Cardiothoracic and vascular radiology

PAPER 2

1 A 46-year-old male who was in a high-speed road traffic accident presents acutely to the Emergency Department. He has severe chest pain radiating to his back and is haemodynamically unstable. What finding on an anterior posterior chest radiograph is most specific for acute thoracic aortic injury?

a Widening of the mediastinum
b Widened right paratracheal stripe
c Indistinct aortic arch contour
d Obscuration of the aortopulmonary window
e Right-sided haemothorax

2 You are asked to review a chest radiograph following a pacemaker insertion. The leads have been placed via the left subclavian approach and pass down the left mediastinal border before forming a loop with the tip projected over the right ventricle. What is the most likely explanation?

a Partial anomalous pulmonary venous return
b An atrial septal defect
c A persistent left superior vena cava
d A ventricular septal defect
e Normal appearance, no abnormality

3 A three-week-old baby had a chest radiograph to investigate tachypnoea and mild cyanosis which showed cardiomegaly. An echocardiogram revealed a dilated right atrium and abnormal tricuspid valve with a small, dysplastic but functioning right ventricle. What is the most likely diagnosis?

a Tricuspid atresia
b Ebstein's anomaly
c Myocarditis
d An atrial septal defect
e Cor triatriatum

4 A 75-year-old female with dyspnoea had a chest radiograph on admission to the acute medical ward. This showed cardiomegaly with a prominent atrial appendage, a double heart border, a fine ring of calcification behind the cardiac shadow and prominent upper lobe blood vessels. What is the most likely diagnosis?

a A ventricular septal defect
b Mitral valve stenosis
c Ischaemic heart disease
d Aortic root dilatation
e Left ventricular aneurysm

5 A patient with extensive, multi-system arterial disease was scheduled for a lower limb vascular study and intervention. Due to their comorbidities carbon dioxide was considered as a contrast agent rather than iodinated contrast. When should carbon dioxide not be used?

a Intra-arterially below the diaphragm
b Intra-arterially in suspected arteritis
c Intravenously in the presence of an inferior vena cava filter
d Intravenously in Eisenmenger's syndrome
e Intravenously in the presence of a deep venous thrombosis

6 A 64-year-old male smoker was seen by the vascular surgical team in the outpatient clinic with increasing unilateral lower limb claudication. A duplex ultrasound showed a stenosis within the left popliteal artery. What is the most likely cause?

a Popliteal artery entrapment syndrome
b Post-traumatic stenosis
c Cystic adventitial disease
d Atherosclerosis
e Emboli

7 A 44-year-old female presented to the Emergency Department in heart failure. An electrocardiogram demonstrated Q waves in lead III and a VF consistent with a previous inferior myocardial infarction. A coronary angiogram was then performed. Which vessel is most likely to be responsible for the infarct?

a Left main stem
b Left anterior descending artery
c Obtuse marginal artery
d Right coronary artery
e Circumflex artery

8 A 34-year-old male presented to the Cardiology team with syncopal episodes and a family history of premature sudden death. A cardiac magnetic resonance examination was requested which showed a dilated right ventricle with a reduced ejection fraction but a normal left ventricle. There was also high signal within the right ventricular free wall on T1-weighted imaging, suggesting fatty replacement. What is the most likely diagnosis?
- **a** Uhl's syndrome
- **b** Brugada syndrome
- **c** Arrhythmogenic right ventricular dysplasia
- **d** Hypertrophic cardiomyopathy
- **e** Right ventricular outflow tract tachycardia

9 A 43-year-old male presented to the Cardiology team with a long history of coronary heart disease. His chest radiograph demonstrated enlargement of the left ventricular apex. What characteristic would make a diagnosis of a true ventricular aneurysm more likely than a false aneurysm?
- **a** A mouth considerably smaller than the maximal diameter
- **b** No myocardial fibres in the wall
- **c** An aneurysm that protruded only in systole
- **d** A previous history of myocardial infarction
- **e** Thrombus within the aneurysm

10 A 57-year-old man with diabetes mellitus presented with anterior chest pain on minimal exertion and an exercise tolerance test was positive. Cardiac angiography demonstrated 70% stenosis of the circumflex, 90% stenosis of the left anterior descending and complete occlusion of the right coronary arteries. It was agreed with the patient that coronary artery bypass surgery was appropriate. Which of the following native grafts is most appropriate for bypassing the left anterior descending artery?
- **a** Saphenous vein
- **b** Left internal mammary artery
- **c** Left superior epigastric artery
- **d** Radial vein
- **e** An intercostal artery

11 A 57-year-old woman presented with reduced exercise tolerance and shortness of breath. No specific abnormality was found on clinical examination. Chest radiography showed enlarged central pulmonary arteries and subsequent chest CT confirmed pulmonary artery enlargement and also showed right ventricular dilation. What additional feature would make chronic thromboembolism a more likely diagnosis than systemic to pulmonary circulation shunting?
- **a** Pleural effusion
- **b** Interstitial septal lines
- **c** Mosaic attenuation

d Flattening of the interventricular septum
e Reflux of contrast into the inferior vena cava

12 A 55-year-old female presented to the Emergency Department with acute central chest pain and shortness of breath. Her daughter had died recently following a post-partum haemorrhage. She was hypotensive with signs of left cardiac failure and her troponin T was elevated. Coronary angiography demonstrated normal coronary arteries and cardiac MRI was performed. This revealed apical hypokinesis and dilatation with normal basal function. There was no myocardial delayed hyperenhancement. Subsequent echocardiography 12 weeks later showed improved left ventricular function. What is the most likely diagnosis?
a Myocardial infarction involving the left anterior descending artery
b Myocarditis
c Hypertrophic cardiomyopathy
d Coronary artery spasm
e Tako-tsubo cardiomyopathy

13 A 65-year-old man with tearing chest pain radiating to his back was investigated with a contrast enhanced CT of his thorax which demonstrated an intimal flap separating the aortic lumen into two separate channels. The flap was seen to originate just distal to the origin of the left subclavian artery and to extend into the left common iliac artery. An aortic dissection is diagnosed. What is the appropriate Stanford classification?
a Stanford type 1
b Stanford type 2
c Stanford type 3
d Stanford type A
e Stanford type B

14 A 47-year-old lady presented with sudden onset right hemiparesis after lifting a heavy shopping bag. CT of her brain demonstrated two foci of low attenuation within the posterior frontal lobe and anterior frontal lobe adjacent to the interhemispheric fissure on the left which involved both white and grey matter. In addition she was also noted to have an erythematous, swollen left calf which was confirmed with a Doppler study to be due to thrombus within the superficial femoral vein. What is the next most appropriate radiological investigation?
a CT venography
b CT arterography
c Echocardiography
d Abdominal ultrasound
e MRI brain

15 A patient undergoing echocardiography for an acyanotic shunt had the following findings on imaging: dilated left atrium and ventricle, dilated right ventricle, undilated right atrium and undilated aorta. What is the most likely cause of the shunt?
- **a** Ostium primum atrial septal defect (ASD)
- **b** Ventricular septal defect (VSD)
- **c** Patent foramen ovale
- **d** Ostium secundum ASD
- **e** Patent ductus arteriosus (PDA)

16 A 57-year-old solicitor presented with a swollen left calf. She is on hormone replacement therapy and has a history of pulmonary embolism. What ultrasound feature is most in keeping with a diagnosis of deep vein thrombosis?
- **a** Venous distension on Valsalva
- **b** Increased flow within the superficial femoral artery on squeezing the calf
- **c** Decreased flow in superficial veins and deep collaterals
- **d** Phasic flow with respiration
- **e** Loss of phasic flow on Valsalva

17 A 23-year-old intravenous drug abuser presented to the Emergency Department with fever and swelling in his left groin. He was also noted to be short of breath at rest with peripheral cyanosis. A chest radiograph demonstrated widespread bilateral foci of consolidation. Ultrasound of his left groin demonstrated a superficial abscess with non-occlusive thrombus in the left common femoral vein. An echocardiogram performed by a cardiologist showed an echogenic intracardiac mass. What is the best explanation for these findings?
- **a** Tricuspid valve endocarditis and septic pulmonary emboli
- **b** Intracardiac bland thrombus and *Mycoplasma* pneumonia
- **c** Intracardiac bland thrombus and bland pulmonary emboli
- **d** Pulmonary valve endocarditis and septic pulmonary emboli
- **e** Mitral valve endocarditis and *Mycoplasma* pneumonia

18 A 25-year-old presented with shortness of breath after minimal exercise. His general practitioner (GP) examined his cardiovascular system and noted a harsh ejection systolic murmur in the left parasternal region. No other murmurs were detected and there were no other positive clinical findings. His chest radiograph showed calcification in the region of the aortic valve. Which of the following is the most likely aetiology?
- **a** Congenital bicuspid aortic valve
- **b** Aortic valve atherosclerosis
- **c** Rheumatic valve disease
- **d** Previous endocarditis
- **e** Patent ductus arteriosus

19 A 45-year-old gentleman underwent a contrast-enhanced CT scan of the thorax. His main pulmonary artery has a diameter greater than ascending aorta and the central pulmonary arteries are calcified. The peripheral pulmonary arteries have a pruned appearance. What is the likely pulmonary artery pressure?

a 0 mmHg
b 5 mmHg
c 10 mmHg
d 15 mmHg
e 25 mmHg

20 A 73-year-old man underwent a contrast-enhanced cardiac MR examination. His ECG had not changed over the last six months and showed Q waves in leads II, III and aVF. When would you expect peak differential enhancement of the myocardium in the right coronary artery territory following administration of iodinated contrast?

a No enhancement will occur
b Within 10 seconds
c 20–30 seconds
d 60–90 seconds
e 10–15 minutes

21 A 42-year-old female presented with recurrent chest infections and exertional dyspnoea. She had recently also developed atrial fibrillation and suffered an ischaemic neurological event. Her chest radiograph showed a large heart with a small-looking aorta and echocardiography showed paradoxical movement of the interventricular septum. What is the most likely cardiac abnormality?

a Coarctation of the aorta
b Patent ductus arteriosus
c Ostium secundum atrial septal defect
d Rheumatic mitral stenosis
e Pulmonary stenosis

22 A 65-year-old gentleman presented with syncopal episodes and intermittent pain and paraesthesia in his left hand when he exerted his left upper limb. A Doppler ultrasound demonstrated a stenosis of the left subclavian artery. In which artery would flow reversal be most likely?

a Right common carotid artery
b Right vertebral artery
c Right axillary artery
d Left vertebral artery
e Left subclavian artery

23 A 52-year-old female underwent a follow-up contrast-enhanced CT of her thorax after an episode of viral pericarditis. There was a well-demarcated rounded mass in the paracardiac region. The attenuation was 38 HU (hypodense to myocardium). Where is this mass most likely to be situated?
- **a** Right costophrenic angle
- **b** Anterior to the right ventricle
- **c** Right cardiophrenic angle
- **d** Left cardiophrenic angle
- **e** Posterior mediastinum

24 An individual underwent a stent graft repair of an infra-renal aneurysm a day prior. He presents for a follow-up CT aortogram. A blush of contrast is seen near the end of the stent graft. Which type of endoleak is most compatible with the CT aortogram finding?
- **a** Type I
- **b** Type II
- **c** Type III
- **d** Type IV
- **e** This is a normal finding within 24–48 hours after stent grafting

25 With regard to imaging with PET-CT and the use of F-18 labelled FDG, which of the following is the most accurate statement relating to the behaviour of the radioisotope and acquisition of counts?
- **a** F-18 has a half-life of approximately 60 minutes
- **b** F-18 decays by electron capture
- **c** Annihilation with an electron produces photons with an energy of 115 mBq
- **d** The point source resolution of PET is approx 1 mm
- **e** The dominant annihilation photon interaction in tissue is Compton scatter

26 A patient had a cardiac stress Myoview study and the nurse supervising the study was concerned that he could not continue. What would indicate that terminating the study is the appropriate thing to do?
- **a** Mild chest discomfort
- **b** Mild dizziness
- **c** ST segment depression of 1 mm
- **d** Increase in systolic blood pressure from baseline by 40 mmHg
- **e** Increase in diastolic blood pressure above 120 mmHg

27 A 59-year-old lady with no previous cardiac history presented with intermittent chest pain on exertion not typical of cardiac pain. Her chest radiograph was normal and she is not taking any cardiac medication. She is otherwise well except for bilateral osteoarthritis in the knees. What is the best form of imaging to assess for cardiac ischaemia?

a Tc Myoview rest and chemical stress
b Tc Myoview rest only
c Electrocardiogram
d Exercise tolerance test with electrocardiogram
e Cardiac gated CT

28 A 29-week pregnant patient presented with shortness of breath and hypoxia with pleuritic chest pain. Her chest radiograph was normal and no concurrent cardiopulmonary disease was present. Which is the most appropriate line of investigation to further investigate a pulmonary embolus?
a CT pulmonary angiogram with lead protection of the patient's abdomen
b Cardiac echo to exclude intracardiac thrombus
c Reduced-dose ventilation/perfusion scan
d MUGA study
e Therapeutic dose heparin till delivery and definitive imaging

29 A journal published details of the ages of a series of 11 patients presenting for lung biopsy. Their ages are listed as 28, 30, 32, 55, 66, 67, 70, 70, 72, 83 and 87.
What is their median age?
a 60
b 63
c 65
d 67
e 70

30 A 35-year-old female presented to the Emergency Department with acute shortness of breath on a background of progressive exertional dyspnoea and cough over the course of 20 months. She does not smoke. Her initial frontal chest radiograph shows a pneumothorax and a background of a coarse reticulonodular interstitial pattern with multiple cysts in all zones of both lungs. A chest drain tube was inserted and a subsequent CT scan showed numerous diffusely scattered thin-walled cysts surrounded by normal lung parenchyma. A left-sided effusion had a density of –18 HU and the precarinal lymph nodes measured 1.6 cm in short axis. What is the most likely diagnosis?
a Histiocytosis
b Lymphangiomyomatosis
c Emphysema
d Neurofibromatosis
e Bronchiectasis

31 A 32-year-old man developed a low-grade fever and weight loss. He was previously well and had never smoked. CT shows lymphadenopathy on both sides of the diaphragm and a sample taken at mediastinoscopy showed Reed Sternberg cells. There were no further positive findings in the rest of the thorax or abdomen. What is the Ann Arbor stage of this disease?

a Stage I
b Stage II
c Stage III
d Stage IV A
e Stage IV B

32 A 61-year-old female developed gradually worsening hoarseness of her voice. Her PA chest radiograph showed a widened mediastinum and a CT confirmed a lobulated anterior mediastinal mass. The surrounding mediastinal fat showed no stranding fascial planes were preserved. There was no lymphadenopathy and the lungs were of normal appearance. What is the likely density of this lesion?

a Similar to lung
b Similar to mediastinal fat
c Similar to skeletal muscle
d Similar to cancellous bone
e Fluid density

33 A 29-year-old gentleman presented with recurrent right hypochondrial pain and jaundice. He had a peripheral eosinophilia and his chest radiograph showed a cystic structure that contained an air-fluid level with a thin radiolucent crescent in the upper part of the lesion. His Casoni skin test was positive. What is the most likely diagnosis?

a Hamartoma
b *Staphylococcus* abscess
c Aspergillosis
d Hydatid
e Metastatic hepatocellular carcinoma

34 A 75-year-old gentleman who had worked in the construction industry had a chest radiograph prior to an elective cholecystectomy. Multiple calcified pleural plaques were visible bilaterally with basal interstitial shadowing. There was also an ill-defined mass in the left lung. What is the most likely aetiology of the pulmonary tumour?

a Small cell carcinoma
b Bronchoalveolar cell carcinoma
c Squamous cell carcinoma
d Large cell carcinoma
e Aspergilloma

35 A 70-year-old man with long-standing severe rheumatoid arthritis developed progressive dyspnoea. Fine 'Velcro-like' crepitations were audible in his chest and a chest radiograph showed reticulonodular densities and well-circumscribed nodules. Where in the lungs are the reticulonodular densities most likely to be located?
- **a** Apices
- **b** Perihilar
- **c** Subpleural
- **d** Bases
- **e** Paratracheal

36 A 55-year-old man presented with a persistent cough and wheeze. CT of his thorax showed a solitary 2 cm endobronchial polypoidal mass that enhanced vividly in the late arterial phase. There were no other positive findings and a PET scan showed no uptake in this lesion. What is the most likely diagnosis?
- **a** Squamous cell carcinoma
- **b** Rheumatoid nodule
- **c** Carcinoid
- **d** Metastatic nasopharyngeal carcinoma
- **e** Bronchogenic cyst

37 A 78-year-old female patient had a chest radiograph that showed multiple pulmonary nodules of varying sizes in both lungs, without zonal predilection which were thought to be metastases. What is the most likely site of an underlying primary tumour?
- **a** Breast
- **b** Colon
- **c** Bone
- **d** Pancreas
- **e** Ovary

38 A 54-year-old male on long-term methotrexate therapy presented with increasing shortness of breath over several months. Pulmonary function tests demonstrated an obstructive picture and he had no response to a course of antibiotics. A chest radiograph was normal. HRCT reveals mosaic perfusion with air-trapping on expiratory scans, bronchial wall thickening, centrilobular ground-glass and bronchiolectasis. What is the most likely diagnosis?
- **a** Chronic eosinophilic pneumonia
- **b** Bronchiolitis obliterans
- **c** Usual interstitial pneumonia
- **d** Tuberculosis
- **e** Non-specific interstitial pneumonia

39 A four-year-old male presented with a chronic cough. A chest radiograph demonstrated hyperinflation of the lungs with peribronchial thickening and he was treated with a course of antibiotics. Follow-up radiographs demonstrated persistent changes and the development of ring shadows in the right upper lobe. A CT revealed bronchiectasis bilaterally in the upper lobes and bronchoalveolar lavage samples grew *Staphylococcus aureus* and *Pseudomonas aeruginosa*. What is the most likely underlying diagnosis?

a Asthma
b Aspergillosis
c Cystic fibrosis
d Post-infective bronchiectasis
e Tuberculosis

40 In a 74-year-old female with chronic obstructive pulmonary disease (COPD), which of the following descriptions on HRCT would increase the possibility of a *Mycobacterium avium-intracellulare* (MAI) versus *Mycobacterium tuberculosis*?

a Pulmonary consolidation
b Irregular pleural thickening
c Diffuse bronchiectasis and centrilobular nodulation
d Lesions affecting predominantly the apical segments of the lower lobes
e Apical cavitation

41 A 35-year-old female presented with a persistent cough and a chest radiograph was performed. This demonstrated a 2.5-cm mass in the periphery of the right lung and a subsequent CT was performed which confirmed a 2.5-cm lobulated mass in the right lower lobe with a heterogeneous appearance. A focus of low attenuation with the lesion had a density of –100 HU. What is the most appropriate course of action?

a Proceed to a staging abdominal and pelvic CT. The most likely diagnosis is metastatic adenocarcinoma
b Proceed to abdominal CT. The most likely diagnosis is a primary bronchogenic carcinoma
c Advise no further investigations necessary. The most likely diagnosis is a pulmonary hamartoma
d Advise exclusion of granulomatous disease by clinical means
e Advise review of the clinical history for evidence of hydrocarbon inhalation. The most likely diagnosis is lipoid pneumonia

42 A patient with shortness of breath was investigated with a chest radiograph that showed pulmonary infiltrate in a 'reverse bat-wing' distribution. What disease typically has demonstrated this appearance?

a Alveolar proteinosis
b Chronic eosinophilic pneumonia
c Lymphoma

d Goodpasture's syndrome
e Alveolar cell carcinoma

43 A 74-year-old man presented with dyspnoea and chest pain. A chest radiograph showed pleural thickening encasing the right hemithorax and a right pleural effusion. There are no pleural plaques and the visible lung is normal. What is the most likely diagnosis?
a Metastatic thymoma
b Malignant mesothelioma
c Tuberculosis
d Metastatic colonic carcinoma
e Pleural fibroma

44 A 44-year-old male presented with haemoptysis and a chest radiograph was performed. A 1-cm soft-tissue-density nodule was identified projected over the right upper zone. What additional finding is most likely to suggest a malignant aetiology?
a Calcification within the nodule
b Multiple small satellite nodules surrounding the dominant nodule
c Bihilar lymphadenopathy
d Linear densities radiating from the edge of the lesion into the surrounding lung
e The presence of a feeding and draining vessel emanating from the hilar aspect of the nodule

45 A 50-year-old male smoker was investigated for haemoptysis and a bronchocentric 3-cm soft-tissue lesion was seen 1 cm from the carina in the left upper lobe. The maximum visible nodes were 14 mm in the left hilum, a 13-mm subcarinal node in the central mediastinum and a 9-mm right hilar node. There was no further parenchymal lesion or effusion and no distant lesions were visible. What is the appropriate TNM staging?
a T2, N1, M0
b T2, N2, M0
c T2, N3, M0
d T3, N2, M0
e T3, N3, M0

46 In a patient with a long-standing history of rheumatoid arthritis, what is the most frequent respiratory manifestation of the disease?
a Pleural effusion
b Diffuse interstitial lung fibrosis
c Multiple well-circumscribed peripheral lung nodules
d Bronchiectasis
e Cardiomegaly

47 A 30-year-old male who had a history of recurrent respiratory infections as a child presented with exertional dyspnoea. On his chest radiograph there is increased transradiancy of the right lung. What additional feature would support a diagnosis of Swyer-James syndrome?
- **a** Bronchiectasis
- **b** Mismatched ventilation and perfusion defects on V/Q scan with delayed washout in hyperlucent areas
- **c** An increase in size of the ipsilateral pulmonary vessels
- **d** Small contralateral hilum
- **e** A right-sided aortic knuckle

48 A previously fit and healthy 15-year-old boy presents to his GP with an expiratory wheeze. The chest radiograph is normal. What is the most likely diagnosis?
- **a** Tracheal hamartoma
- **b** Bronchogenic cyst
- **c** Tracheobronchopathia osteoplastica
- **d** Asthma
- **e** Endobronchial carcinoid

49 A 56-year-old female with a history of breast carcinoma presented with chest pain that was atypical for cardiac pain and she was afebrile. A chest radiograph demonstrated right upper lobe opacification adjacent to the mediastinum with a very well-defined lateral border and elevation of the right hilum. What is the most likely explanation for these findings?
- **a** Right upper lobe pneumonia
- **b** Lymphangitis carcinomatosis
- **c** Scleroderma
- **d** Radiation pneumonitis
- **e** Chemotherapy-induced lung disease

50 A 26-year-old Afro-Caribbean lady presented with a painful rash on her shins, arthralgia, fever and malaise. A frontal CXR demonstrated bi-hilar lymphadenopathy, but no parenchymal abnormality. What is the most likely diagnosis?
- **a** Primary pulmonary TB
- **b** Lymphoma
- **c** PCP pneumonia
- **d** Post-primary TB
- **e** Sarcoidosis

51 A patient underwent an HRCT that demonstrated small lung volumes and coarsened septal thickening in a predominantly subpleural and basal distribution. There were areas of honeycombing and traction bronchiectasis and bronchiolectasis. What is the most likely diagnosis?

a Radiation fibrosis
b Silicosis
c Chronic extrinsic allergic alveolitis (hypersensitivity pneumonitis)
d Usual interstitial pneumonia (UIP)
e Beryliosis

52 A 62-year-old patient with ongoing dyspnoea underwent CT of the chest. Among other findings it demonstrated two ill-defined foci of consolidation within the posterior and apical segments of the right upper lobe. In addition, within the remainder of the right lung, and to a lesser extent the left lung, there was a more diffuse abnormality characterised by small (<4 mm) centrilobular, well-defined nodules within 1 cm of the pleural surface. These nodules were connected by linear, branching opacities. What is the most likely cause for these findings?
a Obliterative bronchiolitis
b Primary pulmonary lymphoma
c Respiratory syncytial virus infection
d Reactivation tuberculosis
e Renal cell carcinoma metastases

53 A 34-year-old banker presented with dyspnoea on exertion and intermittent chest pain. She was slightly cyanosed and mildly hypoxic at rest, becoming more so on standing. A chest radiograph demonstrated a lobulated 3-cm mass in the left lower zone with a small, rounded focus of calcification within it. 'Cordlike' bands are seen extending from the mass to the left hilum. What is the most likely diagnosis?
a Melanoma metastasis
b Pulmonary capillary haemangiomatosis
c Pulmonary hamartoma
d Angiomyolipoma
e Pulmonary arteriovenous malformation

54 A 43-year-old social worker underwent chest radiography and chest CT. On the chest radiograph there was right-sided widening of the mediastinum in the region of the right hilum and calcification was also seen within the mediastinum with signs of right heart dilatation. Within the right lung there was peribronchial cuffing, septal thickening and wedges of consolidation. CT confirms the presence of a focal, partly calcified right perihilar mediastinal mass, right heart dilatation and peripheral wedge shaped areas of consolidation in the right lung. What is the most likely diagnosis?
a Fibrosing mediastinitis
b Mediastinal granuloma
c Primary pulmonary lymphoma
d Thymic carcinoma
e Histoplasmosis

55 A 56-year-old airport baggage handler presented to the respiratory clinic with dyspnoea and cough in addition to weight loss and occasional chest pain. He had smoked 60 cigarettes a day for over 30 years. There was no evidence of finger clubbing on examination and pulmonary function tests demonstrated a mixed obstructive-restrictive pattern with reduced diffusion capacity. Ground-glass opacification, air trapping, centrilobular nodules and mild septal thickening were seen on HRCT. What is the most likely diagnosis?

a Usual interstitial pneumonitis (UIP)
b Respiratory bronchiolitis-associated interstitial lung disease (RBILD)
c Lymphocytic interstitial pneumonitis (LIP)
d Non-specific interstitial pneumonitis (NSIP)
e Cryptogenic organising pneumonia (COP)

56 HRCT was performed on a 60-year-old patient who had a long history of dyspnoea. He was no longer able to climb the stairs at home due to breathlessness. His chest radiograph showed changes of fibrosis. What further finding on HRCT would most favour a diagnosis of sarcoid over chronic extrinsic allergic alveolitis (EAA)?

a Interstitial thickening
b Traction bronchiectasis
c Air trapping
d Pleural effusions
e Nodular thickening of the fissures

57 A 52-year-old miner presented with increasing exertional dyspnoea and cough, which were becoming more severe over many years. Fine mid- and upper-zone inspiratory crepitations were apparent on examination. His chest radiograph showed small (<10 mm), rounded mid- and upper-zone opacities some of which displayed central calcification. There was also a reticular mid- and upper-zone pattern of opacification. HRCT confirms the presence of thickened intra- and interlobular septal lines and nodules with some thicker parenchymal fibrotic bands and traction bronchiectasis. There is bilateral mediastinal adenopathy with peripheral eggshell calcification. What is the likely diagnosis?

a Silicosis
b Coal workers pneumoconiosis
c Siderosis
d Stannosis
e Caplan's syndrome

58 A 54-year-old female presented to the ENT Department with shortness of breath and increasing stridor. She had a history of chronic myeloid leukaemia and during a recent course of chemotherapy suffered from severe pneumonia and was admitted to ITU for support. CT demonstrated a short, concentric stenosis within the mid to distal trachea. What is the most likely explanation for these findings?

a Post-intubation stricture
b Secondary amyloidosis of the trachea
c Post-pneumonic stricture
d Squamous cell carcinoma of the trachea
e Tracheobronchopathia osteochondroplastica

59 A 32-year-old flight attendant presented with shortness of breath, fever, cough and haemoptysis. There were bilateral crepitations on auscultation and several blue/red raised skin lesions were noted. His CD4 lymphocyte count is 120 (normal >500). HRCT of the chest demonstrated patches of numerous, ill-defined nodules in a perihilar distribution and septal thickening. There was moderate hilar lymphadenopathy but no pleural effusion. What is the most likely diagnosis?
a *Streptococcus* pneumonia
b *Pneumocystis carinii* pneumonia
c Kaposi's sarcoma
d *Mycobacterium avium-intracellulare* infection
e AIDS-related lymphoma of B-cell origin

60 A 40-year-old homeless man presented to the Emergency Department with dyspnoea, fever and cough. Crepitations and bronchial breathing were heard on auscultation. Blood analysis revealed a neutrophilia, macrocytic anaemia and high gamma-glutamyl transpeptidase and alkaline phosphatase. There was bilateral patchy airspace opacification on his chest radiograph and CT demonstrated moderate upper zone centrilobular emphysema with consolidation within the posterior segments of both upper lobes and middle and right lower lobes. What is the most likely diagnosis?
a *Mycoplasma* pneumonia
b Primary tuberculosis
c Aspiration pneumonia
d Streptococcal pneumonia
e Invasive aspergillosis

61 A 47-year-old shop assistant presented with a long history of allergic rhinitis and asthma. In the previous few weeks she had also experienced increasing dyspnoea, arthralgia and diarrhoea, which was occasionally blood stained. Blood analysis showed an elevated eosinophil count, mild renal impairment and positive pANCA antibody. There was patchy, non-segmental, bilateral airspace opacification on HRCT with small nodules. What is the most likely unifying diagnosis?
a Wegener's granulomatosis
b Goodpasture's disease
c Histoplasmosis
d Polyarteritis nodosa
e Churg-Strauss disease

62 A 47-year-old male patient became markedly hypoxic 24 hours after bilateral lung transplantation for idiopathic pulmonary fibrosis. The patient did not have any other significant medical history. He had not been extubated due to increasing oxygen demands over the preceding hours and his chest radiograph showed perihilar airspace opacification and bibasal pleural effusions. He was afebrile and was not fluid overloaded. What is the most likely diagnosis?

a Reperfusion syndrome
b Cardiogenic pulmonary oedema
c Acute transplant rejection
d Post-transplant lymphoproliferative disease
e Post-transplantation infection

63 A patient is due for an angiographic examination but is concerned due to a previous complication following angiography. On his previous admission he developed a femoral pseudoaneurysm (false femoral aneurysm) which required surgical exploration. He asks you how likely this is to happen again. What would make another false femoral pseudoaneurysm more likely?

a Catheterisation of the common femoral artery
b Diagnostic angiography
c High femoral puncture
d Obesity
e Overly vigorous post-procedure compression

64 A cardiology inpatient underwent an ultrasound examination of the groin that showed a 5-cm lesion immediately superficial to the proximal superficial femoral artery. On colour duplex this lesion demonstrated turbulent flow. There was no evidence of communication with the venous system. There was no evidence of infection. What is the most appropriate treatment?

a Observation and routine ultrasound at four weeks
b Application of a manual compression device
c Ultrasound-guided compression
d Percutaneous thrombin injection
e Surgical exploration

65 An 82-year-old female patient was undergoing a percutaneous transhepatic cholangiogram and biliary stent insertion to relieve jaundice related to a hilar cholangiocarcinoma. She was anxious and found the procedure painful so was given several intravenous boluses of midazolam and fentanyl during the procedure. After 45 minutes she had received a total of 12 mg of midazolam. Her respiratory rate was noted to be low and she became less responsive. What is the most appropriate flumazenil regime in this situation?

a 200 mg IV bolus over 15 seconds followed by 100 mg at 1-minute intervals up to a maximum of 1000 mg
b 500 mg IV bolus over 15 seconds followed by 250 mg at 1-minute intervals up to a maximum of 5000 mg

c 1000 mg bolus
d 100–400 mg/hr infusion
e 1000–4000 mg/hr infusion

66 A 74-year-old man was being investigated by a cardiologist for repeated episodes of 'flash' pulmonary oedema. He was hypertensive and echocardiography showed good left ventricular function. Renal artery Doppler and subsequent MR angiography confirmed severe bilateral renal artery stenosis. He was known to have benign prostatic hypertrophy, but there was no renal collecting system dilatation on ultrasound. Following extensive discussion, the decision was made to attempt bilateral renal artery stenting. What benefit over optimal medical therapy is this most likely to result in?
a Improve hypertension
b Improve renal function
c Improve symptoms of prostatism
d Reduce episodes of pulmonary oedema
e Reduce mortality

67 A 42-year-old woman with symptoms of dyspareunia and dysmenorrhoea was found to have bulky uterine fibroids on ultrasound. Following discussion with her gynaecologist she was referred for uterine artery embolisation. During the embolisation procedure it is noted that a significant degree of the fibroid blood supply is derived from the ovarian artery. With the aim of temporarily occluding the ovarian artery, what embolic agent is most appropriate?
a Cyanoacrylate (glue)
b Ethyl alcohol
c Gelfoam
d Polyvinyl alcohol
e Steel coils

68 A 53-year-old alcoholic was admitted with oesophageal variceal bleeding and decompensated alcoholic liver disease. Repeated endoscopy with attempted sclerotherapy and banding was unsuccessful in resolving the bleeding and a transjugular intrahepatic portosystemic shunt (TIPS) procedure was considered. What would be an absolute contraindication to TIPS?
a Ascites
b Budd-Chiari syndrome
c Hepatic encephalopathy
d Hepatic failure
e Severe right-sided heart failure

69 A patient with severe hypertension refractory to maximal medical therapy had a renal angiogram. What angiographic features would suggest that percutaneous transluminal angioplasty (PTA) would be beneficial?
- **a** Mid-renal artery stenosis
- **b** Multiple intra-renal aneurysms
- **c** Ostial stenosis
- **d** Small diameter renal arteries
- **e** String-of-beads appearance

70 You are undertaking a lower limb angiogram in a patient with an acutely ischaemic limb and are considering using intra-arterial thrombolysis. In which of the following situations would you be happy to administer rtPA?
- **a** The patient underwent cardiopulmonary resuscitation one week ago
- **b** The patient is known to have cerebral metastases
- **c** The patient reported an episode of haematemesis
- **d** The patient is pregnant
- **e** The patient received streptokinase 10 years ago