/m^2, with a pulse of 82 beats per minute regular, and a blood pressure of 152/92 mmHg. His cholesterol concentration is 3.3 mmol/l (<5.5).

Which is the most appropriate strategy for this patient?

(Please select 1 option)

○	24 hour ambulatory ECG
○	Atorvastatin
○	Increase aspirin from 150 mg to 300 mg daily
○	Orlistat
◉	Ramipril Correct

The most appropriate strategy for secondary prevention would involve further blood pressure reduction with an angiotensin converting enzyme inhibitor (ACEi), which would not only reduce cardiovascular (CV) risk as suggested by the HOPE study, but would also reduce microvascular risk as revealed by UKPDS.

The NCEP ATPIII criteria suggest a cholesterol of less than 4, but this patient already has a low cholesterol and would not benefit as much from the addition of a statin.

The increase of aspirin from 150 to 300 mg would offer no added advantage.

Orlistat is used under specific criteria for weight reduction and has, as yet, not been shown to reduce CV risk in type 2 diabetes mellitus (T2DM).

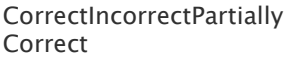
There is no reason here for a 24 hour tape.

Next question | Go to summary

Answer Statistics

Times answered: 11089

Test Analysis



Score: 16.39%

Total Answered: 61

Work Smart

Question 63 of 200

An 80-year-old male presented with palpitations of five hours duration.

One month previously he suffered weakness of the right arm and problems with his speech which resolved within four hours. He was taking no medication.

On examination, he was stable with a pulse of 135 beats per minute which was confirmed to be atrial fibrillation on ECG. He had a blood pressure of 112/80 mmHg and appeared clinically euthyroid.

Within one hour he reverted to sinus rhythm spontaneously.

Echocardiogram was normal but a 24 hour ECG revealed three episodes of atrial fibrillation each lasting around ten minutes.

Which one of the following is the most appropriate initial treatment for this patient?

(Please select 1 option)

○	Amiodarone
○	Aspirin
◉	Atenolol Incorrect answer selected
○	Digoxin
○	Warfarin This is the correct answer

The most appropriate initial therapy for this patient who has a high risk of thrombo-embolic stroke is anticoagulation with warfarin maintaining an international normalised ratio (INR) between 2-3.

This should be the initial priority as he has already had one episode of transient ischaemic attack (TIA).

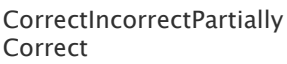
The maintenance of sinus rhythm would be the next step and amiodarone or sotalol are options.

Next question | Go to summary

Answer Statistics

Times answered: 9481

Test Analysis



Score: 16.13%

Total Answered: 62

Work Smart

Question 64 of 200

A 72-year-old man noted to have a systolic murmur undergoes an echocardiogram which demonstrates aortic stenosis.

Which of the following is associated with a poor prognosis in this patient?

(Please select 1 option)

○	Aortic regurgitation
◉	Cardiomegaly on chest x ray Incorrect answer selected
○	Clinical features of left ventricular failure This is the correct answer
○	ECG evidence of left ventricular hypertrophy
○	Severe valvular calcification on echocardiogram

Aortic stenosis is associated with a worse prognosis when accompanied by left ventricular (LV) dysfunction.

Other predictors of a poorer prognosis include:

- Increasing gradient across the valve (above 70 mmHg)
- Age of patient, and
- Symptomatology.

Although the severity of valvular calcification is prognostically important in an asymptomatic patient, the most important predictor is LV function.

Work Smart

Question 65 of 200

A 40-year-old female with mitral stenosis consults for advice regarding operative procedures.

In which of the following circumstances would antibiotic prophylaxis of infective endocarditis be required?

(Please select 1 option)

○	Caesarian section
○	Cardiac catheterisation
○	Dental scaling
◉	Termination of pregnancy Incorrect answer selected
○	None of the above This is the correct answer

According to NICE guidelines, antibiotic Prophylaxis against infective endocarditis (CG64) is not recommended in common cardiac valve abnormalities.

Prophylaxis is only recommended in those patients who are at highest risk of adverse outcomes on the development of endocarditis. These patient groups include:

- Prosthetic cardiac valve or prosthetic material used for cardiac valve repair
- Previous endocarditis
- Unrepaired cyanotic congenital heart disease including palliative shunts and conduits
- Completely repaired congenital heart defect with prosthetic material or device, whether placed by surgery or by catheter intervention, during the first six months after the procedure
-

Repaired congenital heart disease with residual defects (persisting leaks or abnormal flow) at the site or adjacent to the site of a prosthetic patch or prosthetic device (which inhibit endothelialisation)

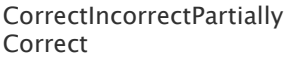
- Cardiac transplantation recipients who develop cardiac valve abnormalities.

Next question | Go to summary

Answer Statistics

Times answered: 11051

Test Analysis



Score: 15.62%

Total Answered: 64

Work Smart

Question 66 of 200

A 72-year-old woman presented with acute severe chest pain with an ECG revealing ST segment elevation in leads II, III and, aVF.

She was treated with thrombolysis but two days later became acutely unwell.

Examination revealed a loud systolic murmur at the apex which radiated into the axilla with associated pulmonary oedema.

Which of the following is the most likely diagnosis?

(Please select 1 option)

○	Acute left ventricular failure
○	Cardiogenic shock
○	Pericarditis
○	Ruptured papillary muscle This is the correct answer
◉	Ventricular septal defect Incorrect answer selected

The most likely explanation in this patient with a prior inferior myocardial infarct is mitral valve prolapse due to papillary muscle rupture.

Next question | Go to summary

Work Smart

Question 67 of 200

A 60-year-old woman with a two year history of diet controlled type 2 diabetes was admitted with an acute myocardial infarction (MI).

She received thrombolysis together with an insulin infusion and has done well, apart from mild ankle swelling which has been managed with a small dose of furosemide.

Investigations revealed a fasting glucose of 12 mmol/L (3.0-6.0) together with a cholesterol of 6.6 mmol/L (<5.2). Her HbA_{1c} was 60 mmol/mol (20-42).

Which of the following is the most appropriate treatment for her subsequent glycaemic control?

(Please select 1 option)

◉	Continue diet alone Incorrect answer selected
○	Gliclazide modified release
○	Metformin
○	Pioglitazone
○	Subcutaneous insulin This is the correct answer

Following DIGAMI-1 study, it was assumed that three months of insulin was appropriate post-MI.

However, DIGAMI-2 which specifically looked at mortality found no differences between control with oral hypoglycaemic agents (OHAs), insulin, or routine metabolic management.

In the BNF, metform in is listed as contraindicated within six weeks of MI.

Therefore, in this patient we should aim for tighter glycaemic control and probably subcutaneous insulin would be most appropriate here in the first instance, with an early review of glycaemic control at six weeks.

The option then would be to switch to metformin.

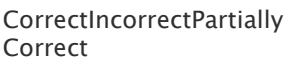
In view of the mild heart failure, pioglitazone should be avoided.

Next question | Go to summary

Answer Statistics

Times answered: 11089

Test Analysis



Score: 15.15%

Total Answered: 66

Work Smart

Exam Themes May 2002

Question 68 of 200

A 50-year-old politician presented with a strange fluttering sensation in his chest, but no chest pain. The symptoms had lasted 24 hours.

An ECG revealed atrial fibrillation with a ventricular rate of 130 beats per minute.

Which one of the following drugs is most likely to restore sinus rhythm?

(Please select 1 option)

○	Adenosine
○	Bisoprolol
◉	Digoxin Incorrect answer selected
○	Flecainide This is the correct answer
○	Verapamil

Flecainide is the drug most likely to restore sinus rhythm in atrial fibrillation.

Care is required in patients who may have left ventricular (LV) dysfunction, although this is unlikely in a previously fit, relatively young patient.

Adenosine is used to cardiovert supraventricular tachycardia (SVT).

Digoxin and bisoprolol are indicated for rate control and are not normally associated with the restoration of sinus rhythm.

Verapamil can be used for rate control in atrial fibrillation, and may be used in the treatment of SVT.

Work Smart

Question 69 of 200

A 78-year-old female with diabetes presented with a two-day history of melaena and dizziness. She had taken an unknown analgesic four days previously.

On examination, she was pale with a pulse of 90 beats per minute, a blood pressure of 100/65 mmHg, and a lower midline scar from an operation for intermittent claudication three months previously.

Investigations revealed:

Haemoglobin	80 g/L	(130-180)
Faecal occult blood	Strongly positive	
Upper gastrointestinal tract endoscopy	Normal	

Which of the following is the most likely cause of her upper gastrointestinal (GI) haemorrhage?

(Please select 1 option)

○	Aorto-enteric fistula	This is the correct answer
○	Gastric erosions	
○	Gastric ulcer	
○	Mallory-Weiss syndrome	
◉	Oesophageal varices	Incorrect answer selected

The upper GI endoscopy is normal, therefore GU, gastric erosions, varices, and Mallory-Weiss syndrome are unlikely.

The strongly positive faecal occult blood (FOB) suggests significant GI haemorrhage.

Aorto-enteric fistulae (AEF) are now known to occur following endovascular repair of abdominal aortic aneurysms (AAA) and secondary to aortic grafting of any kind, presumably because of mechanical forces of dislodged or migrating devices.

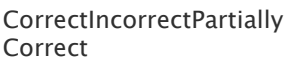
This patient may well have had an aortobifemoral graft as treatment for peripheral vascular disease.

Next question | Go to summary

Answer Statistics

Times answered: 10211

Test Analysis



Work Smart

Question 70 of 200

Which of the following is not associated with left atrial myxoma?

(Please select 1 option)

○	A mid-systolic click This is the correct answer
○	Adrenal hyperplasia
○	Left atrial dilatation
○	Sudden death
◉	Systemic emboli Incorrect answer selected

Atrial myxomas in the heart make up 50% of primary cardiac tumours.

They are most common in the left atrium arising from a pedicle on the fossa ovalis. One third present with emboli, a third with systemic inflammation (erythrocyte sedimentation rate [ESR] elevated in a third), and a third are asymptomatic when detected.

They can intermittently flop through the mitral valve and cause a mid-diastolic click (tumour plop) when they stop moving.

Elevated left atrial pressures cause dilatation. Syncope can occur due to obstruction. They are more common in women.

Carney's complex is a familial multiple neoplasia and lentiginosis syndrome, associated with:

- Primary adrenal hypercortisolism

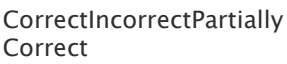
- Lentigines and naevi of the skin
- Various tumours including myxoma.

Next question | Go to summary

Answer Statistics

Times answered: 9015

Test Analysis



Score: 14.49%

Total Answered: 69

Feedback

Work Smart

Question 71 of 200

A 57-year-old female school cleaner is undergoing investigation for breathlessness.

Which of the following is NOT in keeping with a diagnosis of constrictive pericarditis?

(Please select 1 option)

○	Ascites
○	Low JVP with no x and y descent This is the correct answer
○	Orthopnoea
○	Peripheral oedema
◉	Previous cardiac surgery Incorrect answer selected

Constrictive pericarditis typically impedes late diastolic ventricular filling, which produces an elevated jugular venous pressure (JVP), with prominent x and y descent.

Pulsus paradoxus is a variable finding, unless a pericardial effusion with an abnormally elevated pressure exists.

Other signs include:

- Oedema
- Ascites
- Hepatomegaly
- Orthopnoea
- Dyspnoea.

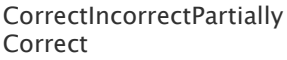
Constrictive pericarditis may be a subtle cause of dyspnoea after cardiac surgery.

Next question | Go to summary

Answer Statistics

Times answered: 9549

Test Analysis



Score: 14.29%

Total Answered: 70

Feedback

Work Smart

Question 72 of 200

Which of the following is the most likely mechanism by which aspirin exerts its beneficial effects in patients with coronary artery disease?

(Please select 1 option)

◉	Anti-inflammatory action Incorrect answer selected
○	Cyclo-oxygenase (COX) inhibition This is the correct answer
○	Glycoprotein IIB/IIIA receptor inhibition
○	Inhibition of binding of adenosine diphosphonate (ADP) to its platelet receptor
○	Structural changes in platelets

It inhibits platelet aggregation through inhibition on both COX I and II.

Clopidogrel inhibits ADP binding to platelet receptors.

Next question | Go to summary

Answer Statistics

Work Smart

Question 74 of 200

A study reveals an immediate rise in blood pressure following infusion of a hormone in normal volunteers.

Which of the following is the most likely hormone used in this study?

(Please select 1 option)

○	Angiotensin I
○	Angiotensin II This is the correct answer
○	Atrial natriuretic peptide (ANP)
○	Brain natriuretic peptide (BNP)
◉	Prolactin Incorrect answer selected

Angiotensin II, when infused intravenously, produces an immediate rise in blood pressure being a potent vasoconstrictor.

Both BNP and ANP result in natriuresis and lowering of blood pressure.

Prolactin has no specific effect.

Next question | Go to summary

Work Smart

Question 75 of 200

A 69-year-old man is treated for chest infection.

He has been on a stable dose of warfarin for the last six months as a treatment for atrial fibrillation, with INR recordings between 2-2.5. However, his most recent INR was 5 (<1.4).

Which one of the following drugs that has recently been started is likely to be responsible for the increased INR?

(Please select 1 option)

○	Clarithromycin This is the correct answer
○	Co-dydramol
○	Digoxin
○	Rifampicin
◉	Temazepam Incorrect answer selected

Clarithromycin increases the anticoagulant effect of warfarin, through cytochrome P450 enzyme inhibition. Patients who receive clarithromycin (or other macrolides) whilst on warfarin should have their INR closely monitored, as the dose may need to be reduced to avoid an unsafe INR.

Rifampicin is a P450 enzyme inducer and would reduce the anticoagulant effect.

Ciprofloxacin and sulphonamides will also increase the anticoagulant effect of warfarin.

Temazepam, digoxin, and codeine have no appreciable effect on warfarin metabolism.

Work Smart

Exam Themes January 2006

Question 77 of 200

A 29-year-old woman presents with acute right sided weakness.

She has one child aged 4 years and had two spontaneous abortions in the past. After the birth of her child she developed a DVT and required three months' anticoagulation with warfarin.

Examination revealed a right hemiparesis. A CT head scan showed a left middle cerebral artery territory infarct.

Which is the most likely finding on echocardiography?

(Please select 1 option)

◉	Atrial septal defect ✗ Incorrect answer selected
○	Bicuspid aortic valve
○	Left atrial myxoma
○	Normal appearances ✓ This is the correct answer
○	Ventricular septal defect

This patient has a prothrombotic tendency suggestive of the lupus anticoagulant with recurrent abortions, previous deep vein thrombosis (DVT) and now she has developed a right hemiparesis.

This has occurred off warfarin and it is highly unlikely to be due to any right to left transference of clot.

It is more likely to be due to spontaneous infarct related to the thrombophilia and her heart is likely to be normal.

Work Smart

Question 78 of 200

A 70-year-old woman with established aortic stenosis (AS) attends for annual review.

Which one of the following factors is the most important in deciding the timing of surgery?

(Please select 1 option)

○	Aortic valve gradient of 50 mmHg
○	Left ventricular hypertrophy (LVH)
○	The intensity of the murmur
◉	The patient's symptomatology Correct
○	Valvular calcification

The patient's symptomatology is the most important determinant in terms of the decision to operate on stenotic aortic valves. Dyspnoea, chest pain, and syncope are all features of aortic stenosis, and when present suggest a poor prognosis if left.

A gradient of 50 mmHg would be regarded as moderate to severe aortic stenosis, but you would still consider the patient's symptoms prior to deciding to operate. This gradient is measured as the mean gradient over the valve; the peak gradient can also be considered and a value of over 60 mmHg is considered severe.

Left ventricular hypertrophy is a common feature of aortic stenosis, and alone does not influence the decision for surgery.

Calcific aortic disease is again not important in isolation, and the symptoms and gradient should be

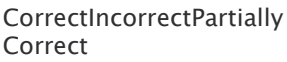
considered.

Next question | Go to summary

Answer Statistics

Times answered: 8670

Test Analysis



Score: 16.88%

Total Answered: 77

Feedback

Work Smart

Question 79 of 200

A 72-year-old man with type 2 diabetes mellitus presented following the sudden onset of palpitations.

An ECG revealed rapid atrial fibrillation. He was commenced on amiodarone but the atrial fibrillation persisted.

Which of the following has been shown to be of greatest benefit in reducing his future risk of vascular events?

(Please select 1 option)

○	Anticoagulation This is the correct answer
○	Aspirin
○	Continuation of amiodarone
◉	DC cardioversion Incorrect answer selected
○	Digoxin

Both sustained and paroxysmal atrial fibrillation (AF) are associated with a relatively high incidence of thromboembolism and stroke.

Clinical trials have demonstrated that warfarin reduces the risk of stroke in patients with AF. This benefit outweighs the risk of bleeding.

Work Smart

Question 80 of 200

A 65-year-old male attends clinic complaining of breathlessness. He has end stage cardiac failure due to dilated cardiomyopathy. Currently he takes furosemide, lisinopril, and carvedilol.

Which one of the following drugs should be added to his current therapy?

(Please select 1 option)

○	Diltiazem
○	Isosorbide mononitrate
○	Nicorandil
○	Spironolactone This is the correct answer
◉	Vitamin C Incorrect answer selected

Spironolactone (aldosterone receptor antagonist) is the optimal add on medication for advanced heart failure symptoms.

Next question | Go to summary

Answer Statistics

1 8%

Work Smart

Question 81 of 200

A 70-year-old female is reviewed in clinic after having had an anterior MI. Her echo reveals some left ventricular impairment.

You are contemplating the addition of a beta blocker to current therapy which consists of bendroflumethiazide, aspirin, and simvastatin.

Which of the following beta blockers should be avoided?

(Please select 1 option)

○	Bisoprolol
○	Carvedilol
○	Metoprolol
◉	Propranolol ✗ Incorrect answer selected
○	Sotalol ✓ This is the correct answer

Sotalol may prolong the QT interval and leads to a risk of ventricular arrhythmias. This can be a particular risk in individuals with hypokalaemia.

The thiazide diuretic bendroflumethiazide predisposes to hypokalaemia, due to its action on inhibiting potassium reabsorption in the distal tubules of the nephrons.

Work Smart

Question 82 of 200

A 65-year-old man is admitted to the coronary care unit with an acute inferior myocardial infarction (MI). There are no contraindications to thrombolysis and he receives streptokinase with good resolution of ECG changes.

Three days later examination is normal, with a blood pressure of 134/76 mmHg. Results reveal a total cholesterol of 4.8 mmol/L (<5.2).

Which one of the following drugs does not have good evidence for reducing future morbidity and mortality?

(Please select 1 option)

○	Aspirin
○	Atenolol
○	Nifedipine This is the correct answer
○	Ramipril
◉	Simvastatin Incorrect answer selected

Aspirin leads to a 12% reduced risk of death and 31% reduced risk of reinfarction in evidence reviewed by the antiplatelet therapy trialists and also GISSI studies.

Several trials have demonstrated benefit from long term treatment with beta blockers, by reducing the incidence of recurrent MI, and death from all causes.

Numerous trials have shown benefit from angiotensin converting enzyme (ACE) inhibitor therapy post

MI in those with and without evidence of left ventricular impairment.

The 4S (Scandinavian Simvastatin Survival Study) demonstrated a benefit from lowering cholesterol with simvastatin in patients with coronary disease[1].

There is no evidence to support a beneficial effect of nifedipine post- MI.

Reference:

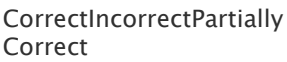
1. Kjekshus J, Pedersen TR. Reducing the risk of coronary events: evidence from the Scandinavian Simvastatin Survival Study (4S). *Am J Cardiol.* 1995;76:64C-68C.

Next question | Go to summary

Answer Statistics

Times answered: 11120

Test Analysis



Work Smart

Exam Themes September 2007

Question 83 of 200

A 27-year-old woman presented with a history of sudden onset right sided weakness and dysphasia lasting eight hours.

She had returned by plane to the United Kingdom from Australia two days previously. She is obese and takes Microgynon but the remainder of physical examination was normal.

Chest x ray, ECG, and a CT head scan were all normal.

Which one of the following investigations is most likely to reveal the underlying cause of this episode?

(Please select 1 option)

○	Carotid Doppler ultrasonography
○	Cerebral angiography
○	MRI of head
○	Transoesophageal echocardiography This is the correct answer
◉	Transthoracic echocardiography Incorrect answer selected

The history here suggests a lower limb deep vein thrombosis with peripheral embolus through a patent foramen ovale, leading to symptoms of left sided cerebral ischaemia.

This is termed the paradoxical embolus, so-called because a thromboembolus arising from the venous circulation can end up in the systemic circulation.

Transoesophageal echocardiography (TOE) is the investigation of choice to investigate for a patent foramen ovale, although transthoracic echocardiography with contrast may be an alternative. TOE

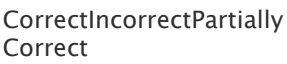
offers better views of the anatomical area.

Next question | Go to summary

Answer Statistics

Times answered: 10483

Test Analysis



Score: 15.85%

Total Answered: 82

Feedback

Work Smart

Question 84 of 200

A 72-year-old man presented following three episodes of transient loss of consciousness not associated with chest pain. There was a previous history of an anterior myocardial infarction.

On examination his blood pressure was 140/80 mmHg and the apex beat was diffuse in character and displaced to the left. There were no neurological signs.

The ECG showed sinus rhythm with occasional ventricular extrasystoles, deep anterior Q waves and ST segment elevation in leads V2-V6, without reciprocal depression.

Which one of the following would be the most appropriate initial course of action?

(Please select 1 option)

○	Administer tissue plasminogen activator
○	Arrange an electroencephalogram
○	Arrange immediate computerised tomography (CT) brain scan
○	Observe in the coronary care unit This is the correct answer
◉	Proceed to coronary arteriography Incorrect answer selected

The history suggests that this man has persistent ST elevation in the anterior leads, with a previous history of anterior myocardial infarction due to left ventricular (LV) aneurysm. The blackouts are cardiac syncope due to rhythm disturbance. An ECHO would quickly support the diagnosis but, because of the risk of sudden death, observation on CCU is required.

The loss of consciousness is likely to be due to recurrent arrhythmic episodes or vertebrobasilar

transient ischaemic attacks (TIAs), as a result of embolisation of an LV thrombus.

The most important investigation for this patient whom you suspect has arrhythmic episodes would be telemetry/24 hour monitoring, and hence observation on the coronary care unit (CCU) is appropriate.

Further Reading

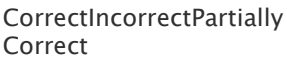
Engel J, et al. Electrocardiographic ST segment elevation: left ventricular aneurysm. *Am J Emerg Med.* 2002;20:238-42.

Next question | Go to summary

Answer Statistics

Times answered: 9369

Test Analysis



Score: 15.66%

Work Smart

Question 85 of 200

A 52-year-old male with a five year history of type 2 diabetes is diagnosed with ischaemic heart disease and has recently commenced atorvastatin 80 mg daily, as his cholesterol was 6.2 mmol/L.

He re-attends complaining of various muscle aches and pains and you find that his liver function tests are elevated from baseline. Pre-treatment ALT was 55 IU/L. Now his ALT is 90 IU/L. He asks whether his statin should be changed or stopped.

Which of the following is the most appropriate next strategy to treat his hypercholesterolaemia?

(Please select 1 option)

○	Atorvastatin 40 mg daily This is the correct answer
○	Bezafibrate
○	Ezetimibe
○	No change required
◉	Simvastatin 20 mg daily Incorrect answer selected

This patient has ischaemic heart disease and type 2 diabetes mellitus and should be receiving a statin as his cholesterol is also elevated. NICE guidance currently recommends starting high-dose statins in patients with type 2 diabetes and established cardiovascular disease.

However he has been intolerant of atorvastatin at its maximum dose with myalgia and raised liver function tests. His LFTs are raised but less that twice the upper limit of normal. The options are to reduce the dose or consider an alternative statin. NICE advises reducing the dose in the first

instance. FIbrates and ezetimibe are generally not recommended in patients with type 2 diabetes. NICE suggests referral to a specialist if statins are completely not tolerated.

Myalgia is a side effect of all statins but the incidence is probably less with rosuvastatin and pravastatin. Starting at a low dose and gradually titrating up can also minimise the risk of side effects: for example, start at 5 mg of rosuvastatin.

If starting another statin, cautious monitoring of LFTs should be performed. If there is a history of statin-related hepatitis or rhabdomyolysis, statins should generally be avoided in the future if possible.

Further Reading:

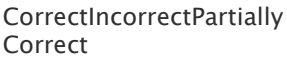
NICE Clinical Knowledge Summaries. Lipid modification - CVD prevention.

Next question | Go to summary

Answer Statistics

Times answered: 10134

Test Analysis



Work Smart

Question 86 of 200

A 52-year-old male attends a well man clinic.

On review, he has a strong family history of ischaemic heart disease, is a smoker of 10 cigarettes per day, and drinks approximately 20 units of alcohol per week.

On examination, he is obese with a BMI of 32 kg/m^2 and has a blood pressure of 152/88 mmHg.

His investigations reveal that he has a fasting plasma glucose of 10.5 mmol/L (3.0-6.0), HbA_{1c} of 62 mmol/mol (20-46) and his cholesterol concentration is 5.5 mmol/L (<5.2).

Which of the following would be expected to be most effective in reducing his cardiovascular (CV) risk?

(Please select 1 option)

○	Improve glycaemic control with metformin
○	Improve hypertensive control with ramipril
○	Reduce cholesterol with simvastatin
○	Stop smoking This is the correct answer
◉	Weight loss with Xenical Incorrect answer selected

This patient has hypertension and diabetes as suggested by the elevated fasting plasma glucose.

Although metformin has been shown to reduce CV mortality in obese diabetics[1], ramipril reduces CV risk in hypertensive diabetics[2], and statins reduce CV mortality[3]; none of these interventions is as

effective as stopping smoking in reducing CV risk.

The best evidence is from The Nurses' Health Study[5] which looked at the risk in 'past smokers' and 'current smokers' in women. In men there is less definitive evidence as the MRFIT trial did not specifically look at past smokers, only baseline smoking status. Despite this lack of explicit evidence it is unlikely that many practitioners would consider the other interventions of relatively more benefit than smoking cessation.

There is no evidence that weight loss per se reduces CV mortality, possibly because the studies have not been carried out.

Reference:

1. The Oxford Centre for Diabetes, Endocrinology and Metabolism (OCDEM). UK Prospective Diabetes Study.
2. Sleight P. The HOPE Study (Heart Outcomes Prevention Evaluation). *J Renin Angiotensin Aldosterone Syst.* 2000;1:18-20.
3. Randomised trial of cholesterol lowering in 4444 patients with coronary heart disease: the Scandinavian Simvastatin Survival Study (4S) *Lancet.* 1994;344:1383-9.
4. Heart Protection Study Collaborative Group. MRC/BHF Heart Protection Study of cholesterol lowering with simvastatin in 20,536 high-risk individuals: a randomised placebo-controlled trial. *Lancet.* 2002;360:7-22.
5. Al-Delaimy WK, Willett WC, Manson JE, et al. Smoking and mortality among women with type 2 diabetes: The Nurses' Health Study cohort. *Diabetes Care.* 2001;24:2043-8.

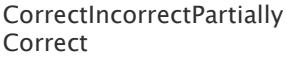
Next question

Go to summary

Answer Statistics

Times answered: 9846

Test Analysis



Work Smart

Question 87 of 200

A 48-year-old female with a three year history of type 2 diabetes presents at annual review.

Despite optimisation of her oral hypoglycaemic therapy she has gained approximately 5 kg in weight over the last year and her HbA_{1c} has deteriorated.

She is also treated with ramipril, bendroflumethiazide, and amlodipine, but her blood pressure remains difficult to control with a recording of 172/102 mmHg.

On examination, she has developed abdominal striae, thin skin is noticeable with bruising and she also has a proximal weakness. A diagnosis of Cushing's syndrome is suspected.

Which is the most appropriate investigation for this patient?

(Please select 1 option)

○	9 am ACTH concentration
○	9 am cortisol concentration
◉	24 hour urine free cortisol concentration Correct
○	Chest x ray
○	CT scan adrenals

Appropriate screening tests for Cushing's syndrome include a 1 mg overnight dexamethasone suppression test (1 mg dexamethasone given at 11 pm and the cortisol measured at 9 am the following morning). Overnight dexamethasone suppression test is the preferred test, as urinary collection has lower sensitivity.

A cortisol concentration less than 50 nmol/L after this test would be regarded as normal.

Another equally good and easily performed test is a 24 hour urine collection measuring free cortisol in the urine. An elevated cortisol (usually above 250 nmol/day) suggests Cushing's syndrome.

Random cortisol or 9 am cortisol provides no diagnostic information whatsoever.

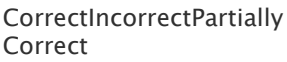
Chest x ray and adrenal CT are useful in investigating the possible cause of Cushing's syndrome.

Next question | Go to summary

Answer Statistics

Times answered: 9758

Test Analysis



Score: 16.28%

Total Answered: 86

Work Smart

Question 89 of 200

A 65-year-old man with a history of myocardial infarction four years earlier was admitted with progressive shortness of breath and decreasing exercise tolerance. He has smoked 40 cigarettes per day for the last 45 years.

He takes lansoprazole, aspirin and lisinopril.

Which of the following laboratory tests would help identify the reason for his symptoms?

(Please select 1 option)

○	Brain natriuretic peptide (BNP) This is the correct answer
○	Clotting screen
○	C reactive protein
◉	Full blood count Incorrect answer selected
○	Urea and electrolytes

This patient has features of heart failure which appear to be related to underlying ischaemic heart disease. The differential diagnosis is COPD, given his extensive smoking history.

Heart failure is a clinical syndrome characterised by dyspnoea, fatigue and ankle oedema. Signs which can point towards the diagnosis are pulmonary rales, pleural effusion, raised jugular venous pressure and peripheral oedema. Objective evidence is gained from echocardiogram, and raised natriuretic peptide concentration.

Cardiomegaly, third heart sound and murmurs can be suggestive of cardiac failure. The European

Society of Cardiology guidelines state there must be symptoms, signs AND objective evidence before a diagnosis of heart failure can be made. It is important to always attempt to identify the underlying cause.

BNP is a biologically active peptide, which has vasodilator and natriuretic properties. It is synthesised in the cardiac ventricles and correlates with left ventricle (LV) pressure, degree of dyspnoea, and state of neurohormonal modulation. Levels increase markedly in left ventricular dysfunction, and the level correlates with symptom severity (and decrease after effective treatment). It is raised in right or left systolic or diastolic heart failure. As such, it is an important clinical marker for the diagnosis of heart failure in patients with dyspnoea that could be attributed to a number of causes. Its use as a prognostic marker, therapy guide or screening marker is under investigation. One note of caution, however, as levels can be raised in comorbid illness, age, renal failure and obesity and therefore correlation should be made with the clinical scenario.

In practice, as this patient has had a previous MI, according to the current NICE guidelines he needs specialist assessment and Doppler echocardiography within two weeks. However, as this is not an option, BNP is the best available answer.

BNP is used first line in patients who have not had a previous MI. Levels >400 pg/ml warrant urgent specialist assessment and echocardiography; intermediate levels (100-400 pg/ml) should be investigated within six weeks.

FBC, U&E and creatinine, CRP and clotting screen are non-specific investigations which are unlikely to directly lead to a diagnosis in this case.

Reference:

NICE. Chronic heart failure (CG108).

Next question

Go to summary

Answer Statistics

Times answered: 7632

Test Analysis

Work Smart

Question 90 of 200

A 35-year-old shop worker presents with pain in her calves which develops after 50 yards of walking. The pain settles with rest.

On examination she has yellow discolouration of her palmar creases.

Her fasting lipid profile reveals:

Cholesterol	9.6 mmol/L	(<5)
Triglycerides	7.3 mmol/L	(<2)

Which of the following is the likely diagnosis?

(Please select 1 option)

○	Chylomicronaemia
○	Familial hypercholesterolaemia
○	Hypoalphalipoproteinaemia
○	Type III hyperlipidaemia This is the correct answer
◉	Type IV hyperlipidaemia Incorrect answer selected

Remnant hyperlipidaemia (type III hyperlipidaemia) is a rare disorder associated with:

- Hypercholesterolaemia, typically 8-12 mmol/L
- Hypertriglyceridaemia, typically 5-20 mmol/L

- Normal ApoB concentration
- Palmar xanthomata - orange discoloration of skin creases
- Tuberoeruptive xanthomata - elbows and knees
- Early onset of cardiovascular disease, and
- Early onset of peripheral vascular disease.

Remnant hyperlipidaemia is due to a combination of abnormal ApoE receptor function (which is normally required for clearance of chylomicron remnants and IDL from the circulation) and a metabolic disorder such as diabetes, obesity, or hypothyroidism.

The receptor defect causes levels of chylomicron remnants and IDL to be higher than normal in the blood stream. The receptor defect is an autosomal recessive mutation or polymorphism.The genotype of the homozygous condition is apo E-2/E-2 and occurs with a frequency of 1:100.

The disorder responds well to treating the metabolic condition and lipid lowering medication.

Hyperlipidaemias are classified according to the Fredrickson classification.

Chylomicronaemia (type I) is associated particularly with severe hypertriglyceridaemia and not with large elevations in cholesterol. There is no increased risk of atherosclerotic disease.

Hypoalphalipoproteinaemia is a rare, familial condition and is associated with low HDL.

Familial hypercholesterolaemia (type IIa) is due to LDL-receptor deficiency and is not associated with elevated triglyceride levels.

In type IV hyperlipidaemia cholesterol levels are within the normal range and triglyceride level are elevated. VLDL levels are also elevated.

Next question

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Answer Statistics

Times answered: 9525

Test Analysis

CorrectIncorrectPartially Correct

Score: 15.73%

Total Answered: 89

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Question 91 of 200

A 26-year-old professional footballer collapses while playing football.

He is rushed to the Emergency Department, and is found to be in ventricular tachycardia. He is defibrillated successfully and his 12 lead ECG following resuscitation demonstrates left ventricular hypertrophy. Ventricular tachycardia recurs and despite prolonged resuscitation he dies.

Which of the following is the most likely diagnosis?

(Please select 1 option)

○	Aortic stenosis
○	Cocaine intoxication
○	Hypertrophic cardiomyopathy This is the correct answer
○	Myocardial infarction
◉	Pulmonary embolism Incorrect answer selected

The history of sudden arrhythmia in a young, previously well, individual is suggestive of hypertrophic cardiomyopathy (HCM). Relatives should be screened for the condition.

The majority of patients with HCM have an abnormal resting ECG, although the changes are non-specific and include left ventricular hypertrophy, ST changes, and T-wave inversion. There may also be right or left axis deviation, conduction abnormalities, sinus bradycardia with ectopic atrial rhythm, and atrial enlargement. The ambulatory ECG can show atrial and ventricular ectopics, sinus pauses, intermittent or variable atrioventricular block, and non-sustained arrhythmias. The ECG findings do

not correlate with prognosis.

Arrhthymias can be premature ventricular complexes, non-sustained ventricular tachycardia and supraventricular tachyarrhythmias. Atrial fibrillation develops in approximately 20% and is associated with an increased risk of fatal cardiac failure.

There is no history to suggest drug abuse, and aortic stenosis is rare in the absence of congenital or rheumatic heart disease.

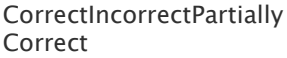
A myocardial infarction and massive pulmonary embolism would have given characteristic ECG changes.

Next question | Go to summary

Answer Statistics

Times answered: 9948

Test Analysis



Score: 15.56%

Total Answered: 90

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Exam Themes January 2005

Question 92 of 200

A 65-year-old is investigated for dyspnoea and is shown to have an ejection fraction of 45% on echocardiography.

How is left ventricular ejection fraction calculated?

(Please select 1 option)

○	Cardiac output/stroke volume
○	End diastolic volume/end systolic volume
○	End diastolic volume/stroke volume
○	End systolic volume/end diastolic volume
◉	Stroke volume/end diastolic volume Correct

The left ventricle pumps only a fraction of the blood it contains.

The ejection fraction is the amount of blood pumped (stroke volume = end diastolic volume − end systolic volume) divided by the amount of blood the ventricle contains (end diastolic volume).

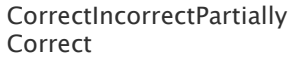
A normal ejection fraction is more than 55% of the blood volume.

Next question | Go to summary

Answer Statistics

Times answered: 8833

Test Analysis



Score: 16.48%

Total Answered: 91

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Question 93 of 200

A 50-year-old man with hypertension already on furosemide, ramipril and digoxin is found to have poor left ventricular function on echocardiogram.

Which antihypertensive should be added?

(Please select 1 option)

○	Carvedilol	This is the correct answer
○	Diltiazem	
○	Doxazosin	
○	Hydralazine	
◉	Nifedipine	Incorrect answer selected

This patient has hypertension and reduced ejection fraction on echo, indicating an element of failure.

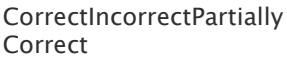
In these circumstances the most appropriate agent with evidence to support its use for reducing morbidity and mortality in failure would be the addition of a beta blocker.

Next question | Go to summary

Answer Statistics

Times answered: 9268

Test Analysis



Score: 16.3%

Total Answered: 92

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Exam Themes January 2005

Question 94 of 200

A 34-year-old male presents with palpitations. The ECG shows a slurred upstroke in the QRS complexes in the chest leads.

Which of the following is the treatment of choice?

(Please select 1 option)

○	Amiodarone
◉	Aspirin ✗ Incorrect answer selected
○	Diltiazem
○	Radiofrequency ablation ✓ This is the correct answer
○	Warfarin

This patient has Wolff-Parkinson-White syndrome as suggested by the delta wave on ECG.

Anticoagulation is not indicated.

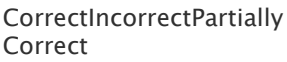
Risk of arrhythmia after ablation is of the order of 7% over five years.

Next question | Go to summary

Answer Statistics

Times answered: 8820

Test Analysis



Score: 16.13%

Total Answered: 93

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Core Questions

Question 95 of 200

A 29-year-old male is admitted with a one hour history of severe central chest pain associated with vomiting.

It transpires that he used cocaine three hours ago. His blood pressure is 142/74 mmHg and he has a pulse of 110 beats per minute regular. His ECG reveals 3 mm ST segment elevation in leads V2-5.

Which of the following is the most appropriate treatment for this patient?

(Please select 1 option)

○	Abciximab
○	Angiography +/- PTCA
○	Isoket (isosorbide dinitrate) infusion This is the correct answer
○	Low molecular weight heparin
◉	Tissue plasminogen activator (rtPA) Incorrect answer selected

Cocaine is a drug of widespread abuse and remains one of the commonest causes of acute myocardial infarction (MI) in men below 35 years of age.

The aetiology of cocaine-induced MI is thought to be related to coronary artery spasm as many patients do not have overt coronary artery disease. This vasoconstriction is thought to be more accentuated in those with pre-existing coronary artery disease or those who smoke. It is probably caused by stimulation of the α-adrenergic receptors in smooth muscle cells. In addition, cocaine increases endothelin-1 (a vasoconstrictor) and decreases nitric oxide (vasodilator).

Consequently guidelines suggest the use of nitrates in the first instance coupled with calcium antagonists. Intravenous benzodiazepines are also effective in resolving chest pain and improving cardiac performance. If there is no improvement in the clinical condition, then angiography should be considered. Fibrinolytics are generally avoided.

Reference:

1. Anderson JL, Adams CD, Antman EM, et al. 2012 ACCF/AHA focused update incorporated into the ACCF/AHA 2007 guidelines for the management of patients with unstable angina/non-ST-elevation myocardial infarction. *J Am Coll Cardiol.* 2013;61:e179-347.
2. McCord J, Jneid H, Hollander JE, et al. Management of cocaine-associated chest pain and myocardial infarction: a scientific statement from the American Heart Association Acute Cardiac Care Committee of the Council on Clinical Cardiology. *Circulation.* 2008;117:1897-907.

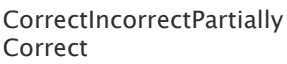
Next question

Go to summary

Answer Statistics

Times answered: 9962

Test Analysis



Score: 15.96%

Total Answered: 94

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Question 96 of 200

A 32-year-old female who is 14 weeks pregnant in her third pregnancy is found to have a blood pressure of 152/88 mmHg. There are no other abnormalities of note on examination.

She has a BMI of 33.3 kg/m^2 and urinalysis is otherwise normal. An ECG reveals left ventricular hypertrophy (LVH).

Which is the most likely aetiology of her elevated blood pressure?

(Please select 1 option)

○	Essential hypertension This is the correct answer
○	Pre-eclampsia
○	Pregnancy-induced hypertension
○	Secondary hypertension
◉	White coat hypertension Incorrect answer selected

This woman has hypertension which is discovered in her pregnancy but has evidence of LVH on her ECG suggesting that this is long standing. Hypertension which is diagnosed before 20 weeks of pregnancy is chronic hypertension, and not directly caused by the pregnancy.

Often, it takes at least two years of sustained hypertension to develop LVH, and although her pregnancy may have contributed to any deterioration, the LVH suggests that it was pre-existent.

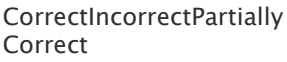
The cause for her hypertension may be secondary but her high BMI is suggestive of it being essential.

Next question | Go to summary

Answer Statistics

Times answered: 9983

Test Analysis



Score: 15.79%

Total Answered: 95

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Question 97 of 200

A 35-year-old woman presents with fever, rigors, malaise, and weight loss. She had undergone prosthetic valve replacement one month before. C3 level was reduced and echocardiography showed small vegetations.

Which microorganism is most likely to be responsible for this?

(Please select 1 option)

○	*Candida*
○	*Coxiella burnetii*
○	*Staphylococcus aureus*
○	*Staphylococcus epidermidis* This is the correct answer
◉	*Streptococcus viridans* Incorrect answer selected

Prosthetic valve endocarditis arising within two months of valve surgery is generally the result of intraoperative contamination of the prosthesis or a bacteraemia postoperative complication.

The nosocomial nature of these infections is reflected in their primary microbial causes:

- Coagulase-negative staphylococci (*Staphylococcus epidermidis*)
- *S. aureus*
- Facultative Gram negative bacilli
- Diphtheroids
- Fungi.

Whilst a recent study[1] did show that *Staphylococcus aureus* was the most common cause of prosthetic valve infective endocarditis it is thought that this may have been due to recruitment or referral bias. The trend has not been replicated in all subsequent studies. Therefore, for the exam, it is safer currently to state that *Staphylococcus* epidermidis is the commonest colonising organism within 6 months of implantation of a prosthetic valve.

The oral cavity, skin, and upper respiratory tract are the respective primary portals for the viridans *Streptococci*, *Staphylococci*, and HACEK organisms (*Haemophilus, Actinobacillus, Cardiobacterium, Eikenella*, and *Kingella*), causing community-acquired native valve endocarditis.

Streptococcus bovis originates from the gastrointestinal tract, where it is associated with polyps and colonic tumours, and *Enterococci* enter the bloodstream from the genitourinary tract.

Reference:

1. Wang A, et al. Contemporary clinical profile and outcome of prosthetic valve endocarditis. *JAMA.* 2007;297:1354-61.
2. Horstkotte D, et al. Guidelines on prevention, diagnosis and treatment of infective endocarditis executive summary; the task force on infective endocarditis of the European society of cardiology. *Eur Heart J.* 2004;25:267-76.

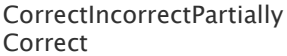
Next question

Go to summary

Answer Statistics

Times answered: 9991

Test Analysis



Score: 15.62%

Total Answered: 96

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Question 98 of 200

A middle aged woman presents with new onset palpitations. She also commentes that she has lost weight recently despite an increased appetite.

Examination reveals a goitre and a degree of exophthalmos. During physical examination she fell unconscious. Blood pressure was 70/40 mmHg.

Electrocardiogram revealed atrial fibrillation (AF) with rapid ventricular response.

Which of the following is the appropriate immediate management?

(Please select 1 option)

○	Anticoagulation
○	Carbimazole
○	DC cardioversion This is the correct answer
○	Intravenous amiodarone
◉	Intravenous propanolol Incorrect answer selected

The patient is haemodynamically compromised due to AF.

The emergency management is DC cardioversion 200J → 360J → 360J.

Adverse signs necessitating DC cardioversion are:

- Blood pressure (BP) ≤90 mmHg
- Chest pain

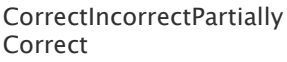
- Heart failure
- Impaired consciousness, and
- Heart rate ≥ 200 bpm.

Next question | Go to summary

Answer Statistics

Times answered: 10201

Test Analysis



Score: 15.46%

Total Answered: 97

Work Smart

Question 99 of 200

A 53-year-old man with a known history of Graves' disease presents to the Emergency Department with palpitations, anxiety, and fine tremor of both hands.

ECG shows rapid atrial fibrillation (AF) with ventricular rate of 160 to 180/min.

His blood pressure was 110/80 mmHg.

TSH	0.01 mU/L	(0.4-5.0)
Free T4	60.3 pmol/L	(10-22)

Which of the following is the immediate management for this patient?

(Please select 1 option)

○	Carbimazole
○	DC cardioversion
○	Digoxin
○	Propanolol This is the correct answer
◉	Warfarin Incorrect answer selected

This patient clearly has symptomatic hyperthyroidism. AF occurs in 10% to 25% of patients with hyperthyroidism, more commonly in men and the elderly than in women or patients less than 75-years-old. Together with the other symptoms described, it is generally caused by increased beta-adrenergic tone. Propranolol is effective in controlling all symptoms prior to initiation of specific

therapy (e.g. carbimazole, which will have a more delayed effect on symptoms).

Conversion to sinus rhythm frequently occurs spontaneously with treatment of hyperthyroidism. Digoxin is very rarely effective alone, but can be used in combination with propranolol if it is ineffective as a single agent.

Electric or pharmacologic cardioversion would only generally be attempted in patients who are haemodynamically unstable in whom other treatments have been unsuccessful. AF is likely to recur if the underlying cause (i.e. hyperthyroidism in this situation) is not treated.

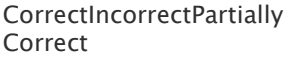
If AF persists, consideration should be given to anticoagulation in patients who are at risk of embolic events but this would not be the first treatment you would initiate.

Next question | Go to summary

Answer Statistics

Times answered: 9197

Test Analysis



Score: 15.31%

Total Answered: 98

Feedback

Question Navigator

Revision Notes

Tags

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Work Smart

Question 100 of 200

A 74-year-old patient with a history of ischaemic heart disease presents with shortness of breath. He is finding difficulty mobilising any further than around his home.

An ECHO demonstrates an ejection fraction of approximately 20%. He is on maximal drug therapy for heart failure, and is not thought to have an infective chest exacerbation. An ECG demonstrates sinus rhythm with a rate of 75/min and widened QRS complexes.

Which is the most appropriate treatment option?

(Please select 1 option)

○	Addition of perhexiline therapy
○	Palliation as an inpatient with PRN morphine
○	Referral for biventricular pacing This is the correct answer
○	Referral for cardiac transplant
◉	Referral for implantable defibrillator Incorrect answer selected

This patient by definition has NYHA III heart failure (HF).

The CARE-HF study of heart failure patients has shown a 37% reduction in the primary end point of death and cardiovascular hospitalisation and a reduction of 36% in all-cause mortality compared with control. Control patients were treated with maximal medical therapy only, and follow up was a mean of 29 months.

Examination of the COMPANION study demonstrates a 40% reduction in the risk of death or

hospitalisation from HF, and a 36% reduction in death from any cause, after implantation of biventricular pacing wires with a defibrillator.

It may be that in the very near future we will be implanting biventricular pacing devices, with defibrillator actions, in those patients in the subject groups included in these studies.

The indications for implantation devices in these studies were: low ejection fraction, dyssynchrony on the ECG (widened QRS), and NYHA III/IV.

Perhexiline therapy may become standard therapy in this patient subgroup in the future, but as yet there is no mortality or morbidity evidence to support its widespread use.

Reference

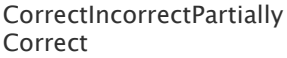
NICE. Implantable cardioverter defibrillators and cardiac resynchronisation therapy for arrhythmias and heart failure (TA134).

Next question | Go to summary

Answer Statistics

Times answered: 10844

Test Analysis



Work Smart

Question 101 of 200

A 65-year-old man is admitted with central crushing chest pain, sweating, and vomiting of one hour duration.

He is conscious with a pulse rate of 100 bpm and a blood pressure of 180/110 mmHg. An ECG shows >2 mm ST elevation in leads II, III, aVF. FBC and U&Es are normal. Troponin T is 100 ng/ml.

Apart from the presence of xanthelasma (+) there are no other positive findings on clinical examination.

He is given oxygen, aspirin, clopidogrel, morphine, and intravenous 5 mg atenolol.

Which of the following is the best next step?

(Please select 1 option)

○	Give thrombolysis immediately
○	Immediate referral to cardiologist for primary angioplasty This is the correct answer
○	Prescribe low molecular weight heparin
○	Prescribe simvastatin
◉	Transfer to coronary care unit for closer monitoring Incorrect answer selected

This is a case of acute inferior ST elevation myocardial infarction (MI), so the next appropriate management in this case is urgent referral for primary angioplasty.

Early revascularisation for ST elevation MI improves prognosis and outcome.

Thrombolysis is less successful than primary angioplasty at restoring flow and has higher bleeding complications.

Monitoring on CCU is appropriate after revascularisation.

Low molecular weight has no benefit in ST elevation MI.

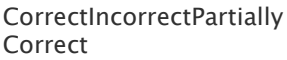
Statin therapy is not required immediately.

Next question | Go to summary

Answer Statistics

Times answered: 9436

Test Analysis



Score: 15%

Total Answered: 100

Work Smart

Question 102 of 200

A 43-year-old gentleman develops chest pain seven minutes after fibreoptic bronchoscopy.

The procedure had been performed without sedation following an intratracheal injection of 5 ml 2.5% cocaine solution and xylocaine spray to the pharynx for topical anaesthesia.

ECG showed an evolving anterior myocardial infarction.

Which of the following would you prefer for his management?

(Please select 1 option)

○	Beta blockers
○	Nitrates This is the correct answer
◉	Percutaneous transluminal coronary angioplasty Incorrect answer selected
○	Thrombolysis with rt-PA
○	Thrombolysis with streptokinase

The underlying mechanism here is vasoconstriction, not thrombosis.

Cocaine is cardiotoxic and its use has been linked to:

- Coronary artery spasm
- Angina
- Myocardial infarction
- Arrhythmias
- Sudden cardiac death, and

- Myocardial contraction bands, which might act as a substrate for arrhythmias.

It is important to avoid beta blockers in treating cocaine induced chest pains or acute myocardial infarctions, as this may result in unopposed 1 adrenergic action with worsening coronary spasm.

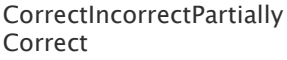
Calcium channel antagonists or nitrates should be administered as early as possible.

Next question | Go to summary

Answer Statistics

Times answered: 9234

Test Analysis



Score: 14.85%

Total Answered: 101

Work Smart

Question 103 of 200

A 67-year-old woman is admitted with blackouts.

Her electrocardiogram shows ventricular escape with complete heart block. As you are standing there she blacks out once more. Her rhythm strip shows P wave asystole.

Which of the following would be the initial immediate treatment here after airway and breathing?

(Please select 1 option)

○	Adenosine 6 mg
○	Adrenaline 1 mg
○	Atropine 0.6 mg
○	Transcutaneous pacing This is the correct answer
◉	Transvenous pacing Incorrect answer selected

Occasionally, atrial electrical activity continues in the absence of ventricular impulses. This is referred to as P-wave asystole and may respond to electrical pacing. This can be achieved by transvenous, transcutaneous or manual techniques. Transvenous pacing takes longer to instigate, and transcutaneous pacing is therefore the initial choice here. Manual pacing is an effective holding measure before more definitive pacing is instituted.

Atropine can also be used, as can adrenaline, for sustained P wave asystole but pacing is the initial treatment of choice. All crash trollies within UK hospitals contain the equipment required to externally pace patients.

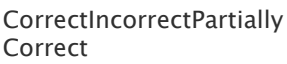
Adenosine can induce asystole, and is only indicated in the treatment of supraventricular tachycardias.

Next question | Go to summary

Answer Statistics

Times answered: 10305

Test Analysis



Score: 14.71%

Total Answered: 102

Feedback

Work Smart

Question 104 of 200

A 24-year-old female is admitted with palpitations. Her pulse is 220 beats/min, blood pressure 70/50 mmHg and she has a respiratory rate 32/min.

She is awake, alert and oriented but dyspnoeic. Her electrocardiogram shows a regular rhythm with QRS complex width of 0.11 s.

What is the most appropriate therapy for this patient?

(Please select 1 option)

○	Adenosine 6 mg/6 mg/12 mg
○	Amiodarone 300 mg
○	Atenolol 50 mg
○	Direct current cardioversion This is the correct answer
◉	Verapamil 10 mg Incorrect answer selected

This is highly likely to be a narrow complex tachycardia.

Strictly speaking, as this patient is showing signs of haemodynamic decompromise (that is, systolic blood pressure less than 90) she should be immediately DC cardioverted under sedation/anaesthesia.

In practice, most people would try adenosine first whilst organising a cardioversion.

Reference:

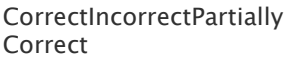
Boodhoo L, Mitchell AR, Bordoli G, et al. DC cardioversion of persistent atrial fibrillation: a comparison of two protocols. *Int J Cardiol.* 2007;114:16-21.

Next question | Go to summary

Answer Statistics

Times answered: 12006

Test Analysis



Score: 14.56%

Total Answered: 103

Feedback

Work Smart

Question 105 of 200

A 66-year-old man with insulin-dependent diabetes given ibuprofen for a knee injury is admitted with palpitations.

His electrocardiogram (ECG) shows a rate of 105 beats per minute, with absent P waves and tall T waves.

His urea and electrolytes show:

Sodium	132 mmol/L	(137-144)
Potassium	6.4 mmol/L	(3.5-4.9)
Urea	11 mmol/L	(2.5-7.5)
Creatinine	180 µmol/L	(60-110)

In this scenario, which of the following is the most appropriate immediate management?

(Please select 1 option)

○	Calcium chloride 10 mmol IV This is the correct answer
○	Calcium resonium orally
○	Dextrose 50 ml 50% with 10 units insulin
○	Dialysis
◉	Furosemide 1 mg/kg IV Incorrect answer selected

The ECG suggests cardiotoxicity related to hyperkalaemia and the history of palpitations is suggestive of arrhythmias.

Therefore cardio protection with calcium chloride or gluconate should be first priority and lowering potassium levels immediately thereafter.

Calcium antagonises the effects of hyperkalaemia on a cellular level by a number of mechanisms. These all return myocyte excitability to normal thereby reducing the risk of arrhythmias. Calcium gluconate is the preferred preparation, but calcium chloride can be used. Caution is needed if the patient is taking digoxin, as hypercalcaemia can potentiate its toxicity. The effects of intravenous calcium occur within one to three minutes but last for only 30-60 minutes, and therefore more definitive treatment is needed to lower potassium levels.

After calcium is given, treatment is required to shift potassium intracellularly. Insulin is most commonly used, which stimulates the Na-K ATPase pump. The effect is seen within 10-20 minutes and usually decreases potassium levels by 0.6-1mEq/L. Salbutamol can also increase the action of the Na-K ATPase pump.

Sodium bicarbonate infusion can shift potassium intracellularly by increasing blood pH, but its use is controversial. It is therefore reserved for cases of severe acidosis, or where there is another indication for its use (for example, TCA overdose).

If the above treatments fail, and the cause of hyperkalaemia cannot be treated, then potassium may need to be removed from the body. The most efficient way to do this is with haemodialysis. This is only performed in resistant cases, or in patients who are already on haemodialysis. For most patients, treatment with an exchange resin such as sodium polystyrene sulphonate is more appropriate.

Reference

Parham WA, et al. Hyperkalemia revisited. *Tex Heart Inst J.* 2006;33:40-7.

Next question

Go to summary

Answer Statistics

Times answered: 9201

Work Smart

Question 106 of 200

A 66-year-old male in intensive care has received 2000 ml of colloid in three hours.

He is receiving an escalating noradrenaline infusion (currently at 0.76 mcg/kg/min), has a blood pressure of 90/50 mmHg, pulse of 90 beats per min, a central venous pressure of 10 mmHg and capillary refill time of 2-3 seconds. His plasma lactate concentration is 2.9 mmol/L (<1.5).

Which of the following is an appropriate method of measuring adequate intravascular filling?

(Please select 1 option)

○	LiDCO (lithium dilution cardiac output)
○	Oesophageal Doppler monitoring
○	PiCCO (pulse contour cardiac output) This is the correct answer
○	Pulmonary artery flotation catheter (PAFC)
◉	Transoesophageal echocardiography (TOE) Incorrect answer selected

PiCCO gives indications of cardiac output, extravascular lung water, intravascular filling and only requires a central line and a PiCCO femoral arterial line and as such is relatively simple to use.

It would also not be unreasonable to insert an oesophageal Doppler device; however they have greater interobserver variation and require a degree of experience to use and are prone to misplacement.

LiDCO is still not validated or practical to be widely used.

PAFC are used widely in the USA however a study has questioned their safety and they have fallen

out of favour in the UK.

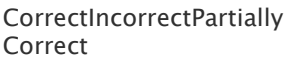
TOE requires considerable expertise to use and is not suitable for cardiac output studies.

Next question | Go to summary

Answer Statistics

Times answered: 7665

Test Analysis



Score: 14.29%

Total Answered: 105

Feedback

Work Smart

Question 107 of 200

A 67-year-old male is admitted with central chest pain of sudden onset which radiates through to his back.

His blood pressure is 160/70 mmHg in his right arm and 140/60 mmHg in his left arm. He has electrocardiographic (ECG) changes in leads II, III, and AVF showing ST elevation of 2 mm.

Which is the most likely diagnosis?

(Please select 1 option)

○	Coarctation of the aorta
○	Dissecting thoracic aortic aneurysm This is the correct answer
○	Inferior myocardial infarct
○	Pancreatitis
◉	Perforated duodenal ulcer Incorrect answer selected

This history is suggestive of a dissecting thoracic aortic aneurysm.

The ECG changes of inferior myocardial infarct suggest that the aneurysm has dissected the right coronary artery at its ascending aortic ostium. An ascending aortic dissection needs immediate surgery. Whilst en route to surgery, beta blockade to control hypertension is appropriate.

An inferior myocardial infarct is high in the differential, however thrombolysis will kill a patient with an aortic dissection.

Coarctation can give different blood pressures in either arm but is a chronic condition. Ulcer and

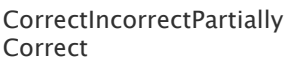
pancreatitis may mimic a heart attack, but with a normal ECG.

Next question | Go to summary

Answer Statistics

Times answered: 11055

Test Analysis



Score: 14.15%

Total Answered: 106

Feedback

Work Smart

Exam Themes May 2006

Question 109 of 200

A 55-year-old male with ischaemic heart disease is seen for review.

He has recently started 40 mg of simvastatin. He reports that he has developed some muscle aches and pains since starting the statin. His creatine kinase is within the normal range.

Which of the following is the most appropriate management of this patient's cardiovascular risk?

(Please select 1 option)

○	Add cholestyramine
○	Add gemfibrozil
○	Stop simvastatin and try nicotinic acid
○	Stop simvastatin and try pravastatin
◉	Stop simvastatin and presribe rosuvastatin Correct

In this patient, who is young and has established IHD, statin treatment is the gold standard of lipid care. None of the other options have as robust an evidence base for improved survival when compared with statin treatment.

This patient likely has statin-induced myalgia. This side effect is common and can be debilitating for patients, but fortunately is not life-threatening. Serious muscle related adverse effects are rare and include myositis (CK elevated with symptoms) and rhabdomyolysis. It is important to check the CK in all patients with statin related muscle symptoms to exclude these serious causes.

Myalgia can gradually improve with time, dose reduction, or changing to an alternative statin.

Pravastatin and rosuvastatin are metabolised via different pathways when compared to simvastatin and atorvastatin. Pravastatin may be suitable for primary prevention, but in this high-risk secondary prevention patient, a stronger agent is required. Rosuvastatin can be effective at even low doses (5-10 mg) and would be the agent of choice here.

Adding gemfibrozil would not be recommended as the risk of myositis and rhabdomyolysis increases with the statin-fibrate combination. This may be particularly relevant to this patient who already has statin related adverse effects.

Cholestyramine and nicotinic acid are useful agents but are limited due to tolerability issues. They also cannot match the benefit in survival that an alternative statin could give.

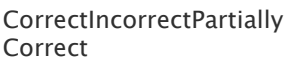
Next question

Go to summary

Answer Statistics

Times answered: 6720

Test Analysis



Work Smart

Question 111 of 200

A 51-year-old man with type 2 diabetes and no previous history of CHD presents at annual review.

Currently he is taking metformin 500 mg bd, aspirin 75 mg od, perindopril 4 mg od, and simvastatin 20 mg od.

On examination, his blood pressure is 140/72 mmHg, he has background diabetic retinopathy and has a peripheral sensory neuropathy to light touch in the feet.

Investigations reveal:

HbA_1C	7.1%	(3.8-6.4)
	54 mmol/mol	(18-46)
Total cholesterol	3.9 mmol/L	(<5.2)
Triglyceride	2.5 mmol/L	(0.45-1.69)
HDL-cholesterol	0.8 mmol/L	(>1.55)
LDL-cholesterol	2.1 mmol/L	(<3.36)

Which treatment option will further improve this patient's dyslipidaemia?

(Please select 1 option)

○	Cholestyramine
◉	Ezetimibe Incorrect answer selected
○	Fenofibrate This is the correct answer

○	No other treatment required
○	Rosuvastatin

This patient's TC and LDL-C are at the currently advocated target levels.

Patients with T2DM commonly have low HDL-C and elevated triglycerides (TG). In some patients, TG may improve with stricter glycaemic control.

The role of HDL-C and triglycerides in cardiovascular risk remains unclear. Some authorities advocate desirable HDL-C levels > 1 mmol/L and plasma TG < 1.7 mmol/L in subjects at risk of cardiovascular disease (CVD).

The FIELD study assessed the effects of fenofibrate therapy on CV mortality in patients with type 2 diabetes. Although the primary end point of CV mortality was not achieved, partly due to high use of non-study lipid lowering therapies (statin use was much higher in placebo group 34% versus 18% in fenofibrate), the composite endpoint of major CVD events was significantly reduced with fenofibrate.

Furthermore, at any given LDL or TC level, reduced HDL-C is associated with an increased CHD risk.

Fenofibrate increases HDL-C by 10-15% and reduces plasma TG by 15-20%.

Concomitant fibrate-statin use is associated with an increased risk of myopathy so evaluation of combination therapy for safety and tolerability is important.

When evaluating a patient with hypertriglyceridaemia, secondary causes need to be considered. These include hypothyroidism and poorly controlled diabetes as well as excess alcohol intake.

Further Reading:

Krumholz HM, Hayward RA. Shifting views on lipid lowering therapy. *BMJ.* 2010;341:c3531.

Next question | Go to summary

Answer Statistics

Times answered: 9446

Work Smart

Exam Themes September 2006

Question 113 of 200

A 63-year-old male is admitted with a 30 minute history of central chest pain associated with nausea and sweating.

His ECG reveals ST elevation in leads II, III, and aVF.

Which of the following coronary arteries is most likely to be occluded?

(Please select 1 option)

○	Circumflex artery
○	Left anterior descending artery
○	Obtuse marginal artery
○	Posterolateral artery
◉	Right coronary artery Correct

The patient has had an inferior myocardial infarction (MI) and this is most likely due to occlusion of the right coronary artery.

Left anterior descending artery (LAD) occlusion results in anterior infarction; circumflex or lateral branch of the LAD results in lateral infarction.

Right coronary artery (RCA) occlusion may also cause posterior infarction.

Work Smart

Exam Themes January 2007

Question 115 of 200

A 59-year-old male presents with a one hour history of central crushing chest pain. He is known to be diabetic, hypertensive, and is a non-smoker.

On examination his pulse rate is 90 beats/min, blood pressure 130/85 mmHg, S1 S2 are audible with no murmurs. There is no evidence of cardiac failure.

An electrocardiogram (ECG) is performed.

In the absence of PCI facilities, which of the following would be an indication for thrombolysis?

(Please select 1 option)

○	Atrial fibirillation >150 min^{-1}
○	Right bundle branch block
○	ST depression of 2 mm in leads II, III, avF
○	ST elevation of 2 mm in V4-V6 This is the correct answer
◉	Supraventricular tachycardia Incorrect answer selected

This patient is having an acute myocardial infarction (MI); the ECG changes of ST elevation of 2 mm in V4-V6 suggest an anterolateral MI.

Given this history and ECG changes, he should be given thrombolytic treatment, along with aspirin, heparin, beta blockade, statin therapy, and subsequent angiotensin-converting enzyme (ACE) inhibition.

ECG criteria for thrombolysis within 24 hours of typical pain include:

- ST elevation of more than 1 mm in standard limb leads
- ST elevation more than 2 mm in anterior chest leads, and
- new left bundle branch block.

Evidence beyond 12 hours of pain is equivocal thrombolysis at this time; it tends to be used if there is clinical deterioration or persistent pain.

According to NICE guidelines on the management of myocardial infarction with ST-segment elevation:

> 1.1.3 Deliver coronary reperfusion therapy (either primary PCI or fibrinolysis) as quickly as possible for eligible people with acute STEMI.
>
> 1.1.4 Offer coronary angiography, with follow-on primary PCI if indicated, as the preferred coronary reperfusion strategy for people with acute STEMI if:
>
> - presentation is within 12 hours of onset of symptoms and
> - primary PCI can be delivered within 120 minutes of the time when fibrinolysis could have been given.
>
> 1.1.5 Offer fibrinolysis to people with acute STEMI presenting within 12 hours of onset of symptoms if primary PCI cannot be delivered within 120 minutes of the time when fibrinolysis could have been given.
>
> 1.1.6 When treating people with fibrinolysis, give an antithrombin at the same time.

Reference

NICE. Myocardial infarction with ST-segment elevation: acute management (CG167).

Next question

Go to summary

Answer Statistics

Times answered: 10077

Work Smart

Exam Themes January 2006

Question 116 of 200

A 60-year-old female presents with a four week history of low grade fever, dyspnoea, and fatigue. Two months ago she received a prosthetic valve replacement for mitral regurgitation.

On examination she has a temperature of 37.7°C. At transoesophageal echocardiography vegetations are seen.

A clinical diagnosis of prosthetic valve endocarditis is made.

Which of the following is the most likely causative organism?

(Please select 1 option)

○	Actinomycosis
○	*Candida albicans*
○	*Enterococci*
○	*Staphylococcus epidermidis* This is the correct answer
◉	*Streptococcus viridans* Incorrect answer selected

Generally there are two identifiable modes of prosthetic valve endocarcitis.

The first occurs within the first year after surgery affecting 0.7-3% of cases and is often due to *Staphylococci.*

Late endocarditis observed after two years post surgery is found in 0.5 - 1% of cases and is typically due to *Streptococci* - typically alpha haemolytic otherwise known as *Strep. viridans.*

Further Reading

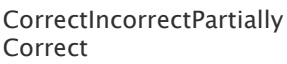
Maroni JP, Terdjman M, Montély JM, Hanania G. Prosthetic valve endocarditis: current problems. *Arch Mal Coeur Vaiss.* 1993;86:1837-43.

Next question | Go to summary

Answer Statistics

Times answered: 8757

Test Analysis



Score: 14.78%

Total Answered: 115

Work Smart

Question 117 of 200

A 60-year-old woman with ischaemic heart disease is seen for review.

She reports that she has developed symmetrical muscle aches and pains and you attribute this to a myalgia associated with simvastatin. Her creatinine kinase is within the normal range.

However, her dyslipidaemia management is still suboptimal and you wish to add in a further agent.

Total cholesterol	5.5 mmol/l	(<5.2)
LDL cholesterol	3.8 mmol/l	(<3.36)
HDL cholesterol	1.3 mmol/l	(>1.55)
Triglycerides	1.4 mmol/l	(0.45-1.69)

You plan to continue the statin treatment.

Which of the following agents would be the most appropriate additional therapy for this patient?

(Please select 1 option)

○	Cholestyramine
○	Ezetimibe This is the correct answer
○	Gemfibrozil
○	Nicotinic acid
◉	Omega-3 fatty acids Incorrect answer selected

This patient presents with a probable statin-induced myalgia which often improves with time. Sometimes stopping therapy briefly or reintroducing a different statin may resolve the myalgia.

Statin-induced myositis is relatively uncommon occurring in approximately 0.1-0.2%. The risk of myositis and the potentially fatal rhabdomyolysis is, in prone subjects, increased with gemfibrozil in combination with a statin and as such should be avoided.

Additional agents could include omega-3 fatty acids and ezetimibe.

Nicotinic acid is less used due to problems with flushing though can be useful particularly in hypertriglyceridaemia.

Cholestyramine can also be used.

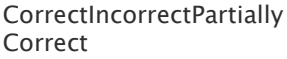
In this case it is the low density lipoprotein (LDL) cholesterol that needs to be targeted and ezetimibe would be the most appropriate choice.

Next question | Go to summary

Answer Statistics

Times answered: 8877

Test Analysis



Work Smart

Question 119 of 200

On auscultation of a patient's heart you hear a pan-systolic murmur.

With which of the following conditions is this murmur associated?

(Please select 1 option)

○	Aortic regurgitation
○	Coarctation of the aorta
○	Mitral stenosis
○	Pulmonary stenosis
◉	Ventricular septal defect Correct

A pansystolic or holosystolic murmur extends from the first heart sound through to the second heart sound which is often hard to hear because of the murmur.

It is seen in septal defects and, more commonly, mitral regurgitation.

Next question | Go to summary

Answer Statistics

1 6%

Work Smart

Question 120 of 200

A 65-year-old man has an ejection systolic murmur and narrow pulse pressure on clinical examination.

There is no history of chest pain, breathlessness, or syncope.

An ECHO confirms aortic stenosis and shows an aortic valve gradient of 40 mmHg. There is good left ventricular function.

Which of the following management options is the most appropriate choice in this case?

(Please select 1 option)

○	Anticoagulation
○	Aortic valvuloplasty
○	Cardiology outpatient review This is the correct answer
○	Routine aortic valve replacement
◉	Urgent aortic valve replacement Incorrect answer selected

Indications for surgery in aortic stenosis include a gradient of 50 mmHg or more, or associated symptoms such as syncope, breathlessness, and episodes of pulmonary oedema.

This patient should be monitored in cardiology clinic so that a decision on the timing of valve surgery can be made.

Work Smart

Exam Themes January 2005

Question 122 of 200

A 68-year-old lady presents to her GP for an annual review of her heart failure treatment.

She has a blood pressure of 165/90 mmHg. She is currently taking furosemide and aspirin and she experiences dyspnoea on walking up hills.

Which of the following is the most appropriate medication to add?

(Please select 1 option)

○	Bendroflumethiazide
○	Enalapril This is the correct answer
○	Isosorbide mononitrate
○	Spironolactone
◉	Titrate dose of furosemide Incorrect answer selected

ACE inhibitors remain one of the cornerstones of the treatment of heart failure (SOLVD and CONSENSUS trials).

There is clear evidence that higher doses exert greater benefit.

They are usually very well tolerated, especially in milder cases.

Reference:

1. Cleland JG. Improving patient outcomes in heart failure: evidence and barriers. *Heart.* 2000;84:i8-i10.

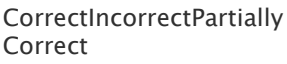
2. NICE. Chronic heart failure in adults: management (CG108).

Next question | Go to summary

Answer Statistics

Times answered: 9388

Test Analysis



Score: 14.88%

Total Answered: 121

Feedback

Work Smart

Question 123 of 200

Closure of the tricuspid valve is marked by which of the following features of the jugular venous waveform?

(Please select 1 option)

○	"a" wave
○	"c" wave This is the correct answer
○	"v" wave
○	"x" descent
◉	"y" descent Incorrect answer selected

The "c" wave of the jugular venous waveform is associated with the closure of the tricuspid valve.

Next question | Go to summary

Answer Statistics

Work Smart

Question 124 of 200

Which of the following cardiac drugs shorten the QT interval?

(Please select 1 option)

○	Amiodarone
○	Digoxin This is the correct answer
○	Moxonidine
○	Sodium nitroprusside
◉	Sotalol Incorrect answer selected

Hypercalcaemia, hypermagnesaemia, digoxin, or thyrotoxicosis cause QT shortening.

Next question | Go to summary

Answer Statistics

Work Smart

Question 125 of 200

A 24-year-old woman with Down's syndrome is found on clinical examination to have a systolic murmur.

Which is the most common cardiac defect seen in patients with Down's syndrome that may explain this murmur?

(Please select 1 option)

○	Atrioventricular septal defect This is the correct answer
○	Mitral regurgitation
○	Patent ductus arteriosus
○	Secundum atrial septal defect
◉	Ventricular septal defect Incorrect answer selected

Endocardial cushion defects, more commonly known as atrioventricular (AV) canal or septal defects, include a range of defects characterised by involvement of the atrial septum, the ventricular septum, and one or both of the AV valves.

Next question | Go to summary

Answer Statistics

Work Smart

Exam Themes May 2006

Question 128 of 200

A 26-year-old man is found to have hypertrophic obstructive cardiomyopathy.

A 24 hour ECG recording reveals runs of non-sustained ventricular tachycardia.

He has had three episodes of syncope in the last two years.

Which of the following is the most appropriate management plan for this man?

(Please select 1 option)

○	Amiodarone
○	AV node ablation
○	Implantable cardioverter defibrillator (ICD) This is the correct answer
○	Permanent pacemaker
◉	Sotalol Incorrect answer selected

When the risk level for sudden cardiac death (SCD) is judged by contemporary criteria to be unacceptably high and deserving of intervention, the ICD is the most effective and reliable treatment option available, harbouring the potential for absolute protection and altering the natural history of this disease in some patients.

Next question | Go to summary

Work Smart

Question 129 of 200

A 17-year-old male presented with episodes of low back pain.

On clinical examination he is tall and has features of Marfan's syndrome. You refer him for echocardiography and he asks why it is needed.

Which of the following is the most common abnormality seen in people with Marfan's syndrome?

(Please select 1 option)

○	Bicuspid aortic valve
○	Coarctation of the aorta
○	Dilation of the aortic sinuses This is the correct answer
○	Primum atrial septal defect
◉	Ventricular septal defect Incorrect answer selected

Marfan's syndrome is associated with dialtation of the aortic sinuses, causing a dilated aortic root. This can lead to aortic root rupture or dissection.

"The normal aorta has three gentle bulges, the aortic sinuses, just distal to the semilunar attachments of the three leaflets of the aortic valve. The cross sectional diameter of the aorta at the nadir of the leaflet attachment where the aorta and ventricular muscle meet, and at the upper limit of the attachment at the sinutubular junction, are very similar, with the leaflets supported with a spatial relation as if to the sides of a cylinder. The diameter of the more distal circle at the sinutubular junction is, if anything, slightly smaller than the left ventricular outflow. This relation is lost in the

Marfan syndrome. The aortic root becomes bulbous and the attachments of the leaflets are splayed out."[1]

Reference:

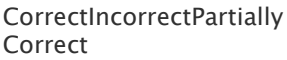
1. Treasure T. Cardiovascular surgery for Marfan syndrome. *Heart.* 2000;84:674-8.

Next question | Go to summary

Answer Statistics

Times answered: 9050

Test Analysis



Score: 14.84%

Total Answered: 128

Work Smart

Exam Themes September 2006

Question 130 of 200

A 70-year-old lady presented with dyspnoea and fever. She has a history of weight loss which has been investigated with colonoscopy which found a tumour of the sigmoid colon and she is awaiting surgery.

On examination, she has a systolic murmur and ECHO shows vegetations on the mitral valve. A diagnosis of infective endocarditis is made.

Which of the following organisms is associated with a high incidence of colorectal tumours?

(Please select 1 option)

○	*Campylobacter jejuni*
○	*Enterococcus faecalis*
○	*Escherichia coli*
◉	*Salmonella typhi* ✗ Incorrect answer selected
○	*Streptococcus bovis* ✓ This is the correct answer

Up to half of patients presenting with *Streptococcus bovis* endocarditis have colorectal tumours.

Next question | Go to summary

Work Smart

Question 131 of 200

On physical examination a 65-year-old man is found to have pulsus alternans where there is regular alternation of the force of his radial pulse.

Which of the following conditions is the most likely diagnosis?

(Please select 1 option)

○	Aortic stenosis
○	Cardiac tamponade
○	Hypertrophic obstructive cardiomyopathy
○	Mixed aortic valve disease
◉	Severe left ventricular failure Correct

Pulsus alternans is a physical finding characterised by a regular alternation of the force of the arterial pulse.

It almost invariably indicates the presence of severe left ventricular systolic dysfunction.

Further Reading:

Cha K, Falk RH. Images in clinical medicine. Pulsus alternans.. *N Engl J Med.* 1996;334:834.

Next question | Go to summary

Work Smart

Question 132 of 200

A 28-year-old man with a known history of congenital heart disease presents with a pansystolic murmur, large V waves in the JVP, and pulsatile hepatomegaly.

Which of the following types of congenital heart disease is most likely to be associated with this presentation?

(Please select 1 option)

○	Atrial septal defect
○	Coarctation of the aorta
○	Ebstein's anomaly This is the correct answer
○	Patent ductus arteriosus
◉	Ventricular septal defect Incorrect answer selected

The clinical features suggest tricuspid regurgitation. The correct answer is therefore Ebstein's anomaly.

The hemodynamic consequences of Ebstein anomaly result from displaced and malformed tricuspid leaflets and atrialization of the right ventricle. The leaflet anomaly leads to tricuspid regurgitation. The severity of regurgitation depends on the extent of leaflet displacement, ranging from mild regurgitation with minimally displaced tricuspid leaflets to severe regurgitation with extreme displacement.

Work Smart

Question 133 of 200

A 50-year-old female presents with dyspnoea, a new murmur, and fever; she is diagnosed with infective endocarditis.

Which of the following is associated with the best prognosis?

(Please select 1 option)

○	Aortic valve infection
○	Culture negative endocarditis
◉	Low complement levels Incorrect answer selected
○	*Staphylococcus aureus* infection
○	*Streptococcus viridans* infection This is the correct answer

Features suggestive of a worse prognosis are:

- acute endocarditis (*Staphylococcus aureus*)
- heart failure
- intravenous drug abuse (often left and right-sided disease)
- prosthetic valve infection
- infection of the aortic rather than mitral valve, and
- associated rhythm disturbance.

Subacute bacterial endocarditis (*Streptococcus viridans*) has a better prognosis.

Work Smart

Question 134 of 200

A 45-year-old man presents with a rash. On examination you find he has eruptive xanthoma.

Which of the following is the most likely diagnosis?

(Please select 1 option)

○	Familial combined hyperlipidaemia
○	Familial hypercholesterolaemia
○	Familial hypertriglyceridaemia This is the correct answer
◉	Hyperlipidaemia associated with nephrotic syndrome Incorrect answer selected
○	Remnant hyperlipidaemia

Eruptive xanthoma occur in a number of types of hypertriglyceridaemia and also in uncontrolled diabetes mellitus.

Of those listed the most likely is familial hypertriglyceridaemia.

Further Reading:

DermNet NZ. Xanthomas.

Next question | Go to summary

Work Smart

Question 135 of 200

A 60-year-old woman has a systolic murmur.

As part of the evaluation you listen to the murmur during a Valsalva manoeuvre and the murmur becomes louder.

Which of the following systolic murmurs becomes louder with a Valsalva?

(Please select 1 option)

○	Aortic stenosis
○	Hypertrophic obstructive cardiomyopathy (HOCM) This is the correct answer
○	Mitral flow murmur
◉	Mitral regurgitation Incorrect answer selected
○	Ventricular septal defect

Most murmurs of stenosis or regurgitation are exaggerated during squatting and get softer with the Valsalva manoeuvre.

The exceptions are HOCM and mitral valve prolapse where the opposite occurs.

Next question | Go to summary

Work Smart

Question 136 of 200

A young boy is born with a heart murmur that is subsequently diagnosed as Ebstein's anomaly.

Which of the following drugs, taken by the mother, may have contributed to this case of congenital heart disease?

(Please select 1 option)

○	Amiodarone
○	Carbimazole
○	Lithium This is the correct answer
○	Phenytoin
◉	Warfarin Incorrect answer selected

Exposure to lithium in utero is associated with Ebstein's anomaly.

Next question | Go to summary

Answer Statistics

Work Smart

Exam Themes January 2006

Question 137 of 200

Which of the following mechanisms best explains the action of simvastatin?

(Please select 1 option)

○	Activates PPAR-alpha
○	Bile acid sequestration
○	Decreases hepatic cholesterol synthesis This is the correct answer
○	Increases peroxisomal beta-oxidation of fatty acids
◉	Inhibits cholesterol absorption Incorrect answer selected

Most circulating cholesterol is manufactured internally, in amounts of about 1000 mg/day, via carbohydrate metabolism through the HMG-CoA reductase pathway.

Statins act by competitively inhibiting HMG-CoA reductase, the first committed enzyme of the HMG-CoA reductase pathway.

Further Reading:

Patient.info. Statins and Other Lipid-lowering Medicines.

Next question | Go to summary

Work Smart

Question 138 of 200

Which of the following mechanisms best explains the action of fibrates?

(Please select 1 option)

○	Bile acid sequestration
○	Decreases hepatic cholesterol synthesis
○	Increased lipoprotein lipase activity via PPAR-alpha This is the correct answer
○	Increases peroxisomal beta-oxidation of fatty acids
◉	Inhibits cholesterol absorption Incorrect answer selected

The effect of fibrates on the metabolism of triglyceride-rich lipoproteins is due to a PPAR-alpha-dependent stimulation of lipoprotein lipase and of apolipoprotein (apo)A-V, and to an inhibition of apoC-III expression. The increase in plasma HDL-cholesterol depends partly on an overexpression of apoA-I and apoA-II.

Reference:

Fruchart JC, Duriez P. Mode of action of fibrates in the regulation of triglyceride and HDL-cholesterol metabolism. *Drugs Today (Barc).* 2006;42:39-64.

Next question | Go to summary

Work Smart

Exam Themes January 2006

Question 139 of 200

A 60-year-old man presented with a rash over his forearms, shins and face when he visited the cardiology clinic in the summer.

Which of the following medications is the most likely to be associated with this photosensitive rash?

(Please select 1 option)

○	Atenolol
○	Bendroflumethiazide This is the correct answer
○	Clopidogrel
○	Digoxin
◉	Ezetimibe Incorrect answer selected

Photosensitivity is a common adverse effect and the cardiology drugs affected include amiodarone and thiazide diuretics.

Angiotensin-converting enzyme (ACE) inhibitors and angiotensin 2 receptor blockers (A2RBs) commonly cause rashes some of which appear to be photosensitive.

Next question | Go to summary

Work Smart

Exam Themes January 2006

Question 140 of 200

A 54-year-old man is found to have a prolonged corrected QT interval on his ECG.

Which of the following drugs is the most likely cause?

(Please select 1 option)

○	Cefaclor
○	Digoxin
○	Moxonidine
○	Sotalol This is the correct answer
◉	Telmisartan Incorrect answer selected

The following are causes of drug-induced long QT:

- Sotalol
- Amiodarone
- Class 1a antiarrhythmic drugs
- Tricyclic antidepressants
- Chloroquine, and
- Terfenadine.

Work Smart

Exam Themes May 2006

Question 141 of 200

A 65-year-old man presented with chest pain and was found to have ST elevation in leads II, III, and aVF.

He was thrombolysed and has been stable on coronary care. On the third day of admission he becomes confused and agitated, and on reviewing the history it becomes apparent that he was a heavy alcohol drinker before admission, taking 80 units of alcohol per week.

Which of the following management options would be most helpful in this situation?

(Please select 1 option)

○	CT brain scan
○	Diazepam This is the correct answer
○	Haloperidol
○	Psychiatric referral
◉	Thiamine Incorrect answer selected

This man is withdrawing from alcohol and this is associated with anxiety and tachycardia which is the last thing that someone who has just had a myocardial infarction (MI) should suffer from. Also there is a risk of seizure.

Benzodiazepines are the first line of treatment for withdrawal and diazepam should be used in this situation to prevent deterioration to seizures which carry a high morbidity. You are then likely to want to put this gentleman on a reducing regimen of a longer acting benzodiazepine such as

chlordiazepoxide.

Thiamine replacement is critical in patients with a history of alcohol abuse, where they may have Wernicke's encephalopathy which can progress to irreversible neurology and Korsakoff's psychosis if not treatment in a timely fashion. However, the morbidity of alcohol withdrawal seizures is high and in this case I would want to give benzodiazepines first (in reality you would give the two concurrently but this is not an option here).

A psychiatric referral may be necessary if his symptoms prove difficult to control but usually the psychiatry team would not be keen to intervene in what is really a medical emergency; they often advise on other strategies for sedation however.

This is unlikely to be an intracerebral bleed from thrombolysis on the third day but a computerised tomography (CT) scan may be indicated if there are focal neurological signs.

Haloperidol is best avoided because of the risk of causing hypotension. It can also result in prolongation of the QT interval, with risk of ventricular arrhythmias especially in patients with a recent history of cardiac damage (such as MI).

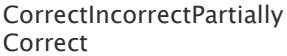
Next question

Go to summary

Answer Statistics

Times answered: 8962

Test Analysis



Work Smart

Exam Themes September 2006

Question 142 of 200

A 55-year-old man is being treated for hyperlipidaemia with atorvastatin 40 mg nocte. He has a history of ischaemic heart disease.

His fasting lipids show:

Total cholesterol	3.8 mmol/L	(<5.2)
Triglycerides	1.3 mmol/L	(0.5-1.7)
LDL-cholesterol	1.9 mmol/L	(<2.6)
HDL-cholesterol	0.7 mmol/L	(0.7-1.7)

Which of the following changes of treatment would be expected to raise his HDL cholesterol level by the greatest amount?

(Please select 1 option)

○	Add cholestyramine
○	Add ezetimibe
○	Add fenofibrate
◉	Add nicotinic acid Correct
○	Switch atorvastatin to rosuvastatin

This is a contentious area which has been the topic of a significant amount of research in recent

years. There does seem to be some evidence of positive effects of nicotinic acid in terms of cardiovascular events and atherosclerosis evolution. However, the results of the HPS-THRIVE2 study resulted in the suspension of these treatments in 2013 by the EMA.

The current NHS standpoint seems to be that whilst the value of nicotinic acid is limited by its side-effects (especially vasodilatation) it does lower both cholesterol and triglyceride concentrations by inhibiting synthesis and increases HDL-cholesterol when used in doses of 1.5-3g daily. It is recommended for use by specialists in combination with a statin, where a statin alone has failed to adequately control dyslipidaemia.

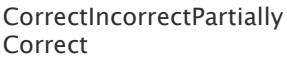
Further reading:
http://www.evidence.nhs.uk/Search?q=nicotinic+acid

Next question | Go to summary

Answer Statistics

Times answered: 9270

Test Analysis



Work Smart

Question 144 of 200

A 58-year-old male has a six year history of hypertension for which he is receiving Candesartan, Amlodipine, Bendroflumethiazide, and Aliskiren.

Which of the following best describes the mechanism of action of Aliskiren?

(Please select 1 option)

○	Aldosterone synthase inhibitor
○	Aldosterone receptor blocker
○	Bradykinin inhibitor
○	Direct renin inhibitor This is the correct answer
◉	Second generation angiotensin receptor antagonist Incorrect answer selected

Aliskiren is a direct renin inhibitor and represents the first new class of drug available in over a decade for the treatment of hypertension. Renin has long been recognized as a possible site for blockade of the renin-angiotensin-aldosterone system (RAS) because it catalyses conversion of angiotensinogen to angiotensin I and is a rate-limiting step in the RAS cascade.

Aliskiren binds to the active site of the renin molecule, blocking angiotensinogen cleavage, thus, preventing the formation of angiotensin I. Clinical studies have demonstrated at least equivalent blood pressure lowering efficacy compared with existing drugs with a favourable side effect profile.

Work Smart

Question 145 of 200

A 16-year-old profoundly deaf boy on holiday in the United Kingdom from Denmark presents with recurrent episodes of syncope and is found to have a long QT interval on his ECG.

His faxed medical records indicate that he has Jervell and Lange-Nielsen syndrome.

Which of the following genes is affected in this condition?

(Please select 1 option)

○	CACNA1c gene
○	Caveolin 3 related gene
○	Human ether-à-go-go related gene (hERG)
○	KCNQ1 gene This is the correct answer
◉	SCN5A gene Incorrect answer selected

Mutations in the KCNE1 and KCNQ1 genes cause Jervell and Lange-Nielsen syndrome.

The KCNE1 and KCNQ1 genes provide instructions for making proteins that work together to form a channel across cell membranes. These channels transport positively charged potassium atoms (ions) out of cells. The movement of potassium ions through these channels is critical for maintaining the normal functions of inner ear structures and cardiac muscle.

All the other genes mentioned are associated with long QT syndromes.

The human ether-à-go-go related gene (hERG) is the gene affected by drugs that lengthen QT interval inadvertently; erythromycin, terfenadine, and ketoconazole.

Further Reading:

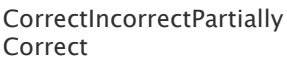
Genetics Home Reference. Jervell and Lange-Nielsen syndrome.

Next question | Go to summary

Answer Statistics

Times answered: 9114

Test Analysis



Score: 14.58%

Total Answered: 144

Feedback

Work Smart

Question 146 of 200

A 75-year-old man is admitted to hospital with acute coronary syndrome and is diagnosed with a myocardial infarction (MI).

Four days later he develops a further episode of chest pain with non-specific ST-T wave changes on the ECG.

Which of the following cardiac enzymes would be the most appropriate for deciding if this second episode was a further MI?

(Please select 1 option)

○	AST
○	CK-MB This is the correct answer
○	LDH
○	Troponin I
◉	Troponin T Incorrect answer selected

Troponin T remains elevated for ten days following an MI so a second episode of chest pain within that time, suspicious of MI, needs to be evaluated with creatine kinase (CK)-myoglobin (MB) which rises over three days to form a diagnostic profile.

Next question | Go to summary

Work Smart

Question 147 of 200

A 60-year-old man presents with features of left ventricular failure. He is comfortable at rest but ordinary physical activity (two flights of stairs) results in fatigue and shortness of breath.

Which of the following New York Heart Association's classifications best match the severity of this man's disease?

(Please select 1 option)

○	Normal
○	NYHA Class I
○	NYHA Class II This is the correct answer
○	NYHA Class III
◉	NYHA Class IV Incorrect answer selected

In 1928 the New York Heart Association published a classification of patients with cardiac disease based on clinical severity and prognosis.

"Class II. Patients with cardiac disease resulting in slight limitation of physical activity. They are comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea or anginal pain."

Further Reading:

1. American Heart Association. Classification of Functional Capacity and Objective Assessment.
2. Dolgin M. *Nomenclature and Criteria for Diagnosis of Diseases of the Heart and Great*

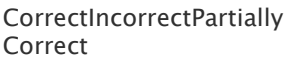
Vessels. 9th ed. Boston, Mass: Little Brown & Co; 1994.

Next question | Go to summary

Answer Statistics

Times answered: 8838

Test Analysis



Score: 14.38%

Total Answered: 146

Feedback

Work Smart

Question 148 of 200

An 18-year-old with cerebral palsy is admitted after a respiratory arrest having been intubated by paramedics.

Nobody can gain intravenous access as the patient is too shut down. A femoral line is not possible due to contractures. You do not have the experience to perform central venous cannulation.

Which of the following is the best option for administering intravenous fluids/emergency drugs in this situation of inability to gain venous access?

(Please select 1 option)

○	Down the endotracheal tube
○	Intramuscular
○	Intraosseous This is the correct answer
○	Nasogastric
◉	Subcutaneous Incorrect answer selected

Nasogastric, intramuscular, and subcutaneous are too slow and unreliable for emergency situations (although in cardiac arrest the endotracheal route is recognised). Venous cut down is a possibility but requires skill in the procedure.

Intraosseous is still perfectly viable in the adult patient: 2 cm below the tibial tuberosity on the antero-medial side or 2 cm proximal to the medial malleolus.

Work Smart

Question 149 of 200

A 52-year-old male presents with a three week history of fevers, deteriorating breathlessness and fatigue. Two years ago he underwent prosthetic valve replacement for a calcified bicuspid aortic valve.

On examination he has a temperature of 37.7°C and four nail-fold infarcts. Vegetations are demonstrated on transoesophageal echocardiography.

Which of the following is the most likely causative organism?

(Please select 1 option)

◉	*Candida* spp. ✗ Incorrect answer selected
○	*Enterococcus*
○	*Staphylococcus aureus*
○	*Staphylococcus epidermidis*
○	*Streptococcus viridans* ✓ This is the correct answer

Generally there are two identifiable modes of prosthetic valve endocarditis.

The first occurs in the first year after surgery affecting 0.7-3% of cases and is often due to *Staphylococci*.

Late endocarditis observed after two years post-surgery is found in 0.5-1% of cases and is typically due to *Strep. viridans.*

Further Reading:

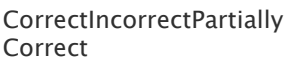
Maroni JP, et al. Prosthetic valve endocarditis: current problems. *Arch Mal Coeur Vaiss.* 1993;86:1837-43.

Next question | Go to summary

Answer Statistics

Times answered: 9148

Test Analysis



Score: 14.19%

Total Answered: 148

Work Smart

Question 150 of 200

A 64-year-old man is admitted with a right femoral neck fracture following a fall.

Also seen in the radiograph of the pelvis are several prominent calcified vessels.

What is the most appropriate next step in management of this finding?

(Please select 1 option)

○	Anticoagulate with heparin
○	Ignore it This is the correct answer
○	Order a pulmonary ventilation-perfusion scan
○	Request a serum troponin test
◉	Start the patient on a nitrate infusion Incorrect answer selected

This finding is typical for Monckeberg's calcific medial sclerosis, a benign condition involving muscular arteries of older persons.

Next question | Go to summary

Answer Statistics

1 26%

Work Smart

Exam Themes January 2006

Question 152 of 200

A 27-year-old woman complained of palpitations, breathlessness, and chest pain radiating to the left arm.

These symptoms had developed six weeks previously, after she had witnessed her father dying from a myocardial infarction.

In the past 10 years she had been investigated for abdominal pain, headaches, joint pains, and dyspareunia, without serious cause being found for these symptoms.

Which of the following is the most likely diagnosis?

(Please select 1 option)

◉	Depressive episode Incorrect answer selected
○	Factitious disorder
○	Generalised anxiety disorder
○	Obsessive compulsive disorder
○	Somatisation disorder This is the correct answer

Although the brief scenario does not have quite enough criteria to fulfil a diagnosis there is enough to make somatisation disorder the most likely answer.

Somatisation disorder is characterised by multiple recurring pains and gastrointestinal, sexual, and pseudo-neurologic symptoms that occur over a period of years.

To meet the diagnostic criteria for somatisation disorder, the patient's physical complaints must not be

intentionally induced and must result in medical attention or significant impairment in social, occupational, or other important areas of functioning.

By definition, the first symptoms appear in adolescence and the full criteria are met by 30 years of age.

Of all the other disorders, 'factitious disorder' would seem the least likely.

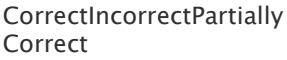
The other three are possible explanations but not as likely as somatisation.

Next question | Go to summary

Answer Statistics

Times answered: 9409

Test Analysis



Score: 14.57%

Work Smart

Exam Themes May 2001

Question 153 of 200

Which one of the following is true regarding acute pulmonary embolism?

(Please select 1 option)

○	A normal ECG excludes the diagnosis
○	Embolectomy is more effective than thrombolysis in improving survival
○	Heparin is as effective as thrombolytic therapy
○	The presence of hypoxaemia is an indication for thrombolysis
◉	Thrombolysis administered through a peripheral vein is as effective as through a pulmonary artery catheter Correct

Embolectomies are rarely done nowadays due to the excellent results with thrombolysis.

Thrombolytic therapy is reserved for those with severely compromised circulation (equally effective through peripheral vein or via catheter in pulmonary artery).

Heparin reduces risk of further embolism (anticoagulant) and reduces pulmonary vasoconstriction.

Next question | Go to summary

Answer Statistics

Work Smart

Question 154 of 200

Which of the following regarding the anatomy of the heart is true?

(Please select 1 option)

○	The aortic valve has three cusps This is the correct answer
○	The ascending aorta is entirely outside the pericardial sac
○	The left atrial appendage is identified readily by transthoracic echocardiography
○	The left ventricle lies anterior to the right ventricle
◉	The right atrium is posterior to the left atrium Incorrect answer selected

The right ventricle lies anterior to the left ventricle.

The left atrium is the most posterior chamber of the heart, the right atrium is just anterior and to the right of the left atrium.

The left atrial appendage is not readily seen on transthoracic echocardiography and requires transoesophageal echocardiography.

Next question | Go to summary

Answer Statistics

Work Smart

Question 155 of 200

A 48-year-old male is referred with impotence.

He has a history of angina, hypertension, and type 2 diabetes.

Which one of the following drugs that he takes would present a contraindication to his being able to receive sildenafil?

(Please select 1 option)

○	Aspirin
○	Bendroflumethiazide
○	Isosorbide mononitrate This is the correct answer
◉	Lisinopril Incorrect answer selected
○	Metformin

Nitrates and sildenafil are contraindicated due to the precipitant drops in blood pressure.

Viagra is also associated with increases in intraocular pressure so should be avoided in glaucoma, hereditary retinal disease, and in those with hypotension.

Next question | Go to summary

Work Smart

Question 156 of 200

A 75-year-old woman presents with a two month history of episodic loss of vision in her right eye.

Her electrocardiogram was normal and carotid ultrasound reveal a 49% stenosis of the right internal carotid artery, as assessed by the NASCAT criteria.

Which is the most appropriate treatment for this patient?

(Please select 1 option)

○	Aspirin This is the correct answer
○	Carotid endarterectomy
○	Dipyridamole
○	Clopidogrel
◉	Warfarin Incorrect answer selected

NICE guidelines recommend that patients who have had a suspected TIA who are at high risk of a stroke (ABCD score of 4 or above) should have aspirin (300 mg OD) started immediately. They also need specialist assessment and investigation within 24 hours of onset of symptoms. Secondary prevention measures should be introduced as soon as the diagnosis is confirmed, with consideration of individual risk factors.

The ABCD scoring system uses:

Age	≥60	1 point
BP	≥140/90 mmHg at initial evaluation	1 point

Clinical features	Unilateral weakness	2 points
	Isolated speech disturbance	1 point
	Other	0 points
Duration of symptoms	≥60 minutes	2 points
	10-59 minutes	1 point
	< 10 minutes	0 points
Diabetes mellitus	Present	1 point

Although you cannot calculate the ABCD score with the information given in this question, aspirin remains the most appropriate answer.

Carotid endarterectomy has been established as an effective treatment for both symptomatic patients and asymptomatic patients who are shown to have carotid artery stenosis. It reduces the risk of disabling stroke or death by 48% in a person with severe symptomatic carotid stenosis (>70%) who has had a TIA. The perioperative risk of disabling stroke or death is approximately 3%. Current UK guidelines recommend endarterectomy for symptomatic patients with greater than 70% stenosis, based on the North American Symptomatic Carotid Endarterectomy Trial which showed clear benefit. The endarterectomy should be performed as soon as the patient is fit for surgery, preferably within two weeks of a TIA.

The benefit is marginal for symptomatic patients with 50-69% stenosis, but may be greater in male patients. NICE recommends these patients are also considered for endarterectomy. There is significantly less benefit for asymptomatic patients, even those with greater than 60% stenosis. Patients with less than 50% stenosis should not be considered for carotid surgery.

Recurrent stenosis can occur in 1-20% of patients following endarterectomy, and re-operation is needed in 1-3% of cases. Ipsilateral strokes occur in 9% of patients following endarterectomy, and 26% of those treated with medical management alone (within 2 years).

All patients with suspected non-disabling stroke or TIA who are considered as candidates for carotid endarterectomy should have carotid imaging within 1 week. If the patient has had a disabling stroke there is no real benefit in them undergoing the procedure.

Modified-release dipyridamole is indicated in combination with aspirin only once a TIA has been confirmed by a specialist. Alone, it is recommended only if aspirin is contraindicated or not tolerated.

Clopidogrel is recommended in patients who have had an ischaemic stroke, rather than a TIA.

Warfarin is only indicated with cerebral venous sinus thrombosis, or if the patient has atrial fibrillation.

Please note that for this explanation we have used the North American Symptomatic Carotid Endarterecomy Trial (NASCET) criteria, as opposed to the European Carotid Surgery Trialists' Collaborative Group (ECST)

criteria when discussing carotid endarterectomy. Patients should be considered for endarterctomy if they have symptomatic carotid stenosis of 70-99% as assessed according to the ECST criteria. Carotid imaging reports will state which criteria are being used.

Reference:

1. Chambers BR, Donnan GA. Carotid endarterectomy for asymptomatic carotid stenosis. *Cochrane Database Syst Rev.* 2005;(4):CD001923.
2. NICE. Stroke and transient ischaemic attack in over 16s: diagnosis and initial management (CG68).
3. NICE. Clopidogrel and modified-release dipyridamole for the prevention of occlusive vascular events (TA210).

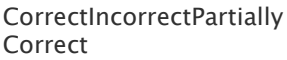
Next question

Go to summary

Answer Statistics

Times answered: 9557

Test Analysis



Work Smart

Question 157 of 200

A 16-year-old male presents with acute severe asthma.

On examination his peripheral pulse volume fell during inspiration.

Which one of the following is the most likely explanation for this clinical sign?

(Please select 1 option)

○	A falling heart rate on inspiration
○	Myocardial depression due to hypoxia
○	Peripheral vasodilatation
○	Reduced left atrial filling pressure on inspiration This is the correct answer
◉	The cardiac effect of high dose beta agonist bronchodilator drugs Incorrect answer selected

This patient is demonstrating pulsus paradoxus.

The right heart responds directly to changes in intrathoracic pressure, while the filling of the left heart depends on the pulmonary vascular volume.

At high respiratory rates, with severe air flow limitation (for example, acute asthma) there is an increased and sudden negative intrathoracic pressure on inspiration and this will enhance the normal fall in blood pressure.

Work Smart

Question 158 of 200

Which of the following arteries are branches of the axillary artery?

(Please select 1 option)

○	Inferior ulnar collateral artery
○	Internal thoracic artery
○	Profunda brachii artery
○	Subscapular artery This is the correct answer
◉	Superior ulnar collateral artery Incorrect answer selected

The internal thoracic artery arises from the subclavian artery.

The inferior and superior ulnar collateral arteries and the profunda brachii are branches of the brachial artery.

The subscapular artery arises from the axillary and is its largest branch, eventually anastomosing with the lateral thoracic and intercostal arteries.

Next question | Go to summary

Answer Statistics

Work Smart

Question 159 of 200

A 43-year-old woman presents to the Emergency Department with diarrhoea and vomiting over the past 48 hours. She has a history of hypertension for which she takes indapamide 1.5 mg daily, but no other past medical history of note.

On examination she looks unwell and has a BP of 122/71 mmHg and a pulse of 79. Her abdomen is soft but there is tenderness consistent with her gastroenteritis.

Investigations show:

Haemoglobin	148 g/L	(115-160)
White cell count	9.8 $\times 10^{9}$/L	(4-10)
Platelets	174 $\times 10^{9}$/L	(150-400)
Sodium	140 mmol/L	(134-143)
Potassium	2.9 mmol/L	(3.5-5)
Creatinine	139 µmol/L	(60-120)

Which of the following is most likely to be found on her ECG?

(Please select 1 option)

○	Atrial fibrillation
⊙	J waves Incorrect answer selected
○	Peaked T waves

○	Shortening of the QT interval
○	ST depression This is the correct answer

When potassium falls below 3 mmol/l, the ECG often demonstrates:

- Flattening of the T waves
- ST depression
- QT prolongation, and
- Prominent U waves.

Patients are at increased risk of ventricular ectopics, torsades de pointes, and ventricular tachycardia.

Other constitutional symptoms associated with hypokalaemia of less than 3.0 mmol/L include:

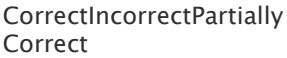
- Tiredness
- General weakness
- Muscle pain, and
- Constipation.

Next question | Go to summary

Answer Statistics

Times answered: 6551

Test Analysis



Work Smart

Question 160 of 200

A 67-year-old man is referred with symptoms of fatigue and a low-grade fever. He has lost a few pounds in weight over the past few weeks and suffered from persistent night sweats.

Past history of note includes chronic gum disease and a number of broken teeth. He is also allergic to penicillin.

On examination, he has a temperature of 37.8°C, and his BP is 105/70 mmHg with a pulse of 95. There are splinter haemorrhages on examination of the fingers on both hands. He has a systolic murmur loudest in the mitral area.

Investigations show:

Haemoglobin	108 g/L	(135-180)
White cell count	11.1 $\times 10^{9}$/L	(4-10)
Platelets	201 $\times 10^{9}$/L	(150-400)
Sodium	139 mmol/L	(134-143)
Potassium	4.5 mmol/L	(3.5-5)
Creatinine	135 µmol/L	(60-120)
C-reactive protein	125 mg/L	(<10)

Which of the following is the most appropriate empirical antibiotic regime?

(Please select 1 option)

⊙	Benzylpenicillin and gentamicin Incorrect answer selected
○	Ceftazidime and metronidazole

○	Flucloxacillin and gentamicin
○	Linezolid and gentamicin
○	Vancomycin and gentamicin This is the correct answer

Viridans or *Bovis streptococci* would figure very high on the index of suspicion, as causes of endocarditis here. As such, in the presence of penicillin allergy, guidelines from the Royal College recommend vancomycin and gentamicin combination therapy as the best alternative to benzylpenicillin and gentamicin.

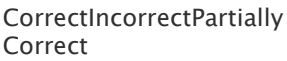
Flucloxacillin and gentamicin is the regime of choice for methicillin-sensitive *Staphylococcus aureus*, with linezolid an appropriate alternative in MRSA.

Next question | Go to summary

Answer Statistics

Times answered: 7063

Test Analysis



Work Smart

Question 161 of 200

A 72-year-old man with a history of oesophageal carcinoma is recovering on the surgical ward after oesophagogastrectomy.

You are asked to see him because he has developed worsening central chest pain, looks pale and sweaty, and has dropped his blood pressure to 100/55 mmHg with a pulse of 92. He has bibasal crackles on auscultation of the chest.

Investigations show:

Haemoglobin	108 g/L	(135-180)
White cell count	9.0 $\times 10^{9}$/L	(4-10)
Platelets	180 $\times 10^{9}$/L	(150-400)
Sodium	139 mmol/L	(134-143)
Potassium	4.4 mmol/L	(3.5-5)
Creatinine	145 µmol/L	(60-120)
ECG	Anterior ST elevation consistent with acute MI	

Which of the following is the most appropriate management?

(Please select 1 option)

○	Angioplasty This is the correct answer
○	Aspirin, clopidogrel, and low molecular weight heparin

○	Aspirin, clopidogrel, low molecular weight heparin, and abciximab
○	CABG
◉	Thrombolysis Incorrect answer selected

Thrombolysis is contraindicated in this gentleman due to his recent surgery, and anti-platelet therapy with or without IIb3a inhibitor will provide limited advantage in a man with a STEMI, while simultaneously increasing his risk of significant bleeding so soon after surgery.

As such, there is only one logical management plan for him: to consider angioplasty.

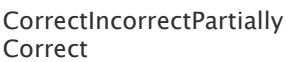
Evidence suggests angioplasty is superior to thrombolysis in the general population, and as such, this man should be managed aggressively and transferred to the catheter lab as soon as is practicable.

Next question | Go to summary

Answer Statistics

Times answered: 6621

Test Analysis



Work Smart

Question 162 of 200

A 56-year-old man presents to the Emergency Department with an inferior myocardial infarction. He has a history of smoking and hypertension and is a poor attendee at the GP surgery.

On initial admission he is hypotensive and bradycardic, with clear inferior ST elevation. He is taken to the catheter lab and stented. You are asked to see him a few hours later as he is persistently hypotensive with poor urine output. He has remained pain free since his stenting.

On examination his BP is 90/50 mmHg, his pulse is 69, he has an elevated JVP, but his chest is clear.

Investigations show:

Haemoglobin	140 g/L	(135-180)
White cell count	6.6 $\times 10^{9}$/L	(4-11)
Platelets	188 $\times 10^{9}$/L	(150-400)
Serum sodium	138 mmol/L	(135-146)
Serum potassium	5.3 mmol/L	(3.5-5)
Creatinine	131 µmol/L	(79-118)

Which of the following is the most appropriate next step?

(Please select 1 option)

○	IV Dobutamine
○	IV Fluid loading This is the correct answer
⊙	

	IV Nitrate ☐ Incorrect answer selected
○	Rescue angioplasty
○	Thrombolysis

This man has suffered a right ventricular infarction, leading to the classical picture of elevated JVP, no signs of left ventricular failure, and systemic hypotension.

The majority of patients improve after a fluid challenge, but this should not be continued if blood pressure fails to improve, as excessive fluid loading may contribute to worsening cardiogenic shock.

In patients who do not improve, monitoring of right sided pressures is the next most appropriate step, with consideration of inotropes. Most patients with right ventricular infarction improve after 48-72 hours.

Next question | Go to summary

Answer Statistics

Times answered: 6653

Test Analysis

CorrectIncorrectPartially Correct

Work Smart

Question 163 of 200

A 56-year-old woman presents to the cardiology clinic with increasing attacks of syncope and pre-syncope over the past few months. She is worried that she may have an underlying cardiac defect. She has a 72 hour ECG recording.

Which of the following would be the most significant finding on 72 hour tape?

(Please select 1 option)

○	1,000 atrial ectopics recorded over the 72 hours
○	1,000 ventricular ectopics recorded over the 72 hours
○	Bradycardia of 40 bpm whilst asleep
○	Mobitz type 1 heart block with right bundle branch block (RBBB) whilst feeling lightheaded This is the correct answer
◉	Runs of four to six beats of SVT without symptoms Incorrect answer selected

Second degree heart block with RBBB implies that this patient has a significantly increased risk of complete heart block.

Runs of four to six beats of SVT, and atrial and ventricular ectopics at this rate would be seen as insignificant.

Ultimately, prior to committing to pace maker insertion, repeat tape is the most likely next step, with an electronic patient diary to see if the recorded arrhythmia corresponds to her symptoms.

Work Smart

Question 164 of 200

A 24-year-old woman who is known to suffer from mitral valve prolapse comes to the Emergency Department complaining of sudden, terrible, tearing pain between her shoulder blades. She notes that her mother died suddenly when she was aged 38.

On examination her BP is 166/94 mmHg, her pulse is 95 and regular. Her chest is clear. Her skin seems rather thin and pale white, you can see extensive bruising over her shins, and her blood vessels are easily visible as you look at her arms.

She has a number of keloid scars, which appear to have occurred after relatively minor skin injuries. She is given oxygen and diamorphine for pain relief.

Investigations show:

Haemoglobin	120 g/L	(11.5-16.5)
White cells	6.8 $\times 10^{9}$/L	(4-11)
Platelets	180 $\times 10^{9}$/L	(150-400)
Sodium	140 mmol/L	(135-146)
Potassium	4.2 mmol/L	(3.5-5)
Creatinine	90 µmol/L	(79-118)
AP chest x ray	Mediastinum width 9.5 cm	
ECG	3 mm inferior ST elevation	

Which of the following is the most appropriate initial therapy?

(Please select 1 option)

◉	Alteplase ☐ Incorrect answer selected
○	Angioplasty
○	Heparin and IV nitrate
○	IV beta-blockade ☐ This is the correct answer
○	Streptokinase

The history is highly suspicious of aortic dissection, with involvement of the right coronary artery suggesting a type A dissection.

This patient needs beta blockade to reduce her BP and myocardial oxygen demand and investigation to confirm the diagnosis. Most emergency departments have rapid access to CT aortogram and this is the investigation of choice.

Regarding type A dissection, progression to surgery is inevitable.

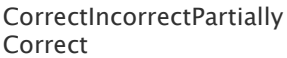
The underlying clinical features are suggestive of Ehlers-Danlos syndrome which puts her at high risk of vascular rupture/dissections.

Next question | Go to summary

Answer Statistics

Times answered: 6162

Test Analysis



Work Smart

Question 165 of 200

A 49-year-old woman comes to the clinic complaining of rapidly worsening lethargy and nausea. Over the past few days she has become increasingly unwell and is now barely able to get out of the house.

Other symptoms of note include progressive shortness of breath and a cough productive of blood stained sputum. Her only consultations with the doctor over the past six months have been about the shape of her nose; she has suffered some collapse of her nasal bridge and is considering plastic surgery.

On examination you notice collapse of the bridge of her nose, and nasal congestion when she speaks. Her BP is elevated at 155/95 mmHg. You can hear crepitations on auscultation of the chest.

Investigations show:

Haemoglobin	120 g/L	(115-165)
White cell count	11.6 $\times 10^9$/L	(4-11)
Platelets	202 $\times 10^9$/L	(150-400)
Serum sodium	139 mmol/L	(135-146)
Serum potassium	5.8 mmol/L	(3.5-5)
Creatinine	285 µmol/L	(79-118)
CXR	Patchy interstitial shadowing	
C-ANCA	Positive	

Which of the following is the most appropriate treatment?

(Please select 1 option)

○	Infliximab
○	Methylprednisolone and azathioprine
◉	Methylprednisolone and cyclophosphamide Correct
○	Methylprednisolone and methotrexate
○	Prednisolone

Methylprednisolone and cyclophosphamide is the treatment of choice for induction of remission in Wegener's granulomatosis, the obvious diagnosis here.

Evidence from controlled trials suggests that once remission is achieved, azathioprine or methotrexate may be reasonable alternatives to cyclophosphamide.

In refractory Wegener's, both infliximab and rituximab have shown some degree of promise.

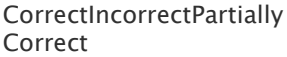
Prognosis is dependent on prompt diagnosis and early intervention with immunosuppressive therapies, with evidence suggesting that time to diagnosis has shortened over the past few years.

Next question Go to summary

Answer Statistics

Times answered: 6629

Test Analysis



Work Smart

Question 166 of 200

Which of the following is an absolute contraindication to β blockers?

(Please select 1 option)

○	Diabetes
○	Heart block This is the correct answer
○	Mild COPD
○	Peripheral vascular disease
◉	Psoriasis Incorrect answer selected

The JBS 2005 guidelines list asthma or heart block as 'compelling contraindications' to β blockers as life-threatening complications may occur.

All the other options may be exacerbated by β blockers and so are considered 'relative' contraindications.

Next question | Go to summary

Answer Statistics

Work Smart

Question 167 of 200

A 61-year-old Caucasian patient presents at a busy outpatient clinic.

She had a hysterectomy in her 40s for symptomatic fibroids following completion of her family, and developed pre-eclampsia in both of her pregnancies. She is a current and lifelong smoker, takes no alcohol and previously worked as a secretary.

Present medication consists of Premarin 300 mcg OD, salbutamol PRN, Seretide BD and amlodipine 5 mg OD.

On examination, her blood pressure is 145/90 mmHg. Chest auscultation was normal. Examination is otherwise unremarkable, with normal fundoscopy, urine dip and ECG.

Which additional strategy would be advisable with respect to her hypertension?

(Please select 1 option)

○	Increase amlodipine to 10 mg
○	Prescribe ramipril 10 mg
○	Prescribe spironolactone 25 mg
○	Repeat blood pressure later This is the correct answer
◉	Screen for phaeochromocytoma Incorrect answer selected

The incidental abnormality seen in the stressful situation of an outpatient clinic requires observation. Current guidelines advocate offering ambulatory blood pressure monitoring (ABPM) should a reading exceeding 140/90 mmHg be obtained, primarily at the end of the current consultation. In ambulatory

monitoring, use the average value of at least 14 measurements taken during the person's usual waking hours to confirm a diagnosis of hypertension

Those without a prior diagnosis of hypertension merit two further checks, one month apart, before starting pharmacotherapy, with advice to modify lifestyle factors (dietary, exercise, alcohol and caffeine intake, smoking) in the interim.

Calcium channel blockers are presently recommended as first line treatment in those over 55, or all patients of African or Caribbean descent. If a Calcium channel blocker is not suitable, for example because of oedema or intolerance, or if there is evidence of heart failure or a high risk of heart failure, offer a thiazide-like diuretic. If diuretic treatment is to be initiated or changed, offer a thiazide-like diuretic, such as chlortalidone (12.5-25.0 mg once daily) or indapamide (1.5 mg modified-release or 2.5 mg once daily) in preference to a conventional thiazide diuretic such as bendroflumethiazide or hydrochlorothiazide

Those under 55 with hypertension are advised to start on an ACE inhibitor at first (or ARB blocker should they be intolerant). The starting dose of ramipril is lower than that given in option B (1.25 mg rather than 10 mg), which is uptitrated in the absence of hypotension depending on satisfactory renal function.

Though polypharmacy is in general to be avoided, in a patient with recognised hypertension adding in a second drug is more effective than increasing doses of a first drug. She presently takes a calcium channel blocker, and the next step is addition of an ACE/ARB.

Screening for phaeochromocytoma through assaying a 24 hour urine collection is advocated in patients with more convincing signs of the disease, such as labile blood pressures exceeding 180/10 mmHg, symptoms including headache and palpitations, and signs of end organ involvement including papilloedema, haematuria, and left ventricular hypertrophy.

Further Reading:

NICE. Hypertension (CG127).

Next question | Go to summary

Answer Statistics

Work Smart

Question 168 of 200

A 45-year-old lawyer is referred to clinic with a blood pressure diary for advice on commencing therapy.

He first consulted his general practitioner for a flare of eczema in January (which resolved with topical therapy) when hypertension was first identified. He is presently asymptomatic, with no other medical complaints other than his longstanding eczema.

He has been visiting the gym regularly since February, and has a healthy diet. He is a current infrequent smoker, and drinks sporadically. He is of Nigerian descent.

Electrocardiogram and urine dip are normal. His home blood pressure recordings are as follows:

January	152/90 mmHg
February	147/85 mmHg
March	153/87 mmHg
April	149/88 mmHg
May	151/86 mmHg

Which would be the most appropriate next step?

(Please select 1 option)

○	Prescribe amlodipine 5 mg This is the correct answer
○	Prescribe bendroflumethiazide 2.5 mg
○	Prescribe furosemide 20 mg

○	Prescribe ramipril 2.5 mg
⊙	Smoking cessation advice Incorrect answer selected

The patient's ethnicity subtly yet significantly alters recommended guidance. Amlodipine is the correct response.

Under the age of 55, most patients are started on ACE inhibitors as a first line therapy for hypertension. Though patients of Afro-Caribbean descent are more prone to developing hypertension they have lower renin levels and are less responsive to angiotensin converting enzyme inhibitors.

Hypertension is hence better controlled by calcium channel blockers in this population, which mirrors what is advocated in patients with a new diagnosis of hypertension above the age of 55. If a calcium channel blocker is not suitable, for example because of oedema or intolerance, offer a thiazide-like diuretic such as chlortalidone (12.5-25.0 mg once daily) or indapamide (1.5 mg modified-release or 2.5 mg once daily) in preference to a conventional thiazide diuretic such as bendroflumethiazide or hydrochlorothiazide.

Smoking cessation advice is of course an important adjunct to control of blood pressure, although in view of consistently high readings in a patient with minimal smoke intake, pharmacotherapy is more appropriate.

Reference

NICE. Hypertension (CG127).

Next question Go to summary

Answer Statistics

Times answered: 6612

Test Analysis

Work Smart

Question 169 of 200

A 59-year-old office worker is diagnosed with essential hypertension, following sequential blood pressure readings in the range of 150-162/85-92 mmHg.

She has no other medical issues, and is started on an ACE inhibitor, which is uptitrated over the following year to a dose of ramipril 5 mg OD. At her next consultation she reports a concerted effort to address lifestyle factors over the preceding year, leading to substantial weight loss. She has also given up occasional smoking since her retirement, and is currently asymptomatic.

On clinical examination the blood pressure is 126/78 mmHg. BMI 22.4 kg/m^2. The apex is undisplaced. Fasting blood tests are as follows:

Serum sodium	141 mmol/L	(137-144)
Serum potassium	4.2 mmol/L	(3.5-4.9)
Urea	4.7 mmol/L	(2.5-7.5)
Creatinine	74 µmol/L	(60-110)
Bilirubin	8 µmol/L	(1-22)
Alanine aminotransferase	23 U/L	(5-35)
Alkaline phosphatase	70 U/L	(45-105)
Albumin	32 g/L	(37-49)
Total protein	86 g/L	(61-76)
C-reactive protein	4 mg/L	(<10)
ECG	Normal sinus rhythm	

Which is the next step in management of this patient's blood pressure?

(Please select 1 option)

○	24 hour urinary protein
○	Add aspirin 75 mg for primary prevention
○	Encourage continued weight loss and re-check blood pressure in a year
○	Myeloma screen
◉	Reduce ramipril to 1.25 mg Correct

The patient has closely adhered to advice on lifestyle modification with great success.

Her blood pressure has normalised in the absence of precipitating environmental factors, providing an opportune moment to trial withdrawal of pharmacotherapy. She is at low cardiovascular risk, and the dose of ACE inhibitor should be tapered with a view to stopping it altogether.

Aspirin is not advised for primary prevention of ischaemic heart disease in a low-risk population, as the risk-benefit ratio is unconvincing in this population. Continued weight loss may be beneficial to her overall health, but there is little room for improvement in her blood pressure so there is nothing against reducing her tablets now.

Note the borderline abnormalities in protein and albumin levels. A high protein level in the presence of low albumin level may indicate a surreptitious monoclonal gammopathy, and considering myeloma is advisable at this stage (though it is not part of management of blood pressure, and therefore an incorrect answer to this question).

Serum calcium, immunoglobulins, electrophoresis, and early morning urinary electrophoresis/Bence Jones protein assay complete a myeloma screen, with skeletal survey only being carried out should these be suggestive of myeloma.

A urine dipstick rather than 24 hour protein collection would be more advisable in the first instance as a negative test would exclude significant renal protein losses.

Reference:

1. Barnett H, et al. Don't use aspirin for primary prevention of cardiovascular disease. *BMJ* 2010;340:c1805.
2. NICE. Hypertension (CG127).

Work Smart

Question 170 of 200

An 82-year-old former soldier with no prior medical history of note was admitted following appendicitis treated with laparoscopic appendicectomy a week previously.

There were no immediate postoperative issues of note, with stable blood count and biochemistry.

He is referred to the medical team prior to discharge to address a consistently high systolic blood pressure, ranging around 160-170 mmHg, over repeated readings during the course of the admission, with no diurnal variation. Similar readings are obtained from all four limbs, in lying and standing positions.

A review of his history indicates that the patient takes over the counter analgesia as required, but has never required medical care. He is a former smoker, but gave up many years ago. He has a good diet, and walks his dog two miles a day.

On clinical examination the patient is euvolaemic with an undisplaced apex, normal heart sounds and no bruits. Undilated fundoscopy is normal. Urine dipstick demonstrated a trace of ketones but nil else. The cardiac axis is normal on ECG. Biochemistry, including renal function, fasting glucose, and lipid profile, is normal. BMI is calculated at 22 kg/m^2.

Which is the best strategy to manage this patient's hypertension?

(Please select 1 option)

○	24 hour urine collection to look for proteinuria
○	Aggressively modify lifestyle factors
○	Ambulatory blood pressure monitor
○	Avoid antihypertensives in view of the risk of falls

⊙	Offer antihypertensive therapy	Correct

The hypertension in the very elderly trial (HYVET) clarified uncertainty surrounding the control of blood pressure in elderly patients, and whether its benefits outweighed the risks of side effects in an aged population.

It compared diuretics, plus or minus ACE inhibitors, against placebo in patients above 80 years of age. This yielded not only a decrease in cardiovascular events, but also appreciably improved all cause mortality. The trial set a target blood pressure of 150/80 mmHg, and it is unclear at this stage whether aiming for a lower target will reap further benefits.

It is also uncertain which classes of drugs are best, and in which order. Thiazides, ACE-inhibitors, and calcium channel blockers have been advocated in a stepwise fashion.

In this case, the trace of ketones on urine dipstick is of no consequence as the patient has established diet and bowel habit, is euvolaemic and has recently had abdominal surgery. In the absence of a positive urine dipstick there is no need to pursue the possibility of proteinuria.

This patient has little in the way of lifestyle factors to modify, being a non-smoker with frequent exercise, good diet, and normal BMI.

Regular blood pressure monitoring has in effect been carried out during the week of admission, with a consistently elevated blood pressure; an ambulatory blood pressure monitor would add little. Note that in this population it is important to measure blood pressure in all four limbs, and in lying/standing positions, in view of the risks of diffuse arterial disease and orthostatic hypotension respectively.

Denying this patient antihypertensives in fear of falls is inappropriate in the context of his mobility and independence.

Reference

1. Beckett NS, et al. Treatment of hypertension in patients 80 years of age or older. *N Engl J Med.* 2008;358:1887-98.
2. Zeglin MA, at al. Hypertension in the very elderly: Brief review of management. *Cardiol J.* 2009;16:379-85.

Next question | Go to summary

Answer Statistics

Work Smart

Question 171 of 200

A 36-year-old patient with hypertension presents following an unplanned pregnancy.

Her blood pressure has been modestly controlled on amlodipine 5 mg and ramipril 2.5 mg over the past five years, with the diagnosis of essential hypertension following a thorough screen for secondary causes. She wishes to proceed with the pregnancy. Her current blood pressure is 135/85 mmHg.

Which is next step you would take?

(Please select 1 option)

○	24 hour urine collection for protein
○	ECG to screen for evidence of end organ damage
○	Stop amlodipine
○	Stop ramipril This is the correct answer
◉	Switch to methyldopa Incorrect answer selected

Ramipril, other ACE inhibitors, and angiotensin II receptor blockers have an increased risk of congenital abnormalities in pregnancy. The priority is to stop either of these drugs early in pregnancy, overriding any need to screen for end organ damage with an ECG.

Little information is available on the effects of amlodipine on the fetus, and its use may continue if the blood pressure mandates it.

Methyldopa is a drug used in pre-eclampsia.

Proteinuria is an important finding in pregnancy, though the screening tool of urine dipstick is often followed by a urinary protein/creatinine ratio rather than a formal 24 hour collection.

Target blood pressures in chronic maternal hypertension are 150/100 mmHg, or 140/90 mmHg in the context of end organ damage.

Reference:

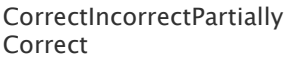
NICE. Hypertension in pregnancy (CG107).

Next question | Go to summary

Answer Statistics

Times answered: 6675

Test Analysis



Score: 15.29%

Work Smart

Question 172 of 200

A 34-year-old patient with longstanding primary hypertension presents in her first pregnancy. ECG, urine dipstick and fundoscopy are normal. Her current blood pressure is 140/95 mmHg.

What is the maximal acceptable blood pressure?

(Please select 1 option)

○	120/70 mmHg
○	130/70 mmHg
○	140/80 mmHg
○	150/90 mmHg
◉	150/100 mmHg Correct

The target blood pressure in patients with pre-existing hypertension is under 150/100 mmHg, or 140/90 mmHg in the presence of end organ failure.

In patients with longstanding hypertension aggressive blood pressure control may compromise placental function, so diastolic blood pressure should be preserved above 80 mmHg.

Any increase in blood pressure above baseline should prompt a search for new pre-eclampsia, testing full blood count, renal and liver function, urinary protein:creatinine ratio, and observing blood pressure closely.

Reference:

NICE. Hypertension in pregnancy (CG107).

Work Smart

Question 173 of 200

A patient is admitted on your ward with endocarditis and is prescribed vancomycin IV. You monitor the patient for signs of toxicity as it has a narrow therapeutic index.

Which of the following is a result of vancomycin toxicity?

(Please select 1 option)

○	Bradycardia
○	Dry mouth
○	Erythema multiforme
○	Hepatoxicity
◉	Ototoxicity Correct

Ototoxicity is associated with vancomycin, and is more likely in patients with high plasma concentrations, renal impairment or pre-existing hearing loss.

It may progress after drug withdrawal, and may be irreversible. Hearing loss may be preceded by tinnitus, which must be regarded as a sign to stop treatment.

The important level to measure here is the trough level as opposed to the peak level with gentamicin.

Next question Go to summary

Work Smart

Core Questions

Question 174 of 200

Mrs PL is taking digoxin for heart failure.

Which of the following drugs, if added to her prescription, would predispose Mrs PL to digoxin toxicity?

(Please select 1 option)

○	Bumetanide This is the correct answer
○	Ibuprofen
○	Paracetamol
○	Phenytoin
◉	St John's wort Incorrect answer selected

Bumetanide is a loop diuretic and may cause hypokalaemia as a side effect. The potassium loss caused by bumetanide increases the toxicity of digoxin.

A comparative study of the medical records of 418 patients taking digitalis over the period 1950 to 1952, and of 679 patients over the period 1964 to 1966, found that the incidence of digitalis toxicity had more than doubled.[1]

Of the earlier group 8.6% developed toxicity compared with 17.2% of the latter group (81% taking diuretics, mainly chlorothiazides, furosemide, ethacrynic acid, chlortalidone). It was concluded that the increased toxicity was related to the increased usage of potassium-depleting diuretics.

Reference:

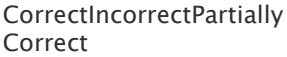
1. Jorgensen AW, Sorensen OH. Digitalis intoxication. A comparative study on the incidence of digitalis intoxication during the periods 1950-52 and 1964-66. *Acta Med Scand.* 1970;188:179-83.

Next question | Go to summary

Answer Statistics

Times answered: 6542

Test Analysis



Score: 16.18%

Total Answered: 173

Work Smart

Question 175 of 200

A 75-year-old lady attends the Emergency Department with dizziness and fainting. She has fully recovered. Neurological examination is normal.

Carotid scanning shows stenosis of 80% on the right and 90% on the left.

Which of the following is the best course of action?

(Please select 1 option)

○	Bilateral carotid endarterectomy
○	Discharge and GP follow up
○	Discharge and outpatient follow up This is the correct answer
○	Urgent carotid endarterectomy on the left
◉	Urgent carotid endarterectomy on the right Incorrect answer selected

This lady has presented with vague symptoms, and does not have any residual neurology on examination. It is possible this presentation has been caused by a posterior circulation transient ischaemic attack, but it could also have been due to a vasovagal or postural hypotension.

Dizziness can be a feature of posterior circulation strokes. Other features are:

- cranial nerve palsies
- unilateral or bilateral motor/sensory deficits
- nystagmus, and
- cerebellar dysfunction.

Anterior circulation strokes result in higher dysfunction (dysphasia, visuospatial disturbances, decreased consciousness), homonymous hemianopia, and motor and sensory deficits.

Investigations here have demonstrated significant carotid artery disease, but as this classically results in anterior circulation symptoms it is unlikely this has caused the symptoms in this case.

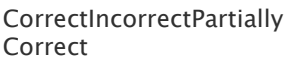
The advice regarding management of asymptomatic severe carotid artery disease varies, and it would be prudent in this situation to arrange timely outpatient review with a specialist to discuss this.

Next question | Go to summary

Answer Statistics

Times answered: 6547

Test Analysis



Score: 16.09%

Work Smart

Question 176 of 200

An 86-year-old man sees you in clinic.

He is a keen marathon runner and tells you that he gets breathless much earlier on in a race than he did 10 years ago.

Which physiological change associated with age would be the most likely cause of his symptoms?

(Please select 1 option)

○	Diastolic dysfunction and reduced stroke volume
○	Higher systolic arterial pressure and increased impedance to left ventricular ejection
○	Increased sino-atrial conduction time
○	Left ventricular hypertrophy
◉	Reduced tachycardic response Correct

Reduced tachycardic response is the correct answer. There is a reduced tachycardic response during exercise associated with age. The heart has to compensate by increasing stroke volume and failure to do so will reduce aerobic capacity. Some fit, healthy, elderly men can compensate for this by increasing left ventricular filling and thus stroke volume (Starling's law).

The other answer options are all physiological changes associated with age. They occur, irrespective of whether a patient exercises or not.

The symptoms that this patient describes are during exercise and failure of the heart to respond appropriately to exercise by increasing the heart rate will lead to dyspnoea.

Reference:

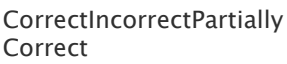
Mangoni AA, Jackson SH. Age-related changes in pharmacokinetics and pharmacodynamics: basic principles and practical applications. *Br J Clin Pharmacol.* 2004;57:6-14.

Next question | Go to summary

Answer Statistics

Times answered: 6622

Test Analysis



Score: 16.57%

Total Answered: 175

Work Smart

Question 177 of 200

A 23-year-old patient on regular haemodialysis was admitted to the hospital after exertional dyspnoea and atrial fibrillation.

A troponin T laboratory request was made.

Which of the following opinions would you formulate?

(Please select 1 option)

○	A rise in cardiac troponin compared with previous one would support the presence of myocardial ischaemia This is the correct answer
○	Any troponin level identifies a patient at greater risk of death compared with a patient without elevated troponin, but this observation does not hold in dialysis population
○	Cardiac troponin test has no diagnostic role in patients undergoing dialysis; it should not be requested
○	He is too young to have cardiovascular disease; troponin test can be omitted
◉	None of the above Incorrect answer selected

The pre-test probability of cardiovascular disease is high in dialysis patients, but the cardiac troponin biomarker should be interpreted in the context of the clinical history and examination for any dialysis patient.

The cardiac troponin tests are frequently elevated in asymptomatic patients undergoing dialysis. In dialysis patients with acute cardiac symptoms, a rising trend in troponin should still suggest significant myocardial ischaemia.

The suggestion that the patient is too young to have cardiovascular disease is incorrect because dialysis patients have exceptionally high risk of cardiovascular disease burden.

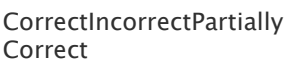
A minor issue is that the effect of haemodialysis on cardiac troponin levels remains controversial. By convention, the troponin is best measured on a pre-dialysis blood sample (unless clinical symptoms dictate otherwise).

Next question | Go to summary

Answer Statistics

Times answered: 6905

Test Analysis



Score: 16.48%

Total Answered: 176

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Work Smart

Question 178 of 200

You are investigating the use of novel markers which may show myocardial damage within the first three hours after myocardial infarction to see if this may improve early diagnosis of damage.

Which of the following is the most appropriate marker?

(Please select 1 option)

○	CKMB
○	Glycogen phosphorylase isoenzyme BB (GPBB) This is the correct answer
○	LDH
○	Troponin I
◉	Troponin T Incorrect answer selected

GPBB is an isoenzyme of glycogen phosphorylase which exists in cardiac muscle. By three hours post myocardial infarction it has risen significantly. As such it is an appropriate marker for early cardiac muscle injury.

Cardiac troponins are the most widely used test following a myocardial infarct in the UK. Both troponin I and T are highly sensitive and specific for cardiac damage, and are of equal clinical value. Serum levels begin to increase within 3-12 hours from the onset of pain, peak at 24-48 hours and return to baseline over 5-14 days.

CK-MB levels also increase within 3-12 hours of onset of chest pain and peak within 24 hours, but return to baseline quicker than troponin (after 48-72 hours). Sensitivity and specificity are not as high

as for troponin levels.

The most sensitive early marker for myocardial infarction is myoglobin (troponin may not rise until 6 hours following myocyte injury). Myoglobin can be detected within 2 hours of cardiac myocyte damage, but is not specific as it is also present in skeletal muscle.

LDH is also less specific than troponin, although the LDH-1 isoenzyme is predominantly found in cardiac muscle so a high LDH-1:LDH-2 ratio can indicate myocardial damage. Levels begin to rise 24-48 hours, peak at 72 hours, and remain elevated for 10 days. It is not widely used in UK practice.

Further Reading:

1. Patient.info. Cardiac Enzymes and Markers for Myocardial Infarction.
2. University of Pittsburg. Profiles of Total CK, CK-MB and Troponin I in Acute Myocardial Infarction (AMI).

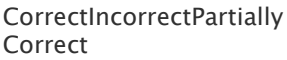
Next question

Go to summary

Answer Statistics

Times answered: 6467

Test Analysis



Score: 16.38%

Total Answered: 177

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Work Smart

Question 179 of 200

A 55-year-old non-smoker presents to the acute medical take with a one month history of chest pain on exertion. There has been no rest pain or deterioration in symptoms.

You perform a full assessment in the Emergency department including a resting 12 lead ECG, which is normal. He is normotensive. His total cholesterol is 5.2. He is not diabetic.

Based on your assessment you feel that he does not need admission. On the post-take ward round your consultant (who is a cardiologist) agrees but asks you to recommend the next investigation based on current NICE guidelines.

From the list below, select the most appropriate response to your consultant's question.

(Please select 1 option)

○	Cardiac CT with calcium scoring
○	Cardiac MR
○	Dobutamine stress echocardiography
○	Exercise tolerance test
◉	Invasive coronary angiogram Correct

Coronary angiogram is recommended for investigation of patients presenting with stable angina and a 61-90% chance of ischaemic heart disease (IHD).

NICE have published a clinical guideline on the assessment and diagnosis of chest pain of recent onset (CG95). This recommends triage of these patients into at risk groups (10-29%, 30-60%, 61-

90%, >90% likelihood of IHD) based on history of symptoms and risk factors (DM, age, smoking, cholesterol).

They provide complex tables which allow you to decide on the initial diagnostic test depending on the patient's profile. Above 90% should be treated as angina without tests.

This patient's risk is 80% and should be referred for invasive coronary angiography.

Despite its very wide use, exercise tolerance testing is no longer recommended for the assessment of patients for angina without known coronary artery disease.

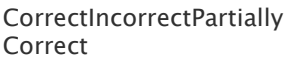
Therefore the correct answer is invasive coronary angiography.

Next question | Go to summary

Answer Statistics

Times answered: 6635

Test Analysis



Score: 16.85%

Total Answered: 178

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Work Smart

Question 180 of 200

You are in a cardiology clinic. A 48-year-old woman has been referred to the cardiology clinic with chest pain. She has been sent for some investigations and has returned to see you for the results.

Investigations have ruled out coronary artery disease but her cholesterol is high. After recording a blood pressure of 150/100 mmHg (for the second time) your CVD risk calculator suggests she should be started on a statin for primary prevention of cardiovascular disease. She has already been given lifestyle advice and is keen to start treatment to reduce her risk further.

You counsel her about starting simvastatin 40 mg once a day. She asks you about her target cholesterol.

Which of the following is your response?

(Please select 1 option)

○	Greater than 20% reduction in non-HDL cholesterol
○	Greater than 40% reduction in non-HDL cholesterol This is the correct answer
○	No target cholesterol or LDL
○	Total cholesterol 4, LDL 2
◉	None of the above Incorrect answer selected

Statin therapy is recommended as part of the management strategy for the primary prevention of cardiovascular disease for adults who have a 10% or greater ten year risk of developing CVD. This level of risk should be estimated using an appropriate risk calculator. The standard treatment initiated

is 20 mg atorvastatin ON.

NICE recommends measuring total cholesterol, HDL cholesterol and non-HDL cholesterol in all patients who have been started on high-intensity statin treatment (as per their 2014 guidelines) after 3 months of treatment, aiming for a greater than 40% reduction in non-HDL cholesterol. If this reduction in non-HDL cholesterol is not achieved, NICE recommends discussing adherence and the timing of the dose, optimising adherence to diet and lifestyle measures, or increasing the dose if the person started on less than atorvastatin 80 mg daily and they are judged to be at higher risk because of comorbidities, risk score, or using clinical judgement.

Reference:

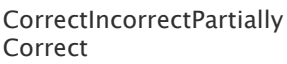
1. NICE. Lipid modification (CG181).
2. NICE. Lipid-modifying drugs (KTT3).

Next question | Go to summary

Answer Statistics

Times answered: 6576

Test Analysis



Score: 16.76%

Total Answered: 179

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Work Smart

Question 181 of 200

An 83-year-old man is referred to the cardiology clinic with a history of palpitations.

He presented to his GP after two days of fast, irregular palpitations. The GP noted an irregular pulse and a 12 lead ECG confirmed atrial fibrillation. He has been referred to you for assessment. In clinic today he is in sinus rhythm. His usual state of health is good; he lives independently with this wife and suffers from controlled hypertension.

He has read in the newspaper about stroke risk associated with AF and asks if he needs any medication to reduce his risk.

From the list, select the most appropriate response.

(Please select 1 option)

○	Aspirin 75 mg once a day
○	Aspirin 300 mg once a day
○	Clopidogrel 75 mg once a day
◉	No anticoagulation necessary Incorrect answer selected
○	Warfarin, dose adjusted to INR This is the correct answer

This patient is diagnosed with paroxysmal AF, and is in sinus rhythm when you review him.

NICE guidelines on Atrial fibrillation (CG180) state the decision to offer antithrombotic therapy is dependent on the patient's risk rather than if they are in paroxysmal, persistent, or permanent AF.

As this patient is above 75 and is hypertensive, the guidelines suggest warfarin, hence warfarin, dose

adjusted to INR, is correct.

Useful clinic tools to decide on appropriate therapy are the CHADS2 and CHADS2-vasc scores.

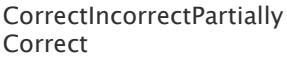
Clopidogrel and aspirin 300 mg OD are not recommended for this indication.

Next question | Go to summary

Answer Statistics

Times answered: 6541

Test Analysis



Score: 16.67%

Total Answered: 180

Work Smart

Core Questions

Question 182 of 200

Your next patient in the care of the elderly clinic is a 79-year-old lady who you initially saw two months ago with a history of palpitations. She has a history of stable coronary artery disease (CAD) and controlled hypertension on bendroflumethiazide. She remains active and lives alone independently.

When you saw her last you sent her for an echo. This demonstrates good LV function, mild concentric LVH and a dilated LA (AP diameter 5.7 cm). A 24 hour ECG has shown AF throughout, maximal rate 135. On questioning during this consultation she has noted a few episodes of palpitations lasting a few hours. Today her ECG confirms AF.

Which of the following is the most appropriate initial management of her arrhythmia?

(Please select 1 option)

○	Arrange DC cardioversion
○	Start amiodarone
○	Start bisoprolol This is the correct answer
○	Start digoxin
◉	Start sotalol Incorrect answer selected

This question tests knowledge of the recommended initial strategy for patients with AF (that is, rhythm or rate control). The decision to start either strategy is based on symptoms and other clinical features.

This patient should be offered rate control in the first instance because she is older (>65), has a

history of CAD and has a large left atrium (>5.5 cm) which makes cardioversion less likely to be successful.

Initial treatment for a rate control strategy is either a standard beta blocker (that is, bisoprolol) or calcium channel blocker. Digoxin should only be used first line for patients who are predominantly sedentary or hypotensive.

Therefore the correct choice is start bisoprolol. The patient should also be considered for anti-coagulation based on her CHADS2 score.

Further Reading:

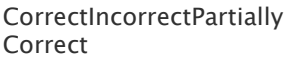
NICE. Atrial fibrillation: the management of atrial fibrillation (CG180).

Next question | Go to summary

Answer Statistics

Times answered: 7239

Test Analysis



Work Smart

Question 183 of 200

A 43-year-old man is on the coronary care unit after suffering a large anterior myocardial infarction.

Fortunately he recovered well following timely reperfusion treatment. After the ward round his wife asks for some advice on how he can reduce the risk of this happening again.

From the list of activities below, which is recommend by NICE for secondary prevention of myocardial infarction?

(Please select 1 option)

○	20-30 minutes of physical activity a day This is the correct answer
○	Abstain from alcohol
○	Beta-carotene supplements
○	Cut down cigarette use
◉	Vitamin E supplements Incorrect answer selected

Following a myocardial infarction, NICE guidelines on MI: secondary prevention (CG172) recommend a number of lifestyle modifications as prevention. These include increasing physical activity to 20-30 minutes per day, which seems daunting to patients who may not have exercised as such since school.

It advises this is increased slowly and cardiac rehabilitation classes can help promote and encourage this.

Abstinence from alcohol is not recommended per se, but should be used in moderation.

Smokers should be encouraged to stop, and cutting down does not work.

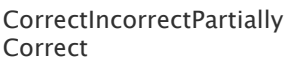
Vitamin E and beta-carotene supplements are specifically mentioned and are not to be recommended.

Next question | Go to summary

Answer Statistics

Times answered: 6518

Test Analysis



Score: 16.48%

Total Answered: 182

Work Smart

Question 184 of 200

You are helping out the consultant in the afternoon care of the elderly clinic.

Your next patient is a 92-year-old man with a history of aortic stenosis. He has annual transthoracic echocardiograms and his pressure gradient across the valve is stable. His is asymptomatic currently. After the clinic your consultant asks you to discuss each case with her. While discussing this patient, your consultant asks you to explain the pathophysiological mechanisms which occur in aortic stenosis.

Which of the following is the pathophysiological response in aortic stenosis?

(Please select 1 option)

○	Concentric left ventricular hypertrophy	This is the correct answer
○	Eccentric left ventricular hypertrophy	
○	Increase in myocyte calcium	
○	Reduced collagen	
◉	Significant fibrosis	Incorrect answer selected

Aortic stenosis (AS) is the most common valve problem in the United Kingdom.

There are a number of compensatory mechanisms to maintain perfusion pressure. However, as time goes on and the valve becomes more narrow, these mechanisms result in the known later complications of AS.

The LV hypertrophies increase (in the size of myocytes) in a concentric, rather than an eccentric

(asymmetric), manner in response to the increase in afterload.

There is also an increase in interstitial collagen and little fibrosis (hence reduced collagen and significant fibrosis are incorrect).

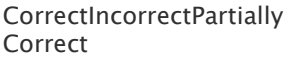
There is no change in myocyte calcium.

Next question | Go to summary

Answer Statistics

Times answered: 6534

Test Analysis



Score: 16.39%

Total Answered: 183

Work Smart

Question 185 of 200

You have shown an interest in paediatric cardiology and your clinical supervisor has arranged for you to attend some clinics with the visiting paediatric cardiologist.

You have a very interesting session and you were particularly interested in the patients you saw with ventricular septal defects (VSDs). After this session you have been stimulated to do some self-directed learning and want to read about VSDs. As part of your reading you learn about the anatomical classification of VSDs and the frequency of each type.

During your reading, what did you discover to be the most common site for a VSD?

(Please select 1 option)

○	Muscular - inlet
○	Muscular - outlet
○	Muscular - trabecular
◉	Perimembranous Correct
○	None of the above

There are a number of different classifications for VSDs.

One easy way to group these is based on the division of the ventricular septum into membranous and muscular portions.

Muscular inlet, outlet, and trabecular are the subdivision of the muscular VSDs and occur in 5%, 5-10% and 5-10% respectively.

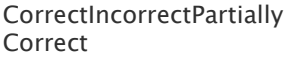
Perimembranous VSDs account for 70-80% of VSDs and are situated between the inlet and outlet portions of the septum.

Next question | Go to summary

Answer Statistics

Times answered: 6575

Test Analysis



Score: 16.85%

Total Answered: 184

Feedback

Work Smart

Question 186 of 200

A 30-year-old pregnant patient is referred to the cardiology clinic with a history of regular fast palpitations. The gestational age is 27 weeks. There is no history of collapse and the patient is usually fit and well.

You examine the patient. Pulse is 105 and regular and the blood pressure is 105/80 mmHg. Venous pressure is not elevated. Heart sounds are normal and a resting 12 lead ECG shows sinus rhythm only.

Regarding the normal pregnancy, which from the list below is an expected physiological change?

(Please select 1 option)

○	Bradycardia
○	Elevated JVP
○	Hypertension
○	Reduced stroke volume
◉	Tachycardia Correct

There are a number of physiological changes which occur during pregnancy.

The heart rate increases by 10-20 bpm, stroke volume and cardiac output increase but venous pressure should remain the same due to a 25% reduction in systemic and pulmonary vascular resistance.

Blood pressure should drop in the first and second trimester and then climb to pre-pregnancy levels

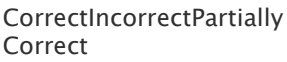
by the third trimester.

Next question | Go to summary

Answer Statistics

Times answered: 6535

Test Analysis



Score: 17.3%

Total Answered: 185

Feedback

Work Smart

Question 187 of 200

An elderly gentleman is brought to the Emergency Department after suffering a witnessed collapse in a supermarket. A passer-by came to his aid immediately and he regained consciousness quickly. His usual state of health is good and he is independent.

On arrival his GCS is 15/15. Blood pressure is 101/72 mmHg. Pulse is 40 regular. Cardiovascular, respiratory, and neurological examination is normal.

A 12 lead ECG demonstrates a bradycardia with no obvious association between the QRS complexes and P waves. You call the cardiology registrar for help. You talk to the patient about his problem and when pacemakers are needed.

With regard to this, from the list below, which is an absolute indication for a permanent pacemaker?

(Please select 1 option)

○	Acquired third degree heart block without symptoms	This is the correct answer
○	Bifascicular block	
○	First degree heart block without symptoms	
○	Mobitz Type I with symptoms	
◉	Trifascicular block	Incorrect answer selected

Indications for permanent pacemakers are a common cardiology topic in examinations.

There is a long list of relative and absolute indications for permanent pacemakers. These are based on international guidelines.

Complete heart block (whether symptomatic or not) is a indication for a permanent pacemaker as there is an inherent risk of asystole.

Mobitz Type I with symptoms is a relative indication.

Generally, permanent pacing can be justified for any degree of heart block associated with symptoms of bradycardia.

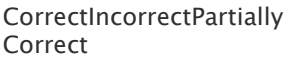
Bifascicular block and trifascicular block are only absolute indications if they are associated with heart block.

Next question | Go to summary

Answer Statistics

Times answered: 6587

Test Analysis



Work Smart

Question 188 of 200

A male infant is rushed to the Emergency Department by his parents with a short history of blue lips and breathlessness. His parents are frantic and you arrange admission to the paediatric ward.

Two days later you decide to go to the ward to see how the patient is doing. You look through the notes and find a report from a transthoracic echocardiogram. The report mentions displacement of the tricuspid valve towards the apex, a small 'atrialised' and hypoplastic RV, an ASD and tricuspid incompetence.

Based on the echo findings, which is the likely diagnosis?

(Please select 1 option)

○	Ebstein's anomaly This is the correct answer
○	Hypoplastic left ventricle
○	Tetralogy of Fallot
○	Truncus arteriosus
◉	None of the above Incorrect answer selected

Ebstein's anomaly is congenital heart defect which has been linked with maternal lithium intake.

There is variable anatomy but the most common findings are a hypoplastic (atrialised) RV, apical displacement of the septal and posterior tricuspid valve leaflets, and ASD.

Wolff-Parkinson-White syndrome occurs in around 15% of the patients.

Presentation depends on the extent of the defects and can be at any stage of childhood with heart

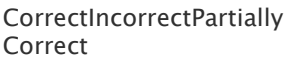
failure or arrhythmias.

Next question | Go to summary

Answer Statistics

Times answered: 6468

Test Analysis



Score: 17.11%

Total Answered: 187

Feedback

Work Smart

Question 189 of 200

A 43-year-old man presents to the Emergency Department with a three hour history of chest pain. He has a history of 'angina' diagnosed by his GP. He is awaiting objective assessment to confirm this. His GP started aspirin and gave him a GTN spray with instructions how to use it.

The pain came on after walking up a hill but has not gone away. He took three puffs of GTN but this had no significant effect. He looks sweaty and unwell. You review his 12 lead ECG but it looks normal to you. You think this patient has an acute coronary syndrome (ACS) and decide to admit for assessment.

Which of the features listed below is a good indicator of presence of acute coronary syndrome?

(Please select 1 option)

◉	Associated feeling of impending doom	✗ Incorrect answer selected
○	Associated nausea and sweating	✓ This is the correct answer
○	Good response to GTN	
○	Pain in chest lasting at least one hour	
○	Pain which varies with patient's position	

Diagnosis of ACS is based on clinical history and/or presence of ischaemic ECG changes with or without troponin elevation. Each of these should not be relied upon in isolation but interpreted in the context of the others.

NICE have produced guidance on Chest pain of recent onset (CG95). It lists clinical factors which are

good indicators of ACS. These include typical pain lasting at least 15 minutes and associated nausea and sweating.

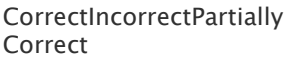
The guidance specifically mentions that response to GTN should not be used as GTN has a strong placebo.

Next question | Go to summary

Answer Statistics

Times answered: 6559

Test Analysis



Score: 17.02%

Total Answered: 188

Work Smart

Question 190 of 200

Your next patient in the care of the elderly clinic is a 77-year-old man with a history of hypertensive heart disease leading to congestive cardiac failure.

Unfortunately, in the past few months his symptoms have worsened and he is becoming housebound. His wife has accompanied him and is worried about his state. She asks you directly: "How long has he got left?" You tell his wife that certain test results can suggest a worse prognosis.

From the list, which blood test result suggests a worse prognosis in heart failure?

(Please select 1 option)

○	Hypocalcaemia
◉	Hyponatraemia Correct
○	Low serum BNP/ NT-pro-BNP
○	Low serum uric acid
○	Polycythaemia

Heart failure is a chronic condition with a high morbidity and mortality.

There are a number of clinical features and biochemical parameters which provide useful prognostic information.

Prognostic markers include:

- High BNP/NT-pro-BNP

- Anaemia
- Hyponatraemia, and
- Increased uric acid.

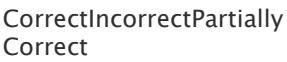
Serum calcium is not a useful in prognosis in heart failure.

Next question | Go to summary

Answer Statistics

Times answered: 6418

Test Analysis



Score: 17.46%

Total Answered: 189

Work Smart

Question 191 of 200

A 32-year-old woman presents to the clinic with symptoms of pneumonia and you suspect she has an underlying *Mycoplasma* infection.

On examination she is pyrexial, 38.2°C, her BP is 110/70 mmHg and her pulse is 90. She looks pale and has signs of a right sided pneumonia.

You suspect that she may have haemolytic anaemia.

Which of the following would you expect to find on laboratory testing?

(Please select 1 option)

○	Decreased LDH
○	Decreased reticulocyte count
○	Increase in bilirubin (predominantly conjugated)
○	Increased haptoglobin
◉	Presence of spherocytes on the blood film Correct

Presence of spherocytes or fragmented red blood cells on the film is suggestive of haemolytic anaemia. In mycoplasma infection spherocytes are a result of cold agglutinin damage to the red cell membrane. Nucleated red cells may also be seen.

Reticulocyte counts are of course increased in haemolytic anaemia due to increased circulating immature red blood cells.

The increase in bilirubin is predominantly unconjugated. Lactate dehydrogenase (LDH) is increased

and haptoglobins are reduced.

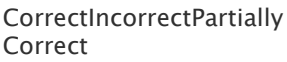
Urinary urobilinogen is increased and haemosiderinuria may be seen.

Next question | Go to summary

Answer Statistics

Times answered: 7128

Test Analysis



Score: 17.89%

Total Answered: 190

Feedback

Work Smart

Question 192 of 200

Which of the following is not a component of the cardiac electrical conduction pathway?

(Please select 1 option)

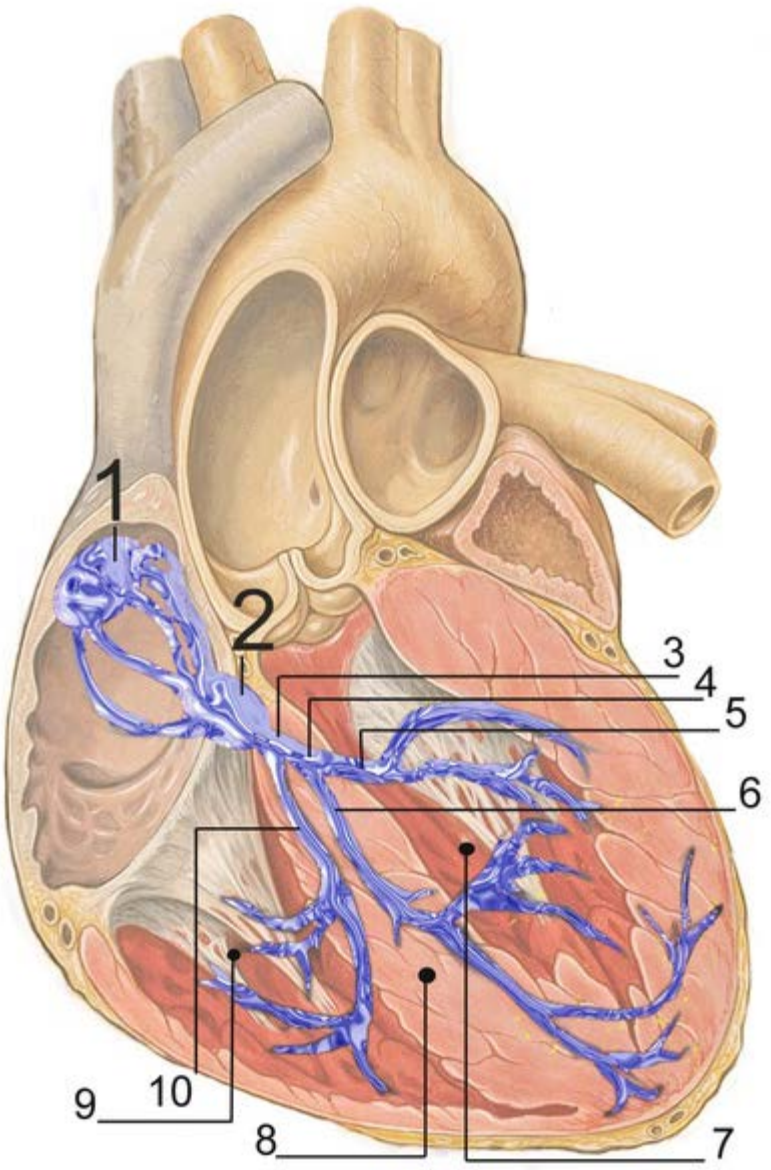
○	Atrioventricular node
○	Bundle of His
○	Purkinje fibres
◉	Sarcomere Correct
○	Sinoatrial node

To enable the circulation of blood through the heart, and through the body, the heart requires coordinated muscular contraction. This is made possible because of the electrical conduction pathway of the heart. An understanding of the anatomy and physiology of the conducting system is important to allow the interpretation of ECGs and the diagnosis of arrhythmias.

The electrical signal starts off at the sinoatrial node (SAN); it then passes to the atrioventricular node (AVN) depolarising the left and right atrium whilst it passes through, thus enabling contraction.

At the atrioventricular node, a short delay occurs, allowing the atrium to start relaxing, before the impulse travels down the bundle of His, and divides along the left and right bundle branches, where it causes depolarisation of the right and left ventricles, and thus ventricular contraction.

Once the atrium and ventricle have repolarised, the cycle starts anew.



1. Sinoatrial node
2. Atrioventricular node
3. Bundle of His
4. Left bundle branch
5. Left posterior fascicle
6. Left anterior fascicle
7. Left ventricle.
8. Ventricular Septum
9. Right Ventricle
10. Right Bundle Branch

Next question

Go to summary

Work Smart

Question 193 of 200

Following a lecture on cardiac physiology, your consultant asks you during a ward round to calculate how much blood (in ml) Mr. Smith's ventricle ejects every time his heart beats. He gives you the following values:

- Blood pressure: 136/90 mmHg units
- Cardiac output: 5000 ml/minute
- Heart Rate: 72/minute
- Urine output: 5 ml/kg/hr

(Please select 1 option)

○	5ml	
○	20ml	
◉	50ml	Incorrect answer selected
○	70ml	This is the correct answer
○	130ml	

Cardiac output (CO), or the volume of blood being pumped by the heart in one minute, is essential for normal function. It is a reflection of how well the rest of the body is being perfused, and therefore how well the body can work (perfusion enables energy production). It is multifactorial, and these can be calculated using stroke volume (SV) and heart rate (HR):

- CO = HR × SV

If 5000 ml is pumped in one minute, with 72 beats of the heart, each beat will pump around 5000/72 = 69.4 ml.

This relationship can be seen at all times: indeed, when one of the parameters in the equation changes, the others change accordingly, to maintain the CO within a tight range.

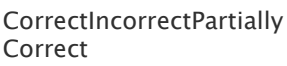
In this situation, the blood pressure, and urine output were both useless information, as all that was needed was the cardiac output (which in a normal adult ranges from 5-8 L/min), and the heart rate.

Next question | Go to summary

Answer Statistics

Times answered: 7577

Test Analysis



Score: 18.23%

Work Smart

Core Questions

Question 194 of 200

A 54-year-old woman comes to the surgery with increasing shortness of breath over the past few months.

She has received doxorubicin and trastuzumab for breast cancer and completed her last course of chemotherapy a few months earlier. On examination her BP is 100/60 mm, pulse is 88 and regular. There is bilateral pitting peripheral oedema, and crackles at the bases on auscultation of the lungs.

Which of the following is the most likely cause of her cardiac failure?

(Please select 1 option)

○	Dilated cardiomyopathy This is the correct answer
○	Ischaemic cardiomyopathy
○	Multiple pulmonary emboli
○	Pericardial effusion
◉	Restrictive cardiomyopathy Incorrect answer selected

Anthracyclines are known to activate stress signal pathways within the heart.

HER2 activation is potentially protective against the damage that this stress signaling induces, and HER2 inhibition removes this layer of protection, leading to dilated cardiomyopathy.

Increasing use of trastuzumab (herceptin) has driven recognition of the problem; it is estimated to occur in 1-4% of patients treated with the drug.

Next question | Go to summary

Answer Statistics

Times answered: 6566

Test Analysis

CorrectIncorrectPartially Correct

Score: 18.13%

Total Answered: 193

Feedback

Question Navigator

Work Smart

Question 195 of 200

A 67-year-old man presents with reduced exercise tolerance. He has a past medical history of an aortic valve replacement.

On examination there is an ejection systolic murmur heard loudest in the aortic area, along with a high pitched early diastolic sound. The JVP rises on inspiration, and is associated with a rapid descent.

Which of the following is the likely cause?

(Please select 1 option)

○	Aortic regurgitation
○	Aortic stenosis
◉	Bacterial endocarditis Incorrect answer selected
○	Constrictive pericarditis This is the correct answer
○	Superior vena cava obstruction

Constrictive pericarditis is often associated with previous cardiac surgery. Other common features in the past medical history include previous pericarditis, radiotherapy, or connective tissue disease. These risk factors are all postulated to result in inflammation of the pericardium, and resultant fibrosis and constriction. Common clinical features include Kussmaul's sign (raised JVP on inspiration) and a pericardial knock. The ejection systolic murmur heard in this case is a flow murmur from the previous aortic valve replacement.

Aortic stenosis, aortic regurgitation, or bacterial endocarditis would not explain the JVP rising on inspiration, its rapid descent or the high pitched early diastolic sound.

Superior vena cava obstruction tends to present with shortness of breath, facial oedema, headache and venous distension in the upper limbs, chest, and neck.

Constrictive pericarditis can be a difficult diagnosis to make, and even echocardiography is not always suggestive.

Reference:

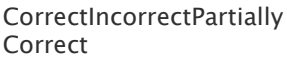
Gaudino M, Anselmi A, Pavone N, Massetti M. Constrictive pericarditis after cardiac surgery. *Ann Thorac Surg.* 2013;95:731-6.

Next question | Go to summary

Answer Statistics

Times answered: 4539

Test Analysis



Work Smart

Core Questions

Question 196 of 200

An 83-year-old lady with known end stage renal failure on haemodialysis three time a week missed her last haemodialysis session because she suffered a fall.

The biochemistry result of her current blood test shows a serum potassium of 7.3 mmol/L. An ECG reveals small P waves, peaked T waves, and prolongation of the QRS complex.

Which is the first step in the management of this condition?

(Please select 1 option)

○	10 mg salbutamol nebuliser
○	10 ml of 10% calcium gluconate intravenously This is the correct answer
○	10 units of actrapid insulin intravenously with 100 ml of 20% dextrose
○	500 ml of 1.26% sodium bicarbonate intravenously
◉	Haemodialysis Incorrect answer selected

Patients with renal failure are at risk of developing hyperkalaemia and the fact that this patient has missed her haemodialysis slot is the explanation in this case. The described ECG changes are typical of severe hyperkalaemia and suggest that the patient is at risk of developing an arrhythmia, usually ventricular fibrillation or asystole.

The immediate management is calcium gluconate which acts to stabilise the myocardial membrane. Salbutamol, insulin, and haemodialysis would all lower the serum potassium, but stabilisation of the cardiac membrane is most important initially. Insulin, in the form of actrapid given with intravenous

glucose, is normally the next step to reduce the serum potassium. Bicarbonate only helps increase excretion of potassium by the kidney if the patient is still passing urine, which may not necessarily be true in this case.

Dialysis should then be given as soon as possible to maintain lower potassium levels, and correct other electrolyte abnormalities.

Reference:

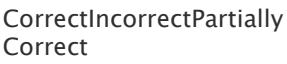
Putcha N, Allon M. Management of hyperkalemia in dialysis patients. *Semin Dial.* 2007;20:431-9.

Next question | Go to summary

Answer Statistics

Times answered: 4523

Test Analysis



Work Smart

Core Questions

Question 197 of 200

A 76-year-old woman presented with an acute myocardial infarction.

The ECG showed ST segment elevation in leads II, III, and, aVF.

Which coronary artery is most likely to be occluded?

(Please select 1 option)

○	Circumflex artery
○	Diagonal branch of the left anterior descending artery
○	Left anterior descending artery
○	Left coronary artery
◉	Right coronary artery Correct

This patient has an inferior myocardial infarction, which is usually due to occlusion of the right coronary artery.

Less commonly, circumflex occlusion may be responsible.

Next question | Go to summary

Answer Statistics

Work Smart

Core Questions

Question 198 of 200

A 32-year-old woman who is 35 weeks pregnant with her first child presents to the Emergency Department with severe shortness of breath. She reports that over the past few days she has become increasingly short of breath, finding it almost impossible to walk up the stairs and having to sleep propped up on 4 pillows in bed. Her ankle oedema has also increased significantly.

On examination her BP is 105/70 mmHg, pulse is 92 bpm and regular. JVP is elevated. There are bibasal crackles on auscultation consistent with heart failure, and O2 saturations on air are reduced to 92%. Routine bloods are unremarkable. Chest x ray reveals evidence of cardiomegaly with bilateral upper lobe diversion.

Which of the following is the most likely diagnosis?

(Please select 1 option)

○	Ischaemic cardiomyopathy
○	Peripartum cardiomyopathy This is the correct answer
○	Primary pulmonary hypertension (PPH)
○	Pulmonary embolism
◉	Viral myocarditis Incorrect answer selected

The answer is peripartum cardiomyopathy, (PCM). This patient presents with symptoms and signs of biventricular heart failure during the third trimester. This fits with a diagnosis of PCM, the aetiology of which is unknown, although both myocarditis and low levels of dietary selenium have been postulated as causes. Management of PCM is similar to the management of heart failure in any other situation

with vasodilators, diuretics, and beta blockade. ACE inhibition is reserved for the postpartum period.

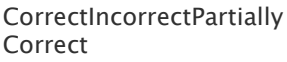
Ischaemic cardiomyopathy is unlikely given the lack of risk factors for IHD, and both primary pulmonary hypertension and pulmonary embolism would present with signs of right sided cardiac strain rather than the biventricular failure seen here. Viral myocarditis is a possible differential, although there are no features to suggest underlying viral infection.

Next question | Go to summary

Answer Statistics

Times answered: 2989

Test Analysis



Score: 18.27%

Total Answered: 197

Work Smart

Core Questions

Question 199 of 200

Which physiological change will directly contribute to increased pulse pressure?

(Please select 1 option)

○	High aortic compliance
○	Low aortic compliance This is the correct answer
◉	Reduced peripheral resistance Incorrect answer selected
○	Reduced stroke volume
○	Reduced venous return

Pulse pressure is the difference between the systolic and diastolic pressure. If the aorta is less compliant (stiffer and less able to contract), there will be a higher systolic pressure and therefore increased pulse pressure.

Reduced stroke volume, high aortic compliance, reduced venous return, and reduced peripheral resistance all result in reduced pulse pressure.

Next question | Go to summary

Work Smart

Core Questions

Question 200 of 200

A 35-year-old male presents with shortness of breath.

On examination, one notes a mid-diastolic rumbling murmur. He has an echocardiogram which confirms mitral stenosis.

What is the most common cause of mitral stenosis?

(Please select 1 option)

○	Calcification
◉	Infective endocarditis Incorrect answer selected
○	Malignant carcinoid syndrome
○	Mitral Valve Prolapse
○	Rheumatic fever This is the correct answer

Mitral stenosis is a valvular heart disease characterised by the narrowing of the orifice of the mitral valve of the heart.

The most common cause is rheumatic fever which presents on average 16 years after the initial episode of rheumatic fever. Infective endocarditis is the second most common cause of mitral stenosis. In pregnancy, mitral stenosis is the most common murmur.

Other rarer causes of rheumatic fever include:

- congenital heart disease

- annular calcification
- endomyocardial fibroelastosis
- malignant carcinoid syndrome
- systemic lupus erythematosus
- Whipple's disease
- Fabry disease
- rheumatoid arthritis
- hurler' disease
- hunter's disease, and
- amyloidosis.

Of the list of options, mitral valve prolapse presents clinically as mitral regurgitation.

Further reading:

Bonow, Robert O.; Mann, Douglas L.; Zipes, Douglas P.; Peter Libby M.D. (2012). *Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine*. Elsevier Saunders. ISBN 978-1-4377-0398-6.

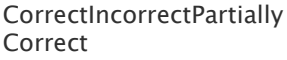
Next question

Go to summary

Answer Statistics

Times answered: 1469

Test Analysis



Work Smart

Question 3 of 80

Which of the following is correct concerning a precordial thump?

(Please select 1 option)

○	Can be delivered up to twice during a cardiac arrest
◉	Can be given following an unwitnessed cardiac arrest Incorrect answer selected
○	Is more successful with pulseless VT than VF This is the correct answer
○	Should be administered after a warning has been given to the patient
○	Should be aimed at the position of V4 on the anterior chest wall

Guidelines from the Resuscitation Council (UK) state that if a patient has a monitored and witnessed VF/VT arrest in hospital, a single shock should be given. Chest compressions should be started immediately after, with a compression to ventilation ratio of 30:2 for 2 minutes. Three quick successive (stacked) shocks are no longer recommended, unless the arrest occurs in the immediate post-operative period following cardiac surgery or when the patient is already attached to a manual defibrillator.

A precordial thump can be successful if given within seconds of the onset of a shockable rhythm. Delivery should not delay calling for help, or accessing a defibrillator, but would be indicated here whilst awaiting the defibrillator. Chest compressions should start immediately if it is unsuccessful. Only one thump should be delivered over the lower third of the sternum. The ulnar edge of a tightly clenched fist is used to deliver a sharp impact from a height of about 20 cm, then retract immediately (thereby creating an impulse-like stimulus). Repeating a precordial thump is not recommended.

Warning a patient who has arrested will serve little purpose.

It is important to remember that a precordial thump has a very low success rate for cardioversion. In general it delivers approximately 7-10 joules of energy, but this is operator dependent and references vary to this regard. There is more success with pulseless VT than with VF.

Reference:

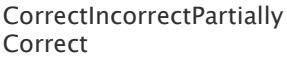
Resuscitation Council (UK). Resuscitation guidelines.

Next question | Go to summary

Answer Statistics

Times answered: 8191

Test Analysis



Score: 50%

Work Smart

Question 5 of 80

In Down's syndrome, which is the most common congenital heart defect?

(Please select 1 option)

○	Atrial septal defect
◉	Atrioventricular septal defect ☐ Correct
○	Patent ductus arteriosus
○	Tetralogy of Fallot
○	Ventricular septal defect

Fifty percent of Down's syndrome births have congenital heart disease.

Defects, in order of decreasing frequency, are:

1. Atrioventricular septal defect
2. Ventricular septal defect
3. Patent ductus arteriosus
4. Tetralogy of Fallot, and
5. Atrial septal defect.

Next question | Go to summary

Work Smart

Exam Themes January 2001

Question 10 of 80

Which of the following concerning the use of intravenous bicarbonate in cardiorespiratory arrest is correct?

(Please select 1 option)

○	Exacerbates intracellular acidosis ✓ This is the correct answer
○	Has a positive inotropic effect on ischaemic myocardium
○	Improves oxygen release to the tissues
○	Increases cerebral blood flow
◉	Reduces pre-existent hyperkalaemia ✗ Incorrect answer selected

Bicarbonate therapy can increase extracellular pH only if the carbon dioxide (CO_2) produced can be removed by adequate ventilation.

Indeed, if hypercapnia occurs then as CO_2 crosses cell membranes easily, intracellular pH may decrease even further with further deterioration of cellular function.

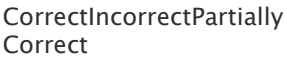
Bicarbonate has a negative inotropic effect, reducing cerebral blood flow; it shifts the oxygen dissociation curve to the left, inhibiting oxygen release to tissues.

Next question | Go to summary

Answer Statistics

Times answered: 9432

Test Analysis



Score: 22.22%

Total Answered: 9

Feedback

Question Navigator

Revision Notes

Work Smart

Exam Themes January 2002

Question 11 of 80

A 57-year-old male is admitted with acute dyspnoea and chest pain. A pulmonary embolism (PE) is confirmed.

Which of the following is a recognised feature of a significant pulmonary embolism?

(Please select 1 option)

○	An arterial pH less than 7.2
○	An increase in serum troponin levels This is the correct answer
○	Blood gases show increased pCO_2 on air
○	Normal D-dimer levels
◉	Reduced plasma lactate levels Incorrect answer selected

Cardiac troponins are reliable markers of myocardial injury that are increasingly being used to diagnose an acute coronary syndrome in patients presenting with undifferentiated chest pain or dyspnoea.

If elevated cardiac troponin levels also occur in patients with pulmonary embolism because of right ventricular dilation and myocardial injury, such patients could be misdiagnosed.

'We performed a prospective cohort study to determine the prevalence of elevated cardiac troponin I (cTnI) levels in patients with submassive pulmonary embolism.

Methods: Consecutive patients with objectively confirmed submassive pulmonary embolism and no previous history of ischemic heart disease, other cardiac disease or renal insufficiency, were

included. Creatine kinase and cTnI levels were measured within 24 hours of clinical presentation on two occasions eight to 12 hours apart.

Results: Of 24 patients with submassive pulmonary embolism, five (20.8%) had elevated cTnI levels of 0.4 microg/L or higher (95% confidence interval, 7.1-42.2%). One of these patients had a cTnI level higher than 2.3 µg/L that was suggestive of myocardial infarction.

Conclusion: Pulmonary embolism should be considered in the differential diagnosis of patients presenting with undifferentiated chest pain or dyspnoea and an elevated cardiac troponin level.'

(Arch Intern Med, 162(1): 79-81 2002)

Hypoxaemia and hypocapnoea are common after major pulmonary embolism and may also be found after more minor events. Absence of these phenomena, on the other hand, by no means excludes embolism and their presence is non-specific.

In suspected minor embolism this investigation is, at best, only of marginal value. The precise stimulus to hyperventilation is unknown and there is also difficulty in understanding the reasons for hypoxaemia when it is present.

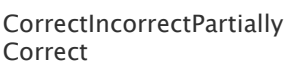
Next question

Go to summary

Answer Statistics

Times answered: 9389

Test Analysis



Work Smart

Exam Themes January 2002

Question 11 of 80

A 57-year-old male is admitted with acute dyspnoea and chest pain. A pulmonary embolism (PE) is confirmed.

Which of the following is a recognised feature of a significant pulmonary embolism?

(Please select 1 option)

○	An arterial pH less than 7.2
○	An increase in serum troponin levels
○	Blood gases show increased pCO_2 on air
○	Normal D-dimer levels
○	Reduced plasma lactate levels

Submit answer | Skip question | Go to summary

Test Analysis

CorrectIncorrectPartially Correct

Work Smart

Question 14 of 80

Which of the following is true regarding mitral stenosis?

(Please select 1 option)

○	Doppler U/S is usually inaccurate in determining severity
○	In AF, the opening snap disappears
○	It is tolerated well in pregnancy
○	The opening snap is not heard when the mitral valve is heavily calcified This is the correct answer
◉	There is characteristically a low wedge pressure Incorrect answer selected

Mitral stenosis is typically a consequence of childhood rheumatic fever, but congenital disease is well recognised.

It is associated with a tapping apex beat, a loud S1, opening snap and mid-diastolic rumble with pre-systolic accentuation in those in sinus rhythm.

The opening snap is characteristically lost with heavy valvular calcification.

In particular mitral stenosis is poorly tolerated in pregnancy due to volume overload.

It is well characterised by Doppler echocardiography.

Work Smart

Question 15 of 80

A 17-year-old female is found to have a cardiac murmur characterized by a mid-systolic click. An echocardiogram reveals mitral insufficiency with upward displacement of one leaflet. There is also aortic root dilation to 4 cm. She has a dislocated right ocular crystalline lens.

She dies suddenly and unexpectedly. The medical examiner finds a prolapsed mitral valve with elongation, thinning, and rupture of chordae tendineae.

A mutation involving which of the following genes is most likely have be present in this patient?

(Please select 1 option)

○	Beta-myosin
○	CFTR
◉	FGFR Incorrect answer selected
○	Fibrillin This is the correct answer
○	Spectrin

Marfan's syndrome is a connective tissue disorder that is associated with floppy mitral valve and also with cystic medial necrosis that predisposes to aortic dissection. Abnormalities of the beta myosin gene may be associated with some forms of dilated cardiomyopathy.

The CFTR gene is associated with cystic fibrosis. The obstructive lung disease from widespread bronchiectasis that results from cystic fibrosis involving the lung can lead to pulmonary hypertension with cor pulmonale.

The fibroblast growth factor receptor (FGFR) gene mutations can be associated with skeletal dysplasias.

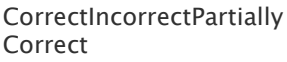
The spectrin gene mutation can be associated with red cell membrane abnormalities associated with hereditary spherocytosis. Anemias in adults with this condition are not typically severe, though anemias in general can increase cardiac stress.

Next question | Go to summary

Answer Statistics

Times answered: 8526

Test Analysis



Score: 14.29%

Total Answered: 14

Work Smart

Question 16 of 80

A 17-year-old girl is short in stature for her age. She has not shown any changes of puberty. She has a webbed neck.

Her vital signs include: temperature 36.6°C, respiratory rate 18/min, pulse 75 bpm, and BP 165/85 mmHg. On physical examination, she has a continuous murmur heard over both the front of the chest as well as her back. Her lower extremities are cool with poor capillary filling.

A chest radiograph reveals a prominent left heart border, no oedema nor effusions, and rib notching.

Which of the following pathologic lesions best explains these findings?

(Please select 1 option)

○	Constriction of the aorta past the ductus arteriosus This is the correct answer
○	Lack of development of the spiral septum and partial absence of conus musculature
○	Shortening and thickening of chordae tendineae of the mitral valve
◉	Single large atrioventricular valve Incorrect answer selected
○	Supravalvular narrowing in the aortic root

She has coarctation of the aorta, and the constriction is postductal, allowing prolonged survival.

Her physical characteristics also suggest Turner syndrome (monosomy X).

Work Smart

Question 18 of 80

A 57-year-old man develops deep venous thrombosis during a hospitalisation for prostatectomy.

He exhibits decreased mental status with right hemiplegia, and a CT scan of the head suggests an acute cerebral infarction in the distribution of the left middle cerebral artery.

A chest x ray reveals cardiac enlargement and prominence of the main pulmonary arteries that suggests pulmonary hypertension. His serum troponin I is <0.4 ng/ml.

Which of the following lesions is most likely to be present on echocardiography?

(Please select 1 option)

○	Coarctation of the aorta
◉	Dextrocardia Incorrect answer selected
○	Pulmonary stenosis
○	Tetralogy of Fallot
○	Ventricular septal defect This is the correct answer

This is 'paradoxical embolus' from right to left. This can only happen if there is a defect that allows passage from right to left. This can happen across a patent foramen ovale.

In this case, the pulmonary hypertension suggests that there may have been a shunt persistent for a long time - Eisenmenger complex.

An atrial or a ventricular septal defect can provide the shunt.

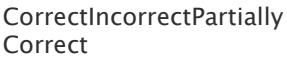
Tetralogy of fallot and pulmonary stenosis do not cause pulmonary hypertension. A coarct does not cause cardiomegaly.

Next question | Go to summary

Answer Statistics

Times answered: 11124

Test Analysis



Score: 11.76%

Total Answered: 17

Feedback

Work Smart

Question 19 of 80

A 58-year-old man has had an enlarging abdomen for several months.

He has experienced no abdominal or chest pain. On physical examination he has a non-tender abdomen with no masses palpable but there is a fluid thrill.

An abdominal ultrasound scan shows a large abdominal fluid collection with a small cirrhotic liver.

A chest x ray shows a globally enlarged heart.

Which of the following conditions is most likely to be present?

(Please select 1 option)

○	Dilated cardiomyopathy This is the correct answer
○	Lymphocytic myocarditis
○	Myocardial amyloid deposition
◉	Nonbacterial thrombotic endocarditis Incorrect answer selected
○	Severe occlusive coronary atherosclerosis

This man has alcoholic liver cirrhosis with ascites.

The cardiomyopathy of alcoholism is a dilated or congestive form.

Next question | Go to summary

Work Smart

Question 20 of 80

A 40-year-old man received an orthotopic cardiac transplant seven years ago to treat a dilated cardiomyopathy. Since that time he has been healthy, with no episodes of rejection or infection. Over the next year, however, he develops fatigue with exercise. He has worsening pedal oedema and orthopnoea.

On physical examination, his vital signs are temperature 36.3°C, pulse 78, respiratory rate 16, and BP 130/70 mm Hg. There are no murmurs, rubs, or gallops audible. Bibasilar crackles in the lungs are audible.

Which of the following conditions is most likely to account for these findings?

(Please select 1 option)

○	Angiosarcoma
○	Coronary arteriopathy This is the correct answer
○	Mitral valvular stenosis
○	Myocarditis
◉	Pulmonary hypertension Incorrect answer selected

By five years following cardiac transplantation, nearly all patients have some degree of small coronary vascular narrowing.

Myocarditis is unlikely to be present in the absence of rejection or infection.

Work Smart

Question 21 of 80

In a patient presenting with aortic stenosis (AS), which of the following findings would be most helpful in establishing a diagnosis of congenital bicuspid valve as the aetiology?

(Please select 1 option)

○	Age
○	Calcified leaflets
○	Commissural fusion on ECHO
○	Negative history for rheumatic fever
◉	Systolic ejection click Correct

Age and calcified aortic root suggest calcific aortic valvular disease.

Rheumatic AS results from fibrosis of the leaflets and fusion of the commissures.

An ejection click or ejection sound, best heard at the apex, implies that the site of the stenosis is mostly valvular and of congenital origin, that is, bicuspid valvular disease.

Next question | Go to summary

Answer Statistics

Work Smart

Question 22 of 80

Which of the following is true regarding the coronary circulation?

(Please select 1 option)

○	Adenosine is an important mediator of metabolic vasodilatation This is the correct answer
○	Coronary blood flow is independent of myocardial oxygen consumption due to autoregulation
○	Coronary blood flow within a normal range of blood pressure is primarily determined by perfusion pressure
◉	Increased myocardial O_2 demand is met primarily by increasing O_2 extraction Incorrect answer selected
○	The vasodilatory reserve of the epicardium and endocardium is equivalent under normal physiologic conditions

Adenosine has a particularly short half life, acts on specific adenosine cell surface receptors (A1 and A2) and is inactivated by adenosine deaminase. It results in coronary vasodilatation and depression of sinus node automaticity and AVN conduction.

Coronary blood flow is dependent on myocardial oxygen consumption and is pretty independently maintained throughout the ranges of blood pressure.

Increasing O_2 demands are met by increased blood supply facilitated by vasodilatation brought about by adenosine production.

Work Smart

Question 23 of 80

A 30-year-old intravenous drug abuser develops acute aortic regurgitation due to infective endocarditis.

Which of the following is not typical of acute aortic regurgitation?

(Please select 1 option)

○	Decrescendo diastolic murmur
○	High cardiac output
○	Hypotension
◉	Mitral valve pre-closure Incorrect answer selected
○	Peripheral vasodilatation This is the correct answer

Findings that would be typical include:

- large pulse volume
- increased pulse pressure
- a decrescendo murmur, and
- a low diastolic blood pressure.

Vasoconstriction not dilatation is typically found.

Further Reading:

Medscape. Aortic Regurgitation.

Work Smart

Question 24 of 80

A 60-year-old man's echocardiogram shows a dilated left ventricular (LV) cavity with the remainder of the other chamber sizes normal.

Which of the following is the most likely diagnosis?

(Please select 1 option)

○	Aortic regurgitation (AR) This is the correct answer
○	Aortic stenosis (AS)
○	Hypertensive heart disease
○	Hypertrophic cardiomyopathy
◉	Mitral stenosis (MS) Incorrect answer selected

No echocardiographic data are provided regarding the valves, but a volume overload as with AR would result in dilatation of the left ventricle.

AS, hypertrophic cardiomyopathy, and hypertension would have the effect of causing hypertrophy and a smaller LV cavity.

MS would have little effect on LV dimensions.

Next question | Go to summary

Work Smart

Question 25 of 80

Angina due to an imbalance between O^2 supply and demand without atherosclerosis would most likely be seen in which of the following circumstances?

(Please select 1 option)

○	Aortic regurgitation This is the correct answer
○	Cardiac tamponade
○	Pulmonary regurgitation
○	Right heart failure
◉	Tricuspid regurgitation Incorrect answer selected

Non-atherosclerotic angina would be associated with conditions such as:

- thyrotoxicosis
- aortic regurgitation
- aortic stenosis
- hypertrophic cardiomyopathy, and
- anaemia

to name but a few.

Work Smart

Question 30 of 80

A 69-year-old woman presented with an ulcer over the left ankle, which had developed over the previous nine months. She had a history of right deep vein thrombosis (DVT) five years previously.

On examination, she had a superficial slough-based ulcer, 6 cm in diameter, over the medial malleolus, with no evidence of cellulitis.

Which investigation is needed before application of compression bandaging?

(Please select 1 option)

○	Ankle-brachial pressure index This is the correct answer
○	Bacteriological swab of the ulcer
◉	Bilateral lower limb arteriogram Incorrect answer selected
○	Right leg venogram
○	Venous duplex ultrasound scan

It has been reported that venous ulcerations are the most common type of ulcer affecting the lower extremities. The probable underlying cause of venous congestion, which may promote ulceration, is venous insufficiency.

The treatment of venous ulceration is control of oedema, treating any infection, and compression. However, compressive dressings or devices should not be applied if the arterial circulation is impaired.

It is thus important to identify any arterial disease, and ankle-brachial pressure index is a simple way

of doing this. One may then progress to lower limb arteriogram if indicated.

There is no clinical sign of infection, and although a bacterial swab would help to rule out pathogens within the ulcer, arterial insufficiency is the more important issue.

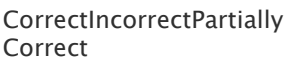
If there is a clinical suspicion of DVT then duplex (or rarely a venogram) is indicated to decide on the indication for warfarin.

Next question | Go to summary

Answer Statistics

Times answered: 10147

Test Analysis



Score: 13.79%

Total Answered: 29

Work Smart

Question 31 of 80

A 55-year-old female who has a long history of alcohol abuse presents with back pain and mild diarrhoea, one month after having a pacemaker inserted.

On examination, she had a fever of 39°C and her abdomen was soft and non-tender.

Which of the following is the most likely diagnosis?

(Please select 1 option)

○	Diverticulitis
○	Ischaemic colitis
○	Pancreatitis
○	Pseudomembranous colitis
◉	Staphylococcal discitis Correct

All patients with alcohol dependence have an increased risk of pancreatitis, but this is less likely without any abdominal signs.

Ischaemic colitis classically presents with bloody diarrhoea.

The prophylactic antibiotics given four weeks previously for her pacemaker insertion would not really have predisposed her to pseudomembranous colitis.

Staphylococci are skin organisms most commonly introduced during pacemaker insertion and such a discitis would present with back pain.

Work Smart

Question 33 of 80

A 65-year-old male with left ventricular systolic dysfunction was dyspnoeic on climbing stairs but not at rest. The patient was commenced on ramipril and furosemide.

Which one of the following drugs would improve the patient's prognosis further?

(Please select 1 option)

○	Amiodarone
○	Digoxin
○	Diltiazem
◉	Isosorbide mononitrate — Incorrect answer selected
○	Metoprolol — This is the correct answer

This patient has NYHA grade II heart failure and is already receiving angiotensin converting enzyme (ACE) inhibitors and diuretics.

Studies such as CIBIS, MERIT HF, and COPERNICUS clearly demonstrate the advantage of beta blockers even with severe heart failure.

Next question | Go to summary

Work Smart

Question 34 of 80

A 70-year-old male with a five year history of type 2 diabetes mellitus (T2DM) presents for annual review with a blood pressure of 188/88 mmHg.

Clinical examination was normal.

An ECG reveals evidence of left ventricular hypertrophy (LVH). Creatinine is elevated at 152 µmol/L and urine is positive on microalbumin testing.

Which one of the following drugs is the most appropriate treatment for this patient's hypertension?

(Please select 1 option)

○	Atenolol
○	Amlodipine
○	Bendroflumethiazide
◉	Doxazosin ✗ Incorrect answer selected
○	Valsartan ✓ This is the correct answer

Regarding the British Hypertension Society guidelines and NICE guidelines on the treatment of BP in type 2 Diabetes, this elderly male with diabetes has isolated systolic hypertension associated with LVH (LVH being defined as a complication of hypertension).

Evidence would support the use of a calcium channel blocker and/or angiotensin-converting enzyme inhibitor (ACEi) as first line.

In a diabetic patient with evidence of nephropathy or any patient with LVH there is compelling

evidence to suggest that ACEI or angiotensin II receptor blockers should be first line treatment for hypertension.

Reference:

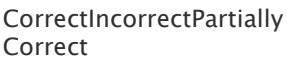
Williams B, et al. British Hypertension Society guidelines for hypertension management 2004 (BHS-IV): summary. *BMJ.* 2004;328:634-40.

Next question | Go to summary

Answer Statistics

Times answered: 11694

Test Analysis



Score: 15.15%

Total Answered: 33

Work Smart

Question 36 of 80

A 16-year-old male is brought to emergency admissions with alcohol intoxication.

An initial ECG reveals atrial fibrillation (AF) but a repeat ECG after 12 hours when he has sobered up, shows sinus rhythm. An echocariogram is normal.

What is the most appropriate management for this patient?

(Please select 1 option)

○	Aspirin for 3 months
○	Bisoprolol for 3 months
○	Lifestyle advice This is the correct answer
○	Sotalol for one month
◉	Warfarin for one month Incorrect answer selected

Excessive alcohol is a recognised cause for atrial fibrillation and is the likely cause here as the rhythm has reverted to sinus after 12 hours. There is also no evidence of structural heart disease as the electrocardiogram was normal.

Therefore this patient needs advice regarding moderation of alcohol consumption and needs to be warned of the toxic effects that alcohol can have on the heart and other organs.

There is no indication for short term aspirin. Atenolol provides rate control, which is not an issue. Sotalol/amiodarone and flecainide can be used in paroxysmal AF. Short term warfarin is used for four to six weeks prior to elective cardioversion to protect against embolic complications.

Work Smart

Question 37 of 80

A 70-year-old man was referred by his GP with difficulty in treating hypertension.

He had longstanding hypertension which had been well controlled over many years but recently he was found to have a blood pressure of 190/110 mmHg which proved resistant to additional treatment.

He was generally asymptomatic and complied with medication. Investigations showed normal U+Es.

Which one of the following is the most likely cause?

(Please select 1 option)

○	Chronic pyelonephritis
○	Conn's syndrome (primary hyperaldosteronism)
○	Phaeochromocytoma
◉	Polycystic kidney disease Incorrect answer selected
○	Renovascular disease This is the correct answer

Primary hyperaldosteronism (Conn's syndrome) typically has hypokalaemic alkalosis. One should also suspect Conn's with patients resistant to conventional antihypertensive treatment and with the electrolytes in the direction of Conn's without necessarily being outside the normal range (plasma Na > 140 and K < 4).

However, in this patient's case, he has longstanding hypertension which has deteriorated and normal electrolytes. Therefore the most likely cause is renovascular disease related to his hypertension.

Renovascular disease is due to disease affecting the arterial supply of the kidney(s). The resulting

renal hypoperfusion leads to hyperactivation of the renin-angiotensin-aldosterone axis, causing hypertension. Atherosclerosis is the most common cause, but Takayasu's arteritis and fibromuscular dysplasia can be the underlying issue.

Renovascular disease is asymptomatic in its early stages. It subsequently leads to hypertension, which can be resistant to standard treatment. It can also lead to renal impairment when patients are started on ACE inhibitors or angiotensin-II receptor antagonists, hypokalaemia or flash pulmonary oedema.

Renal function often remains normal until the late stages of disease. Acute renal failure can occur in rapidly advancing cases, or if there are additional renal insults.

A definitive diagnosis is usually made using angiography. Management involves optimising vascular risk factors, cautious use of ACE inhibitors and angiotensin-II receptor antagonists, and avoiding other nephrotoxics. Vascular intervention, such as stenting, is also possible but there is no good consensus in clinical practice about the benefit of this, and it is often decided on an individual level. The ASTRAL trial showed no significant difference between stenting and medical therapy, but only included patients where the treating physician was unsure of which intervention should be used.

Chronic pyelonephritis and polycystic kidney disease tend to lead to renal impairment, in addition to hypertension.

Phaeochromocytomas cause paroxysms of severe hypertension, rather than longstanding hypertension.

Reference:

ASTRAL Investigators, et al. Revascularization versus medical therapy for renal-artery stenosis. *N Engl J Med.* 2009;361:1953-62.

Next question

Go to summary

Answer Statistics

Times answered: 11104

Work Smart

Question 39 of 80

A 35-year-old female presents with chest pain on exertion.

On examination she has yellow discolouration of her palmar creases and a diagnosis of remnant hyperlipidaemia (type III hyperlipidaemia) is made.

Which of the following is the cause of this hyperlipidaemia?

(Please select 1 option)

○	Apo CIII homozygosity
○	Apo E-2 homozygosity This is the correct answer
○	LCAT deficiency
○	LDL receptor deficiency
◉	Lipoprotein lipase deficiency Incorrect answer selected

Remnant hyperlipidaemia is associated with:

- Hypercholesterolaemia
- Hypertriglyceridaemia
- Palmar xanthomata, and
- Early onset of cardiovascular disease.

The genotype of the condition is apo E-2/E-2 and occurs with a frequency of 1:100.

Low density lipoprotein (LDL) receptor deficiency is associated with familial hypercholesterolaemia.

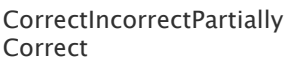
Lipoprotein lipase deficiency is rare and associated with marked hypertriglyceridaemia.

Next question | Go to summary

Answer Statistics

Times answered: 9009

Test Analysis



Score: 13.16%

Total Answered: 38

Feedback

Work Smart

Question 40 of 80

Which of the following lipid abnormalities are most likely to be detected in a patient with type 2 diabetes?

(Please select 1 option)

○	Elevated HDL concentrations
○	Elevated LDL concentrations
○	Large buoyant LDL molecules
○	Reduced triglyceride concentrations
◉	Small dense LDL molecules Correct

In type 2 diabetes, increased cholesteryl ester transfer protein (CETP) activity results in the transfer of triglycerides from very low-density lipoprotein (VLDL) to high-density lipoprotein (HDL) and low-density lipoprotein (LDL).

This results in small, dense LDL which is more atherogenic, being able to be oxidised more readily and penetrate endothelium and macrophages.

LDL is not typically elevated in type 2 diabetes although there are qualitative changes as indicated above.

HDL is typically low in the patient with type 2 diabetes.

Triglycerides are often elevated with poor glycaemic control.

Work Smart

Question 43 of 80

A 35-year-old lady at 14 weeks' gestation is found to have a blood pressure of 160/100 mmHg. Her father is known to have hypertension.

Electrocardiogram (ECG) demonstrates features of left ventricular hypertrophy (LVH).

Which is the most likely diagnosis?

(Please select 1 option)

○	Eclampsia
○	Essential hypertension This is the correct answer
○	Pre-eclampsia
○	Pregnancy-induced hypertension
◉	Renal hypertension Incorrect answer selected

ECG feature of LVH is the key, telling that her hypertension is not of recent onset, ruling out pregnancy related causes.

Of all types of hypertension, essential hypertension is the most prevalent.

Her family history also supports the diagnosis.

Next question | Go to summary

Work Smart

Question 44 of 80

Which of the following options describes troponin?

(Please select 1 option)

○	A component of thick filaments
○	A component of thin filaments This is the correct answer
○	A myosin heavy chain
○	A myosin light chain
◉	A substance produced by pulmonary vascular endothelium Incorrect answer selected

Troponin is a component of thin filaments (along with actin and tropomyosin), and is the protein to which calcium binds to accomplish this regulation.

Troponin has three subunits: TnC, TnI, and TnT.

When calcium is bound to specific sites on TnC, the structure of the thin filament changes in such a manner that myosin (a molecular motor organised in muscle thick filaments) attaches to thin filaments and produces force and/or movement.

In the absence of calcium, tropomyosin interferes with this action of myosin, and therefore muscles remain relaxed.

Work Smart

Exam Themes May 2006

Question 48 of 80

A 25-year-old female who is 20 weeks pregnant with her first child is admitted with palpitations.

The ECG reveals a supraventricular tachycardia (SVT) and this self terminates 20 minutes after admission. Subsequently she has further runs of symptomatic SVT.

Which would be the most appropriate treatment for this patient's paroxysmal supraventricular tachycardia?

(Please select 1 option)

○	Amiodarone
○	Disopyramide
○	Flecainide
○	Metoprolol This is the correct answer
◉	Verapamil Incorrect answer selected

Tachyarrhythmias may increase during pregnancy although the causes are not entirely clear.

Regarding the termination of acute SVT, adenosine appears to be safe in pregnancy. In the case of the prevention of recurrent SVT then verapamil or beta blockers have data supporting their use.

Current AHA/EHA criteria for the treatment of SVTs in pregnancy do suggest using metoprolol (level of evidence 1B) rather than verapamil (C), although they recommend avoiding the former in the first trimester.

Work Smart

Question 49 of 80

A 38-year-old woman with a ten year history of type 1 diabetes attends for annual review.

She has background diabetic retinopathy and microalbuminuria with a urine albumin:creatinine ratio of 4.8 mg/dL (<3). Currently, she takes basal bolus insulin four times daily and lisinopril.

She is a non-smoker, has a BMI of 30 kg/m^2 and a blood pressure of 124/70 mm/hg.

Investigations reveal:

HbA_{1c}	56 mmol/mol	(20-46)
	7.3%	(3.8-6.4)
Total cholesterol	5.2 mmol/L	(<5.2)
Triglyceride	1.9 mmol/L	(0.45-1.69)
LDL cholesterol	3.3 mmol/L	(<3.36)
HDL cholesterol	1.3 mmol/L	(>1.55)

Which would be the most appropriate treatment for this patient's lipid profile?

(Please select 1 option)

○	Atorvastatin Correct
○	Ezetimibe
○	Fenofibrate
○	No treatment required

○	Omega-3 fatty acids

Type 1 diabetes after a duration of 10 years is associated with a 2% annual coronary heart disease (CHD) event rate, while the risk of cardiovascular events is increased in people with type 1 diabetes by factors such as coexisting microvascular complications, in particular nephropathy.

Furthermore, female gender is associated with an approximate twofold increase in relative cardiovascular disease (CVD) risk in type 1 diabetes, while other factors associated with increased CVD risk in type 1 diabetes include:

- degree of glycaemia, and
- duration of diabetes

as well as classically recognised factors such as

- hypertension, and
- dyslipidaemia.

The most recent CVD treatment guidelines JBS-2 advocate that treatment targets for low density lipoprotein-cholesterol (LDL-C) and total cholesterol (TC) of <2 and <4 mmol/L in all people with diabetes over the age of 40 years, and in those under 40 where there are coexisting risk factors, for example:

- Poor glycaemic control (HbA_{1c} >75 mmol/mol or >9%)
- Coexisting microvascular complications
- Presence of another CVD risk factor, or
- Features of the metabolic syndrome (NCEP ATP III).

The most recent NICE guidelines recommend primary prevention with statins in all patients with type 1 diabetes who are over the age of 40 years or who have had diabetes for 10 years or more, have established nephropathy, or have other CVD risk factors. Recommended first line treatment is atorvastatin 20 mg daily.

Ezetimibe is recommended if statins are not tolerated, or they fail to control LDL cholesterol adequately.

Fenofibrate should not be offered for cholesterol control in patients with type 1 diabetes.

Reference:

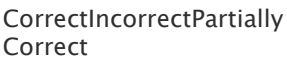
NICE. Lipid-modifying drugs (KTT3).

Next question | Go to summary

Answer Statistics

Times answered: 11345

Test Analysis



Score: 20.83%

Total Answered: 48

Feedback

Question Navigator

Work Smart

Exam Themes September 2006

Question 51 of 80

A 29-year-old female with Turner's syndrome is referred by the GP concerned about her blood pressure which he has found to be persistently elevated at between 140-160/90 mmHg.

On examination she is noted to have a blood pressure of 148/92 mmHg, with no radio-femoral delay and no murmur audible.

Which of the following is the most likely cause of her hypertension?

(Please select 1 option)

○	Coarctation of the aorta
○	Essential hypertension This is the correct answer
○	Primary hyperaldosteronism
○	Renal artery stenosis
◉	Single horsehoe kidney Incorrect answer selected

Hypertension is quite common in Turner's syndrome (10%) and is typically idiopathic - essential.

In a small proportion, causes can include coarctation of the aorta and renal dysfunction due to horsehoe kidney.

In this case, essential hypertension is the most likely cause but in the absence of specific features of coarctation this would again be the most appropriate option.

Work Smart

Question 52 of 80

On physical examination of a 42-year-old man you find a 'jerky' pulse.

Which of the following conditions is most associated with a 'jerky' pulse?

(Please select 1 option)

○	Aortic stenosis
○	Cardiac tamponade
○	Hypertrophic obstructive cardiomyopathy This is the correct answer
◉	'Mixed' aortic valve disease Incorrect answer selected
○	Severe left ventricular failure

Hypertrophic obstructive cardiomyopathy (HOCM) is typically associated with a jerky pulse although it may present with entirely normal clinical findings.

Next question | Go to summary

Answer Statistics

Work Smart

Exam Themes January 2005

Question 55 of 80

A 69-year-old man presents with sudden onset tearing chest pain that radiates through to his back.

He is sweaty. His BP is 140/90 mmHg and pulse 95 bpm. A CXR shows a widened mediastinum and CT scan confirms an aortic dissection of the descending aorta.

Which of the following is the most appropriate initial management of this patient?

(Please select 1 option)

○	Immediate surgical referral
○	IV labetolol This is the correct answer
◉	Observe on high dependency unit Incorrect answer selected
○	Refer for cardiac catherisation
○	Verapamil orally

Advances in the understanding of this disease have established that lesions limited to the descending aorta (type B) generally have better survival compared with those involving the ascending aorta.

Current recommendations support the use of beta blockers as the initial management with an increasing number of endovascular and surgical techniques being used as local expertise dictates.

Reference:

Suzuki T, Mehta RH, Ince H, et al. Clinical profiles and outcomes of acute type B aortic dissection in the current era: lessons from the International Registry of Aortic Dissection (IRAD). *Circulation.* 2003;108:II312-7.

Work Smart

Exam Themes January 2006

Question 58 of 80

A 60-year-old man has left ventricular failure and clinically he is classified as NYHA Class III. He takes furosemide, aspirin, and ramipril.

The addition of which one of the following beta blockers would be expected further to improve his prognosis?

(Please select 1 option)

○	Acebutolol
○	Bisoprolol ✓ This is the correct answer
○	Esmolol
◉	Propranolol ✗ Incorrect answer selected
○	Sotalol

Bisoprolol is a highly selective beta1-adrenoceptor antagonist.

Administration of bisoprolol to patients with chronic heart failure is associated with increases in left ventricular function and reductions in heart rate; increases in heart rate variability are also seen.

Two major randomised, double-blind, placebo-controlled, multicentre trials have examined the clinical efficacy of bisoprolol in combination with ACE inhibitors and diuretics in patients with stable chronic heart failure (New York Heart Association class III or IV).

Reference:

McGavin JK, Keating GM. Bisoprolol: a review of its use in chronic heart failure. *Drugs.*

Work Smart

Question 61 of 80

Which of the following is associated with Marfan's syndrome?

(Please select 1 option)

○	Autosomal recessive inheritance
○	Cognitive impairment
○	Increased upper:lower body ratio
○	Pulmonary stenosis
◉	Retinal detachment Correct

Marfan's syndrome is an autosomal dominant condition associated with ocular abnormalities such as upwards lens dislocation and retinal detachment[1].

It is associated with a number of other ocular abnormalities, including:

- myopia
- increased axial globe length
- corneal flatness
- subluxation of the lenses (ectopia lentis)
- early glaucoma, and
- early cataracts.

About 6 out of 10 people with Marfan's syndrome have dislocated lenses in one or both eyes.

Aortic regurgitation (not pulmonary stenosis) may be a finding and aneurysmal dilatation is a feature.

Other associated cardiovascular respiratory complications include:

- mitral valve prolapse
- aortic aneurysms
- cardiac conduction defects
- emphysema
- pneumothorax, and
- kyphoscoliosis.

Upper to lower body ratio (head to symphysis pubis:symphysis pubis to toes) is decreased in Marfan's syndrome. Other common physical traits include:

- long arms, legs, and fingers
- tall and thin body type
- scoliosis
- pectus excavatum or pectus carinatum
- flexible joints
- flat feet, and
- crowded teeth.

Reference:

Sharma T, Gopal L, Shanmugam MP, et al. Retinal detachment in Marfan syndrome: clinical characteristics and surgical outcome. *Retina.* 2002;22(4):423-8.

Online Mendelian Inheritance in Man (OMIM). Marfan Syndrome.

Patient.info. Marfan's Syndrome.

Next question

Go to summary

Answer Statistics

Times answered: 9204

Work Smart

Question 62 of 80

A 73-year-old male with type 2 diabetes requires improved glycaemic control. He also suffers from heart failure which is controlled with furosemide, ramipril, and bisoprolol.

Which of the following hypoglycaemic agents is contraindicated in this patient?

(Please select 1 option)

○	Acarbose
○	Glipizide
○	Metformin
○	Nateglinide
◉	Pioglitazone Correct

Pioglitazone can result in fluid retention of unknown aetiology which may cause a mild dilutional anaemia (haemoglobin typically falls by 10 to 20 g/L) and ankle oedema. It is contraindicated in congestive heart failure.

Sulphonylureas, acarbose, and nateglinide can be used in patients with heart failure.

To reduce the risk of lactic acidosis, metformin should be avoided in those at risk of tissue hypoxia or sudden deterioration in renal function, such as those with dehydration, severe infection, shock, sepsis, acute heart failure, respiratory failure, or hepatic impairment, or those who have recently had a myocardial infarction.

Although acute heart failure may increase the risk of lactic acidosis with metformin, this patient's heart

Work Smart

Question 64 of 80

A 40-year-old male attends for a consultation after discovering that his brother has been diagnosed with a familial hypertrophic obstructive cardiomyopathy (HOCM).

Which screening method should he be offered?

(Please select 1 option)

○	Coronary angiograms
○	Exercise ECG
○	Genetic testing
○	Transoesophageal echocardiogram
◉	Transthoracic echocardiogram Correct

Current guidelines suggest that a resting ECG and TTE (transthoracic ECHO) are the most effective screening strategies for relatives of patients with HOCM.

Genetic testing is not recommended as a first line screening tool given varying rates of penetrance.

Next question | Go to summary

Answer Statistics

Work Smart

Question 70 of 80

A 17-year-old boy was seen in the Emergency Department for worsening shortness of breath and wheeze.

He has a two year history of asthma which responds to high doses of oral steroids. Further history revealed tingling and numbness affecting his toes for few months. He was given a full course of antibiotics and oral steroids by the GP but this did not help.

He does not have any other comorbidities. There is no family history of note. He does not smoke and does not drink alcohol. His exercise tolerance has been gradually deteriorating. There is no history of foreign travel.

The examination revealed pulse 104/min, BP 125/70 mmHg, respiratory rate 22/min, apyrexial, and oxygen saturations 97% on room air. There was bilateral wheeze in the chest and vesicular breath sounds.

Neurological examination revealed decreased sensation in a stocking distribution. The rest of the neurological and systemic examination was normal.

The initial blood results reveal:

Hb	105 g/L	(130-180)
WCC	10.4 $\times 10^{9}$/L	(4-11)
Neutrophils	2.06 $\times 10^{9}$/L	(1.5-7.0)
Lymphocytes	1.77 $\times 10^{9}$/L	(1.5-4.0)
Eosinophils	4.0 $\times 10^{9}$/L	(0.04-0.4)
Urea	4.4 mmol/L	(2.5-7.5)
Creatinine	115 µmol/L	(60-110)

Urine dipstick was positive for blood. Chest x ray was normal.

Which of the following is the most likely diagnosis?

(Please select 1 option)

○	Atopic asthma
◉	Atypical pneumonia Incorrect answer selected
○	Churg-Strauss syndrome This is the correct answer
○	Goodpasture's syndrome
○	Glomerulonephritis

Churg-Strauss syndrome is a rare type of vasculitis affecting small to medium sized vessels.

It typically presents with asthma and high eosinophilic count. It can involve other systems, as in this question: inflammation of vasa nervosum giving rise to symptoms of peripheral neuropathy, vasculitis of renal vessels giving rise to microscopic haematuria, and mild renal impairment. Multisystem abnormality should raise the possibility of vasculitis.

Regarding the options:

Atopic asthma would not explain the other symptoms in the patient such as peripheral neuropathy, raised eosinophils, impaired renal functions along with microscopic haematuria.

Similarly, atypical pneumonia would not explain all the symptoms. The patient has a normal CXR which would make this choice less likely.

Churg-Strauss syndrome is a rare vasculitis. This question presents the typical picture of a patient with Churg-Strauss syndrome with asthma, mild renal impairment, microscopic haematuria, raised eosinophilic count. This vasculitis involves small to medium sized blood vessels (capillaries, venules, arterioles).

The American College of Rheumatology (ACR) has proposed six criteria for the diagnosis of Churg-Strauss syndrome. The presence of four or more criteria yields a sensitivity of 85% and a specificity of 99.7%.

These criteria include:

1. Asthma (wheezing, expiratory rhonchi)
2. Eosinophilia of more than 10% in peripheral blood
3. Paranasal sinusitis
4. Pulmonary infiltrates (may be transient)
5. Histological proof of vasculitis with extravascular eosinophils, and

6. Mononeuritis multiplex or polyneuropathy.

Management includes glucocorticoids, and immunosuppressant drugs (cyclophosphamide, azathioprine, mycophenolate).

Normal CXR and absence of haemoptysis are against Goodpasture's syndrome. Patients with Goodpasture's syndrome have positive anti-GBM antibodies.

Evidence of microscopic haematuria does suggest underlying glomerulonephritis, but again this diagnosis alone is not sufficient to explain the whole picture.

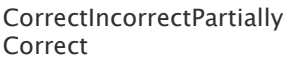
Next question

Go to summary

Answer Statistics

Times answered: 6467

Test Analysis



Work Smart

Question 72 of 80

You are working as part of the on-call medical team and a GP calls for some advice about a 62-year-old male patient.

He is a heavy smoker and has a long and extensive history of peripheral vascular disease. He has had two recent admissions under the vascular surgeons, both occasions requiring embolectomy surgery. His GP is unsure which medication to start to reduce his risk of an occlusive vascular event. Unfortunately, the patient is intolerant of aspirin with documented severe allergy. There is no history of stroke or TIA. The patient is in sinus rhythm.

Based on this information and with regard to current NICE guidance, which management option listed is recommended to reduce occlusive vascular events in this patient?

(Please select 1 option)

○	Clopidogrel This is the correct answer
○	Dabigatran
○	Dipyridamole modified release
○	Dipyridamole modified release with clopidogrel
◉	Warfarin Incorrect answer selected

In 2010 NICE released a technology appraisal on the use of clopidogrel and modified release dipyridamole in the prevention of occlusive vascular events. It relates to patients who have had an occlusive vascular event or have established peripheral artery disease (PAD), as with this patient.

Clopidogrel is the first line option for those who have PAD but cannot tolerate aspirin.

Dipyridamole MR is an option for patients who have had a stroke or a TIA but not primary prevention. In combination with aspirin, dipyridamole can be used if the patient has had a TIA or if they have had a stroke and cannot tolerate clopidogrel.It is an option used alone if they have had a stroke and aspirin/clopidogrel are not tolerated or if they have suffered a TIA and aspirin is not tolerated.

Warfarin is not indicated if they are in sinus rhythm.

Dipyridamole is not indicated in combination with clopidogrel.

Dabigatran is indicated for thromboembolic events post orthopaedic surgery or AF.

Therefore for primary prevention of occlusive vascular events in patients with established PAD but who have not had a stroke/TIA, clopidogrel is the most appropriate choice.

Reference:

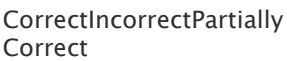
NICE. Clopidogrel and modified-release dipyridamole for the prevention of occlusive vascular events (TA210).

Next question | Go to summary

Answer Statistics

Times answered: 6596

Test Analysis



Work Smart

Core Questions

Question 74 of 80

A 47-year-old lady is admitted to the coronary care unit with symptoms suggestive of decompensated heart failure. She has a history of severe mitral regurgitation secondary to mitral prolapse and is awaiting valve surgery. You are asked to admit the patient and the medical student attached to the firm asks to come with you. You take a full history and examine the patient, making sure to point out all the relevant clinical features to the medical student.

After you finish seeing the patient you discuss the case with the medical student. She asks you the most common cause of mitral regurgitation (MR).

Which of the following should be your response to the medical student's question?

(Please select 1 option)

○	Collagen vascular disease
○	Infective endocarditis
○	Myxomatous degeneration This is the correct answer
○	Rheumatic fever
◉	Rupture of the chordate tendinae Incorrect answer selected

Myxomatous degeneration of the mitral valve is by far the most common cause of MR in the United Kingdom. The others listed are less common causes.

The management of severe MR is surgery; either replacement or repair, depending on the anatomy.

A percutaneous repair with clips is possible in some patients unsuitable for conventional surgery.

Work Smart

Question 75 of 80

A 37-year-old female patient who is undergoing treatment for breast cancer is admitted to the acute medical assessment unit with a seven-day history of increasing breathlessness.

On examination, she looks breathless. Her JVP is elevated with prominent "x" and "y" descents. The heart sounds are soft. A 12 lead ECG shows low voltage complexes.

Transthoracic echocardiography shows pericardial thickening with a restrictive Doppler pattern.

With regard to the investigation findings, which is the most likely cause of this patient's pericardial disease?

(Please select 1 option)

○	Dermatomyositis
○	Mediastinal irradiation This is the correct answer
○	Scleroderma
○	SLE
◉	Uraemia Incorrect answer selected

All the options listed here are causes of pericardial disease.

The echo findings, in this case, are strongly suggestive of constrictive pericarditis where dense fibrous tissue replaces the normal pericardium. Common causes include irradiation, TB, and any cause of purulent pericarditis.

Therefore the correct answer is mediastinal irradiation.

Work Smart

Question 77 of 80

1. Aorta
2. Aortic valve
3. Left atrium
4. Left ventricle
5. Right atrium
6. Right ventricle
7. Mitral valve
8. Pulmonary artery
9. Pulmonary valve
10. Pulmonary vein
11. Tricuspid valve
12. Vena cava

In which order does blood flow through a normal heart?

(Please select 1 option)

○	12-3-11-4-9-8-10-5-7-6-2-1	
○	12-5-7-6-9-8-10-3-11-4-2-1	
◉	12-5-11-6-8-9-10-3-7-4-2-1	Incorrect answer selected
○	12-5-11-6-9-8-10-3-7-4-2-1	This is the correct answer
○	12-5-11-6-9-10-8-3-7-4-2-1	

Understanding the relationship of the different parts of the heart can be made easy by following the blood trajectory - this knowledge will help you understand how certain drugs that work on one part of the heart can help with a problem in another part of the heart, and also help you diagnose certain problems (such as valve defects and the symptoms associated with it).

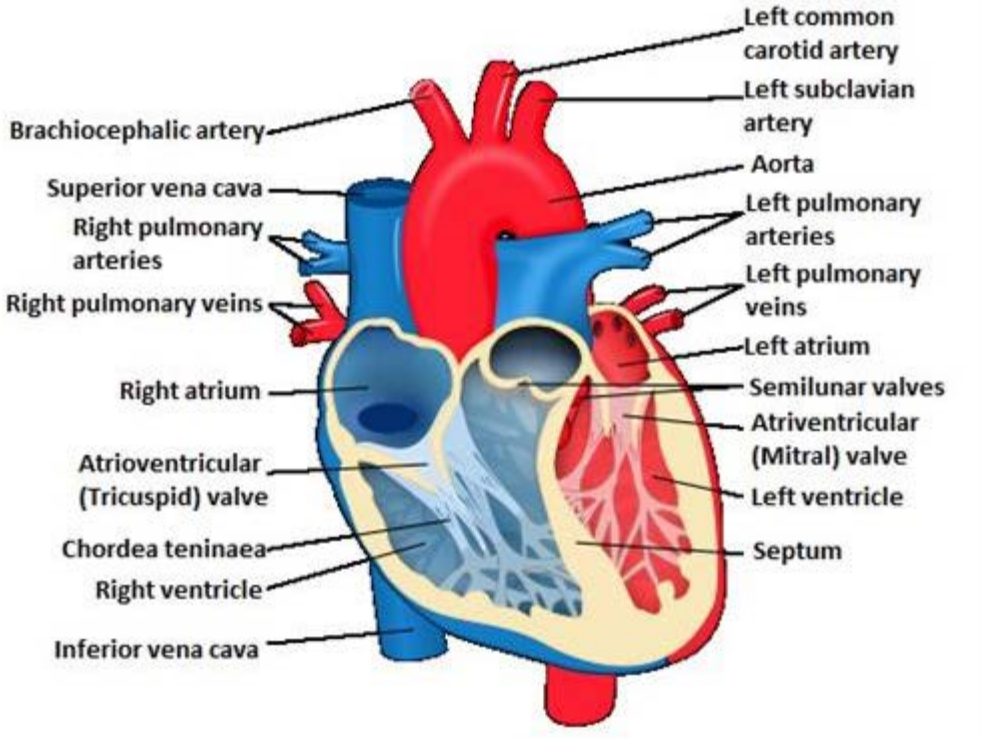
After circulating around the body, the blood is brought back to the heart by the (superior and inferior) vena cava.

It then passes into the right atrium, through the tricuspid valve into the right ventricle.

From there, it travels via the pulmonary valve into the pulmonary artery (remember, blood always leave the heart via an artery), through the lungs, back into the heart via the pulmonary vein and into the left atrium.

It then passes the mitral valve to enter the left ventricle, and exits into the aorta via the aortic valve.

All this movement is regulated by synchronised contraction of the myocardium (muscular part of the heart).



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Next question | Go to summary

Answer Statistics

Work Smart

Question 78 of 80

A 17-year-old man from a traveller family presents to the Emergency Department for review, complaining of headaches, nose bleeds and pain in his calves on exercising. He tells you that he was taken to the paediatric clinic as a child because of a heart problem, but due to moving around the country he hasn't attended for many years.

On examination his BP is 152/90mmHg in his right arm, it is 25mmHg lower in the left arm. His left arm appears slightly smaller than the right, and there is radiofemoral pulse delay. There is a systolic murmur and palpable thrill over the chest wall. Routine bloods are normal.

Which of the following is the most likely diagnosis?

(Please select 1 option)

○	Aortic stenosis
○	Coarctation of the aorta This is the correct answer
◉	Hypertrophic obstructive cardiomyopathy Incorrect answer selected
○	Patent ductus arteriosus
○	Pulmonary stenosis

The answer is coarctation of the aorta. The classical signs pointing towards coarctation here include the differential blood pressures between the right and left arms, radiofemoral delay, systolic murmur, and thrill. Symptoms such as headache and nose bleeds occur due to hypertension proximal to the coarctation, and the pain in his calves is almost certainly due to poor distal blood supply. A chest radiograph is likely to demonstrate evidence of rib notching and may demonstrate an indentation of

the aortic shadow at the site of the coarctation. In adults, balloon angioplasty and stenting is the preferred intervention.

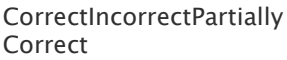
Aortic stenosis is more likely to present with symptoms of left ventricular failure and would be unusual in a patient of this age, and pulmonary stenosis classically presents with symptoms of right heart failure. Hypertrophic obstructive cardiomyopathy (HOCM) usually presents with symptoms of outflow tract obstruction or syncope due to increased propensity for rhythm disturbance. A patent ductus arteriosus rarely presents for the first time in adulthood, and it is almost certainly only small lesions that present this late, usually with isolated rhythm disturbance.

Next question | Go to summary

Answer Statistics

Times answered: 2813

Test Analysis



Work Smart

Question 80 of 80

A 63-year-old gentleman develops an anterior ST elevation myocardial infarction at home and is transferred to the nearest tertiary unit for percutaneous coronary intervention. During angiography, he develops Ventricular Tachycardia but is successfully resuscitated and stabilised by the cardiac arrest teams.

Which is the optimal treatment for improving long term prognosis following this?

(Please select 1 option)

○	Anticoagulate with warfarin
○	Implantable cardiac device (ICD) This is the correct answer
○	Pace maker
○	Statin therapy
◉	Thrombolysis Incorrect answer selected

ICD's are recommended in patients with one or more episode of VT/VF or patients who are high risk of arrhythmias.

The other options above, may be of use alongside an ICD, but will not prevent further VT or improve long term prognosis without an ICD.

Further reading:

Patient education: Implantable cardioverter-defibrillators (Beyond the Basics)

Work Smart

Question 1 of 126

Which of the following may be responsible for a hypokalaemic hypertension?

(Please select 1 option)

◉	Bartter's syndrome Incorrect answer selected
○	Diabetic nephropathy
○	Liddle's syndrome This is the correct answer
○	Non-classical congenital adrenal hyperplasia
○	Type IV renal tubular acidosis (RTA)

Liddle's syndrome is typically associated with hypokalaemic hypertension and low renin and aldosterone concentrations - the so-called pseudo-hyperaldosteronism.

Bartter's syndrome is associated with hypokalaemia, though hypertension is not a feature.

In type IV RTA, there is a hyporeninaemic hypoaldosteronism, which may also be produced with diabetic nephropathy, hence hyperkalaemia is more typical.

Next question | Go to summary

Answer Statistics

Work Smart

Question 1 of 84

Which of the following antimicrobials is associated with prolongation of the QT interval?

(Please select 1 option)

○	Cefuroxime
○	Co-amoxiclav
◉	Erythromycin Correct
○	Gentamicin
○	Isoniazid

The macrolides are associated with a prolongation of the QT interval.

Other antimicrobials associated with prolonged QT include quinine and levofloxacin.

Next question | Go to summary

Answer Statistics

Work Smart

Question 2 of 84

Which of the following antiarrhythmic drugs may be used in the treatment of long QT syndrome?

(Please select 1 option)

○	Amiodarone
◉	Atenolol Correct
○	Flecainide
○	Propafenone
○	Sotalol

Beta blockers are the mainstay of treatment in long QT syndrome.

The most commonly used drugs are propranolol and nadolol, but metoprolol and atenolol are also used.

Sotalol is a complex drug, and although it is classified as a beta blocker it is in fact a mix of the d and l isomers which have quite different effects. The d isomer prolongs repolarisation, resulting in a class III anti-arrhythmic effect. The l isomer acts to both prolong repolarisation and also as a beta blocker. The beta blocker effect is dose-dependent and is not cardio-selective. The overall action of sotalol is to prolong the QT interval, and therefore it is not used in this situation.

Implantable cardioverter defibrillators are the most effective treatment in high risk cases.

The others drugs may produce a prolongation of the QT interval, exacerbating risk of polymorphic ventricular tachycardia (VT) and torsades de pointes.

Further Reading

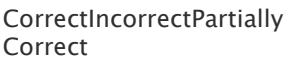
ECG Library. Long QT Interval.

Next question | Go to summary

Answer Statistics

Times answered: 9101

Test Analysis



Score: 100%

Total Answered: 2

Feedback

Work Smart

Exam Themes May 2002

Question 3 of 84

A 19-year-old woman presents to the clinic having had five blackouts over the last year, all while she is standing up.

She gets warnings of blurred vision, nausea, and feeling hot. She has been witnessed twice to have jerking of all limbs while she is unconscious. The attacks last 30 to 60 seconds.

She recovers quickly after the attacks. She has never bitten her tongue or sustained any injuries.

Physical examination and an ECG are normal. Her grandmother and sister suffer from epilepsy.

Which of the following investigations is the most appropriate?

(Please select 1 option)

○	24 hour ECG recording
○	CT brain
◉	ECHO Incorrect answer selected
○	EEG
○	Tilt table test This is the correct answer

The most likely diagnosis is vasovagal syncope.

The gradual onset of the attack is typical. It is common for patients with syncope to have jerking of their limbs while they are unconscious.

Warning symptoms of darkening/blurring of vision, dizziness and feeling hot are characteristic in

syncope. Patients usually recover very quickly after the event.

Tilt table test is a useful test to support the diagnosis of vasovagal syncope.

Further Reading:

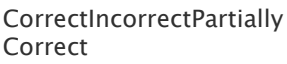
Cleveland Clinic. Head-upright tilt table testing.

Next question | Go to summary

Answer Statistics

Times answered: 9583

Test Analysis



Score: 66.67%

Total Answered: 3

Work Smart

Question 3 of 126

A 13-year-old female presents following a sore throat with chest pain, fever, and a skin rash. Examination reveals a diastolic murmur. Her ASO titre is elevated.

Which of the following is a major criterion for the diagnosis of rheumatic fever?

(Please select 1 option)

○	Fever
○	Migratory erythema
◉	Polyarthritis Correct
○	Prolonged PR interval
○	Raised ESR

The major criteria associated with rheumatic fever are:

- polyarthritis
- erythema marginatum
- Sydenham's chorea
- carditis, and
- subcutaneous nodules.

Minor criteria include:

- raised erythrocyte sedimentaion rate (ESR)

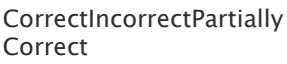
- arthralgia
- pyrexia, and
- prolonged PR interval.

Next question | Go to summary

Answer Statistics

Times answered: 8358

Test Analysis



Score: 50%

Total Answered: 2

Work Smart

Question 5 of 126

In most cardiac arrest situations 1 mg of adrenaline (epinephrine) is given intravenously every three minutes.

What is the correct volume and concentration of the adrenaline?

(Please select 1 option)

○	0.1 ml of 1 in 100
○	1 ml of 1 in 1000
○	1 ml of 1 in 10,000
○	10 ml of 1 in 1000
◉	10 ml of 1 in 10,000 Correct

A 1 mg dose of adrenaline (epinephrine) would be administered with 0.1 ml of 1 in 100, 1 ml of 1 in 1000 and 10 ml of 1 in 10,000.

However, 10 ml of 1 in 10,000 is the recommended dose and concentration and is considered the optimum volume of adrenaline during cardiac arrest, and is recommended by the UK Resuscitation Council.

Next question | Go to summary

Work Smart

Question 4 of 84

In adult basic life support which of the following is the correct ratio of chest compressions to ventilations?

(Please select 1 option)

○	5 to 1
○	8 to 1
◉	10 to 1 Incorrect answer selected
○	15 to 2
○	30 to 2 This is the correct answer

Fifteen compressions to two breaths was the recommended ratio regardless of the number of rescuers performing basic life support, but the latest guidelines now suggest 30:2.

Reference:

Resuscitation Council (UK). Resuscitation guidelines.

Next question | Go to summary

Answer Statistics

Work Smart

Question 5 of 84

A 55-year-old man presents with gynaecomastia. He is receiving treatment for heart failure and gastro-oesophageal reflux.

Which of the following drugs he takes is most likely to be responsible for his gynaecomastia?

(Please select 1 option)

○	Aspirin
◉	Carvedilol Incorrect answer selected
○	Furosemide
○	Ramipril
○	Spironolactone This is the correct answer

Spironolactone, like cimetidine, ciclosporin, and omeprazole, is associated with gynaecomastia. Ramipril has very rarely been associated with gynaecomastia.

None of the other agents are associated.

Other causes of gynaecomastia include:

- Digoxin
- Cimetidine
- LHRH analogues, and
- Finasteride.

Work Smart

Question 7 of 126

A 65-year-old man was advised to start oral digoxin at a dose of 250 µg daily. His physician explained that the full effect of this treatment would not be apparent for at least a week.

Which one of the following pharmacokinetic variables did the physician use to give this explanation?

(Please select 1 option)

◉	Bioavailablity ✗ Incorrect answer selected
○	Half life ✓ This is the correct answer
○	Plasma protein binding
○	Renal clearance
○	Volume of distribution

Digoxin follows first order kinetics and has a half life of 1.6 days in a patient with normal renal function.

Sixty five per cent of the drug absorbed remains in the system after one day.

Subsequent doses gradually accumulate until a steady state is achieved after four to five days.

Next question | Go to summary

Work Smart

Question 10 of 126

In Down's syndrome, which is the most common congenital heart defect?

(Please select 1 option)

○	Atrial septal defect
○	Atrioventricular septal defect Correct
○	Patent ductus arteriosus
○	Tetralogy of Fallot
○	Ventricular septal defect

Fifty percent of Down's syndrome births have congenital heart disease.

Defects, in order of decreasing frequency, are:

1. Atrioventricular septal defect
2. Ventricular septal defect
3. Patent ductus arteriosus
4. Tetralogy of Fallot, and
5. Atrial septal defect.

Next question | Go to summary

Work Smart

Question 11 of 126

A 67-year-old man presents with sudden onset atrial fibrillation (ventricular rate of 150/minute). His serum creatinine concentration was 250 µmol/L (70-110).

Which is the main factor that determines the choice of loading dose of digoxin in this patient?

(Please select 1 option)

○	Absorption
○	Apparent volume of distribution
◉	Lipid solubility Incorrect answer selected
○	Plasma half life
○	Renal clearance This is the correct answer

The pharmacokinetics of digoxin are complex and best explained by a two compartment model.

The loading dose is mainly dependent on the volume of distribution of a drug but this patient has moderate renal failure.

The loading dose is calculated (using various models) by taking into account age, creatinine clearance, body surface area, etc.

Volume of distribution becomes important particularly when body weight is 40 kg or less.

On balance it is the renal failure that is the most important factor in this patient in determining the loading dose.

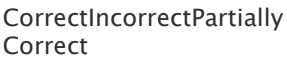
Digoxin is cleared by the kidneys so the maintenance dose would require adjustment in renal failure.

Next question | Go to summary

Answer Statistics

Times answered: 9723

Test Analysis



Score: 50%

Total Answered: 6

Feedback

Work Smart

Question 6 of 84

A previously well 60-year-old lady is admitted with an acute anterior myocardial infarction. A random blood glucose concentration was found to be 12.1 mmol/L (<6.7).

Which is the optimal management method of her blood sugar?

(Please select 1 option)

○	Commence gliclazide
○	Commence intravenous insulin This is the correct answer
◉	Commence metformin Incorrect answer selected
○	Commence subcutaneous insulin
○	No therapy other than continued dietary control

The DIGAMI study has demonstrated that there is a survival advantage in initially treating such patients with elevated glucose concentrations with sliding scale insulin for 24 hours post-infarct, even if they are not known to be diabetic. It also suggested there was a better prognosis if patients had treatment with subcutaneous insulin for three months following a myocardial infarct.[1]

However, DIGAMI 2 contested these results suggesting no survival benefits between insulin or oral hypoglycaemic agents (OHAs).

However, in the acute setting, insulin sliding scale is thought to be the optimum treatment.

Reference:

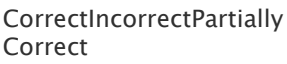
1. Almbrand B, Johannesson M, Sjöstrand B, et al. Cost-effectiveness of intense insulin treatment after acute myocardial infarction in patients with diabetes mellitus; results from the DIGAMI study. *Eur Heart J.* 2000;21:733-9.

Next question | Go to summary

Answer Statistics

Times answered: 9448

Test Analysis



Score: 33.33%

Total Answered: 6

Work Smart

Question 13 of 126

A 60-year-old man had a myocardial infarction (MI) six weeks ago.

He is taking aspirin 75 mg/day and metoprolol 50 mg 2/day.

During a routine follow up exercise test he has a 20 beat run of non-sustained VT. He achieved stage 4 of the Bruce protocol and 92% of his target heart rate. The non-sustained VT occurred halfway through stage 2. ST segments were normal during the study.

Which of the following is the definitive investigation?

(Please select 1 option)

○	24 hour Holter monitor
○	Coronary angiography
○	Echocardiogram
○	Electrophysiological study (EPS) This is the correct answer
◉	Thallium exercise scan Incorrect answer selected

Post MI ventricular tachycardia (VT) is most commonly due to scar tissue. It may also be related to ischaemia, but no signs of ischaemia were induced.

The definitive investigation would be EPS due to the fact that if this were scar related VT, the site could be localised and even possibly ablated. If not, then an implantable cardiac defibrillator (ICD) implantation may be warranted on Multicenter Automatic Defibrillator Implantation Trial (MADIT)[1] criteria, if left ventricular (LV) dysfunction exists.

Angiography plus thallium may inform us of significant coronary artery disease (CAD) but not offer us a solution to the problem.

An echocardiogram would not be of much use apart from assessing LV function, although in this patient one might assume that LV function is pretty good achieving stage 4 of Bruce protocol, thus an echocardiogram, although required, would not be the definitive test and would be lower on the selection list.

There is no need for Holter as the VT has already been recorded.

The MADIT trial was stopped early in 1996 by the steering committee due to extremely positive results in the ICD group. As a consequence it was only published in abstract form. However, MADIT-2 showed a 5.6% 20 month absolute survival benefit in patients with LV dysfunction (EF<30%), post MI, treated prophylactically with an ICD[2].

Reference:

1. Multicenter Automatic Defibrillator Implantation Trial (MADIT). *Am J Cardiol.* 1997;79:16-7.
2. Moss AJ, Zareba W, Hall WJ, et al. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. *N Engl J Med.* 2002;346:877-83.

Next question

Go to summary

Answer Statistics

Times answered: 9055

Test Analysis

CorrectIncorrectPartially Correct

Work Smart

Question 7 of 84

A 75-year-old man presents with severe central crushing chest pain. ECG shows evidence of an inferior myocardial infarction (MI). He receives primary stenting to the proximal right coronary artery

Four hours after initial presentation, he starts feeling dizzy and breathless. His pulse is 30 bpm regular, BP 70/50 mmHg. Heart sounds are soft and chest clear to auscultation. ECG shows 2:1 AV block with broad QRS and T wave inversion inferiorly. IV atropine was administered but had no effect.

Which is the next most important treatment?

(Please select 1 option)

○	Emergency insertion of a permanent pacemaker
○	Emergency temporary transvenous pacing wire This is the correct answer
○	IV dopamine
◉	IV isoprenaline Incorrect answer selected
○	Monitor his progress

This patient has had an inferior MI which is commonly associated with conduction abnormalities. He now develops heart block which leaves him bradycardic, symptomatic, and with a low BP; simply monitoring progress is not appropriate.

Isoprenaline is contraindicated in acute MI due to its positive inotropic effects and arrhythmogenic potential. IV dopamine is an inotrope which will not treat conduction block.

A temporary wire would deal with the situation until the inferior MI has fully resolved. Conduction

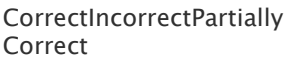
block can recover in the next few days so a permanent pacemaker may not be required

Next question | Go to summary

Answer Statistics

Times answered: 8760

Test Analysis



Score: 28.57%

Total Answered: 7

Feedback

Work Smart

Question 14 of 126

A 75-year-old man with a history of anterior MI is taking amiodarone 400 mg/day for history of VT. He has a prolonged QTc interval on his ECG of 550 ms.

Which of the following is the most appropriate management?

(Please select 1 option)

○	Admit to hospital for monitoring
○	Atenolol
○	Change amiodarone to flecainide
○	Continue with amiodarone
◉	Discontinue amiodarone immediately Correct

In iatrogenic long QT, which is what this is likely to be, it is safer to stop the offending drug rather than add further drugs on board (for example, beta blockers, even though atenolol is used for long QT).

Flecainide is contraindicated in this situation (CAST study).

Next question | Go to summary

Answer Statistics

Work Smart

Question 8 of 84

A 28-year-old man who is known to have hypertrophic cardiomyopathy (HCM) has an out of hospital cardiac arrest and is successfully resuscitated.

Which is the most appropriate mode of treatment?

(Please select 1 option)

○	Alcohol septal ablation
○	Amiodarone
◉	Beta blocker ✗ Incorrect answer selected
○	Implantable defibrillator ✓ This is the correct answer
○	Myomectomy

Patients with HCM are at increased risk of sudden cardiac death (SCD) due to ventricular fibrillation/tachycardia (VF/VT). Implantable cardiac defibrillators (ICD) are superior to amiodarone or beta blockers for preventing this.

Reducing outflow tract obstruction with myomectomy or alcohol septal ablation does not reduce the risk of SCD.

Other indications for ICD implantation include:

- Cardiac arrest due to VF/VT
- Sustained VT causing haemodynamic compromise
- Chronic heart failure, left ventricular ejection fraction (LVEF) less than 40% and associated

syncopal episodes due to non-sustained VT post-myocardial infarction, non- sustained VT with LVEF less than 40%

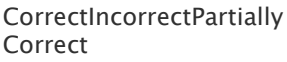
- Arrhythmogenic right ventricular cardiomyopathy causing cardiac arrest
- Congenital long QT with family history of sudden cardiac death at young age.

Next question | Go to summary

Answer Statistics

Times answered: 11004

Test Analysis



Score: 25%

Total Answered: 8

Work Smart

Question 9 of 84

A 21-year-old man with hypertrophic cardiomyopathy presents in clinic with dizzy spells but has not had any syncopal episodes.

Which of the following, if present, would indicate an increased risk of sudden cardiac death?

(Please select 1 option)

◉	A significant blood pressure drop during exercise Correct
○	Asymmetric septal hypertrophy with maximum wall thickness of 2.1 cm
○	Left ventricular outflow tract gradient of 80 mmHg
○	Systolic anterior movement of the mitral valve on echocardiography
○	Worsening exertional angina

Patients with hypertrophic cardiomyopathy (HCM) are at increased risk of sudden cardiac death due to ventricular fibrillation/tachycardia (VF/VT).

The five poor prognostic markers which are predictive of sudden cardiac death are:

- Syncope
- Family history of HCM and sudden cardiac death
- Maximum left ventricular wall thickness greater than 3 cm
- Blood pressure drop during peak exercise on stress testing, and
- Documented runs of non-sustained VT on 24 hour tape.

Left ventricular outflow tract (LVOT) obstruction causes symptoms and can lead to deterioration of LV function but does not predict sudden cardiac death.

Asymmetric septal hypertrophy is a feature of HCM. In order to assess the risk for sudden cardiac death a detailed echocardiogram with measurements of the maximum left ventricular wall thickness is required.

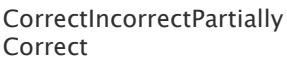
Systolic anterior movement of the mitral valve is often seen on echocardiogram and is thought to be the mechanism behind the left ventricular outflow tract obstruction.

Next question | Go to summary

Answer Statistics

Times answered: 8360

Test Analysis



Score: 33.33%

Work Smart

Question 17 of 126

A 70-year-old man with dilated cardiomyopathy remains symptomatic in NYHA class 2 due to chronic heart failure.

On examination his pulse is 90 regular, BP 140/90 mmHg, heart sounds normal, and his chest auscultation did not reveal any abnormalities. He is currently taking lisinopril 30 mg OD and furosemide 80 mg OD.

Which is the best treatment option?

(Please select 1 option)

○	Amiodarone
○	Carvedilol This is the correct answer
○	Digoxin
○	Spironolactone
◉	Valsartan Incorrect answer selected

Beta blockers improve mortality and quality of life in chronic heart failure (COPERNICUS, MERIT, CIBIS trials).

They should be initiated once patients are stable, and can be used in all classes of heart failure, though they can cause an acute deterioration in patients who have very severe symptoms. They should be avoided in the acute setting.

Spironolactone improves outcome and symptoms in severe (class 3-4) chronic heart failure (RALES).

Valsartan does not affect outcome as add on treatment (VALHEFT).

Digoxin may reduce hospitalisation and improves QOL but has a neutral benefit to mortality (DIG study).

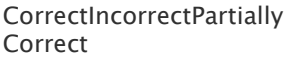
Amiodarone in the absence of arrhythmias does not affect outcome.

Next question | Go to summary

Answer Statistics

Times answered: 8143

Test Analysis



Score: 40%

Total Answered: 10

Work Smart

Exam Themes September 2000

Question 10 of 84

On auscultation of the heart of a 30-year-old female a loud first heart sound is heard.

Which of the following may be responsible for this auscultatory feature?

(Please select 1 option)

◉	A long preceding diastolic interval	Incorrect answer selected
○	Atrial premature beat	This is the correct answer
○	Increased pulmonary arterial pressure	
○	Increased systemic arterial pressure	
○	Rupture of a papillary muscle	

A loud first heart sound is due to abrupt closure of the mitral valve against a high left atrial pressure and may occur with shortened diastole, mitral stenosis or left-right shunts.

It can also be heard with atrial premature beats.

Mitral regurgitation occurs with papillary muscle rupture and thereby the first heart sound is soft. A2 and P2 are loud in systemic hypertension and pulmonary hypertension respectively.

Next question | Go to summary

Work Smart

Question 22 of 126

A 14-year-old boy presents with hypertension.

Which of the following statements concerning hypertension in the young is true?

(Please select 1 option)

○	Abnormalities are frequently seen on DMSA scan This is the correct answer
○	Aortic coarctation is the commonest secondary cause
○	Headache is the usual presenting feature
○	It is defined as systolic blood pressure above the 99th centile for age
⊙	Sodium nitroprusside is useful for the long-term treatment of severe cases Incorrect answer selected

Sodium nitroprusside is useful only in the short term, as cyanide levels accumulate with time.

Hypertension is usually diagnosed incidentally, and is defined as systolic blood pressure greater than the 95th centile for age.

Secondary causes are usually due to renal abnormalities, with reflux-associated scarring being the commonest renal disease. This will cause abnormalities on dimercaptosuccinic acid (DMSA) scan.

Coarctation of the aorta is the commonest non-renal cause, with pheochromocytoma/neuroblastoma, congenital adrenal hyperplasia, Cushing's syndrome, and steroid therapy being rarer causes.

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Work Smart

Question 24 of 126

Which of the following statements is true of coronary artery anatomy?

(Please select 1 option)

○	Right bundle branch block in acute anterior myocardial infarction suggests obstruction prior to the first septal branch of the left anterior descending coronary artery This is the correct answer
○	The AV node is supplied by the left anterior descending coronary artery
○	The left main stem is about 4 cm long
○	The posterior descending artery is usually a branch of the circumflex artery
◉	The sinus node is supplied by a branch of the right coronary in over 90% of subjects Incorrect answer selected

The posterior descending artery is most often (85%) a branch of the right coronary artery.

The sinus node artery is a branch of the right coronary artery in 60% of cases.

The AV node is supplied from the right coronary artery.

The left main stem is much shorter than 4 cm.

Next question | Go to summary

Work Smart

Question 25 of 126

A 55-year-old man with type 2 diabetes mellitus and ischaemic heart disease has been researching the internet.

He asks your opinion on transmyocardial laser revascularisation.

Which of the following statements about this technique is true?

(Please select 1 option)

○	Avoids the need for major surgery
○	Damages the endocardium This is the correct answer
○	Involves destruction of coronary stenoses
○	Is of particular use in severe proximal coronary artery disease
◉	Stimulates collateral vessel formation Incorrect answer selected

Open chest surgery is undertaken, during which laser holes are punched from the epicardial surface into areas of suspected ischaemic or hibernating ventricular muscle. The process is not fully understood.

The epicardial end of the hole heals up leaving artificial channels communicating with the ventricular chamber and effectively forming new coronary vessels.

Laser transmyocardial revascularisation has potential in distal disease such as in diabetes.

Angioplasty and coronary artery bypass graft (CABG) are useful in proximal disease.

Work Smart

Question 26 of 126

A 62-year-old man has experienced substernal chest pain upon exertion with increasing frequency over the past one year.

An electrocardiogram shows T wave inversion in the anterolateral leads at rest. He has a total serum cholesterol of 7.0 mmol/l (<5.2).

On angiography, he has an 85% narrowing of the left anterior descending (LAD) artery.

Which of the following events is most likely to occur in this patient?

(Please select 1 option)

○	A systemic artery embolus from a left atrial mural thrombus
○	A systemic artery embolus from a left ventricular mural thrombus This is the correct answer
○	A systemic artery embolus from thrombosis in a peripheral vein
○	Pulmonary embolism from a left ventricular mural thrombus
◉	Pulmonary embolism from thrombosis in a peripheral vein Incorrect answer selected

The suggestion here is that this man has coronary artery disease with an impending myocardial infarction.

Infarction of the LAD would cause necrosis of the left ventricle.

Thrombus may form on an area of dyskinetic ventricle. Therefore he is most at risk of embolus of thrombus from the left ventricle (LV).

Work Smart

Question 28 of 126

Which one of the following statements is true about the Austin Flint murmur?

(Please select 1 option)

○	It can be distinguished from the murmur of mitral stenosis by absence of presystolic accentuation
○	It does not occur in aortic incompetence secondary to an aortitis
◉	It is an early sign of aortic regurgitation ✗ Incorrect answer selected
○	It is associated with a loud first heart sound
○	It is a low frequency mid/late diastolic murmur ✓ This is the correct answer

The Austin Flint murmur is a low frequency mid/late diastolic murmur which may show pre-systolic accentuation and is virtually indistinguishable from that of mitral stenosis.

It is due to partial closure of the anterior leaflet of the mitral valve by the regurgitant jet.

There is no correlation between the presence of murmur and severity of AR, or aetiology.

The first heart sound is normal but in severe cases it may be absent.

Next question | Go to summary

Work Smart

Question 29 of 126

Which one of the following is a contraindication to thrombolysis?

(Please select 1 option)

○	Age over 75 years
○	Asthma
○	Background diabetic retinopathy
○	Previous history of hemorrhagic stroke This is the correct answer
◉	The presence of atrial fibrillation Incorrect answer selected

Those over 75 years benefit from thrombolysis as much or more than younger patients with myocardial infarction (MI).

Proliferative diabetic retinopathy is a relative contraindication.

Important contraindications to thrombolysis include:

- Gastrointestinal (GI) bleeding
- Heavy vaginal bleeding
- Recent stroke or surgery
- Uncontrolled severe hypertension
- Previous history of hemorrhagic stroke
- Prolonged cardiopulmonary resuscitation (CPR) (more than half an hour).

Work Smart

Question 30 of 126

Which one of the following cardiac enzymes would be expected to begin to increase between 6-10 hours after a myocardial infarction?

(Please select 1 option)

○	Aspartate transaminase (AST) This is the correct answer
○	Creatine kinase (CK)
○	LDH
○	Troponin I
◉	Troponin T Incorrect answer selected

Cardiac troponins are the most widely used test following a myocardial infarct in the UK. Both troponin I and T are highly sensitive and specific for cardiac damage, and are of equal clinical value. Serum levels begin to increase within 3-12 hours from the onset of pain, peak at 24-48 hours and return to baseline over 5-14 days.

CK-MB levels also increase within 3-12 hours of onset of chest pain and peak within 24 hours, but return to baseline quicker than troponin (after 48-72 hours). Sensitivity and specificity are not as high as for troponin levels.

The most sensitive early marker for myocardial infarction is myoglobin (troponin may not rise until 6 hours following myocyte injury). Myoglobin can be detected within 2 hours of cardiac myocyte damage, but is not specific as it is also present in skeletal muscle.

LDH is also less specific than troponin, although the LDH-1 isoenzyme is predominantly found in cardiac muscle so a high LDH-1:LDH-2 ratio can indicate myocardial damage. Levels begin to rise 24-48 hours, peak at 72 hours, and remain elevated for 10 days. It is not widely used in UK practice.

AST is very non-specific, and is no longer widely used in the UK. Levels become elevated at 6-10 hours, peak at 24-36 hours and remain high for 3-5 days.

Further Reading:

1. Patient.info. Cardiac Enzymes and Markers for Myocardial Infarction.
2. University of Pittsburgh Medical Center. Profiles of Total CK, CK-MB and Troponin I in Acute Myocardial Infarction (AMI).
3. Pathology Outlines. Clinical Chemistry - Cardiac related tests.

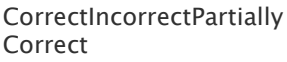
Next question

Go to summary

Answer Statistics

Times answered: 6930

Test Analysis



Work Smart

Question 32 of 126

A 57-year-old man develops deep venous thrombosis during a hospitalisation for prostatectomy.

He exhibits decreased mental status with right hemiplegia, and a CT scan of the head suggests an acute cerebral infarction in the distribution of the left middle cerebral artery.

A chest x ray reveals cardiac enlargement and prominence of the main pulmonary arteries that suggests pulmonary hypertension. His serum troponin I is <0.4 ng/ml.

Which of the following lesions is most likely to be present on echocardiography?

(Please select 1 option)

○	Coarctation of the aorta
○	Dextrocardia
○	Pulmonary stenosis
○	Tetralogy of Fallot
○	Ventricular septal defect Correct

This is 'paradoxical embolus' from right to left. This can only happen if there is a defect that allows passage from right to left. This can happen across a patent foramen ovale.

In this case, the pulmonary hypertension suggests that there may have been a shunt persistent for a long time - Eisenmenger complex.

An atrial or a ventricular septal defect can provide the shunt.

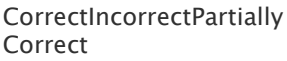
Tetralogy of fallot and pulmonary stenosis do not cause pulmonary hypertension. A coarct does not cause cardiomegaly.

Next question | Go to summary

Answer Statistics

Times answered: 11124

Test Analysis



Score: 26.32%

Total Answered: 19

Feedback

Work Smart

Question 36 of 126

A 35-year-old healthy woman has a faint systolic murmur on physical examination. An echocardiogram is performed, and she is found to have a bicuspid aortic valve.

In explaining the meaning of this finding to her, which is the most appropriate statement?

(Please select 1 option)

◉	An aortic valve replacement is eventually likely to be required Correct
○	Other family members are likely to have the same condition
○	She should be treated with a cholesterol lowering agent
○	The problem has resulted from past injection drug usage
○	This is one manifestation of an underlying autoimmune disease process

Bicuspid aortic valve (BAV) is perhaps the most common form of congenital heart disease in adults (1-2% of population).

Bicuspid valves have a propensity to wear out and calcify with ageing. Different studies have shown different levels of heritability for biscupid valves. It is possible that up to a third of relatives of patients with a bicuspid valve have valve or aortic abnormalities (often a dilated aorta). However, other studies have shown the prevalence of abnormalities in relatives to be much lower. The European Society of Cardiology states than there is an estimated 10% chance of a first degree relative being affected, which increases to 20-30% if you consider aortopathy. NOTCH1 gene mutations may be responsible.

The difficulty answering this question lies with the fact that it is a single best answer question - i.e.

more than one option could be correct, but one is more correct than the other.

The statement "other family members are likely to have the same condition" suggests that their risk of having a bicuspid aortic value is more than 50%. This is not supported by the research.

Only 15% of patients with a bicuspid aortic valve will have a normally functioning valve in the fifth decade, and this often continues to deteriorate with age. Therefore, ultimately, the majority of patients will reach the indications for surgical replacement of the valve. Therefore option 1 is the MOST CORRECT of those given.

Reference & Further Reading:

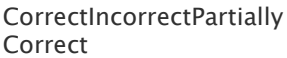
European Society of Cardiology: Bicuspid aortic valve

Next question | Go to summary

Answer Statistics

Times answered: 9014

Test Analysis



Work Smart

Question 18 of 84

A 40-year-old man attending a routine screening has a blood pressure of 166/100 mmHg. Two weeks later his blood pressure was 150/90 mmHg.

He does not smoke. He drinks 35 units alcohol/week. His body mass index (BMI) is 31.5 kg/m^2 (20-25).

What is the best management strategy?

(Please select 1 option)

○	Amlodipine
○	Atenolol
◉	Bendroflumethiazide Incorrect answer selected
○	Enalapril
○	Lifestyle advice This is the correct answer

This 40-year-old man has grade 1 obesity as evidenced by his body mass index:

Grade 1	30-34.9 kg/m^2
Grade 2	35-39.9 kg/m^2
Grade 3	>40 kg/m^2

Hypertension in this individual is most likely due to obesity-related hypertension or due to pseudo-Cushing's syndrome in view of his high alcohol intake and increased BMI.

The following contribute to obesity-related hypertension:

- Heightened sympathetic nervous system activity
- Hyperinsulinaemia, insulin resistance, and
- Hyperleptinaemia

He needs lifestyle advice about reducing his alcohol intake and compatible dietary advice to reduce his weight.

Reference:

NICE. Hypertension: Clinical management of primary hypertension in adults (CG127).

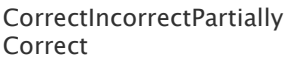
Next question

Go to summary

Answer Statistics

Times answered: 11896

Test Analysis



Work Smart

Question 38 of 126

A 60-year-old woman is admitted with sudden onset of chest pain and is diagnosed with an acute myocardial infarction.

Her acute illness is complicated by low blood pressure and poor tissue perfusion for several days. Her serum lactate becomes elevated. Her serum urea and creatinine are noted to be increasing.

	Day 1	Day 2	Day 3	Normal Range
Urea (mmol/L)	8	22	30	2.5-7.5 mmol/L
Creatinine (µmol/L)	116	140	200	60-110 µmol/L

Granular and hyaline casts are present on microscopic urinalysis.

Which renal lesion is most likely to be present in this situation?

(Please select 1 option)

◉	Acute tubular necrosis Correct
○	Minimal change disease
○	Nodular glomerulosclerosis
○	Pyelonephritis
○	Renal vein thrombosis

Ischaemia, typically in hypotensive hospitalised patients, is the most frequent antecedent to acute

tubular necrosis.

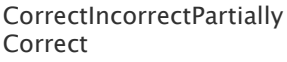
Blood pressure should be maintained in cardiogenic shock with fluids and/or inotropic agents.

Next question | Go to summary

Answer Statistics

Times answered: 9490

Test Analysis



Score: 33.33%

Total Answered: 21

Feedback

Work Smart

Question 19 of 84

A 34-year-old man presented for an insurance medical. He was symptom free, but clinical examination suggested a small ventricular septal defect (VSD).

Which one of the following findings was most likely to have been present?

(Please select 1 option)

○	A short systolic murmur at the left sternal edge
○	A systolic murmur maximal at the apex
○	A systolic murmur with thrill at the left sternal edge (LSE) This is the correct answer
◉	An early diastolic murmur Incorrect answer selected
○	Fixed splitting of the second heart sound

Typically, a small VSD generates a pansystolic murmur at the LSE accompanied by a thrill. The murmur may be heard at the apex but is usually loudest at the LSE.

Very small defects may generate an early/late systolic murmur.

Fixed splitting of the heart sounds usually accompanies atrial septal defects.

Next question | Go to summary

Work Smart

Question 21 of 84

A 69-year-old woman admitted for a surgical procedure is noted to have a soft systolic murmur at the left sternal edge.

Her ECG and chest x ray were normal and transthoracic echocardiography revealed a small posterior pericardial effusion with normal valves.

Which of the following would be the most appropriate next step in this patient's management?

(Please select 1 option)

○	A diagnostic pericardial aspiration
○	Mammography
○	Purified protein derivative test for tuberculosis
○	Reassurance This is the correct answer
◉	Right heart catheterisation Incorrect answer selected

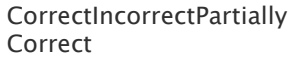
The presence of a small pericardial effusion on echo is quite common and in this patient who otherwise appears well, no further action is required.

Next question | Go to summary

Answer Statistics

Times answered: 10622

Test Analysis



Score: 22.22%

Total Answered: 18

Feedback

Question Navigator

Revision Notes

Tags

Work Smart

Question 22 of 84

A 65-year-old woman presents with heart failure. Her echocardiogram shows a restrictive cardiomyopathy but with structurally normal valves.

Which one of the following is the most likely cause?

(Please select 1 option)

○	Amyloidosis This is the correct answer
○	Coxsackie infection
○	Down's syndrome
○	Marfan's syndrome
◉	Turner's syndrome Incorrect answer selected

The diagnosis is amyloidosis which typically causes an infiltrative restrictive cardiomyopathy in patients of this age group.

Other causes include:

- Sarcoidosis
- Radiotherapy
- Systemic sclerosis
- Carcinoid syndrome.

Coxsackie produces a viral myocarditis with the likelihood of a dilated appearance on echo.

Marfan's is likely to cause valvular regurgitant defects and a dilated cardiomyopathy.

Down's syndrome is more likely to be associated with AV canal defects and consequent dilatation.

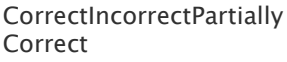
Turner's syndrome is associated with atrial septal defects and coarctation and bicuspid valvular defects.

Next question | Go to summary

Answer Statistics

Times answered: 10924

Test Analysis



Score: 21.05%

Total Answered: 19

Work Smart

Core Questions

Question 23 of 84

A 58-year-old male presents with acute dyspnoea following a convulsion.

On examination his blood pressure was 240/120 mmHg and fundal examination reveals papilloedema with haemorrhages and cotton wool spots. His urea, electrolytes, and creatinine are normal but chest x ray reveals pulmonary oedema and cardiomegaly.

Which one of the following is the most appropriate immediate treatment?

(Please select 1 option)

○	Atenolol 50 mg orally
○	Intravenous labetalol
○	Intravenous sodium nitroprusside This is the correct answer
○	Nifedipine 5 mg sublingually
◉	Nifedipine LA 30 mg orally Incorrect answer selected

This patient has malignant hypertension with papilloedema, convulsions, and pulmonary oedema. Management must be in secondary care and the patient must have bed rest with regular assessment of blood pressure.

Intravenous nitroprusside is the treatment of choice in the UK, allowing reduction of blood pressure at a safe rate.

Labetolol or nicardipine are alternatives, and can be used as oral options following initial control of blood pressure. Labetolol is not favoured as the first-line treatment option as it can result in rapid

reduction of blood pressure which can lead to cerebral infarction in watershed areas.

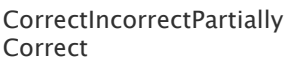
Oral formulations are not recommended in the initial stages of management as they usually do not have as rapid an onset of action, and cannot be titrated as quickly as is required.

Next question | Go to summary

Answer Statistics

Times answered: 11014

Test Analysis



Score: 20%

Total Answered: 20

Work Smart

Question 50 of 126

Which of the following statements regarding B-type natriuretic peptide (BNP) is correct?

(Please select 1 option)

○	BNP augments sodium reabsorption in the kidney
○	BNP causes arterial and venous smooth muscle vasodilatation — This is the correct answer
◉	BNP is synthesised predominantly in the cerebrovascular circulation — Incorrect answer selected
○	BNP synthesis is decreased by thyroid hormone
○	The stimulus for BNP release is increased ventricular pressure load

The ventricular myocardium is the primary site of BNP synthesis.

The stimulus for BNP release is myocyte stretch, rather than transmural pressure load.

BNP synthesis is increased by thyroid hormones as well as glucocorticoids, endothelin-1, angiotensin-II, and tachycardia, independent of the haemodynamic effects of these factors.

In the kidney, BNP causes increased glomerular filtration rate (GFR) and inhibition of sodium reabsorption, leading to natriuresis and diuresis.

BNP leads to reduced blood pressure, and reduced pre-load due to relaxing effects on vascular smooth muscle.

Further Reading:

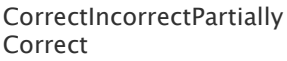
de Lemos JA, McGuire DK, Drazner MH. B-type natriuretic peptide in cardiovascular disease. *Lancet.* 2003;362:316-22.

Next question | Go to summary

Answer Statistics

Times answered: 9126

Test Analysis



Score: 30.43%

Total Answered: 23

Feedback

Work Smart

Question 25 of 84

Neonatal cyanosis is a typical feature of which of the following conditions?

(Please select 1 option)

○	Atrial septal defect (ASD)
○	Mitral regurgitation.
○	Patent ductus arteriosus (PDA)
○	Total anomalous pulmonary venous drainage This is the correct answer
◉	Ventricular septal defect (VSD) Incorrect answer selected

Total anomalous pulmonary venous connection (TAPVC) is associated with cyanosis in the newborn.

TAPVC consists of an abnormality of blood flow in which all four pulmonary veins drain into systemic veins or the right atrium with or without pulmonary venous obstruction.

Systemic and pulmonary venous blood mix in the right atrium.

PDA, ASD and VSD are left to right shunts.

Tricuspid atresia is typically associated with cyanosis but mitral regurgitation is not.

Further Reading:

Medscape. Total Anomalous Pulmonary Venous Connection

Work Smart

Question 55 of 126

An 87-year-old woman was referred to the clinic with a two-month history of alternating constipation and diarrhoea, night sweats, and fatigue. The patient was not sure if she had lost any weight.

On examination, she appeared thin and pale. Her pulse was 80/minute and regular. A systolic murmur was audible at the apex, radiating to the axilla. No diastolic murmurs were heard.

Investigations revealed blood cultures to be positive, and transthoracic echocardiogram revealed a vegetation on the mitral valve.

Which is the most likely causative organism in this case?

(Please select 1 option)

○	Coagulase-negative *Staphylococcus*
○	*Staphylococcus aureus*
◉	*Streptococcus bovis* Correct
○	*Streptococcus mitis*
○	*Streptococcus viridans*

This patient has endocarditis.

In addition to the symptoms that might be attributed to endocarditis (fatigue, night sweats), she also has a history of altered bowel habit that is very suggestive of an underlying malignancy.

Streptococcus bovis is a normal commensal of the gastrointestinal (GI) tract. However, *S. bovis* bacteraemia and endocarditis have a strong association with GI malignancy.

Coagulase-negative staphylococcal endocarditis is exceptionally rare in native valve endocarditis, though it is the commonest cause of prosthetic valve endocarditis in the postoperative period.

Staphylococcus aureus endocarditis is typically the result of a focus of staphylococcal infection (for example, skin abscess).

Streptococcus mitis endocarditis and viridans streptococci (which include *S. mitis*) are normal commensals of the oropharynx and GI tract.

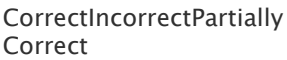
Endocarditis is usually associated with poor dental hygiene; overall, *Streptococcus viridans* accounts for ~40% of cases of endocarditis.

Next question | Go to summary

Answer Statistics

Times answered: 9122

Test Analysis



Work Smart

Question 27 of 84

A 70-year-old female is reviewed in clinic after having had an anterior MI. Her echo reveals some left ventricular impairment.

You are contemplating the addition of a beta blocker to current therapy which consists of bendroflumethiazide, aspirin, and simvastatin.

Which of the following beta blockers should be avoided?

(Please select 1 option)

○	Bisoprolol
○	Carvedilol
○	Metoprolol
○	Propranolol
◉	Sotalol Correct

Sotalol may prolong the QT interval and leads to a risk of ventricular arrhythmias. This can be a particular risk in individuals with hypokalaemia.

The thiazide diuretic bendroflumethiazide predisposes to hypokalaemia, due to its action on inhibiting potassium reabsorption in the distal tubules of the nephrons.

Work Smart

Question 28 of 84

A 70-year-old male with a history of syncope and hypertension is found to have runs of non-sustained ventricular tachycardia during telemetry.

Investigations show a serum magnesium of 0.4 mmol/L (0.75-1.05).

Which one of the following is most likely to be responsible for this biochemical abnormality?

(Please select 1 option)

○	Chronic renal failure
○	Diuretic therapy This is the correct answer
○	Elevated PTH concentrations
○	Hyperphosphataemia
◉	Ranitidine therapy Incorrect answer selected

Diuretic therapy is a common cause of hypomagnesaemia due to increased renal excretion. It is not seen in hyperparathyroidism.

Chronic renal failure is a cause of hypermagnesaemia. Ranitidine (unlike Proton pump inhibitors) is unlikely to cause hypomagnasemia.

Hypophosphataemia is seen in association with hypomagnesaemia.

Work Smart

Question 31 of 84

A 37-year-old female with type 2 diabetes and obesity requests help with regard to weight loss. She has tried to lose weight with dietary manoeuvres but has succeeded in losing only 3 kg over the last year. She is currently receiving no treatment.

On examination her BMI is 33.5 kg/m^2 and her blood pressure is 142/84 mmHg. Her most recent HbA_{1c} is 52 mmol/mol (20-46).

She asks whether there are any pharmacological therapies that may be appropriate for assisting with weight reduction.

Which of the following agents is appropriate for assisting with weight loss in this patient?

(Please select 1 option)

○	Dexfenfluramine
○	Metformin
○	Orlistat This is the correct answer
○	Phentermine
◉	Insulin detemir Incorrect answer selected

This patient has demonstrated a 3 kg weight loss over the past year but, like many, has become rather stuck.

The NICE guidelines on criteria for Orlistat previously stated it should be used in patients who have demonstrated dietary compliance with at least a 2.5 kg weight reduction prior to initiating orlistat. This

is not now a requirement. Continued weight reduction is required if the patient is to remain on the drug (5% body weight at 12 weeks).

Orlistat functions through inhibiting the absorption of dietary fat from the GI tract. Consequently, its side effects include flatulence and diarrhoea.

Dexfenfluramine is associated with systemic hypertension and strokes and is now withdrawn as an anti-obesity agent, as is phentermine (valvular fibrosis) in the successful but dangerous combination Phen-Fen.

Metformin is not an agent that would create weight loss, but merely improves insulin sensitivity and maintains weight (or gain weight as in sulphonylurea therapy). Similarly this patient's HbA_{1c} is well controlled on diet alone.

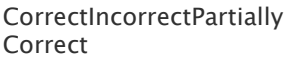
Insulin detemir has been associated with less weight gain or even slight weight loss compared with other insulins. However, her HbA_{1c} is at target (<53 mmol/mol) and therefore she does not require additional anti-glycaemic therapy at this time.

Next question | Go to summary

Answer Statistics

Times answered: 9375

Test Analysis



Work Smart

Question 59 of 126

A 75-year-old man with atrial fibrillation is successfully cardioverted having had six weeks of anticoagulation.

Which one of the following drugs would be most likely to maintain sinus rhythm following this procedure?

(Please select 1 option)

◉	Amiodarone Correct
○	Digoxin
○	Nebivolol
○	Sotalol
○	Verapamil

Amiodarone is a class 3 anti-arrhythmic and has the best membrane stabilising properties of the above drugs, and is most likely to maintain sinus rhythm (SR).

Sotalol is another class 3 anti-arrhythmic with an ability to maintain SR but is less effective than amiodarone.

Next question | Go to summary

Work Smart

Question 32 of 84

A 54-year-old male redevelops chest pain 72 hours after treatment for an anterior myocardial infarction.

Which of the following markers will be the most appropriate to detect reinfarction?

(Please select 1 option)

○	CK-MB This is the correct answer
○	LDH
◉	Myoglobin Incorrect answer selected
○	Troponin I
○	Troponin T

Although troponin is highly sensitive and specific it remains elevated for at least one week after infarction.

Similarly lactate dehydrogenase (LDH) will be present for approximately one week after infarction.

After myocardial infarction (MI), CK-MB levels become elevated within 3 to 8 hours, peak within 9 to 30 hours, and return to normal after 48 to 72 hours.

Although myoglobin has a short half life, similar sensitivity to CK-MB rises quickly after an MI and is cleared after an MI, it is not specific enough for diagnostic use.

Work Smart

Question 63 of 126

Which of the following investigations is used to monitor the treatment of infective endocarditis?

(Please select 1 option)

○	Blood culture
○	C reactive protein This is the correct answer
◉	Echocardiography Incorrect answer selected
○	Erythrocyte sedimentation rate
○	Serum bactericidal titres of antibiotics

Serum bactericidal titres against the infecting organism are no longer recommended.

There was always great variation in the monitoring methods used for these tests and in the interpretation of their results. At best they could only predict bacteriological, not clinical cure, and bacteriological failure is very rare.

The most useful laboratory test for monitoring the response to treatment (which is usually obvious clinically) is serial C-reactive protein estimation.

This is of much more use than the erythrocyte sedimentation rate, which is much slower to fall.

Next question | Go to summary

Work Smart

Question 64 of 126

A 16-year-old girl was incidentally found to have delta wave on ECG suggestive of Wolff-Parkinson-White syndrome. There was no tachycardia and she was asymptomatic.

Which is the next step in management?

(Please select 1 option)

◉	Beta blocker therapy Incorrect answer selected
○	Electrophysiological study and provocation of arrhythmia
○	Radiofrequency catheter ablation of the bypass tract
○	Reassurance This is the correct answer
○	Repeat ECG

The electrocardiogram (ECG) appearances of a delta wave occur in approximately 1.5 per 1000 of the population, but many individuals never experience paroxysmal tachycardias.

The degree of pre-excitation during sinus rhythm is variable: it may be intermittent if the refractory period of the accessory pathway is close to the sinus cycle length, or unapparent if the delta wave is obscured due to rapid AV nodal conduction.

Radiofrequency catheter ablation of bypass tracts is possible in more than 90% of patients and is the treatment of choice in patients with symptomatic arrhythmias.

Work Smart

Question 37 of 84

A 65-year-old African man with a known history of hypertension presents with ankle oedema after taking an antihypertensive prescribed by his general practitioner. He is now found to have a blood pressure of 180/100 mmHg.

Which of the following would be the preferred drug for this patient?

(Please select 1 option)

○	Amlodipine
○	Atenolol
○	Bendroflumethiazide This is the correct answer
○	Ramipril
◉	Verapamil Incorrect answer selected

The patient has ankle oedema which is usually due to vasodilatation by calcium channel blockers.

The optimal antihypertensive therapy for black Afro-Caribbean patients (if a CCB is not suitable, for example because of oedema) will be a thiazide-like diuretic according to current NICE guidance, 2011.

Angiotensin converting enzyme (ACE) inhibitors are preferred for those patients with heart failure or diabetic nephropathy.

β-blockers are preferred for post-myocardial infarction and ischaemic heart disease.

Reference

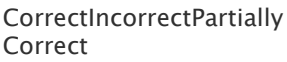
NICE. Hypertension (CG127).

Next question | Go to summary

Answer Statistics

Times answered: 11865

Test Analysis



Score: 18.52%

Total Answered: 27

Feedback

Work Smart

Question 70 of 126

A 59-year-old man is admitted with chest pain of eight hours duration and has ST elevation in the inferior leads on his admission ECG.

An electrocardiogram from a previous clinic visit shows sinus rhythm two months ago. He has insulin-dependent diabetes mellitus and chronic renal failure.

Investigations reveal:

Fasting plasma glucose	7.4 mmol/L	(3.0-6.0)
Sodium	137 mmol/L	(137-144)
Potassium	4.4 mmol/L	(3.5-4.9)
Urea	10 mmol/L	(2.5-7.5)
Creatinine	200 µmol/L	(60-110)

Which of the following which represent an absolute contraindication to the use of thrombolysis?

(Please select 1 option)

○	Allergy to penicillin
○	Gastrointestinal bleeding in last three months
○	History of haemorrhagic stroke This is the correct answer
○	Ischaemic stroke 12 months ago
◉	On warfarin therapy Incorrect answer selected

Absolute contraindications to thrombolysis include:

- Previous haemorrhagic stroke
- Ischaemic stroke in last six months
- Central nervous system damage or neoplasm
- Within three weeks of major surgery, head injury or major trauma
- Active internal bleeding (menses excluded) or gastrointestinal bleeding within the past month
- Known or suspected aortic dissection
- Known bleeding disorder
- Proliferative diabetic retinopathy.

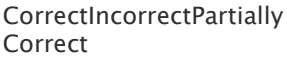
Allergy and oral anticoagulants are relative contraindications.

Next question | Go to summary

Answer Statistics

Times answered: 9178

Test Analysis



Work Smart

Question 73 of 126

A 54-year-old obese man with a history of angina and hypertension presents with central crushing chest pain of two hours duration.

High flow oxygen, sublingual GTN, and aspirin are administered and venous access is obtained. Whilst being attached to an ECG monitor he collapses, with a doctor present, and the initial rhythm is pulseless ventricular tachycardia (VT). The external defibrillator is located two minutes away on another ward.

Which of the following is the most appropriate immediate treatment for this man?

(Please select 1 option)

○	A ventilation to compression ratio of 30:2 should be commenced
○	Await arrival of defibrillator, then deliver shock
○	Continuous chest compressions should be started
○	He should be given a precordial thump followed by chest compressions This is the correct answer
◉	Intravenous adrenaline should be given Incorrect answer selected

Guidelines from the Resuscitation Council (UK) state that if a patient has a monitored and witnessed VF/VT arrest in hospital, three quick successive (stacked) shocks should be given. Chest compressions should be started immediately after the third, with a compression to ventilation ratio of 30:2 for 2 minutes.

A precordial thump can be successful if given within seconds of the onset of a shockable rhythm.

Delivery should not delay calling for help, or accessing a defibrillator, but would be indicated here whilst awaiting the defibrillator. Chest compressions should start immediately if it is unsuccessful.

Intravenous adrenaline would be given every 3-5 minutes once chest compressions had started.

Reference

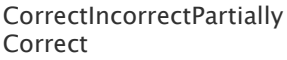
Resuscitation Council (UK). Adult Advanced Life Support.

Next question | Go to summary

Answer Statistics

Times answered: 10284

Test Analysis



Score: 32.26%

Total Answered: 31

Work Smart

Question 75 of 126

A 45-year-old HIV-seropositive man attended the outpatient clinic for the results of a fasting serum lipid test.

He had been diagnosed with HIV disease two years previously and was started on highly active antiretroviral therapy. One year after commencing antiretrovirals, his CD4 count had risen from 10 cells/mm^3 to 120 cells/mm^3 with an undetectable viral load.

His current medications consisted of zidovudine, lamivudine, lopinavir, aciclovir, fluconazole, and co-trimoxazole.

Fasting lipid profile revealed:

Serum cholesterol	4.1 mmol/L	(<5.2)
Serum triglyceride	18.2 mmol/L	(0.45-1.69)

Which of the following medications is most likely to be responsible for these results?

(Please select 1 option)

◉	Co-trimoxazole Incorrect answer selected
○	Fluconazole
○	Lamivudine
○	Lopinavir This is the correct answer
○	Zidovudine

Lipodystrophy, lipoatrophy, and alterations in serum lipid values have been observed in patients with human immunodeficiency virus (HIV) disease who are taking highly active antiretroviral therapy.

Elevated serum lipid levels have been associated with premature coronary artery disease.

Hypertriglyceridaemia is also thought to contribute to central fat deposition and insulin resistance that is also seen in these patients.

Abnormalities of serum lipid levels are likely to be multifactorial in patients with HIV disease, but appear much commoner in patients taking protease inhibitors.

Isolated hypertriglyceridaemia can occur in HIV disease in the absence of protease inhibitors, but extremely high serum triglycerides have been documented in some patients treated with these drugs.

If the elevation in lipid levels is modest, measures such as dietary modification and exercise may be tried first. Omega-3 fish oils may also be beneficial in reducing modestly elevated serum triglycerides.

In refractory cases, or where there is extreme isolated hypertriglyceridaemia, a fibrate should be used.

In addition, patients with HIV disease may also have elevated serum lipid levels due to familial hyperlipidaemia.

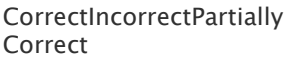
Next question

Go to summary

Answer Statistics

Times answered: 9939

Test Analysis



Work Smart

Question 76 of 126

A 62-year-old male who is being treated for stable angina presents with muscle aches and pains. He has been taking simvastatin 40 mg daily, atenolol 50 mg daily, together with aspirin 75 mg daily for approximately two years.

Recently he was admitted for an episode of acute coronary syndrome and a number of other therapies were added. You suspect a statin-related myopathy and a CPK concentration is 820 IU/L (50-200).

Which of the following is most likely to be responsible for the precipitation of his statin-related myopathy?

(Please select 1 option)

○	Bisoprolol
○	Clopidogrel
○	Diltiazem This is the correct answer
○	Omega-3 fatty acids
◉	Spironolactone Incorrect answer selected

Statin-associated myopathy occurs in up to 5% of those treated with statins and may be exacerbated by the co-prescription of other drugs such as calcium channel blockers, macrolide antibiotics, fibrates, amiodarone, and also grapefruit juice.

Whilst patients may tolerate a statin extremely well, a myopathy or rhabdomyolysis can quite easily

be precipitated by the addition of these agents.

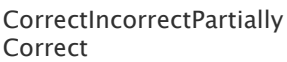
NICE guidance on Myocardial infarction: secondary prevention (CG172) advises that you should not offer or advise patients to use omega-3 capsules to prevent another MI.

Next question | Go to summary

Answer Statistics

Times answered: 8636

Test Analysis



Score: 30.3%

Total Answered: 33

Work Smart

Exam Themes September 2006

Question 43 of 84

A 59-year-old lady is admitted with a 30 minute history of heavy central chest pain associated with nausea and sweating.

Her ECG shows ST elevation in leads V1, V2, V3 and V4.

Which of the following coronary arteries is most likely to be occluded?

(Please select 1 option)

○	Circumflex artery
◉	Left anterior descending artery Correct
○	Obtuse marginal artery
○	Posterior descending artery
○	Right coronary artery

An anteroseptal myocardial infarction (MI) is due to an infarct in the territory of the left anterior descending artery.

Next question | Go to summary

Answer Statistics

Work Smart

Question 45 of 84

A 55-year-old man presented to the Emergency Department with sudden breathlessness.

He is sweaty and obviously short of breath. He is a smoker with a past history of hypertension. There are crackles on inspiration at both his lung bases and his CXR shows upper lobe venous diversion and perihilar shadowing.

His ECG shows sinus tachycardia only and his cardiac enzymes, when they return the next day, are normal. His symptoms resolved quickly with oxygen and furosemide.

Which of the following conditions is the most likely explanation of this presentation?

(Please select 1 option)

○	Hypertrophic obstructive cardiomyopathy
○	Myocardial infarction
○	Phaeochromocytoma
○	Pulmonary embolism
◉	Renal artery stenosis Correct

Flash pulmonary oedema in someone with a history of hypertension, especially those suspected of being arteriopaths such as smokers, should raise the possibility of renal artery stenosis.

Further Reading:

McLaughlin K, Jardine AG, Moss JG. ABC of arterial and venous disease. Renal artery stenosis. *BMJ* 2000;320:1124-7.

Work Smart

Question 46 of 84

A 29-year-old lady presented to the Emergency Department with a diagnosis of DVT.

She is in the third trimester of her first pregnancy and she has been 'taking it easy' by resting a lot at home.

In the department she develops a right hemiparesis.

Which of the following is the most likely underlying cardiac abnormality?

(Please select 1 option)

○	Patent ductus arteriosus
◉	Patent foramen ovale Correct
○	Primum atrial septal defect
○	Secundum atrial septal defect
○	Ventricular septal defect

This is a 'paradoxical embolus' where a right sided thrombus has crossed into the arterial circulation.

The commonest cause is a patent foramen ovale. Although atrial septal defects are also a cause, they are more rare.

Next question | Go to summary

Work Smart

Question 49 of 84

A 58-year-old man with a history of schizophrenia on thioridazine is found to have episodes of torsades de pointes ventricular tachycardia (VT).

His blood pressure is 110/70 mmHg.

Which of the following is the most appropriate management?

(Please select 1 option)

○	IV betablocker
○	IV lidocaine
○	IV magnesium This is the correct answer
○	Overdrive pacing
◉	Synchronised DC cardioversion Incorrect answer selected

Thioridazine, an antipsychotic, and many other drugs can prolong the QT interval and increase the risk of torsade de pointes VT.

Self-limiting bursts of torsade may be seen on an ECG and prompt urgent treatment.

Further Reading:

Medscape. Torsade de Pointes.

Work Smart

Question 50 of 84

A 60-year-old man presented with an episode of right-sided weakness that lasted 10 minutes and fully resolved.

Examination reveals that he is in atrial fibrillation.

Assuming he remains in atrial fibrillation which of the following is the most appropriate management regime?

(Please select 1 option)

○	Aspirin
○	No additional drug treatment
○	Warfarin, INR range 2-3 This is the correct answer
◉	Warfarin, INR range 2-3 for six months then aspirin Incorrect answer selected
○	Warfarin, INR range 3-4

This is a high risk patient for future stroke and should be anticoagulated with warfarin (CHADS2 score 2)

An initial target range of INR 2-3 is the most appropriate (target INR 2.5).

Next question | Go to summary

Work Smart

Question 51 of 84

A 48-year-old man presents with acute coronary syndrome.

On examination he has palmar crease xanthoma.

Which of the following is the most likely diagnosis of his lipid abnormalities?

(Please select 1 option)

○	Familial combined hyperlipidaemia
◉	Familial hypercholesterolaemia Incorrect answer selected
○	Familial hypertriglyceridaemia
○	Lipoprotein lipase deficiency
○	Remnant hyperlipidaemia This is the correct answer

Remnant hyperlipidaemia (type III hyperlipidaemia) is associated with:

- Hypercholesterolaemia, typically 8-12 mmol/l
- Hypertriglyceridaemia, typically 5-20 mmol/l
- Normal ApoB concentration
- Palmar xanthomata - orange discoloration of skin creases
- Tuberoeruptive xanthomata - elbows and knees
- Early onset of cardiovascular disease
- Early onset of peripheral vascular disease.

Remnant hyperlipidaemia is due to abnormal function of the ApoE receptor, which is normally

required for clearance of chylomicron remnants and IDL from the circulation.

The receptor defect causes levels of chylomicron remnants and IDL to be higher than normal in the blood stream. The receptor defect is an autosomal recessive mutation or polymorphism.

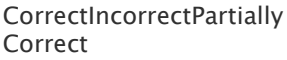
The genotype of the homozygous condition is apo E-2/E-2 and occurs with a frequency of 1:100.

Next question | Go to summary

Answer Statistics

Times answered: 8870

Test Analysis



Score: 24.24%

Total Answered: 33

Work Smart

Question 53 of 84

A 52-year-old lady presents with a history of crushing central chest pain, sweating, and dyspnoea.

An ECG confirms acute myocardial infarction with ST elevation in leads V2-V4 and ST depression in leads II and III.

Which of the following would be a contraindication to thrombolysis in this lady?

(Please select 1 option)

○	History of peptic ulcer disease
○	Intracranial neoplasm This is the correct answer
○	Ischaemic stroke two years previously
◉	Menstruation Incorrect answer selected
○	Pre-proliferative diabetic retinopathy

Contraindications to thrombolysis include:

- Intracranial neoplasm (as here)
- Ischaemic stroke within six months
- Pregnancy
- Active internal bleeding
- Aortic dissection
- Recent significant head injury, and
- Severe and uncontrolled hypertension.

Work Smart

Exam Themes January 2005

Question 84 of 126

A 55-year-old man presents with severe dyspnoea with tachycardia. Clinical examination raises the possibility that pericardial disease may be the cause.

Which of the following clinical features best distinguishes cardiac tamponade from constrictive pericarditis?

(Please select 1 option)

○	Hypotension This is the correct answer
○	Kussmaul's sign
○	Muffled heart sounds
○	Pulsus paradoxus
◉	Raised JVP Incorrect answer selected

Cardiac tamponade is characterised by Beck's triad of:

- hypotension
- raised JVP, and
- muffled heart sounds.

Constrictive pericarditis tends to present with features of right sided cardiac failure with hypotension as a late feature.

In cardiac tamponade there is pulsus paradoxus (a greater than 10 mmHg fall in systolic BP on

inspiration) but this is less commonly seen in constrictive pericarditis, though can still be present in both.

Kussmaul's sign (a rise in the JVP on inspiration) is more likely to be seen in constrictive pericarditis than cardiac tamponade.

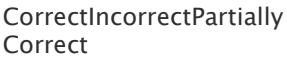
Muffled heart sounds is neither distinctive nor helps to discriminate. It is non-specific and subjective so should not be relied upon in clinical practice.

Next question | Go to summary

Answer Statistics

Times answered: 8940

Test Analysis



Score: 28.57%

Work Smart

Question 87 of 126

Which of the following mechanisms best explains the action of OMACOR (omega-3-acid ethyl esters)?

(Please select 1 option)

○	Activation of PPAR-alpha
○	Bile acid sequestration
○	Decreases hepatic cholesterol synthesis
○	Increases peroxisomomal beta-oxidation of fatty acids This is the correct answer
◉	Inhibits cholesterol absorption Incorrect answer selected

Omacor reduces triglycerides by different, independent effects in the liver.

The synthesis of triglycerides is inhibited through reduced production of triglycerides in the liver, as EPA and DHA are poor substrates for the enzymes responsible for triglyceride synthesis.

EPA and DHA also inhibit esterification of other fatty acids. Omacor increases peroxisomomal beta-oxidation of fatty acids in the liver.

Further Reading:

Electronic Medicines Compendium (EMC). Omacor.

Work Smart

Question 88 of 126

Which of the following mechanisms best explains the action of ezetimibe?

(Please select 1 option)

◉	Activates PPAR-alpha Incorrect answer selected
○	Bile acid sequestration
○	Decreases hepatic cholesterol synthesis
○	Increases peroxisomal beta-oxidation of fatty acids
○	Inhibits cholesterol absorption This is the correct answer

Ezetimibe localises at the brush border of the small intestine, where it inhibits the absorption of cholesterol from the diet.

Further Reading:

Patient.info. Lipid-regulating Drugs (including Statins).

Next question | Go to summary

Answer Statistics

Work Smart

Exam Themes May 2007

Question 60 of 84

A 26-year-old female with a small ventriculo-septal defect (VSD) presents in the sixth week of pregnancy. She has been told that she would need antibiotic prophylaxis for dental surgery, and various other procedures.

She asks you to tell her whether she will have to take this during her pregnancy, and if so, at which point it will be needed.

Which of the following should you advise?

(Please select 1 option)

○	Antibiotic prophylaxis is not indicated This is the correct answer
◉	At delivery Incorrect answer selected
○	Onset of labour
○	Second trimester
○	Third trimester

Infective endocarditis (IE) is a rare condition, but one which carries significant morbidity and mortality. It may arise following bacteraemia in any patient, but those with a predisposing cardiac lesion are at an increased risk.

In previous years, at risk patients have been given antibiotic prophylaxis before certain interventional procedures to reduce the risk of developing IE. However, in recent years the lack of a robust evidence base has led to this practice being questioned.

In light of this, NICE issued guidance in 2008. These guidelines highlight that the patients at risk of developing IE are those with:

- Acquired valvular heart disease (stenosis or regurgitation)
- Valve replacement
- Structural congenital heart disease (including surgically corrected or palliated structural conditions, but excluding isolated atrial septal defect, fully repaired ventricular septal defect or fully repaired patent ductus arteriosus, and closure devices that are judged to be endothelialised)
- Previous infective endocarditis
- Hypertrophic cardiomyopathy.

In these patients any episodes of infection should be fully investigated and treated promptly to reduce the risk of endocarditis developing. However, prophylaxis is not recommended for undergoing dental procedures, or procedures at the following sites:

- Upper and lower gastrointestinal tract
- Genitourinary tract (including childbirth)
- Upper and lower respiratory tract (including ENT).

Chlorhexadine mouthwash is also not recommended.

The only recommendation for antibiotics is if an at-risk patient is undergoing a gastrointestinal or genitourinary procedure at a site where there is a suspected infection; in these cases an antibiotic should be given that covers organisms that cause IE.

Reference:

NICE. Prophylaxis against infective endocarditis (CG64).

Next question | Go to summary

Answer Statistics

Times answered: 9966

Work Smart

Question 87 of 126

Which of the following is associated with Marfan's syndrome?

(Please select 1 option)

○	Autosomal recessive inheritance
○	Cognitive impairment
○	Increased upper:lower body ratio
○	Pulmonary stenosis
○	Retinal detachment Correct

Marfan's syndrome is an autosomal dominant condition associated with ocular abnormalities such as upwards lens dislocation and retinal detachment[1].

It is associated with a number of other ocular abnormalities, including:

- myopia
- increased axial globe length
- corneal flatness
- subluxation of the lenses (ectopia lentis)
- early glaucoma, and
- early cataracts.

About 6 out of 10 people with Marfan's syndrome have dislocated lenses in one or both eyes.

Aortic regurgitation (not pulmonary stenosis) may be a finding and aneurysmal dilatation is a feature.

Other associated cardiovascular respiratory complications include:

- mitral valve prolapse
- aortic aneurysms
- cardiac conduction defects
- emphysema
- pneumothorax, and
- kyphoscoliosis.

Upper to lower body ratio (head to symphysis pubis:symphysis pubis to toes) is decreased in Marfan's syndrome. Other common physical traits include:

- long arms, legs, and fingers
- tall and thin body type
- scoliosis
- pectus excavatum or pectus carinatum
- flexible joints
- flat feet, and
- crowded teeth.

Reference:

Sharma T, Gopal L, Shanmugam MP, et al. Retinal detachment in Marfan syndrome: clinical characteristics and surgical outcome. *Retina.* 2002;22(4):423-8.

Online Mendelian Inheritance in Man (OMIM). Marfan Syndrome.

Patient.info. Marfan's Syndrome.

Next question | Skip question | Go to summary

Test Analysis

CorrectIncorrectPartially Correct

Work Smart

Exam Themes September 2007

Question 91 of 126

Which of the following are characteristic electrocardiogram (ECG) features of hypokalaemia?

(Please select 1 option)

○	Flattened P waves
○	ST elevation
○	U waves This is the correct answer
○	Ventricular tachycardia
◉	Wide QRS Incorrect answer selected

U waves are characteristic features of hypokalaemia.

Further ECG features of hypokalaemia include ST depression, low amplitude T waves, and ventricular fibrillation.

Ventricular tachycardia is thought to be exceedingly rare in hypokalaemia.

The remaining answers are ECG findings typical of hyperkalaemia, together with absent P waves, tall tented t waves, asystole, and ventricular fibrillation.

Next question | Go to summary

Work Smart

Question 65 of 84

A 57-year-old woman who has been receiving haemodialysis for the past five years is found dead in bed by her husband. She had a long history of type 1 diabetes for over 20 years and in her later years, suffered from neuropathy and retinopathy as well as chronic renal failure. Most recently she was under investigation for angina.

Which of the following is the most likely cause of death in this patient?

(Please select 1 option)

○	Hyperkalaemia
○	Hypoglycaemia
◉	Myocardial infarction Correct
○	Pulmonary embolus
○	Stroke

Patients who undergo long-term haemodialysis suffer from increasing arterial calcification, which is associated with both increased risk of myocardial infarction and stroke, but the greatest absolute increase is in MI rates.

Interestingly, trials of high-dose statins have proved disappointing in the dialysis population, suggesting that calcification drives much of the increased risk.

Whilst both hypoglycaemia and hyperkalaemia are alternative possibilities as causes of death, myocardial infarction is more likely than both to have been responsible.

Work Smart

Question 67 of 84

A 56-year-old woman presents to the cardiology clinic with increasing attacks of syncope and pre-syncope over the past few months. She is worried that she may have an underlying cardiac defect. She has a 72 hour ECG recording.

Which of the following would be the most significant finding on 72 hour tape?

(Please select 1 option)

○	1,000 atrial ectopics recorded over the 72 hours
○	1,000 ventricular ectopics recorded over the 72 hours
○	Bradycardia of 40 bpm whilst asleep
○	Mobitz type 1 heart block with right bundle branch block (RBBB) whilst feeling lightheaded This is the correct answer
◉	Runs of four to six beats of SVT without symptoms Incorrect answer selected

Second degree heart block with RBBB implies that this patient has a significantly increased risk of complete heart block.

Runs of four to six beats of SVT, and atrial and ventricular ectopics at this rate would be seen as insignificant.

Ultimately, prior to committing to pace maker insertion, repeat tape is the most likely next step, with an electronic patient diary to see if the recorded arrhythmia corresponds to her symptoms.

Work Smart

Question 102 of 126

An 84-year-old female with permanent atrial fibrillation, ischaemic heart disease with well preserved left ventricular systolic function, and mild COPD is due elective surgery for a large abdominal aortic aneurysm.

Choose the most appropriate drug from the list to reduce perioperative cardiac risk in this patient.

(Please select 1 option)

○	Atenolol This is the correct answer
○	Carvedilol
○	Metoprolol
◉	Oxprenolol Incorrect answer selected
○	Sotalol

The ESC guidelines in 2009 for perioperative management of patients undergoing high risk vascular surgery recommends prophylactic beta blockers for high risk vascular surgery (including those patients with COPD).

Bisoprolol is probably the best clinical choice in this case, but is not on the list.

Atenolol is the best choice from this list; it is cardioselective and long acting, reducing risk of postoperative myocardial ischaemia and tachycardia.

Carvedilol is non-selective and so has greater risk of exacerbating COPD.

Oxprenolol is undesirable because of its intrinsic sympathomimetic properties.

Metoprolol though selective is shorter acting.

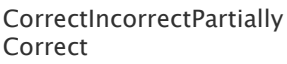
Sotalol may be appropriate for paroxysmal AF, but not permanent AF.

Next question | Go to summary

Answer Statistics

Times answered: 6625

Test Analysis



Score: 25.64%

Total Answered: 39

Feedback

Work Smart

Question 104 of 126

A 61-year-old Caucasian patient presents to the gastroenterology clinic following a three month history of malaise with no other specific symptoms.

She had a hysterectomy in her 40s for symptomatic fibroids following completion of her family, and developed pre-eclampsia in both of her pregnancies. She is a current and lifelong smoker, takes no alcohol, and previously worked as a secretary.

Present medication consists of Premarin 300 mcg OD, salbutamol PRN, Seretide BD, and amlodipine 5 mg OD.

On examination the patient is pale with normal capillary refill time. The heart rate is 72, sinus rhythm. Blood pressure is 168/95 mmHg. Chest auscultation revealed neither crackles nor wheeze. Examination is otherwise unremarkable, with normal fundoscopy, urine dip, and ECG.

Iron deficiency anaemia is seen on full blood count, and outpatient endoscopy is organised.

Which of the following is not a risk factor for the patient's pre-existent hypertension?

(Please select 1 option)

○	Hormone replacement therapy
○	Multiparity
◉	Obstructive airway disease Correct
○	Prior pre-eclampsia
○	Smoking

This patient with iron deficiency anaemia presents with incidental hypertension, which may be

multifactorial. Hypertension has classically been described in a male population, though relevant risk factors have been more recently identified in women.

These include:

- Multiple previous pregnancies
- Menopause
- Hysterectomy, and
- Hormone replacement therapy.

Though obstructive airway disease can cause pulmonary hypertension, and smoking is a well-recognised risk factor for arterial hypertension, in isolation it is not a cause of systemic hypertension.

Obstructive airway disease induced by familial α-1 antitrypsin deficiency is not associated with systemic hypertension.

Pre-eclampsia is a risk factor for consequent hypertension. Interestingly, active smokers appear to have a lower incidence of pre-eclampsia.

Note that this patient takes unopposed oestrogen, which is safe in her case following hysterectomy though inadvisable in patients with an intact uterus due to the risk of endometrial carcinoma.

References:

1. NICE. Hypertension (CG127)
2. Wilson BJ, et al. Hypertensive diseases of pregnancy and risk of hypertension and stroke in later life: results from cohort study. *BMJ.* 2003;326:845.

Next question

Go to summary

Answer Statistics

Times answered: 6667

Test Analysis

Work Smart

Question 70 of 84

A 38-year-old teacher attends the hypertension clinic, having been referred via her general practitioner following a sequence of elevated systolic blood pressure readings.

Though she is worried about the long term consequences of hypertension she has never trusted the medical profession, is worried about the possible side effects of medication, and wishes to control her blood pressure through alternative therapies.

Which of the following interventions is part of currently advocated measures to reduce blood pressure?

(Please select 1 option)

○	Acupuncture
◉	Ginseng ✗ Incorrect answer selected
○	High fibre diet
○	Meditation ✓ This is the correct answer
○	Sodium supplements

The Dietary Approaches to Stop Hypertension (DASH) diet demonstrated a convincing and dynamic link between dietary intake and systemic blood pressure, with rapid improvement in blood pressure on a fruit and vegetable based diet with low dairy and fat consumption. However this is yet to translate into novel lifestyle modifications.

Though a vast body of work is available on complementary therapies for hypertension, of the above

only relaxation therapies have been conclusively shown to reduce blood pressure as part of a preventative effort to improve a patient's risk profile.

Sodium supplements are the opposite of what is recommended, with dietary salt restriction being a key and effective part of advice.

Calcium, magnesium, and potassium supplements have some tenuous supporting data against the background of other contradictory studies, and are not recommended in national guidelines.

Ginseng has anecdotally been associated with hypertension. Sadly long term compliance with drastic changes in a lifelong diet is poor.

Other conventional and well known lifestyle measures against hypertension include increased exercise, weight loss, moderation of alcohol intake, and smoking cessation. These aims should be reiterated when consulting any patient with new or indeed longstanding hypertension.

References

1. NICE. Hypertension (CG127).
2. Savica V, et al. The effect of nutrition on blood pressure. *Annu Rev Nutr.* 2010;30:365-401.

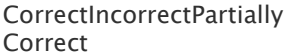
Next question

Go to summary

Answer Statistics

Times answered: 6787

Test Analysis



Work Smart

Question 72 of 84

A 70-year-old known hypertensive and diabetic patient presents with dyspnoea on minimal exertion. He reports being comfortable at rest, but minor exertion results in significant fatigue and dyspnoea.

On examination he is pale, pulse rate is 98/min and regular, BP is 160/70 mmHg and there are fine basal crepitations in the lungs. ECG showed left ventricular hypertrophy and renal function was slightly deranged.

Which is the most appropriate long term treatment for cardiac failure in this patient?

(Please select 1 option)

○	ACE-I alone
○	Furosemide alone
○	Spironolactone, ramipril, and aspirin
○	Spironolactone, ramipril, and carvedilol This is the correct answer
◉	Spironolactone, ramipril, and digoxin Incorrect answer selected

This gentleman has NYHA class III cardiac failure.

All patients with cardiac failure should be on an angiotensin converting enzyme inhibitor (ACE-i) if there is no contraindication. In this patient there will be an additional benefit with regard to treating his hypertension and prevention of diabetic nephropathy.

Once stable, a β blocker should be added. It is proven that cardioselective β blockers have important beneficial effects especially in patients with underlying coronary artery disease.

The randomised Aldactone evaluation study (RALES) trial showed 30% reduction in mortality when

spironolactone (25 mg) was added to the standard therapy, and NICE therefore recommends it as second line therapy following an ACE-inhibitor and beta blocker. However, in NYHA class III and IV cardiac failure, it can be used upfront and is therefore indicated here. The patient's slight renal dysfunction is not a contraindication, but you would need to monitor renal function and adjust treatment appropriately if it further deteriorated.

Digoxin is used in heart failure with atrial fibrillation. As it is a weak positive inotrope, its role in heart failure with sinus rhythm may be best reserved if the patient remains symptomatic despite optimal therapy. Elderly patients with renal impairment are at increased risk of toxicity, and therefore it requires close monitoring if it is required.

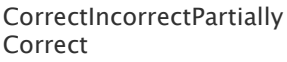
Next question

Go to summary

Answer Statistics

Times answered: 6644

Test Analysis



Work Smart

Question 74 of 84

A 29-year-old woman with a history of depression is admitted by ambulance after being found unconscious by her boyfriend. Apparently an empty bottle of amitriptyline tablets was found at the scene.

On examination her GCS is 10, her BP is 110/70 mmHg, pulse is 90 and regular. There are no other abnormal findings apart from some scars consistent with deliberate self harm.

Investigations show:

Haemoglobin	130 g/L	(115-160)
White cell count	6.1 $\times 10^9$/L	(4-11)
Platelets	152 $\times 10^9$/L	(150-400)
Sodium	137 mmol/L	(135-146)
Potassium	4.0 mmol/L	(3.5-5)
Creatinine	132 µmol/L	(79-118)
Bicarbonate	12 mmol/L	(22-30)
pH	7.18	(7.35-7.45)

The nurses call you over whilst you are writing up her file as she is having more prolonged runs of VT on the monitor.

Which of the following is the next best step?

(Please select 1 option)

◉	Give amiodarone Incorrect answer selected
○	Give lidocaine
○	Give phenytoin
○	Give sodium bicarbonate This is the correct answer
○	Observe her

This is a rare occasion where sodium bicarbonate is recommended as first line therapy, here for VT/QRS widening in tricyclic poisoning. It provides exogenous sodium to overcome the competitive fast sodium channel blockade produced by tricyclics, and produces an alkalaemia (or reverses acidaemia) that mitigates the fast sodium channel blockade by the tricyclic ingested.

Lidocaine is the second line choice for management of arrhythmias in this situation. It may exacerbate hypotension, so as such is not an appropriate first line choice.

Phenytoin, as well as being an anticonvulsant, may also have a role in suppressing ventricular tachycardia.

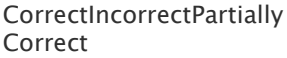
Amiodarone or observations alone are not recommended.

Next question | Go to summary

Answer Statistics

Times answered: 6545

Test Analysis



Work Smart

Core Questions

Question 77 of 84

A 23-year-old man attended his local NHS walk-in centre with a history of chest pains.

The doctor arranged a 12 lead ECG which he is surprised to find suggests left ventricular hypertrophy. The doctor decides to refer the patient to the local acute medical department. The patient is admitted and the next day has a transthoracic echocardiogram. This demonstrates asymmetric septal hypertrophy with a small LV cavity. Systolic function appears normal.

The cardiologist explains the diagnosis of probable hypertrophic cardiomyopathy. On the ward round the next day the patient is worried about the associated risk of death.

Which of the features listed is a recognised risk factor for sudden cardiac death?

(Please select 1 option)

○	Atrial fibrillation
○	Drop in systolic blood pressure of 25 mmHg on exercise This is the correct answer
○	Mitral regurgitation
◉	Older age at diagnosis Incorrect answer selected
○	Systolic anterior motion of the mitral valve leaflets

Abnormal blood pressure response to exercise is a marker for increased risk of sudden cardiac death in hypertrophic cardiomyopathy.

Hypertrophic cardiomyopathy (HCM) is often asymptomatic and is noticed following routine ECGs or echocardiograms for other reasons.

HCM is a complex disease and there is a wide variability in severity and risk of serious complications (mainly ventricular arrhythmias).

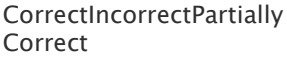
Unfortunately, risk of sudden cardiac death (SCD) is difficult to predict but there are recognised risk factors. Younger age at diagnosis and non-sustained VT are markers of risk. Abnormal blood pressure response to exercise is a marker for risk of SCD.

Next question | Go to summary

Answer Statistics

Times answered: 6641

Test Analysis



Score: 21.95%

Total Answered: 41

Work Smart

Question 79 of 84

According to Starling's law, when the end-diastolic volume increases, resulting in myocardial stretch, how does the heart maintain an adequate cardiac output?

(Please select 1 option)

◉	Increases capillary permeability Incorrect answer selected
○	Increases central vasodilation to redistribute the fluid to other organs
○	Increases myocardial contraction This is the correct answer
○	Increases peripheral vasodilation to reduce strain on the heart
○	Increases urine production to reduce intravascular volume

The cardiac output (CO) is the volume of blood being pumped by the heart in one minute, and must be maintained within a narrow range to allow normal function. It is a reflection of how well the body is being perfused, and therefore how well the body can work (perfusion enables energy production). It can be calculated from the stroke volume (SV) and heart rate (HR) as follows:

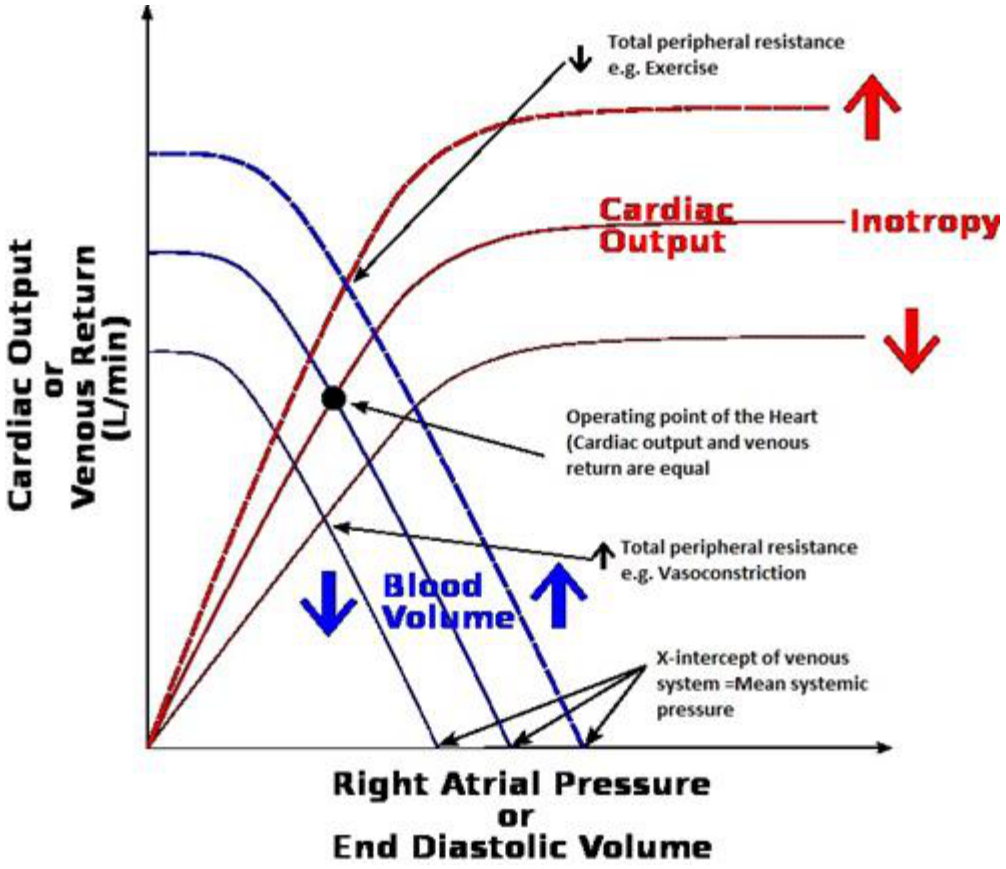
$CO = HR \times SV$

Stroke volume, (the amount of blood pushed out of the left ventricle on each pump of the heart), is determined by many factors which are summed up in (Frank-) Starling's law. This law states that when the myocardium stretches due to blood pooling, the force of contraction increases, to preserve the stroke volume and thus the cardiac output.

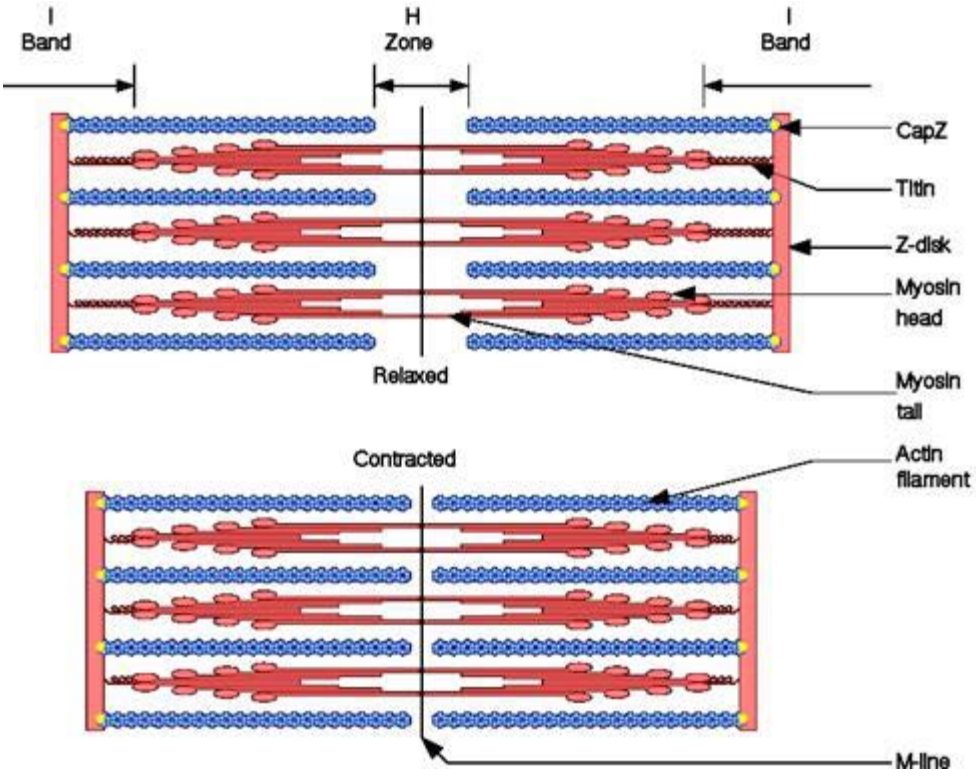
The diagram below shows that the ideal operating point of the heart occurs when cardiac output and

venous return are equal (that is, blood in equals blood out).

As end-diastolic volume increases from this point, there is greater myocardial stretch and a greater rebound contraction. The result is that cardiac output can increase but only up to a certain point. After this, cardiac output cannot increase further despite excessive end-diastolic pressure.



This increase in rebound contraction involves the sarcomere; the basic muscle unit of the myocardium (see diagram below). When required, the sarcomere can stretch to allow more interaction between its branches (actin and myosin filaments). At 2.2 micrometers, the number of interactions is maximal. If the heart continues to stretch the sarcomeres lengthens to over 2.2 micrometers, and the number of interactions decrease. This results in less effective contractions of the heart overall which can eventually lead to heart failure.



Next question

Go to summary

Answer Statistics

1		2%
2		3%
3		80%
4		13%
5		2%

Times answered: 6524

Test Analysis

CorrectIncorrectPartially
Correct

Work Smart

Question 83 of 84

A 56-year-old man with a history of type 2 diabetes is admitted to the Emergency Department with nausea and vomiting. He has been unable to keep fluids down for the past few days, but has continued to take his medication, including lisinopril and a loop diuretic.

On examination his BP is 105/70 mmHg, pulse is 80 bpm and regular. Heart sounds are normal, and his chest is clear. His abdomen is soft but is mildly tender. You are alerted by the nursing staff to his venous blood gas results which show potassium of 7.5 mmol/l, and his ECG which shows tall peaked T waves.

Which of the following is the most appropriate next step?

(Please select 1 option)

○	IV calcium gluconate This is the correct answer
○	IV insulin and dextrose
◉	IV normal saline Incorrect answer selected
○	Oral calcium resonium
○	Salbutamol nebuliser

The answer is IV calcium gluconate. This man has life threatening hyperkalaemia, most likely as a result of pre-renal acute kidney injury. The tall T-waves indicate the myocardium has become sensitised by the hyperkalaemia, and this can deteriorate to VF or VT. IV calcium gluconate should therefore be given immediately, with cardiac monitoring, to stabilise the myocardium. Its effect is short-lived (approximately 15-30 minutes) but does allow time for more definitive management.

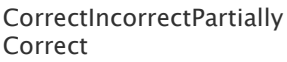
IV insulin and dextrose should then be given to reduce potassium levels, and salbutamol nebulisers can also be used but are less effective. IV hydration will ultimately be required, but the hyperkalaemia should be dealt with initially. Oral calcium resonium is a potassium binder which slowly reduces potassium, and it is of more use in chronic hyperkalaemia rather than the acute situation seen here.

Next question | Go to summary

Answer Statistics

Times answered: 2850

Test Analysis



Score: 20.93%

Total Answered: 43

Work Smart

Question 84 of 84

A 23-year-old man with Marfan's syndrome is admitted with central chest pain radiating to his back. A differential BP in both arms is noted and a CT is performed which demonstrates a Type B aortic dissection suitable for medical management. You are asked to review him with respect to management of his BP. The highest recorded BP is 135/85mmHg, pulse is 85bpm and regular. A lab creatinine is measured at 100 µmol/l (60-110).

Which of the following is the most appropriate way to manage his blood pressure?

(Please select 1 option)

○	IV labetalol This is the correct answer
○	IV nitroprusside
○	No intervention required
○	Oral amlodipine
◉	Oral lisinopril Incorrect answer selected

The answer is IV labetalol. Medical management is preferred for Type B aortic dissections, as early surgery has been associated with significant complications. Conventional targets for pulse and BP are less than 80bpm for pulse rate, and between 100 and 120 mmHg for systolic BP. In patients who cannot tolerate a beta blocker, a calcium channel blocker or nitrate is a reasonable alternative.

IV nitroprusside is an alternative, but it doesn't reduce pulse rate, and as such IV beta blockade is preferred. Amlodipine could be used in a patient who is beta blocker intolerant but as both this and lisinopril are once daily oral medications they are more difficult to titrate in the acute setting. As this

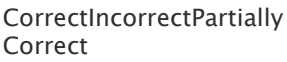
patient's BP and pulse are above the ideal target, taking no action is not the best option.

Next question | Go to summary

Answer Statistics

Times answered: 2922

Test Analysis



Score: 20.45%

Total Answered: 44

Feedback