

QBase Medicine: 1

MCQs for the MRCP Part 1

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Contents

Foreword	vii
Preface	ix
Exam 1	1
Answers	15
Exam 2	33
Answers	47
Exam 3	65
Answers	79
Exam 4	97
Answers	111
Exam 5	129
Answers	143

Foreword

Multiple Choice Examinations (MCQ's) form part of the assessment process in many postgraduate examinations within the medical profession. The MCQ paper is perceived as a threatening test of breadth of knowledge. It is said that the use of negative marking discourages guessing and that candidates fail by answering too many questions. Whilst not a substitute for knowledge and adequate preparation, assessment of an individual's examination technique can provide feedback leading to improved performance.

Our experience in teaching MCQ technique to candidates suggests that the advice "do not guess" is not necessarily correct. Candidates are consistently surprised at the positive benefits of their educated and wild guesses. Statistically, negative marking tends to produce a null score rather than a negative score for wild guesses. However, the acquisition of knowledge and insight skews this null score towards a positive score. This can significantly improve performance leading to success in the examination. The use of an interactive computer program facilitates the process of assessing one's exam technique.

This book, by Dr Punit Ramrakha, supplies five full MRCP Part 1 papers covering the material required for the examination. Each set of answers is provided with a comprehensive explanation. The accompanying CD-ROM contains the QBase Interactive MCQ Examination system that has been used successfully in other postgraduate disciplines. It allows the candidate to generate customised exams for revision or assessment purposes. Furthermore, the system provides detailed structured analysis of performance and exam technique using the unique "Confidence Option" facility.

Candidates for the MRCP Part 1 Examination will find this book and CD-ROM a valuable learning experience. It should be used repeatedly to improve exam technique and maximise their score. Knowledge and technique act synergistically to improve scores. Proper preparation will prevent poor performance in the exam.

To those candidates facing the exam in the future, we wish you good luck!

EDWARD HAMMOND
ANDREW MCINDOE
Q BASE SERIES EDITORS
1998

Preface

Membership of the Royal College of Physicians is a major milestone for physicians in training and opens the door to varied and exciting careers in medicine. The examinations are competitive, have a high failure rate, and unfortunately for many, even Part 1 can be a disheartening, soul-destroying obstacle. The key to success is to plan your time carefully, not trying to learn all of medicine before the examination but studying in a way that prepares you for that specific examination. Part 1 of the MRCP exam consists of multiple choice questions and the most efficient way to prepare for this is to practice MCQs - to acquire knowledge, identify gaps and learn the technique to answering MCQs to maximise your score.

This book joins a whole host of other books aimed at the candidates for the MRCP Part 1 but differs in a number of important ways. The exam itself is evolving with greater emphasis on basic sciences and mechanisms of disease and requires an understanding of medicine somewhat deeper than lists of unmemorable facts to be triggered by certain keywords in the question. The choice of topics in this book reflects this bias and I have tried wherever possible to provide sufficient details to make the topic easier to understand and remember. The questions are collected in five papers and the distribution of questions in the papers reflects the actual exam with a mixture of simple and more complicated topics. No pretension is made to provide all the facts on any given topic and unfortunately the list of topics cannot be comprehensive in a book of this size.

Perhaps the greatest strength of this book is the CD-ROM enclosed. The program by Drs Hammond and McIndoe provides a unique revision tool as for the first time it allows the candidate to practice individual subjects, identify and concentrate on weaker areas, and perfect the technique to answer MCQs before sitting the real exam. These differences make *QBase: Medicine* the first in a new generation of truly interactive revision aids for the MRCP that should provide an invaluable companion for the candidate.

I hope these questions are useful. Good luck!

PUNIT RAMRAKHA
1998

Exam 1

Question 1 The following joints are typically involved in primary generalised osteoarthritis:

- A. Ankle
- B. Hip
- C. 1st metacarpal
- D. Metacarpo-phalangeal
- E. Proximal interphalangeal

Question 2 In benign monoclonal gammopathy:

- A. Up to 5% of bone marrow cells may be plasma cells
- B. The incidence of myeloma in the 10 years after diagnosis is <2%
- C. A normochromic normocytic anaemia is common
- D. There is an increased susceptibility to viral infections
- E. Soft-tissue plasma-cell tumours are occasionally found

Question 3 The following statements about stroke are correct:

- A. Aspirin is helpful in the primary prevention of stroke in patients without cardiac disease
- B. Ticlopidine is superior to aspirin in reducing the risk of stroke following TIAs
- C. A progressing CVA may benefit from anticoagulation
- D. Carotid endarterectomy is superior to medical treatment in symptomatic patients with significant carotid artery stenosis
- E. Aspirin, used alone, reduces the risk of stroke in patients with non-rheumatic atrial fibrillation

Question 4 Recognised causes of peripheral neuropathy include:

- A. Amyloid
- B. Diabetes mellitus
- C. Alcohol
- D. Porphyria
- E. Vincristine

Question 5 In hepatitis B infection:

- A. The presence of delta agent is indicative of chronic infection
- B. Minimal change glomerulonephritis is a recognised complication
- C. Anicteric neonatal infection often results in persistent infection
- D. 10% of patients have splenomegaly
- E. Anti-HBs antibody implies past infection with hepatitis B

Question 6 Differential diagnosis of upper zone infiltrates on CXR includes:

- A. Asbestosis
- B. Pulmonary haemosiderosis
- C. Ankylosing spondylitis
- D. Histiocytosis X
- E. Bronchiectasis

Question 7 The following features are characteristic of mania:

- A. Hyperthermia
- B. Alcohol abuse
- C. Auditory hallucinations
- D. Memory impairment
- E. Suicide attempts

Question 8 The following statements about chorea are true:

- A. Sydenham's chorea may recrudesce with the oral contraceptive pill
- B. Is associated with genes on chromosome 4
- C. Can follow infarction of the subthalamus
- D. Is associated with acanthocytes in the peripheral blood
- E. May be treated with haloperidol

Question 9 In the treatment of cardiogenic shock:

- A. Enoximone reduces the left ventricular end diastolic pressure
- B. Adrenaline increases the systemic vascular resistance
- C. Cardiac output is increased by noradrenaline
- D. Isoprenaline increases myocardial oxygen consumption
- E. Dobutamine increases systemic vascular resistance

Question 10 Concerning asplenic patients:

- A. They are more susceptible to malaria
- B. Should be offered vaccination against meningococcus A and C
- C. Children are more susceptible to infections when they are older
- D. They are more at risk if they lost the spleen through traumatic rupture
- E. The commonest pathogen is *Haemophilus influenzae*

Question 11 The following are useful in the treatment of Crohn's disease:

- A. Cyclosporin
- B. Metronidazole
- C. Cholestyramine
- D. Cyclophosphamide
- E. Total parenteral nutrition

Question 12 Osteoporosis is associated with:

- A. Caffeine
- B. Hypothyroidism
- C. Cigarette smoking
- D. Obesity
- E. Alcoholism

Question 13 The following are likely to be observed in a patient with mixed essential (type II) cryoglobulinaemia:

- A. Glomerulonephritis
- B. Palpable purpura

- C. Cold intolerance
- D. Evidence of prior hepatitis B infection
- E. Normal serum complement levels

Question 14 Psittacosis is:

- A. Associated with Horder's spots
- B. Best treated with ampicillin
- C. Commonly transmitted from man to man
- D. May be associated with headache
- E. Caused by a virus

Question 15 Clinical features of ankylosing spondylitis include:

- A. Achilles tendonitis
- B. Hip disease
- C. Conjunctivitis
- D. Aphthous ulceration
- E. Heart block

Question 16 A middle-aged woman is investigated for recurrent chest pains and palpitations. No obvious cause is found. The following suggest the symptoms may relate to anxiety:

- A. Circumoral paraesthesia
- B. Feelings of unreality
- C. Constipation
- D. Frequent atrial ectopic beats
- E. A conviction of having cancer

Question 17 The QRS complex on the ECG:

- A. Is caused by ventricular myocardial repolarisation
- B. Will normally contain a Q-wave up to half the height of the R-wave
- C. Corresponds with the phase of isovolumetric contraction
- D. Is shortened in tricyclic poisoning
- E. May be used to assess rotation of the heart along its longitudinal axis

Question 18 Recognised features of neuromuscular junction disease include:

- A. Usually affects distal more than proximal muscles
- B. Ptosis
- C. Diplopia
- D. Distal sensory loss
- E. Dysphagia

Question 19 Therapeutic activity of the following substances depends on their biochemical conversion to active metabolites:

- A. Diazepam
- B. Sulphasalazine
- C. Enalapril
- D. Captopril

E. Cholecalciferol

Question 20 Clinical manifestations of pseudohypoparathyroidism include:

- A. Hypocalcaemia that does not respond to vitamin D and calcium supplementation
- B. Low serum levels of parathyroid hormone
- C. Exaggerated response of urinary cyclic AMP to PTH injection
- D. Short stature
- E. Normal intellect

Question 21 Genetic anticipation is seen in the following conditions:

- A. Myotonic dystrophy
- B. Alzheimer's disease
- C. Fragile X syndrome
- D. Familial hypokalaemic periodic paralysis
- E. Huntington's chorea

Question 22 In infective endocarditis:

- A. Bacteria are commonly found in the kidney
- B. Renal lesions are due to glomerulonephritis
- C. Frank haematuria suggests an unrelated cause
- D. Renal involvement is associated with a poor prognosis
- E. Persistent hypocomplementaemia is the rule

Question 23 The following are associated with a reactive arthritis:

- A. *Campylobacter jejuni*
- B. *Chlamydia trachomatis*
- C. *Helicobacter pylori*
- D. *Mycoplasma*
- E. *Shigella flexneri*

Question 24 The following symptoms are correctly matched to the lipid disorder:

- A. High plasma HDL Tangier disease
- B. Mental retardation and high levels of gangliosides in the brain Tay Sach's disease
- C. High serum 17-alpha-hydroxyprogesterone congenital adrenal hyperplasia
- D. High LDL cholesterol type IIa hyperlipidaemia
- E. Enlarged liver and spleen due to sphingomyelin accumulation Niemann-Pick disease

Question 25 The following complement abnormalities result in the associated clinical picture:

- A. C1-esterase deficiency and hypersensitivity type 3 reactions
- B. C3-nephritic factor and partial lipodystrophy
- C. Homozygous C3 deficiency and meningococcal meningitis
- D. Homozygous C7 deficiency and boils
- E. C2 deficiency and pneumococcal meningitis

Question 26 The following are features of multiple endocrine neoplasia type 2:

- A. Hypoglycaemia

- B. Recurrent goitre
- C. Hypertension
- D. Facial flushing
- E. Raised urinary cyclic AMP levels

Question 27 The following are features of renal osteodystrophy:

- A. Hypophosphataemia
- B. Hypocalcaemia
- C. Hypomagnesaemia
- D. Elevated circulating parathormone
- E. Periarticular bone cysts

Question 28 Pleural effusions with a protein content of 22 g/l may be found in:

- A. Nephrotic syndrome
- B. 'Wet' beri beri
- C. Hypothyroidism
- D. Systemic lupus
- E. Acute intermittent porphyria

Question 29 Antibiotics may be helpful in the treatment of:

- A. Tropical sprue
- B. Whipple's disease
- C. Intestinal lymphangiectasia
- D. Alpha-chain disease
- E. Systemic sclerosis

Question 30 HLA-B27:

- A. Occurs in 10% of Caucasians
- B. Is found on bacteria that cause a reactive arthritis
- C. Is associated with a poor prognosis in Reiter's syndrome
- D. Is inherited as an autosomal recessive trait
- E. Is an erythrocyte alloantigen

Question 31 Digoxin:

- A. Has been proven to prolong survival in patients with chronic heart failure
- B. May be used for the control of fetal arrhythmias in pregnancy
- C. Is not known to be teratogenic
- D. Digoxin-like substances secreted by the placenta may interfere with digoxin assays during pregnancy
- E. Provides effective control of heart rate in patients with AF at rest and during exercise

Question 32 Regarding ulcerative colitis:

- A. The disease is exacerbated by smoking
- B. Sacroilitis responds to treatment of colitis
- C. Is associated with sclerosing cholangitis
- D. Crypt abscesses are pathognomonic of ulcerative colitis

E. Pseudopolyps are pre-malignant

Question 33 The following are features of primary hypothyroidism in the adult:

- A. Raised serum creatinine kinase
- B. Pleural effusions
- C. Malignant change within the thyroid
- D. Fibrosis of the thyroid
- E. Circulating thyroid autoantibodies

Question 34 The following are reliable indices of iron deficiency:

- A. Serum ferritin below 15 µg/l
- B. MCHC below 30 g/dl
- C. MCH below 25 g/dl
- D. Absence of stainable iron in a marrow biopsy
- E. Raised free erythrocyte protoporphyrin

Question 35 The following statements regarding post-streptococcal glomerulonephritis are true:

- A. Both sexes are equally affected
- B. The elderly are more susceptible to this complication of streptococcal infection than the young
- C. Middle-aged men have the worst prognosis
- D. Nephrotic-range proteinuria is common
- E. Renal biopsy is essential to the management

Question 36 The following associations are correct:

- A. Intention tremor cerebellar syndrome
- B. Hemiballismus Huntington's disease
- C. Myoclonus uraemia
- D. Tics Gilles de la Tourette syndrome
- E. Dystonia writer's cramp

Question 37 The following statements concerning vasoactive factors are true:

- A. Endothelin-I is a potent vasoconstrictor with mitogenic properties
- B. Endothelin-I is broken down by endothelin-converting enzyme
- C. Nitric oxide is synthesised from L-arginine
- D. Infusion of nitric oxide antagonists causes vasoconstriction in normal humans
- E. Nitric oxide activity is enhanced by cyclic GMP phosphodiesterase inhibitors

Question 38 The following are true concerning nephrotic syndrome:

- A. Plasma volume is increased
- B. It is usually associated with renal sodium wasting
- C. It occurs with diffuse or focal forms of glomerulonephritis
- D. Patients are susceptible to infections
- E. Albumin infusions are beneficial

Question 39 Adverse drug reactions:

- A. Most commonly affect the cardiovascular and respiratory systems
- B. Are uncommon in patients taking digoxin and diuretics
- C. Often affect the gastrointestinal tract and skin
- D. Are particularly likely to occur in females over 60 years old
- E. Cause up to 3% of admissions to acute medical wards

Question 40 The following are recognised complications of oral treatment with amiodarone:

- A. Pneumonitis
- B. Hypotension
- C. Photosensitivity
- D. Hyperthyroidism
- E. Torsade de pointes

Question 41 Patchy hypopigmentation is a feature of:

- A. Lichen sclerosus et atrophicus
- B. Tuberous sclerosis
- C. Pityriasis rosea
- D. Morphoea
- E. Facial eczema

Question 42 In schizophrenia, the prognosis is significantly improved by:

- A. An acute onset
- B. Obvious precipitating factors
- C. Previous obsessional personality
- D. A family history of the disorder
- E. Catatonia

Question 43 Human immunodeficiency virus:

- A. Is a DNA virus
- B. Its genome encodes for reverse transcriptase
- C. Its primary target cell is the CD8+ T lymphocytes
- D. Anti-HIV antibody is detectable 6-12 weeks after exposure
- E. Can be cultured from the peripheral blood of infected individuals even before the antibody titre rises

Question 44 In sarcoidosis:

- A. A negative transvenous myocardial biopsy excludes the diagnosis
- B. Clinical manifestations of cardiac involvement occur in 20-30% of patients
- C. Q waves may occur due to sarcoid disease of the coronary arteries
- D. Left ventricular aneurysm is a well recognised complication
- E. Magnetic resonance imaging may enable the diagnosis to be made

Question 45 Concerning Graves' disease in pregnancy:

- A. Fetal hyperthyroidism is caused by maternal T4 crossing the placenta
- B. Propylthiouracil may cause neonatal goitre

- C. Radioiodine may be used as it does not cross the placenta
- D. Transient neonatal hypothyroidism is common
- E. Propranolol may be used for control of tachycardia

Question 46 The following are features of primary pulmonary hypertension:

- A. Finger clubbing
- B. Right axis deviation on the ECG
- C. Reduced right ventricular ejection fraction
- D. Austin Flint murmur
- E. Pulmonary plethora on the chest radiograph

Question 47 The following features distinguish an ostium primum from a secundum atrial septal defect:

- A. Systolic ejection murmur at the upper left sternal border
- B. Fixed split second heart sound
- C. Right atrial enlargement on chest X-ray
- D. Left axis deviation on the ECG
- E. Parasternal heave on palpation of the precordium

Question 48 Regarding the oxyhaemoglobin dissociation curve:

- A. Anaemia causes a shift to the right
- B. 2,3-diphosphoglycerate shifts the curve to the left
- C. Rise in pH shifts the curve to the right
- D. There is a shift to the left with a rise in temperature
- E. Increasing the percentage of carboxyhaemoglobin has no effect on the curve

Question 49 The following are true:

- A. HIV-positive haemophiliacs rarely get Kaposi's sarcoma
- B. Bacterial chest infections are more likely in intravenous drug users
- C. Staphylococcal arthritis is more common in haemophiliacs
- D. *Cryptosporidium* diarrhoea is more common in homosexually acquired HIV
- E. In non-Hodgkin's lymphoma, being HIV positive increases the likelihood of extranodal disease.

Question 50 Radiological changes of osteomalacia include:

- A. Biconcave vertebrae
- B. Subperiosteal bone resorption
- C. Stress fractures of metatarsals
- D. Multilocular bone cysts
- E. Looser's zones

Question 51 Hepatic involvement is common in:

- A. Felty's syndrome
- B. Still's disease
- C. Systemic sclerosis
- D. Cystic fibrosis

E. Primary amyloidosis

Question 52 Leptospirosis:

- A. Most infected individuals recover within 2 weeks without treatment
- B. May be diagnosed on urine culture
- C. Tetracycline is the treatment of choice
- D. May be complicated by thrombotic thrombocytopenic purpura
- E. Is more common around the New Forest

Question 53 Regarding bleeding disorders:

- A. Prolonged bleeding time is a characteristic feature of Christmas disease
- B. DDAVP may be used for the treatment of haemophilia
- C. Bleeding in patients with Osler-Weber-Rendu is due to thrombocytopenia
- D. Prothrombin time is normal in patients with von Willebrand's disease
- E. Alcoholic cirrhosis is associated with hypofibrinoginaemia

Question 54 Predictors of poor prognosis in multiple sclerosis include:

- A. Incomplete recovery between attacks
- B. Optic neuritis as the presenting feature
- C. The level and pattern of oligoclonal IgG in CSF
- D. Uthoff's phenomenon
- E. Early onset of cerebellar ataxia

Question 55 Concerning the nerves supplying the upper limb:

- A. The musculocutaneous nerve supplies the deltoid muscle
- B. The radial nerve lies posterior to the shaft of the humerus between the medial and lateral heads of the triceps muscle
- C. The median nerve supplies branches to the coracobrachialis
- D. The ulnar nerve does not supply any muscles in the arm
- E. The median nerve supplies branches to all the short muscles of the thumb

Question 56

Serum brainin levels are being promoted as a screening test for migraine with a positive predictive value of 95%. The following statements are true:

- A. Test sensitivity is the number of people who test positive per 100 persons in the population
- B. Test specificity is the proportion of patients without migraine that test negative
- C. The positive predictive value of the test is the proportion of correctly identified true positives (i.e. patients with migraine)
- D. The positive predictive value of serum brainin levels may vary depending on the population tested
- E. This implies that 5% of patients with migraine will test negative

Question 57 In extrinsic allergic alveolitis:

- A. Rheumatoid factor and anti-nuclear factor are positive in 30%
- B. There may be asymptomatic pulmonary insufficiency for years
- C. Type II hypersensitivity is involved

- D. Systemic symptoms develop within 20 minutes of exposure
- E. Antigen-specific serum precipitins are diagnostic

Question 58 Type IV renal tubular acidosis:

- A. Is associated with elevated supine renin levels
- B. Is usually treated with bicarbonate supplementation
- C. Urine pH is typically >5.3 after an acid load
- D. May follow renal tract obstruction
- E. Hypokalaemic hyperchloraemic metabolic acidosis is usually present

Question 59 Paradoxical splitting of the second heart sound is caused by:

- A. Right bundle branch block
- B. Subaortic stenosis
- C. Valvular aortic stenosis
- D. Hypertensive heart disease with LVF
- E. Atrial septal defect

Question 60 Prolonged bleeding time is a characteristic feature of:

- A. Haemophilia
- B. Thrombocytopenic purpura
- C. von Willebrand's disease
- D. Henoch-Schönlein purpura
- E. Christmas disease

Answers

Question 1

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Osteoarthritis is a non-inflammatory degenerative disease of the joints affecting females > males (ratio 3:1). Other joints affected include distal interphalangeal joints, hips, knees and lumbosacral joints. Radiological features include loss of joint space, increased bone density, cysts and marginal osteophytes.

Question 2

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

Patients with benign monoclonal gammopathy need to be distinguished from those with multiple myeloma. In the former, paraprotein levels are low (<3 g/dl) with no anaemia or osteolytic bone lesions and <5% plasma cells in the bone marrow, normal serum albumin, little or no immunoglobulin in the urine and no evidence of progression. They do not require therapy unless they show signs of progression. Up to 20% develop myeloma within 10 years. Soft tissue tumours means not 'benign'.

Question 3

A. FALSE B. TRUE C. TRUE D. TRUE E. TRUE

Aspirin increased the risk of haemorrhagic stroke when used in a primary prevention trial but it is of proven benefit in secondary prevention (following TIAs or a stroke). In patients with atrial fibrillation or rheumatic valve disease, aspirin does reduce the risk of embolic stroke but

anticoagulation with warfarin is preferable.

Ticlopidine is a platelet antagonist that is more effective than aspirin but its side-effects (neutropenia in up to 10%) limit its use in the UK although it is widely used in Europe and the USA.

Embolic strokes may benefit from anticoagulation and/or thrombolysis; warfarin is more effective than aspirin which is better than nothing. There is no proven benefit of anticoagulation for patients with 'Lone AF' below the age of 50 years.

Question 4

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Causes of peripheral neuropathy: ('DAM IT BICH')

Drugs (vincristine, metronidazole, gold, isoniazid (B6 deficiency), phenytoin (folate deficiency), ethambutol, cisplatin, amiodarone);

Alcohol, amyloid;

Metabolic (DM, hypothyroid, CRF, porphyria - acute, intermittent and variagate);

Infection (diphtheria, Guillian Barré syndrome);

Tumour (Ca lung);

B vitamin deficiency (B₁, B₆, B₁₂);

Idiopathic;

Connective tissue diseases (SLE, PAN) Charcot-Marie tooth;

Heavy metal (Pb/Hg) poisoning.

Painful peripheral neuropathy occurs with diabetic amyotrophy, ethanol, beri-beri, drug toxicity (metronidazole), AIDS and Strachan syndrome (orogenital ulcers, sensory neuropathy, amblyopia).

Question 5

A. FALSE B. FALSE C. TRUE D. TRUE E. FALSE

Hepatitis B is a DNA virus transmitted parenterally. HBsAg is seen in the serum 1-5 months after exposure (presence after 6 months implies carrier state and is seen in 5-10%). HBeAg is seen 6-12 weeks after exposure and implies high infectivity (persistence >12 weeks implies chronic infection). Anti-HBc implies previous exposure; anti-HBs alone is seen with vaccination. The glomerulonephritis associated with hepatitis B infection is membranous rather than minimal change.

Question 6

A. FALSE B. FALSE C. TRUE D. TRUE E. FALSE

Upper zone lung infiltrates are also seen with tuberculosis, *Aspergillus* infection, *Klebsiella pneumoniae*, silicosis, radiation, chronic extrinsic allergic alveolitis and coal workers' pneumoconiosis.

Lower zone lung fibrosis is a feature of bronchiectasis, asbestosis, rheumatoid arthritis, scleroderma, radiation, drugs (busulphan, nitrofurantoin, bleomycin, methotrexate, chronic high oxygen, chloramphenicol, amiodarone and melphalan), cryptogenic fibrosing alveolitis, sarcoidosis, tuberous sclerosis and neurofibromatosis.

Question 7

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Mania and hypomania are characterised by an abnormally elevated or irritable mood lasting for over a week. Features include pressure of speech and thought, flight of ideas, distractibility, grandiosity, poor attention span, normal memory, increased activity, increased libido, insomnia and weight loss but increased appetite. Psychotic symptoms such as hallucinations and delusions are typically mood congruent. Alcohol abuse and an ongoing risk for suicide may be found. Hyperthermia and dehydration may occur but are rare.

Question 8

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

The OCP or pregnancy may cause chorea to recur in patients who suffered Sydenham's chorea during an episode of acute rheumatic fever.

Other causes of chorea include SLE, drugs (L-dopa, phenytoin), polycythaemia, thyrotoxicosis, carbon monoxide poisoning, neuroacanthocytosis (with orofacial dyskinesia, peripheral axonal neuropathy), Wilson's disease, kernicterus.

Subthalamic infarcts cause hemiballismus.

Huntington's disease is associated with trinucleotide expansion on chromosome 4.

Question 9

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Enoximone is a selective phosphodiesterase inhibitor and exerts most of its effects on the myocardium. It reduces afterload and increases cardiac contractility and cardiac output.

Adrenaline acts on both alpha and beta receptors. At low doses, beta effects predominate (tachycardia, increased cardiac output, lower SVR) but at higher doses, alpha effects take over with peripheral vasoconstriction.

Noradrenaline is mainly an alpha-agonist and increases the SVR.

Isoprenaline is a beta-agonist and produces a tachycardia, increasing myocardial consumption.

Dobutamine increases cardiac output and vasodilates by acting on beta-adrenergic receptors.

Question 10

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

Recommended vaccinations for the hyposplenic patient include meningococcal groups A and C, Hib (*H. influenzae* type b) and pneumococcal vaccine. (The pneumococcal vaccine is of proven benefit if given to patients prior to elective splenectomy but is of doubtful value if given after.)

Younger patients are more at risk from overwhelming post-splenectomy infections than older patients and should take oral penicillin prophylactically. The incidence of overwhelming sepsis is 1% in children and 0.1% in adults, the greatest risk being within the first 3 years following splenectomy. The most common organisms are *Pneumococcus* > *H. Influenzae* > *N. Meningitidis*. 10-20% of infections are polymicrobial.

Question 11

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Cholestyramine and aluminium hydroxide bind bile acids and reduce diarrhoea from ileal disease, after small bowel resection, bacterial colonisation and 'post-vagotomy diarrhoea'.

Other agents that may be used include cyclosporin, azathioprine, olsalazine (2 x ASA) or mesalazine (5-ASA only), methylcellulose (to bulk stool and increase consistency: NOT codeine or loperamide).

TPN is used for acute exacerbations and in patients with malnutrition from extensive disease.

Question 12

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Osteoporosis implies loss of mineral in the bone in excess of the natural decline expected with age. Caffeine, cigarette smoking and alcoholism are associated with osteoporosis. Other recognised associations include thyrotoxicosis, primary biliary cirrhosis, Cushing's syndrome (and iatrogenic administration of corticosteroids), hypogonadism, post-menopause, DM, acromegaly, space-flight and malnutrition. Localized osteoporosis is seen in rheumatoid arthritis (periarticular), chronic renal failure and in patients receiving long-term intravenous heparin therapy.

The mainstay of therapy is prevention of deterioration (e.g. oestrogen therapy for women postmenopause).

Etidronate therapy increases bone density and reduces the incidence of fractures but needs to be given long-term for benefit.

Question 13

A. FALSE B. TRUE C. FALSE D. FALSE E. FALSE

Clinical manifestations in cryoglobulinemia are due to precipitation of the abnormal circulating immunoglobulins in situations where the temperature falls below 37 ° C. Features include Raynaud's (may progress to gangrene of the fingertips), purpura (especially on the legs), hepatosplenomegaly (with abnormal LFTs), symptoms of hyperviscosity (headaches, confusion, weakness), arthralgias and fever. GN is rare (i.e. not 'likely to be found') and frequently fatal. Cold intolerance is seen in Type I (monoclonal immunoglobulin) and not mixed essential cryoglobulinaemia. Serum complement C4 is typically low (although C3 levels may be normal).

Question 14

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

Psittacosis is a chlamydial infection contracted from birds and is caused by *Chlamydia psittaci*. After an incubation period of 1-2 weeks, patients develop low-grade fever, cough, meningitis, epistaxis, thrombophlebitis myalgias, confusion and eventually stupor. Clinically there are signs of hepatosplenomegaly and Horder's spots (similar to the 'rose spots' of typhoid). CXR shows diffuse or segmental pneumonia. Diagnosis is by serology (complement fixing antibody). Treatment: tetracycline is the drug of choice.

Question 15

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Ankylosing spondylitis is a disease of the insertions of tendons into bone (i.e. an enthesitis). This produces heel pain (plantar fasciitis), achilles tendonitis, quadriceps tendonitis, iliac crest pain, etc. In addition, other organ systems may be involved. Chest pains are common and may be due to pericarditis, costochondral disease or dilatation of the aortic root and aortic incompetence (aortic valve involvement is accompanied by first-degree heart block). Other features include urethritis and chronic prostatitis, anterior uveitis, apical pulmonary fibrosis, cauda equina syndrome and amyloidosis.

Question 16

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

Patients with anxiety attacks may experience two different forms of feelings of unreality: depersonalisation (the patient has changed) and derealisation (reality has changed). With hyperventilation, light-headedness, paraesthesiae and carpo-pedal spasm are frequently observed. Diarrhoea and 'intestinal hurry' are more common than constipation with anxiety. While a preoccupation with having heart disease may be understandable in a patient with chest pain, an unrealistic conviction of having cancer suggests a delusion - not a feature of anxiety.

Question 17

A. FALSE B. FALSE C. TRUE D. FALSE E. TRUE

A normal Q wave is <0.04 s wide and $<25\%$ of the total QRS complex. Pathological Q waves are seen with full-thickness myocardial infarction, myocarditis or cardiac trauma, hypertrophic cardiomyopathy and Wolff-Parkinson-White. Artefactual Q waves are seen with dextrocardia (other clues: decreasing size of QRS complex across the chest leads, rightward axis) or reversed limb leads (other clues: lead I looks like reversed polarity, leads II and III appear to have swapped round and aVR and aVL also look as if they have been swapped).

Question 18

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Myasthenia gravis is caused by antibody to the acetylcholine receptor on the postsynaptic membrane. Presenting features include ptosis - worse with upgaze, variable strabismus, facial weakness (myasthenic 'snarl' when the patient smiles), nasal weak voice, dysphagia (and sometimes painful swallowing); tendon reflexes are usually normal or increased.

Associated autoimmune diseases: thyrotoxicosis (5%), hypothyroidism, rheumatoid arthritis, diabetes mellitus, polymyositis, SLE, pernicious anaemia, Sjögren's syndrome, pemphigus and sarcoid.

Eaton-Lambert syndrome is caused by antibody to presynaptic calcium channels. Associated with small cell lung carcinoma. Unlike myasthenia, patients exhibit post-exercise increase in power and tendon reflexes (post-tetanic potentiation). Cholinergic drugs have no effect. Treat with guanethidine (increase acetylcholine release from nerve terminals).

Question 19

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Sulphasalazine is the combination of sulphonamide and 5-ASA. It is mainly metabolised in the colon where the anti-inflammatory 5-ASA is released. Many of the side effects are due to the sulphonamide component (e.g. reversible azospermia). Enalapril is a pro-drug and is metabolised to the active enalaprilat. In contrast, captopril does not require activation. Cholecalciferol needs hydroxylation to the active 1,25-dihydroxycholecalciferol

Question 20

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

Pseudohypoparathyroidism results from an end-organ resistance to the effects of parathyroid hormone. It is associated with short metacarpals and metatarsals, round face and mental retardation.

Biochemically, the patients are similar to primary hypoparathyroidism (low calcium, normal or raised phosphate) but with normal or raised alkaline phosphatase and PTH.

Primary hypoparathyroidism is a failure of the parathyroid glands. It may be autoimmune and is associated with other autoimmune diseases such as hypothyroidism, pernicious anaemia, hypogonadism and Addison's disease.

Patients with pseudo-pseudohypoparathyroidism have the morphological features of pseudohypoparathyroidism but normal calcium.

Question 21

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

In certain inherited disorders, successive generations display a progressive worsening of disease phenotype (i.e. earlier onset, more severe disease, etc.). This is described as genetic anticipation. This phenomenon is seen with myotonic dystrophy, Fragile X syndrome and Huntington's chorea, and at the genetic level is associated with an expansion of the abnormal portion of the gene (i.e. enlargement of the trinucleotide repeat region in Huntington's disease).

Question 22

A. FALSE B. TRUE C. FALSE D. FALSE E. FALSE

Haematuria in infective endocarditis is usually due to immune complex deposition, vasculitis and glomerulonephritis. Bacteria are only found in the kidney following systemic embolization of infected material from the heart and resulting mycotic aneurysm (rare). Complement levels are low in the acute phase and may rise (acute phase response) with treatment. Other immune phenomena include splinter haemorrhages, Osler's nodes, Janeway lesions. Complications include intracardiac abscess, valve destruction, emboli and mycotic aneurysms.

After blood cultures, treatment should be started immediately.

Dental treatment should be undertaken early (within 10 days) as there is a risk that oral organisms may become resistant to the antibiotics with time. The timing of surgery depends on the haemodynamics - ideally clear the infection first.

Question 23

A. TRUE B. TRUE C. FALSE D. FALSE E. TRUE

Other infective agents that have been associated with a reactive arthritis include *Salmonella*, and *Yersenia*. Arthralgia (but no arthritis) may occur following infections with influenza virus, coxsackievirus, EBV, mumps, *Mycoplasma pneumoniae* and *Brucella*. Clinically there is usually knee or joint pain and swelling which settles over 3 months. 50% will have a recurrence of the disease.

Question 24

A. FALSE B. TRUE C. TRUE D. TRUE E. TRUE

Tangier disease is a disorder characterised by low HDL levels but no cardiovascular disease. Clinical features include tonsillar hyperplasia (orange discoloration), polyneuropathy, lymphadenopathy, hepatosplenomegaly and corneal opacities.

Tay Sach's disease is due to hexosaminidase deficiency and clinical features are caused by the accumulation of GM2 gangliosides. Features include Ashkenazi Jews, cherry red spot in the macula, dementia, seizures, blindness and death usually by 2 years of age.

Niemann-Pick disease is due to the accumulation of sphingomyelin in macrophages of the

reticuloendothelial system. Clinical features include hepatosplenomegaly and mental retardation and foam cells in the bone marrow, lymph nodes, spleen and liver.

Familial hypercholesterolaemia with excess LDL is due to a primary deficiency of the LDL receptor. It is strongly associated with arteriosclerosis, tendon xanthomata, arcus senilis, tendinitis and polyarthritis. In Type IIa LDL receptor deficiency, TG levels are normal.

Question 25

A. FALSE B. TRUE C. FALSE D. FALSE E. TRUE

C1-esterase inhibitor deficiency produces hereditary angioedema (autosomal dominant condition resulting in recurrent life-threatening upper respiratory tract and GI oedema). Danazol is used as prophylaxis against acute attacks but treatment of an acute episode involves administration of purified C1-esterase inhibitor. C3-nephritic factor is an autoantibody that stabilises the alternate pathway C3 convertase. It is associated with partial lipodystrophy and mesangiocapillary glomerulonephritis.

Deficiency of C2 is the most common complement protein deficiency - 40% develop atypical SLE; patients are predisposed towards pneumococcal and *H. influenzae* infections. C3 is required for opsonisation and deficiency is associated with life-threatening infections from encapsulated bacteria. C5 (Lenier's syndrome) - childhood eczema, Gram negative infections and diarrhoea. C7 deficiency is associated with Raynaud's phenomenon. Deficiencies of the later components are not as severe as the earlier components and are associated with recurrent *Neisseria* infections.

Question 26

A. FALSE B. TRUE C. TRUE D. TRUE E. TRUE

Multiple endocrine neoplasia type IIa (Sipple's syndrome) is the association of pheochromocytoma (hypertension, often malignant, multiple, and extra-adrenal), medullary carcinoma of the thyroid (secretion of calcitonin causes flushing) and parathyroid hyperplasia (and occasionally gliomas or meningiomas).

Multiple endocrine neoplasia type III (= MEN IIb) has the same features as MEN type IIa but in addition is associated with a Marfanoid habitus, mucosal and intestinal neuromata; protruberent lips produce a characteristic facies. Hyperparathyroidism is relatively rare.

The gene for this (IIa and IIb) has been termed the ret locus and is located on chromosome 10. In patients with MEN type II without overt thyroid carcinoma, prophylactic thyroidectomy is indicated in patients with an abnormal pentagastrin test (or if predicted by genetic tests).

Question 27

A. FALSE B. TRUE C. FALSE D. TRUE E. FALSE

Renal osteodystrophy is associated with reduced phosphate excretion and hyperphosphataemia. This is treated with oral phosphate binders, dietary restriction of phosphate, oral calcium carbonate, aluminium hydroxide, etc. There is impaired 25-hydroxylation of cholecalciferol and as a result, hypocalcaemia, elevated alkaline phosphatase and osteomalacia. There is secondary hyperparathyroidism with osteitis fibrosa cystica ('brown tumours' that are located in long bones, away from the joints: periarticular cysts are a feature of amyloid). Patients require calcium supplements as well as 1,25-DHCC. Magnesium levels are typically raised as magnesium excretion is reduced. Radiographic changes include vascular calcification, 'ruggerjersey' spine and subperiosteal lesions.

Question 28

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Causes of a transudate (protein content <30 g/l): constrictive pericarditis, Meig's syndrome, any cause of congestive cardiac failure, hypoproteinaemia (cirrhosis, nephrotic syndrome, proteinlosing enteropathy, etc.), beri-beri (thiamine deficiency), myxoedema and dialysis.

Causes of an exudate (protein >30 g/l, pleural fluid: serum protein ratio >0.5 , pleural LDH >200 U): infection (TB, pneumonia, subphrenic abscess), connective tissue diseases, pulmonary infarction, acute pancreatitis, familial Mediterranean fever, Dressler's syndrome, mesothelioma, sarcoid, yellow nail syndrome (lymphoedema) and neoplasia.

Pleural fluid glucose is reduced in rheumatoid arthritis, empyema, TB and malignancy.

Question 29

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Tropical sprue responds to tetracycline with folic acid. Features: abdominal bloating, diarrhoea (may be epidemic), nutritional deficiencies (B_{12} , folate, vitamin D) (need malabsorption of 2 or more nutrients (e.g. B_{12} and fats) for diagnosis).

Whipple's disease (malabsorption, systemic symptoms, arthritis, lymphadenopathy, intracranial masses, pulmonary infiltrates, etc.) is caused by *Trophelma whippoli*. It responds to chloramphenicol or 2 weeks penicillin + streptomycin then tetracycline for 1 year.

Intestinal lymphangiectasia may be primary (idiopathic) or secondary to lymph obstruction (malignancy, constrictive pericarditis). It produces steatorrhoea and hypoproteinaemia.

Treatment: replace dietary fat by medium-chain TGs.

Alpha-chain disease is a plasma cell proliferation in the small bowel producing an IgA (seen in the Mediterranean and S. America - poor hygiene and intestinal infestation). Antibiotics work initially but the patients usually require chemotherapy for the underlying myeloma.

Antibiotics are useful in treating bacterial overgrowth and malabsorption in systemic sclerosis.

Question 30

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

HLA-B27 is a Class I major histocompatibility complex protein. These MHC proteins are expressed as autosomal co-dominant traits. Class I proteins like B27 are found on all cells of the body. B27 is very rare in W. Africa as compared to the Caucasian population. $>90\%$ of patients with ankylosing spondylitis are B27 positive as are 40-50% of patients with anterior uveitis, 90% of patients with balanitis/urethritis and 90% of patients with Reiter's disease (asymmetrical oligoarthritis, painless oral and genital ulcers, conjunctivitis).

Question 31

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Withdrawal of digoxin increases hospital admissions and reduces quality of life in patients with heart failure who were taking it, but no study as yet has demonstrated any effect on overall survival. Despite extensive use in pregnancy there is no reported teratogenicity. It is effective in 50-60% of fetal tachyarrhythmias. Digoxin is a steroid analogue and digoxin-like substances from the placenta may interfere with assays - it is not known if these have any digoxin-like activity. Digoxin has little impact on heart rate during exercise as its actions on the AV node can be overridden by sympathetic stimulation. Verapamil and beta-blockers provide better rate control in this situation.

Question 32

A. FALSE B. FALSE C. TRUE D. FALSE E. FALSE

Smoking reduces the frequency of attacks of ulcerative colitis. Markers of disease activity in UC are peripheral arthropathy, pyoderma gangrenosum, erythema nodosum, aphthous ulceration, uveitis and episcleritis.

Ankylosing spondylitis, sacroilitis and liver involvement (sclerosing cholangitis, chronic active hepatitis) usually do not respond to treatment of UC. Patients with UC have a colon cancer risk of ~ 10% at 15 years (early onset, whole colon involvement). Thus they should undergo colonoscopy and multiple biopsies at yearly intervals 7-8 years after diagnosis.

Crypt abscesses are found in Crohn's and rarely in UC which is a disease characterised by inflammation of mucosa only (cf. Crohn's where the full thickness of the bowel wall is involved). Pseudopolyps are islands of relatively normal mucosal tissue isolated by ulceration of the surrounding mucosa.

They are not pre-malignant.

Treatment: surgery for mega-colon, bleeding, perforation, >5 days symptoms not settling or evidence of mucosal dysplasia on biopsy.

Question 33

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Primary hypothyroidism refers to failure (and atrophy) of the thyroid gland. Causes include autoimmune thyroid disease (associated with IDDM, Addison's disease or pernicious anaemia), Hashimoto's thyroiditis (years later), post-surgery or radioiodine therapy, drug-induced (especially amiodarone), dietary iodine-deficiency or congenital.

Secondary hypothyroidism follows pituitary failure.

Clinical features of hypothyroidism (primary and secondary) include dry skin and hair, menorrhagia, muscle cramps, infertility, pericardial and pleural effusions, periorbital oedema, raised CPK, raised serum cholesterol, gout, delusions ('myxoedema madness'), bradycardia and slowrelaxing reflexes.

Features favouring secondary (pituitary) hypothyroidism are signs of hypopituitarism (hypopigmentation, etc.), normal cholesterol, TSH not elevated in spite of low free T4, no rise in TSH on infusion of TRH.

Question 34

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

Low ferritin reflects depleted body stores. MCH (mean cell haemoglobin) and MCHC (mean cell haemoglobin concentration) are indices of microcytosis rather than iron deficiency and are also low in conditions such as thalassaemia, sideroblastic anaemia and anaemia of chronic disease.

Free erythrocyte protoporphyrin represents porphyrin rings with no iron to make into haem - also seen in lead poisoning, sideroblastic anaemia and erythropoietic protoporphyria.

Question 35

A. FALSE B. FALSE C. FALSE D. FALSE E. FALSE

Post-streptococcal glomerulonephritis commonly follows infection by Lancefield Group A beta-haemolytic streptococci of nephrotogenic type. The pathology is caused by deposition of immune complexes in the glomerulus and subsequent inflammation and injury. Males are more

commonly affected (M:F 2:1). It is more common in children. Presentation is with nephrotic syndrome (haematuria, proteinuria, hypertension, oedema, oliguria and renal failure); nephrotic syndrome is uncommon.

The prognosis in children is excellent and worst in the elderly (irreversible renal impairment and hypertension). Renal biopsy is not essential if there is a good history and elevated antistreptolysin titre.

Question 36

A. FALSE B. FALSE C. TRUE D. TRUE E. TRUE

Hemiballismus is produced by a lesion in the subthalamus (stroke).

Chorea is caused by diseases of the basal ganglia - Huntington's disease, SLE, Wilson's disease, rheumatic fever (Sydenham's), polycythaemia, neuroacanthosis, thyrotoxicosis, drugs (steroids, L-dopa therapy).

Dystonia is prolonged painful muscle spasm and may occur following neuroleptic medication.

Writer's cramp is a form of dystonia.

Myoclonus may be seen in encephalopathies and in uraemic patients.

Question 37

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

The endothelins are a family of vasoactive peptides. Three members have been identified: endothelin-I is the most potent vasoconstrictor identified to date. It stimulates growth in a number of cell types including vascular smooth muscle cells.

The endothelins are generated from precursor molecules by endothelin-converting enzyme (like angiotensin II by ACE). The enzymes degrading endothelins have not yet been characterised but include endopeptidase-24.11.

Nitric oxide, or NO (also known as EDRF-endothelium derived relaxant factor) is cleaved from L-arginine by nitric oxide synthetase. NO is produced continuously by the vascular endothelium and maintains the vasculature in a state of active vasodilatation; thus antagonists (e.g. L-NMMA or L-NAME) produce vasoconstriction in normal human volunteers. NO stimulates soluble guanylate cyclase to produce cyclic GMP which mediates its actions. Inhibition of cGMP breakdown will potentiate NO activity.

Question 38

A. FALSE B. FALSE C. TRUE D. TRUE E. FALSE

Nephrotic syndrome is characterised by severe proteinuria that results in hypoalbuminaemia.

Loss of transferrin results in hypochromic anaemia that is resistant to iron. Renal loss of immunoglobulins increases the susceptibility to infections. Decrease in plasma volume, loss of antithrombin III and increased levels of factors II, V, VII, VII and X result in a procoagulant state (venous thromboses - e.g. renal vein). Serum cholesterol is raised due to increased synthesis of LDL apoprotein B. The decrease in plasma volume usually results in avid sodium retention.

Question 39

A. FALSE B. FALSE C. TRUE D. TRUE E. TRUE

The most common adverse drug reactions are gastrointestinal (nausea) and dermatological (rashes). Approximately 3% of hospital admissions are directly related to adverse drug

interactions.

Question 40

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Originally marketed as an anti-anginal drug, amiodarone is a widely used antiarrhythmic drug with Class III activity. Other side effects of amiodarone include rash, headache, tremor, sleep disturbance, corneal deposits (do not usually interfere with vision), nausea, constipation, peripheral neuropathy and pulmonary fibrosis. It contains high amounts of iodine and can affect thyroid function causing hypothyroidism more frequently than hyperthyroidism. It has a very long half life and accumulates in the liver and thyroid (increasing the density of the liver on CT). Intravenous amiodarone can precipitate profound hypertension and bradycardia and should be used with caution.

Question 41

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Generalised hypopigmentation: phenylketouria (babies), hypopituitarism, albinism (nystagmus, pink iris).

Patchy hypopigmentation: vitiligo, achromic naevus, piebaldism (white forelock), ash-leaf macules, chemical (hydroquinone).

Patchy hypopigmentation with inflammation: *Tinea versicolor* (upper trunk), leprosy, pityriasis alba (itching, flaking).

Patchy hypopigmentation with atrophy or induration: radiotherapy, morphoea, burns, lichen sclerosus.

Pytriasis versicolor (not rosea) causes hypopigmentation.

Features of tuberous sclerosis: adenoma sebaceum, periungual fibromas,

Shagreen patches (flesh coloured tumours often over LS region), ash-leaf macules (visible under Woods light) and small erythematous facial papules.

Question 42

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Family history and catatonia are poor prognostic features. First rank symptoms of schizophrenia are auditory hallucinations, thought withdrawal, interruption, insertion, thought broadcasting, delusional perceptions, external control of emotions and somatic passivity.

Question 43

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

HIV is an RNA virus of the lentivirus family. It is called a retrovirus as it encodes the enzyme reverse transcriptase (an RNA-dependent DNAPolymerase) which allows DNA to be transcribed from the viral RNA within the infected cell. CD4 is a surface glycoprotein (gp) which binds to gp120 on the surface of the HIV particle. CD4 is also present on macrophages, Langerhan cells and dendritic cells of blood/lymph nodes. These cells act as reservoirs for virus and their immune responses (antigen presentation and T-cell activation) are also impaired. Other cells such as microglial cells and colonic epithelial cells can also be infected but less efficiently. Anti-HIV antibodies usually appear 6-12 weeks after initial infection. HIV can be cultured from peripheral blood lymphocytes of asymptomatic individuals infected with the virus even before

the anti-HIV titres rise. However, the levels of infective virus are generally low and the p24 antigen is not detectable by ELISA. Persistence of the p24 antigen is highly suggestive of higher disease burden and more rapid disease progression.

Question 44

A. FALSE B. FALSE C. FALSE D. TRUE E. TRUE

Patchy myocardial granulomata and their preference for the base of the heart and left ventricle reduce the sensitivity of endomyocardial biopsy for diagnosis of cardiac sarcoidosis. Cardiac involvement is seen in 20-50% but clinical manifestations are present in < 5%. Q waves on the ECG are common but due to cardiac infiltration rather than coronary artery disease/infiltration. Ventricular aneurysm is seen in 8-10% often with mural thrombus. MRI will show the classical patchy scarring involving the base of the IV septum. Gallium and thallium scans may also demonstrate cardiac disease.

The commonest presenting features of cardiac sarcoidosis are:

- Complete AV block (20-30%)
- VT or ventricular extrasystoles
- Supraventricular arrhythmias
- Chest pain similar to angina pectoris
- Sudden death (~15%)
- Acute myocarditis
- Congestive cardiac failure
- Mitral or tricuspid regurgitation

Treatment options include:

- Permanent pacing
- Steroids (for acute attacks)
- Antiarrhythmic therapy

Question 45

A. FALSE B. TRUE C. FALSE D. FALSE E. TRUE

Graves' disease in pregnancy is associated with fetal hyperthyroidism due to maternal antibodies crossing the placenta and causing (in essence) fetal Graves' disease. Neonates are hyperthyroid as the maternal antibody persists for up to 2 months and may need treatment with propylthiouracil.

Carbimazole is worse than propylthiouracil at causing neonatal goitre. Radioiodine cannot be used as it causes cretinism and goitre.

Side-effects of the anti-thyroid drugs (propylthiouracil and carbimazole): agranulocytosis (approx. 0.1% of patients), rash, fever, arthralgia, and jaundice.

Question 46

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Primary pulmonary hypertension is an idiopathic disease with female preponderance (F:M, 9:1). It is associated with the oral contraceptive pill, fenfluramine, crotalaria teas and pregnancy.

Secondary PHT is associated with COAD, cystic fibrosis, obstructive sleep apnoea, residence at high altitude, chronic thromboembolism, pulmonary veno-occlusive disease, Churg-Strauss syndrome, Wegener's, Takayasu's and systemic sclerosis.

Patients with primary PHT are rarely clubbed. Dull retrosternal chest pain, recurrent syncopal

attacks and Raynaud's phenomenon (only 30%) are seen. Clinically there is a loud P2, parasternal lift and sometimes the Graham-Steele murmur of functional pulmonary incompetence. ECG shows RBBB, RV strain pattern and right atrial hypertrophy. CXR signs include prominent proximal pulmonary arteries but 'pruned' distal branches, and in longstanding cases, calcification of the pulmonary arteries.

Question 47

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

Atrial septal defects can occur in a number of different positions. Patients with secundum ASD are often asymptomatic in childhood and are not diagnosed until middle age. Primum ASD is a much more severe defect often involving the AV canal (VSD or abnormal mitral or tricuspid valves producing a pan-systolic murmur). Both types of ASD produce fixed splitting of the second heart sound with an ejection murmur over the pulmonary valve. A diastolic flow murmur over the tricuspid may be audible. Right atrial enlargement is not common (pulmonary plethora more common). On the ECG, both types of ASD produce a RBBB pattern on the ECG: primum ASD is associated with left axis deviation while secundum ASD is associated with right axis deviation.

Associated conditions:

1. Secundum ASD - Floppy mitral valve, anomalous pulmonary venous drainage, mitral stenosis (Lutembacher's syndrome);
2. Primum ASD - Down's syndrome, Klinefelter's syndrome, Noonan's syndrome, renal abnormalities, common atrium (cardiac), pulmonary stenosis, coarctation of the aorta.

Question 48

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

Tissue oxygenation depends not only on blood flow but also on the amount of oxygen carried per unit volume of blood. The relationship between the oxygen saturation of haemoglobin and the partial pressure of oxygen describes a sigmoid curve. A 'shift' of the curve to the right increases the arteriolar-venous difference in oxygen tensions and releases more oxygen to the tissues and occurs with acidosis (metabolic or respiratory), fever and 2,3-diphosphoglycerate. A left shift is seen with carbon monoxide.

Question 49

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Kaposi's sarcoma is commonly seen in homosexual patients with AIDS and faeco-oral contact seems to predispose for this. It is occasionally seen in intravenous drug users with AIDS but rarely occurs in haemophiliacs with AIDS. There is recent evidence that a novel Herpes virus (HHV-8) may be involved in the pathogenesis of Kaposi's sarcoma and can be detected by PCR in lesions. Intravenous drug users are more likely to develop chest infections and this is related to septic microemboli and impaired pulmonary pathogen handling. *Cryptosporidium* diarrhoea is common in HIV-positive individuals and is seen together with *isosporiasis* (especially in Haitians). There is no effective therapy. Extranodal disease is more common in HIV positive individuals: 40% develop CNS disease and 33% marrow infiltration as compared to 2% and 7.5% respectively if non-HIV.

Question 50

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

In osteomalacia there is impaired mineralisation of bone usually consequent on vitamin D deficiency. In rickets this occurs during bone growth (i.e. in childhood). This may be from dietary deficiency, lack of sunlight or renal wasting (e.g. renal tubular acidosis in Fanconi's syndrome). The kidney converts 25-hydroxycholecalciferol (25-HCC) to the active compound 1,25-dihydroxycholecalciferol (1,25-DHCC) and patients with renal failure develop osteomalacia if this is not replaced either as alphacalcidol (1-alpha-hydroxycholecalciferol) or calcitriol (1,25-DHCC). The liver metabolises (activates and deactivates) vitamin D; chronic liver disease (failure of activation) or anticonvulsant therapy (induction of enzymes to deactivate vitamin D) can produce osteomalacia. Hypophosphataemic rickets (vitamin D-resistant rickets) is an Xlinked dominant disorder where there is renal unresponsiveness to vitamin D. Radiological changes in osteomalacia include Looser's zones (apparent partial fractures seen in scapulae and long bones without displacement) and loss of cortical bone giving rise to the characteristic appearance of the vertebrae ('codfish vertebrae', 'rugger-jersey spine'). Bone cysts are a feature of hyperparathyroidism. Subperiosteal bone resorption is seen in osteoporosis and hyperparathyroidism.

Question 51

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Felty's syndrome is associated with lymphocytic infiltration, regeneration and macronodular cirrhosis. Still's disease has hepatosplenomegaly, abnormal LFTs and sometimes overt jaundice. Liver pathology is common in cystic fibrosis but is usually asymptomatic in childhood - adolescents may develop cirrhosis and bleeding varices. Amyloidosis AL is primary - carpal tunnel, peripheral neuropathy, purpura, heart and tongue infiltration. AA is secondary (to chronic inflammation, e.g. TB, bronchiectasis) and involves kidneys, liver and spleen.

Question 52

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

Leptospirosis may be caused by *Leptospira icterohaemorrhagiae* (rat's urine - Weil's disease), *L. canicola* (dogs) or *L. hardjo* (cattle). Spread is via contact with infected urine, contaminated water or soil. After an incubation period of 1-3 weeks, clinical symptoms develop. Weil's disease can be divided into three phases: the septicaemic phase (fever, aches, conjunctival injection, pyuria and haematuria, headache) - the organism may be isolated from blood and CSF. The 'immune phase' is characterised by meningism, uveitis, encephalitis, jaundice, GI haemorrhage and renal failure and is associated with leptospirae in the urine. In the third phase, the illness abates but recurrence is common. Diagnosis: dark ground microscopy to demonstrate organism; serology. Treatment is with penicillin. Doxycycline is of uncertain efficacy. Beware the Jarisch-Herxheimer reaction when treating spirochetal illness.

Question 53

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

The bleeding time reflects platelets and endothelial/vascular function and is prolonged when either of these is abnormal, e.g. von Willebrand's disease, Bernard Soulier syndrome (absence of

platelet glycoprotein Ib receptor for vWF), Glanzman's thrombasthenia (lack of platelet glycoprotein IIb/IIIa), uraemia, aspirin, liver disease, scurvy, Ehlers-Danlos syndrome, etc. Christmas disease is an X-linked disorder due to factor IX deficiency. This results in prolongation of the APTT, but not the bleeding time.

DDAVP stimulates the immediate release of factor VIII:C and von Willebrand factor (vWF) from endothelial cell stores and avoids the risks of factor transfusions. However, repeat doses are only fully effective when given about 48 hours later. It has no effect on factor IX:C levels.

Osler-Weber-Rendu (hereditary haemorrhagic telangiectasia) is associated with abnormally fragile blood vessels (telangiectasia), which are prone to bleed.

Alcoholic liver disease results in reduced synthesis of factors II, III, IX and X (low levels of protein C, S, antithrombin III), defective clearance of tissue plasminogen activator, dysfibrinogenaemia and thrombocytopenia.

Question 54

A. TRUE B. FALSE C. FALSE D. FALSE E. TRUE

Poor prognostic factors include advanced age at onset, presentation with acute brainstem syndrome, early loss of mental acuity with euphoria. Treatment options includes steroids, supportive nursing care, physiotherapy, antispasmodics, etc; beta-interferon is undergoing clinical trials in patients with relapsing-remitting MS and reduces the incidence of lesions on MRI scanning - it is still considered an experimental therapy.

Uthoff's phenomenon is muscle weakness experienced classically after a hot bath (but may also be seen in hot weather) and is thought to be due to the effect of temperature on the conduction properties of demyelinated fibres. L'hermitte's sign is sharp, tingling pains down the arms produced by flexion of the neck (thought to be related to demyelination in the cervical spinal cord).

Question 55

A. FALSE B. TRUE C. FALSE D. TRUE E. FALSE

The musculocutaneous nerve is the terminal branch of the lateral cord of the brachial plexus. It supplies biceps, brachialis and coracobrachialis in the arm and ends as the lateral cutaneous nerve of the forearm supplying both surfaces of the radial side of the forearm. The deltoid is supplied by the axillary nerve. The radial nerve arises from the posterior cord and runs posterior to the shaft of the humerus and then curves to pass into the forearm anterior to the elbow joint. It supplies triceps, brachioradialis, extensor carpi radialis longus and gives cutaneous branches to the lateral and posterior aspects of the arm and forearm. The median nerve has no branches in the arm. It supplies all the forearm flexors except flexor carpi ulnaris and the medial aspect of flexor digitorum profundus (ulnar nerve). It supplies the short muscles of the thumb except adductor policis (ulnar), and the lateral two lumbricals. The ulnar nerve has no branches in the arm and passes into the forearm posterior to the medial epicondyle.

Question 56

A. FALSE B. TRUE C. FALSE D. TRUE E. FALSE

A screening test is used to identify patients who may have a particular disease. Some who test positive will not have the disease and some who have the disease will test negative. The sensitivity of the test is the proportion of true positives correctly identified by the test (i.e. the proportion of patients with migraine who test positive). The specificity of the test is the

proportion of true negatives correctly identified by the test (i.e. the proportion of patients without migraine out of all those who test negative).

The positive predictive value is the proportion of those who test positive who actually are positive (i.e. the proportion of patients with migraine out of all those who test positive). Thus a positive predictive value of 95% implies that out of 100 patients who test positive, 95 will have the disease, while 5 will be false positives. The positive predictive value depends on the prevalence of the disease.

Question 57

A. FALSE B. FALSE C. FALSE D. FALSE E. FALSE

Extrinsic allergic alveolitis comprises a number of disorders where inhaled antigens provoke a hypersensitivity reaction in the bronchioles of sensitized individuals. The pathology in the acute reaction is mediated predominantly by type III hypersensitivity (immune complex) with some IgE-mediated type I reaction. With chronic exposure, type IV (cell mediated) reaction takes over with infiltration with lymphocytes, granuloma formation and bronchiolitis obliterans.

Farmers' lung is the most common of these in the UK (the antigen is from the fungus *Mycopolysporum faeni*). Pigeon fancier's lung is another example. (Psittacosis and ornithosis are zoonoses (infections) and not allergic alveolitides). Symptoms develop 4-8 hours after exposure to the allergen with fever, dry cough, dyspnoea and malaise. Chest crackles may be audible. Investigations reveal a neutrophilia in the acute attacks. Serum precipitins may be present but are not diagnostic as they may occur in individuals exposed to the antigen but who do not develop the disease (e.g. 30% of pigeon fanciers test positive but they do not all develop the disease). CXR may be normal in the acute episodes but chronic exposure results in upper zone fibrosis. Treatment involves avoidance of the antigen and steroids.

Question 58

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

Type IV renal tubular acidosis is characterised by hyporeninaemic hypoaldosteronism. There is reduced uptake of sodium and thus reduced secretion of potassium and H⁺. This may be due to hypoaldosteronism (Addison's disease - aldosterone opens the sodium channel), hyporeninaemia (elderly diabetics, NSAIDs) or renal hyporesponsiveness to aldosteronism (following obstructive roopathy, sickle cell disease, drugs that block the Na⁺ channel (amiloride/triamterene) or aldosterone receptor (spironolactone)). The key to diagnosis is the serum potassium which is usually elevated out of proportion to the degree of renal impairment. There is no defect in acid excretion and urine pH falls <5.3 on giving an acid load. Unlike type I and type II RTA, treatment is with loop diuretics, a low potassium diet and lowdose fludrocortisone.

Question 59

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Common abnormalities of the second heart sound include:

1. Loud A₂: Tachycardia, hypertension, transposition;
2. Loud P₂: Pulmonary hypertension;
3. Single S₂: Fallot's tetralogy, severe pulmonary or aortic stenosis, pulmonary valve atresia, Eisenmenger's complex, large ventricular septal defect;
4. Widely split S₂: RBBB, pulmonary stenosis, deep inspiration, mitral incompetence, ventricular septal defect;

5. Reversed split S₂: LBBB, aortic stenosis, patent ductus arteriosus (PDA), right ventricular pacing;

6. Fixed split S₂: Atrial septal defect.

Common abnormalities of the first heart sound include:

1. Loud S₁: Mitral stenosis, tachycardia, short PR interval (e.g. WPW);

2. Soft S₁: Delayed ventricular ejection (e.g. aortic stenosis), long PR interval (i.e. first-or second-degree heart block);

3. Wide split S₁: RBBB, LBBB, ventricular ectopic beats, ventricular tachycardia;

4. Variable intensity S₁: atrial fibrillation, nodal tachycardia, ventricular tachycardia, complete heart block.

Question 60

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

The bleeding time reflects platelets and endothelial/vascular function and is prolonged when either of these is abnormal, e.g. von Willebrand's disease, Bernard Soulier syndrome (absence of platelet glycoprotein Ib receptor for vWF), Glanzman's thrombasthenia (lack of platelet glycoprotein IIb/IIIa), uraemia, aspirin, liver disease, thrombocytopenia (of any cause), scurvy, Ehlers-Danlos syndrome, etc.

Exam 2

Question 1 The following statements are true regarding TIAs:

- A. Approx. 30% will have only one episode
- B. Approx. 30% will continue to have TIAs alone
- C. Approx. 30% will have a completed stroke within 3 years
- D. Approx. 30% with carotid territory TIAs will have only minor carotid disease on angiography
- E. Approx. 30% are associated with intracranial haemorrhage

Question 2 The following disorders are recognised causes of haemoptysis and renal failure:

- A. Goodpasture's syndrome
- B. Cryoglobulinaemia
- C. Addison's disease
- D. Leptospirosis
- E. Carbon tetrachloride poisoning

Question 3 The following are associated with venous thromboses:

- A. Systemic lupus erythematosus
- B. Glanzman's syndrome
- C. Adenocarcinoma
- D. Protein C deficiency
- E. Defective fibrinolytic mechanism

Question 4 The following renal diseases are linked to the appropriate mode of inheritance:

- A. Cystinosis X-linked
- B. Hartnup's disease autosomal recessive disorder
- C. Alport's syndrome autosomal dominant disorder
- D. Fabry's disease autosomal recessive disorder
- E. Familial hypophosphataemia Y-linked

Question 5 Genetic polymorphisms of drug metabolism:

- A. Exhibit inter-ethnic differences
- B. Are not associated with adverse effects
- C. Are dependent on the pharmacological actions of the drug
- D. Are due to altered gene expression
- E. Are not clinically important for drugs that are eliminated by the kidney

Question 6 Kaposi's sarcoma:

- A. Arises from muscle cells
- B. Is associated with HLA DR5 haplotype
- C. Can be treated with radiotherapy
- D. HIV-positive patients often die directly from its complications
- E. Can be treated with chemotherapy

Question 7 The following are recognised causes of Budd-Chiari syndrome:

- A. Paroxysmal nocturnal haemoglobinuria

- B. Behçet's disease
- C. Congenital hepatic fibrosis
- D. Antithrombin III deficiency
- E. Leptospirosis

Question 8 In myxoedema coma:

- A. Patients are usually known to be hypothyroid
- B. Treatment should be started with 500 µg/l thyroxine intravenously
- C. Corticosteroids should be given
- D. Mortality is >70%
- E. Hypoglycaemia is common

Question 9 Concerning HIV infection:

- A. Seroconversion can be associated with an acute aseptic meningoencephalitis
- B. Persistent generalised lymphadenopathy is usually tender
- C. *Cryptococcus neoformans* is the commonest cause of meningitis in AIDS patients
- D. Oral candidiasis in an otherwise asymptomatic individual is a predictor of progression to AIDS
- E. Pentamidine is the first drug of choice for preventing PCP infection

Question 10 The following are effective drugs in ankylosing spondylitis:

- A. Indomethacin
- B. Gold
- C. D-penicillamine
- D. Prednisolone
- E. Methotrexate

Question 11 Adrenal failure may be associated with:

- A. Pallor
- B. Vitiligo
- C. Diabetes
- D. Hypocalcaemia
- E. Hypercalcaemia

Question 12 Propranolol is appropriate treatment as monotherapy in:

- A. Pheochromocytoma
- B. Migraine
- C. Essential tremor
- D. Thyroid storm
- E. Raynaud's phenomenon

Question 13 In acromegaly:

- A. There is an increased risk of malignancy
- B. Patients often have hypercalcaemia
- C. Excessive daytime drowsiness is a recognised association
- D. Serum growth hormone is suppressed during an oral glucose tolerance test

E. Cardiovascular disease is a common cause of morbidity

Question 14 The following have an autosomal recessive mode of inheritance:

- A. Hereditary spherocytosis
- B. Oculocutaneous albinism
- C. Haemophilia B
- D. Friedreich's ataxia
- E. Hereditary haemorrhagic telangiectasia

Question 15 Polycythaemia rubra vera is associated with:

- A. A raised ESR and plasma viscosity
- B. Raised serum vitamin B₁₂ levels
- C. Haemorrhage
- D. A raised leukocyte alkaline phosphatase
- E. Raised erythropoietin

Question 16 Regarding Bell's palsy:

- A. Post-auricular pain commonly precedes paralysis
- B. Is associated with hyperacusis
- C. High dose steroids within a week of onset improve prognosis
- D. May be bilateral in up to 20% of patients
- E. Is associated with facial myokymia

Question 17 The following statements are true:

- A. Basophilic stippling is seen in beta-thalassaemia
- B. Target cells occur in hypersplenism
- C. Howell-Jolly bodies are a feature of coeliac disease
- D. Heinz bodies are characteristic of G6PDH deficiency
- E. Macrocytosis may be seen in methotrexate therapy

Question 18 The following features may be associated with iron-deficiency:

- A. A sensitive and painful glossitis
- B. Dysphagia
- C. Increased liver iron
- D. Koilonychia
- E. Dermatitis herpetiformis

Question 19 In endocarditis:

- A. Caused by enterococci, the organism is highly sensitive to penicillins
- B. The group D organism *Streptococcus agalacticae* is frequently associated with colonic villous adenomas
- C. Indolent infection late after cardiac surgery is often due to infection with *Staphylococcus aureus*
- D. Anticoagulation is indicated to reduce the risk of emboli when large vegetations are present
- E. Mycotic aneurysms may rupture after complete eradication of infection

Question 20 Regarding the jugular venous pressure:

- A. The x descent is rapid in cardiac tamponade
- B. Regular cannon waves are seen in nodal tachycardia
- C. Inspection of the normal adult usually reveals a, c and v waves
- D. The physiological third heart sound is synchronous with the x descent
- E. Fixed elevation is seen with IVC obstruction

Question 21 In the treatment of chronic active hepatitis due to hepatitis B virus:

- A. ~15% of untreated patients seroconvert from HBeAg +ve to anti-HBe +ve per year
- B. Aspirin should be avoided
- C. Interferon seroconverts ~ 50% of patients
- D. All patients should receive a trial of steroids
- E. Patients often have a clinical relapse of liver disease with therapy

Question 22 Proximal renal tubular acidosis is associated with:

- A. A normal anion-gap acidosis
- B. Bicarbonate wasting by the proximal tubule
- C. Glycosuria
- D. Heavy metal poisoning
- E. Rapid response to oral bicarbonate supplementation

Question 23 During fasting, the following may be used for gluconeogenesis:

- A. Pyruvate
- B. Glycerol
- C. Lactate
- D. Amino acids
- E. Acetyl coenzyme A

Question 24 The following help distinguish inflammatory from non-inflammatory arthropathy:

- A. A joint effusion
- B. Early morning stiffness
- C. Late afternoon joint pain
- D. Muscle wasting around the affected joint
- E. A high platelet count

Question 25 The following are recognised features of classical neurofibromatosis:

- A. Scoliosis
- B. Axillary freckles
- C. Low IQ
- D. Hamartomas of the iris
- E. Cerebral gliomas

Question 26 The following are causes of intracranial calcification on skull X-ray:

- A. Hyperparathyroidism
- B. Sturge-Weber syndrome
- C. Meningioma
- D. Chromophobe pituitary adenoma

E. Myeloma

Question 27 Clinical features of carbon dioxide retention include:

- A. Papilloedema
- B. Extensor plantars
- C. Miosis
- D. Low volume pulse
- E. Hypertension

Question 28 Secondary failure of erection:

- A. Becomes increasingly common with age
- B. Is associated with a rigid upbringing
- C. Must occur in >25% of attempts before a diagnosis can be made
- D. Is related to overindulgence in alcohol
- E. May be present only in certain situations

Question 29 A 50-year-old man becomes progressively more uncommunicative and withdrawn.

A diagnosis

of dementia rather than depression is supported by:

- A. Sexual impotence
- B. Faecal incontinence
- C. Mutism
- D. Marked impairment of concentration
- E. Several recent episodes of antisocial behaviour

Question 30 Chlamydial pneumonia:

- A. Is caused by Chlamydia trachomatis in neonates
- B. Can be seen in adults with no contact with birds
- C. Myocarditis is a recognised complication
- D. Is treated with benzyl penicillin
- E. Typically produces a lobar pneumonia on CXR

Question 31 Concerning calcium antagonists:

- A. They inhibit the slow calcium efflux of stage 2 of the cardiac action potential
- B. Diltiazem increases AV node refractoriness
- C. Nifedipine is safe for use in pregnancy
- D. Gum hypertrophy is a side effect of the dihydropyridines
- E. Verapamil is the treatment of choice for SVT due to digoxin toxicity

Question 32 In pemphigoid:

- A. Blisters arise on otherwise normal skin
- B. Direct immunofluorescence shows immunoglobulin deposition at the epidermo-dermal junction
- C. Oral ulceration is often the presenting feature
- D. The 45-65-year age group is most commonly affected
- E. Ultimate remission is usual

Question 33 Raised plasma alkaline phosphatase is a typical finding in:

- A. Paget's disease
- B. Osteomalacia
- C. Osteogenesis imperfecta
- D. Homocystinuria
- E. Acute intermittent porphyria

Question 34 A 35-year-old woman has the following blood gases in air: pH 7.49, PaO₂ 16 kPa, PaCO₂ 2.3 kPa. Possible diagnoses include:

- A. Pulmonary embolus
- B. Hyperventilation
- C. Paracetamol overdose
- D. Doxapram overdose
- E. Thyrotoxicosis

Question 35 Regarding retroperitoneal fibrosis:

- A. Methysergide is commonly involved in its aetiology
- B. Is clinically associated with coronary arterial fibrosis
- C. Pathologically involves periaortic lymphocytic infiltration
- D. May respond to steroids
- E. Classically has lateral deviation of both ureters on IVP

Question 36 Regarding cryoglobulinaemia:

- A. Patients with type I cryoglobulinaemia frequently have a monoclonal IgM paraproteinaemia
- B. Type II cryoglobulinaemia is associated with HBsA
- C. Patients with type III cryoglobulinaemia have a monoclonal rheumatoid factor
- D. Cryoglobulinaemia is associated with minimal change glomerulonephritis
- E. It is a recognised complication following Kalar-Azar

Question 37 The following parasitic infections are associated with an eosinophilia:

- A. *Schistosomiasis*
- B. *Leishmaniasis*
- C. Pin worm (*Enterobius vermicularis*)
- D. *Strongyloides stercoralis*
- E. *Wucheria bancroftii*

Question 38 The following are recognised non-metastatic presenting features of carcinoma of the lung:

- A. Painful hands and wrists
- B. Tetany
- C. Polyuria
- D. Hyperpigmentation
- E. Ataxia

Question 39 The following are found in patients with Sjögren's syndrome:

- A. Renal tubular acidosis
- B. Positive rheumatoid factor
- C. Positive anti-nuclear antibody
- D. Increased frequency of HLA-DR7
- E. Negative Schirmer's test

Question 40 Polyarteritis nodosa is associated with:

- A. Eosinophilia
- B. Aneurysmal dilatation of medium-sized arteries
- C. Positive HBsAg
- D. Low complement levels
- E. Renal impairment in over 80%

Question 41 The following support a diagnosis of bronchopulmonary aspergillosis:

- A. Peripheral eosinophilia
- B. Precipitating antibodies to *Aspergillus fumigatus*
- C. Predominantly lower lobe pulmonary infiltrates
- D. Response to systemic corticosteroids
- E. Hilar calcification

Question 42 The following suggest predominant incompetence in mixed mitral valve disease:

- A. Displaced, thrusting apex beat
- B. Loud first heart sound
- C. Presence of a third heart sound
- D. Atrial fibrillation
- E. Left parasternal heave

Question 43 In the management of haemophilia:

- A. The analgesic of choice is aspirin
- B. A haematoma in soft tissue requires urgent surgical decompression
- C. Prior to major surgery, factor VIII or IX levels should be raised to 30% above normal
- D. DDAVP may be beneficial
- E. Factor VIII needs more frequent replacement than factor IX

Question 44 Elevated levels of gammaglobulins in the CSF are associated with:

- A. Subacute sclerosing panencephalitis
- B. Creutzfeldt-Jakob disease
- C. Progressive multifocal leukoencephalopathy
- D. Paraneoplastic encephalopathy
- E. Multiple sclerosis

Question 45 Drugs that worsen neuromuscular diseases include:

- A. Lithium
- B. Lignocaine
- C. Propranolol
- D. Chlorpromazine

E. Quinidine

Question 46 In patients with sarcoidosis:

- A. Heart failure is usually secondary to lung involvement and cor pulmonale
- B. Asymptomatic hilar lymphadenopathy is a common presentation
- C. Pulmonary involvement is usually seen on transbronchial biopsy even in extra-pulmonary presentations of the disease
- D. 50% of patients will have a positive tuberculin test
- E. A fall in serum ACE levels with corticosteroid treatment correlates with disease response

Question 47 Severe pyloric stenosis is accompanied by the following changes:

- A. Elevated urea
- B. Rise in PaCO_2
- C. Raised haematocrit
- D. Reduced plasma sodium
- E. Reduced transferrin

Question 48 Concerning injuries to the nerves in the lower limb:

- A. Damage to the femoral nerve results in paralysis of quadriceps femoris
- B. Damage to the deep peroneal nerve results in foot drop
- C. Section of the obturator nerve causes weakness of adduction of the thigh
- D. Damage to the tibial nerve rarely produces sensory loss
- E. Damage to the common peroneal nerve produces loss of dorsiflexion and eversion of the foot.

Question 49 The following are recognised features of cocaine abuse:

- A. Sexual dysfunction in men
- B. Increased need for sleep
- C. Severe anxiety and paranoid ideation
- D. Hallucinations
- E. Dilated pupils not reactive to light

Question 50 In the congenital long-QT syndrome:

- A. The autosomal dominant form is associated with deafness
- B. Romano-Ward syndrome is associated with mutations on chromosome 6
- C. Some carriers may have a normal QT interval
- D. Alpha-blocker therapy can reduce the incidence of syncope
- E. Cervical sympathectomy may be an effective therapy

Question 51 The following statements are true:

- A. Stimulation of the right vagus nerve slows the rate of sinus node depolarisation
- B. Hyperbaric oxygen increases coronary vascular resistance
- C. Stimulation of the left phrenic nerve produces a sinus tachycardia
- D. Blood in the coronary sinus has a very low oxygen content at all times irrespective of the activity of the individual
- E. Adenosine causes coronary vasodilatation

Question 52 The following may occur with rheumatoid arthritis:

- A. Pleural effusions
- B. Obliterative bronchiolitis
- C. Stridor
- D. Cavitating nodules in the lungs
- E. Fibrosing alveolitis

Question 53 In anaphylactic shock:

- A. Blood pressure falls dramatically
- B. There is excessive bronchodilatation
- C. Subcutaneous adrenaline is the preferred emergency treatment
- D. Histamine is the main cause of shock
- E. H₂ antagonists have no role in the emergency treatment

Question 54 Concerning diseases of the aorta:

- A. One year survival for untreated patients with dissecting aortic aneurysm is < 10%
- B. Repair of ruptured abdominal aortic aneurysm has a mortality of < 20%
- C. Symptomatic patients with an abdominal aneurysm < 5 cm in diameter can be followed medically
- D. The VDRL test is accurate in identifying syphilitic aortitis in all age groups
- E. Most patients with thoracic aortic dissection have unequal pulses

Question 55 The t-test is used to compare the effect of two different calcium antagonists on blood pressure in two patient samples:

- A. Blood pressure is assumed to be a normally distributed variable
- B. A statistically significant result implies one drug is better than the other
- C. The trial results would be invalid if there were more patients with diabetes in one group than the other
- D. There should be identical numbers of patients in both groups
- E. This is an example of an observational study

Question 56 Which of the following statements about somatostatin are true:

- A. Patients with somatostatin secreting tumours have mild diabetes
- B. Somatostatin is synthesised in the glomeruli of the kidney
- C. There are two distinct molecular forms of somatostatin
- D. Octreotide is a somatostatin antagonist and is used for symptomatic relief in carcinoid syndrome
- E. Regardless of the parameter examined, somatostatin appears to inhibit release or function

Question 57 The following cause a rise in serum renin levels:

- A. Standing upright from being supine
- B. Angiotensin II infusion
- C. Treatment with thiazide diuretics
- D. Cortisol
- E. Hypertension

Question 58 A 36-year-old woman complains of severe polydipsia and polyuria without glycosuria. A diagnosis of compulsive water drinking is unlikely if:

- A. The plasma potassium is 2.1 mmol/l
- B. There is a visual field defect
- C. Urine output is diminished by water deprivation
- D. The plasma osmolality is greater than normal
- E. The urine osmolality remains at 300 mOsm/kg

Question 59 Tall R waves in lead V1 on the ECG are seen in:

- A. Right bundle branch block
- B. Ebstein's anomaly
- C. Wolff-Parkinson-White syndrome
- D. Acute pulmonary embolism
- E. Dextrocardia

Question 60 The following drugs produce metabolically active metabolites:

- A. Diazepam
- B. Amitryptilline
- C. Zidovudine
- D. Lisinopril
- E. Benzyl penicillin

Exam 2: Answers

Question 1

A. TRUE B. TRUE C. TRUE D. TRUE E. FALSE

Transient ischaemic attacks by definition leave no residual deficit. The cause is usually platelet thromboembolism but may be seen in hyperviscosity states (e.g. polycythaemia, sickle crises and myeloma). 30% of patients will have a completed stroke and of these about 30% will do so in the first 3 months. However, the commonest cause of death in these patients is acute myocardial infarction.

Antiplatelet drugs (aspirin or ticlopidine) reduce non-fatal MI or CVA and vascular mortality. Anticoagulation is advocated for patients with recurrent TIAs not controlled on antiplatelet therapy and patients with cardiac embolic source. Carotid endarterectomy is beneficial in patients with > 70% stenosis of the internal carotid artery on the symptomatic side.

Question 2

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

The differential diagnosis of renal failure and haemoptysis includes Goodpasture's syndrome (anti-GBM disease), Wegener's granulomatosis, cryoglobulinaemia, Henoch-Schönlein purpura, SLE, PAN, infection (TB, Legionnaire's disease), renal vein thrombosis and pulmonary embolism. Leptospirosis produces hepatic and renal failure but rarely produces haemoptysis. Carbon tetrachloride poisoning is associated with renal failure and jaundice.

Question 3

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Hypercoagulable states may be divided into congenital or acquired defects. Congenital:

deficiency of antithrombin III, protein S or C (Factor V-Leiden mutation). Antithrombin III neutralises factors IXa, Xa, XIa and XIIa and thrombin. Protein C neutralises Va and VIIIa and binds thrombin. Protein S is a co-factor for activated protein C; Acquired: malignancy (migratory thrombophlebitis), myeloproliferative disorders, paroxysmal nocturnal haemoglobinuria (PNH), SLE (anti-phospholipid syndrome), pregnancy, oestrogen therapy, postoperative, nephrotic syndrome (acquired antithrombin III deficiency), hyperlipidaemia and homocystinuria. Glanzman's syndrome is a platelet defect (absence of platelet glycoprotein Ib receptor for vWF) and is associated with bleeding rather than thromboses.

Question 4

A. FALSE B. FALSE C. TRUE D. TRUE E. FALSE

Cystinosis (AR) is an example of a lysosomal storage disease resulting in excess intracellular cysteine deposition. Patients exhibit a Fanconi-like syndrome with renal failure by their early teens. Adults may display dysphagia from oesophageal dysfunction. Oral cystamine arrests the disease progression by depleting intracellular stores of cysteine. Hartnup's disease is due to defective tubular reabsorption of neutral amino acids. This results in tryptophan malabsorption and nicotinamide deficiency (pellagra). Alport's syndrome (AD) females are mildly affected compared to males. It is associated with mild deafness, lens abnormalities, platelet dysfunction, hyperprolinaemia and mental retardation. Fabry's disease (AR, galactosidase A deficiency) in females is often associated with renal impairment alone. In affected males, other features include corneal dystrophy, angiokeratomas (in a 'swimming trunk' distribution), ischaemic heart disease and acroparasthesiae.

Question 5

A. TRUE B. FALSE C. FALSE D. TRUE E. TRUE

Some drugs are metabolised by enzymes susceptible to polymorphisms which affect their activity. This is the basis of fast and slow acetylation (e.g. hydralazine) and slow and poor metabolism (e.g. debrisoquine). The prevalence of these polymorphisms shows considerable variation between racial groups.

Genetic polymorphisms are determined by abnormalities of gene expression and are not dependent on the pharmacological actions of the drug. However, the consequences of poor metabolism of a particular drug are clearly dependent on its pharmacological actions: drugs with a steep dose-response curve or a low therapeutic index may well produce toxic effects in poor metabolisers.

Question 6

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Kaposi's sarcoma is thought to arise from proliferating vascular and lymphoid cells. It is commonly seen in homosexual patients with AIDS and faeco-oral contact seems to predispose for this. It is occasionally seen in intravenous drug users with AIDS but rarely occurs in haemophiliacs with AIDS. There is recent evidence that a novel Herpes virus (HHV-8) may be involved in the pathogenesis of Kaposi's sarcoma and can be detected by PCR in these lesions. It is associated with the HLA DR5 haplotype. Local radiotherapy and local or systemic chemotherapy are effective in controlling the spread of the lesions.

Question 7

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Other recognised causes of acute hepatic vein thrombosis include polycythaemia rubra vera, myeloproliferative disease, lupus, tumours, alcoholic hepatitis, oral contraceptive use, severe dehydration (in children) and parturition.

Congenital hepatic fibrosis causes portal hypertension (pre-sinusoidal). Leptospirosis (Weil's disease) presents acutely with fever, jaundice, headache, conjunctival infection, myositis (painful calves), purpura and bleeding. Meningitis, myocarditis and renal failure may develop. Diagnosis: blood, urine and CSF culture, Schuffner agglutination test and complement fixation test.

Treatment: penicillin.

Question 8

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Coma may be the presenting feature of hypothyroidism in the elderly and may be complicated by severe hypothermia. Other features include hyporeflexia, bradycardia and seizures.

Precipitants include sepsis, acute MI, stroke, immobility or trauma.

After taking blood for T3, T4 and TSH (and excluding other causes of coma, e.g. hypoglycaemia, etc.) treatment should be started with iv T3 or T4; hydrocortisone should be given if pituitary hypothyroidism is suspected. Treat hypothermia and heart failure in the standard way. Survival approx. 80% with appropriate therapy.

Question 9

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

The commonest manifestation of seroconversion following HIV infection is a mononucleosislike syndrome. Other recognised syndromes include aseptic meningoencephalitis, encephalopathy, myelopathy and peripheral neuropathy. In many individuals, seroconversion is subclinical.

Following the acute infection (stage I), individuals are usually asymptomatic for 3-4 years (stage II) before developing persistent generalised lymphadenopathy (non-tender; stage III). Patients developing other disease are classified as stage IV. Predictors of progression to AIDS include: clinical features (fever, weight loss, oral hairy leukoplakia) and laboratory investigations (anaemia, reduced haematocrit, fall in CD4 count, raised ESR, rise in p24 antigen). The drug of choice for pneumocystis is cotrimoxazole. Pentamidine may be used in patients intolerant to cotrimoxazole.

Question 10

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

There is no effective therapy for patients with ankylosing spondylitis. Pain relief with NSAIDs remains the mainstay to allow the patients to exercise and remain mobile.

Pain diminishes as the joints fuse and recurrence of pain suggests fracture or infection.

Question 11

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Primary adrenal failure is associated with hyperpigmentation (palmar creases and buccal mucosa of Caucasians). In patients where this is due to an autoimmune process, other autoimmune disorders such as vitiligo, diabetes mellitus and myasthenia gravis are more common. Common abnormalities on investigation include eosinophilia (mechanism unknown), low sodium, raised or normal potassium, raised urea, mild metabolic acidosis, hypocalcaemia or hypercalcaemia

(seen in about 6%, mechanism uncertain). The ECG shows low voltage QRS complexes and T waves (the hyperkalaemia is usually too mild to produce any of the typical changes), prolongation of the PR interval and the corrected QT interval. The patients have an increase in ADH secretion (in response to the hypovolaemia produced by hypoadrenalism) and so exhibit a delay in the excretion of a free water load (this may be used as a diagnostic test). Patients with secondary adrenal failure usually exhibit pallor (due to pituitary failure). In these patients, aldosterone is preserved so the electrolytes are less affected. However, the patients may still get hypovolaemia from diarrhoea and vomiting or diabetes insipidus (resulting in raised urea), and hyponatraemia due to SIADH or hypothyroidism.

Question 12

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

For a pheochromocytoma, beta-blockers are contraindicated as monotherapy as unopposed alpha adrenoreceptor stimulation would precipitate a hypertensive crisis. Alpha blockade is required in addition. Propranolol is effective as prophylaxis for migraine and as therapy for benign essential tremor and thyrotoxicosis. However, patients with thyroid storm require urgent measures to reduce thyroid synthesis in addition (potassium iodide and propyl thiouracil).

Question 13

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Patients with acromegaly have hypercalciuria and renal stones (direct action of GH on renal tubules) but rarely have hypercalcaemia (only where acromegaly forms part of multiple endocrine neoplasia type I: parathyroid hyperplasia, pituitary and pancreatic tumours). There is an increased risk of colonic polyps which may be malignant. Excessive daytime drowsiness is seen as an enlargement of the tongue produces obstructive sleep apnoea. Other features include DM, osteoarthritis, carpal tunnel syndrome, hypertension, cardiomyopathy and skin tags. Biochemical abnormalities include raised serum phosphate, hyperglycaemia, raised triglycerides and prolactin.

Growth hormone secretion is stimulated by high protein meals and suppressed by glucose in normal individuals. In acromegaly, basal growth hormone levels are raised and these fail to suppress after a glucose load; other conditions where GH fails to suppress include poorly controlled diabetes mellitus, myxoedema, Cushing's syndrome and anorexia nervosa.

The major cause of morbidity and mortality in patients with acromegaly is cardiovascular (myocardial infarction).

Question 14

A. FALSE B. TRUE C. FALSE D. TRUE E. FALSE

Other disorders with autosomal recessive inheritance you should know about include cystic fibrosis, sickle cell anaemia, beta thalassaemia, galactosaemia, phenylketonuria, infantile polycystic kidney disease and Tay Sachs's disease.

Autosomal dominant disorders that appear in MRCP:

Neurofibromatosis, tuberous sclerosis, myotonic dystrophy, Huntington's disease, Marfan's syndrome, acute intermittent porphyria, familial hypercholesterolaemia, familial adenomatous polyposis, adult polycystic kidney disease.

X-linked recessive disorders: Haemophilia, Duchenne muscular dystrophy, G6PD deficiency, testicular feminization syndrome, Alport's syndrome, Lesch-Nyhan syndrome.

Question 15

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Polycythaemia rubra vera (PRV) results from a clonal abnormality of the pluripotent stem cell and is characterised initially by autonomous proliferation of erythroid lineage - later, patients may progress to acute myeloid leukaemia or myelofibrosis. Symptoms are non specific (headache, dizziness, vertigo, tinnitus, etc.).

Pruritis after hot baths is seen in ~40% due to granulocyte histamine release. Haemorrhage (epistaxes, retinal, gingival or GI bleeding) or venous thromboses may occur. There is an elevated red cell mass with normal (or mildly elevated) plasma volume. ESR is low (as RBC falls slowly). Leukocyte alkaline phosphatase is usually elevated (cf. CML where low), ~30% have elevated serum B₁₂ and ~75% have raised B₁₂ binding capacity (due to increased transcobalamin-III). Treatment: Phlebotomy, ³²P, hydroxyurea or busulphan. Avoid Fe-deficiency (small RBCs are more viscous) so monitor MCHC and keep >22.

Raised erythropoietin is seen with secondary polycythaemia.

Causes include smoking, high altitude, chronic lung disease and hypoxia, cyanotic heart disease and renal disease (renal cysts, hydronephrosis, nephrotic syndrome, diffuse renal parenchymal disease and Bartter's syndrome and up to 15% of renal transplant recipients), Wilm's tumour, hepatocellular carcinoma, adrenal tumours, cerebellar haemangioblastoma (von Hippel Lindau) and uterine fibroma.

Question 16

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Paralysis of VIIth cranial nerve: often idiopathic but there may be a viral aetiology with demyelination. Cranial nerves V, IX and X and C2 may also be involved but are not strictly part of Bell's palsy.

Bilateral palsy suggests other diagnoses e.g. carcinomatous meningitis,

Lyme disease, HIV, sarcoid, etc. Facial myokymia (flickering of facial muscles) is a feature of multiple sclerosis.

Associations include diabetes mellitus, severe hypertension, 3rd trimester of pregnancy, dental anaesthesia and cold exposure. Hyperacusis is due to involvement of the branch to stapedius.

Loss of taste and numbness of the tongue may also occur. (Facial numbness suggests Vth nerve involvement; scalp tingling -C2 nerve; loss of gag reflex - IXth nerve; palatal weakness - Xth nerve.) Crocodile tears are due to reinnervation by the tympanic branch of the glossopharyngeal nerve which also supplies the parotid nerve via the lesser superficial petrosal nerve. Treatment: prednisolone 80 mg/day tapering over 10 days may improve recovery.

Question 17

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

The following are diagnostic features on a blood film:

- Basophilic stippling - seen in beta-thalassaemia and lead poisoning;
- Target cells - liver disease, sickle cell disease and thalassaemia; low numbers in iron deficiency;
- Heinz bodies - denatured Hb seen in G6PDH deficiency;
- Howell-Jolly bodies - RNA remnants seen in HYPOsplenism;
- Cabot's rings - RNA/DNA remnants in thalassaemia and B₁₂ deficiency;

- Pappenheimer bodies - granules of siderocytes: seen in lead poisoning, carcinomatosis and post splenectomy;
 - Parasitic inclusions (malaria, babesiosis);
 - Spherocytes - hereditary spherocytosis, immune haemolytic anaemia (IgG mediated), hypersplenism;
 - Schistocytes (fragmented red cells) - valve disease and prosthesis, microangiopathic disorders (DIC, TTP, HUS).
- Causes of macrocytosis - alcohol, coeliac (folate/B₁₂), hypothyroidism, pregnancy, phenytoin, AZT, azathioprine, myelodysplasia and PNH.

Question 18

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

The clinical manifestations of iron deficiency result from tissue iron depletion. Epithelial tissues are most affected. The glossitis is usually painless and associated with atrophy of the papillae (vitamin B₁₂ deficiency is associated with a painful glossitis). Nail changes include spoonshaped deformity (koilonychia) and brittleness. Dysphagia and iron-deficiency anaemia are seen in the Plummer-Vinson syndrome (Patterson-Kelly-Brown syndrome). Dermatitis herpetiformis is associated with a gluten-sensitive enteropathy with features similar to coeliac disease: iron deficiency and anaemia may be seen. The condition responds to dapsone.

Question 19

A. FALSE B. TRUE C. FALSE D. FALSE E. TRUE

Enterococci are sensitive to penicillins but not highly so and require treatment with other agents, e.g. aminoglycosides.

Streptococcus agalactiae is frequently associated with colonic tumours. Indolent infection is usually due to *Staph. epidermidis*.

Anticoagulation does not reduce the risk of embolic phenomena and increases the risk of bleeding from mycotic aneurysms.

Mycotic aneurysms typically affect the cerebral circulation and may rupture late (after many years).

Question 20

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

The JVP is described as having two positive waves (a and v) separated by two descents (x and y). The a wave occurs due to atrial systole (just prior to the carotid pulse). Large a waves are seen in conditions with a raised RVEDP (e.g. pulmonary hypertension). 'Cannon' a waves are produced by atrial contraction against a closed tricuspid valve and are seen in complete heart block, ventricular ectopics, junctional tachycardia. The a wave is absent in atrial fibrillation. The x descent is due to a fall in atrial pressure during ventricular systole as the base of the heart moves caudally. The v wave is a rise in venous pressure due to atrial filling before the tricuspid valve opens. The y descent reflects opening of the tricuspid valve and fall in atrial pressure. The third heart sound is in time with the y descent. Other waves described are the c wave (the effect of tricuspid closure - not visible) and the s wave (fusion of the x descent and v wave due to tricuspid regurgitation with a prominent y descent). Fixed elevation of the JVP is seen in SVC obstruction.

Question 21

A. TRUE B. TRUE C. FALSE D. FALSE E. TRUE

Aspirin should be avoided by patients with chronic HBV hepatitis as it may precipitate Reye's syndrome. Interferon-alpha produces remission in 10-30% only. Factors favouring a response to interferon include non-Asian, female, high pretreatment ALT and low pre-treatment serum HBV DNA. ALT falls and serum HBV DNA disappears with successful therapy together with the appearance of anti-HBe antibody. Established cirrhosis is a contraindication to treatment with interferon. Steroids are theoretically dangerous with active viral replication.

Causes of deterioration in LFTs of HBsAg positive patient: delta superinfection, hepatoma, drug toxicity, alcohol and progression of liver disease.

Question 22

A. TRUE B. TRUE C. TRUE D. TRUE E. FALSE

Proximal RTA (type II) is characterised by diminished bicarbonate resorption from the proximal tubules. As with type I RTA, it results in a normal anion-gap metabolic acidosis (low bicarbonate, raised chloride and, inappropriately, alkaline urine in the face of acidosis. In addition there are multiple defects in resorption of amino acids, glucose, phosphate, urate, etc. It presents with polyuria, thirst, myopathy, osteomalacia and/or rickets. It may be primary as part of Fanconi's syndrome or secondary to heavy metal poisoning, Wilson's disease, paraproteinaemias, cystinosis, medullary cystic disease, transplant rejection, nephrocalcinosis and acetazolamide use. Osteomalacia is more common than in type I RTA. Treatment is with oral bicarbonate but typically high doses are required as the disease is resistant to this.

Question 23

A. TRUE B. TRUE C. TRUE D. TRUE E. FALSE

Gluconeogenesis can take place from lactate, glycerol (from triglyceride metabolism) and amino acids. 90% occurs in the liver in the initial stages, but as the body continues in a state of starvation, other organs can contribute; the kidney may later produce up to 50% of the body requirement of glucose. Lipolysis releases triglycerides which are broken down to glycerol and free fatty acids. These are metabolised to acetyl CoA and diverted to ketone body production as acetyl CoA cannot directly be used for gluconeogenesis.

Question 24

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Features of an inflammatory arthropathy include constitutional symptoms (low-grade fever, malaise, weight loss, etc.) and prolonged early morning stiffness. Thrombocythaemia is a marker of an acute inflammatory response (along with raised ESR, CRP, etc.). Joint effusions rarely occur in non-inflammatory arthritis and suggest infection and/or inflammation.

Question 25

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Type I neurofibromatosis (von Recklinghausen's disease) is autosomal dominant (gene on Chromosome 17). Clinical manifestations include:

1. Skin: Cafe au lait spots: more than 5, >1.5 cm diameter, axillary freckling, subcutaneous or dermal nodules;

2. Pulmonary fibrosis and 'honeycomb' appearance on CXR. Rib notching from neurofibromata may also be seen on the CXR;
3. Eyes: Lisch nodules in iris (melanocytic hamartomas), retinal white dots (astrocytic hamartomas) and exophthalmos;
4. Sarcomatous change occurs in 5-15% of neurofibromata. Nerve compression;
5. Other tumours: Gliomas, meningiomas, medulloblastomas, pheochromocytoma and medullary carcinoma of thyroid.

Question 26

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Other causes of intracranial calcification include craniopharyngioma, pineal, tuberous sclerosis, toxoplasmosis, CMV, TB, cystercicosis, berry aneurysm.
Hyperparathyroidism causes basal ganglia calcification.

Question 27

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Other features include flapping tremor, hyporeflexia, muscle twitching, sweating, headache, bounding pulse, retinal vein distension; if $\text{CO}_2 > 120$ mmHg, then coma and extensor plantars.

Question 28

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Secondary erectile dysfunction commonly results from anxiety about sexual performance. It may be present only in certain situations or with certain partners. Incidence increases with age and may be precipitated by heavy alcohol intake. A rigid upbringing where any expression of sexuality was discouraged is more usually associated with primary erectile dysfunction.

Question 29

A. FALSE B. TRUE C. FALSE D. FALSE E. TRUE

Sexual impotence, mutism and impaired cognition due to impaired concentration may be seen in either depression or dementia and do not aid the differential diagnosis. Faecal incontinence and antisocial behaviour are very rare in depression.

Question 30

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Chlamydia trachomatis is hyperendemic in some parts of the world and is the commonest avoidable cause of blindness worldwide (keratitis). In neonates it can produce a severe pneumonia. *C. psittaci* is the cause of psittacosis, an atypical pneumonia in individuals exposed to birds (e.g. pigeons). It can rarely cause a myocarditis and endocarditis. Diagnosis is by serology. *C. pneumonia* (also known as the TWAR agent) is a common cause of pneumonia in Finland. It produces an atypical pneumonia (similar to psittacosis) but is a prolonged illness with prominent pharyngitis and laryngitis. The organism is resistant to erythromycin (unlike *C. psittaci*) and treatment is with tetracycline. Radiological features are non-specific with patchy shadows in the lung fields; lobar consolidation is rare.

Question 31

A. FALSE B. TRUE C. FALSE D. TRUE E. FALSE

The calcium antagonists inhibit calcium INFLUX not efflux. Diltiazem is a benzothiazepine that is a potent coronary vasodilator but less potent on other vascular beds. Its effect on the AV node is to increase the refractory period and slow the heart rate, which makes it useful for treating SVTs. Nifedipine is not licensed for use in pregnancy. There are some reports of teratogenicity in animals but not humans. Other causes of gum hypertrophy include cyclosporin, chronic myelomonocytic leukaemia and phenytoin. Phenytoin is the drug of choice for arrhythmias from digoxin toxicity.

Question 32

A. FALSE B. TRUE C. FALSE D. FALSE E. TRUE

The skin in pemphigoid usually shows erythema before vesicles/blisters develop. 80% of patients are > 70 years old. Treatment is with steroids (~40 mg/day). Pemphigus occurs in younger patients and often presents with oral ulcers. The vesicles are very fragile and rarely intact on presentation. Patients require massive doses of steroids (120-240 mg/day) - the disease rarely remits spontaneously.

Differential diagnosis is dermatitis herpetiformis. This is associated with gluten enteropathy and HLA B8. Patients tend to be aged 30-40 years, M>F and are affected on extensor surfaces (elbows, knees, buttocks,) shoulders, face and scalp. The vesicles are initially 'herpes-like' in appearance (i.e. vesicles over red base). IgA and C3 are found at the dermo-epidermal junction on immunofluorescence. Treatment: dapsone reduces itching within 72 hours, gluten free diet.

Question 33

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

Plasma alkaline phosphatase is also elevated in biliary disease (e.g. primary biliary cirrhosis, sclerosing cholangitis, other causes of cholestasis). The bone isoenzyme is elevated in conditions with high bone turnover, e.g. healing fractures, osteomalacia, hyperparathyroidism, Paget's, bone metastases (thyroid, breast, lung, kidney and prostate), osteogenic sarcoma, growing children, renal failure, etc. The placenta produces a separate isoenzyme.

In acute intermittent porphyria, serum bilirubin and transaminases rise but there is usually no rise in alkaline phosphatase.

Osteogenesis imperfecta has many different clinical forms. The adult (tarda) form is autosomal dominant - patients have blue sclerae, joint and skin laxity and suffer otosclerosis in middle age (deafness). There is a spectrum of severity, the most severe form being fatal after a few days.

Other conditions associated with a blueish tinge to the sclerae include Marfan's syndrome, Pseudoxanthoma elasticum and Ehlers-Danlos syndrome.

Question 34

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

The normal PaO₂ does not suggest a primary pulmonary pathology and excludes a pulmonary embolus. Hyperventilation is a feature of salicylate poisoning, not paracetamol.

Question 35

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Retroperitoneal fibrosis is commonly idiopathic. Recognised aetiological associations include methysergide, amphetamines, ergotamine, carcinoma, Crohn's disease and connective tissue

diseases. There is an increased association with other fibrotic diseases, e.g. sclerosing cholangitis, fibrosing alveolitis, Riedel's thyroiditis, Peyronie's disease, constrictive pericarditis, coronary artery fibrosis and mediastinal fibrosis. Ureters classically deviate medially but the lumen is rarely occluded. It is important to exclude TB before starting steroid therapy.

Question 36

A. TRUE B. FALSE C. FALSE D. FALSE E. TRUE

Cryoglobulinaemia is divided into three types on the basis of the abnormal immunoglobulin found. Type I is associated with monoclonal immunoglobulin (IgM, A or G, or Bence Jones protein) and is associated with myeloma, Waldenstrom's and chronic lymphocytic leukaemia. Patients with type II (mixed essential) cryoglobulinaemia have mixed cryoglobulins (IgM, IgG and IgA) but with a monoclonal rheumatoid factor (usually of the IgM isotype).

Type II is associated with lymphoproliferative diseases, rheumatoid arthritis and Sjögren's syndrome. Renal involvement is rare - mesangiocapillary GN is the commonest type of renal lesion seen and is frequently fatal.

Type III is associated with polyclonal rheumatoid factors. Disease associations include infections (EBV and CMV, Kalar-Azar, leprosy, HBsAg positive, post-streptococcal GN, infective endocarditis), SLE, RA and primary biliary cirrhosis.

Question 37

A. TRUE B. FALSE C. FALSE D. TRUE E. TRUE

Parasites associated with eosinophilia include:

Protozoa - *isospora belli*;

Nematodes - *strongyloides stercoralis*, *ascaris lumbricoides*, *trichinosis*, *toxocara canis*, filarial infections (*wucheria bancroftii*, *loa loa*, *onchocerca volvulus*);

Cestodes - *echinococcus*, *taenia solium* and *saginata*;

Trematodes - *schistosomiasis*, *clonorchis sinensis*, *fasciola hepatica*.

There is usually NO eosinophilia with *giardia*, *leishmaniasis*, *Entamoeba histolytica* and *Enterobius* infections.

Non-infective causes of eosinophilia include drug allergy, asthma (especially allergic bronchopulmonary aspergillosis), polyarteritis nodosa, Hodgkin's disease and postsplenectomy.

Question 38

A. TRUE B. FALSE C. FALSE D. TRUE E. TRUE

Other non-metastatic manifestations include: ectopic ACTH and PTH secretion, SIADH, hypercalcaemia (squamous cell), thyrotoxicosis, encephalopathy, motor neurone disease and myelopathy, peripheral neuropathy, thrombophlebitis migrans, TTP, DIC, hypertrophic pulmonary osteoarthropathy, dermatomyositis and acanthosis nigricans.

Question 39

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Patients with Sjögren's syndrome present with the combination of keratoconjunctivitis sicca (dry, itchy eyes due to decreased lacrimation), xerostomia (dry mouth from decreased saliva) and features of connective tissue disease (rheumatoid arthritis in up to 50%). Other clinical features include dry skin, dysphagia, pulmonary infections, renal involvement (renal tubular acidosis), peripheral neuropathy, hepatosplenomegaly and lymphoma. Patients are nearly all rheumatoid

factor positive and anti-Ro (SSa) and anti-La (SSB) positive also. Schirmer's test is for lacrimation and is positive in Sjögren's. Sjögren's syndrome is associated with HLA-DR4. HLA associations: HLA-DR2 and narcolepsy, Goodpasture's, multiple sclerosis, SLE; HLA-A3 and -B14 and haemochromatosis; HLA-B5 (and -B12) and Behçet's disease, Takayasu's arteritis; HLA-B35 and viral thyroiditis; HLA-DR3 and primary Sjögren's syndrome, coeliac disease, SLE; HLA-DR4 and rheumatoid arthritis, secondary Sjögren's syndrome.; HLA-DR5 and pernicious anaemia, Hashimoto's thyroiditis.

Question 40

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Patients with polyarteritis are typically middle aged and males are affected more than females. Symptoms include fever, weight loss, myalgia, arthralgia, renal impairment (usual cause of death), hypertension, peripheral neuropathy, lung disease (asthma, ? Churg Strauss variant), arrhythmias and congestive cardiac failure. Investigations - none is specific; neutrophils, eosinophils and ESR are raised. Complement levels are usually normal. Angiography may show aneurysmal dilatation of medium and large arteries. Treatment is with corticosteroids and azathioprine.

Question 41

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

There are three distinct pathologies caused by aspergillus: bronchopulmonary aspergillosis (BPA), invasive aspergillosis and aspergilloma.

Bronchopulmonary aspergillosis (BPA): this is allergic (type I) characterised by worsening asthma, plugs of red-brown sputum containing the organism, peripheral blood eosinophilia, elevated total IgE and aspergillus-specific IgE and IgG. Patients test positive on skin-prick testing. On CXR, the upper lobes are preferentially involved and the patients develop upper lobe bronchiectasis. The symptoms and signs respond to steroids.

Invasive aspergillosis occurs in immunocompromised individuals and carries a high mortality. Typically, there is no elevation in total or specific IgE. Treat urgently with intravenous amphotericin.

Aspergilloma: results from colonisation of a previous lung cavity by the fungus. Patients may present with massive haemoptysis due to erosion into a bronchial artery. Aspergillus precipitins and eosinophilia are typically present. Treat conservatively (bronchial artery embolisation) or with surgery.

Question 42

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

In patients with mixed mitral valve disease it is often difficult to distinguish clinically the dominant lesion. The factors favouring mitral incompetence are a displaced, volume overload (thrusting) apex beat and a soft first heart sound. In addition, the presence of a third heart sound is incompatible with any degree of mitral stenosis. A loud first heart sound and a tapping, non-displaced apex beat suggest predominant stenosis. Usually cardiac catheterisation is necessary to resolve the issue (and will usually be required prior to surgery). A parasternal heave suggests pulmonary hypertension and right ventricular hypertrophy and may occur with either lesion.

Question 43

A. FALSE B. FALSE C. FALSE D. TRUE E. TRUE

Haemophilia is an X-linked disorder resulting from a deficiency of factor VIII. The severity of bleeding disorder reflects the level of factor. Aspirin inhibits platelet function and is contraindicated in patients with haemophilia. Haematomas usually do not require decompression and may be managed by bed-rest and factor replacement. A Factor VIII level of 30% is enough to control a haemarthrosis, but for surgery it is usual to aim for 100%.

DDAVP produces a rise in Factor VIII and avoids the risks of Factor IV. Haemophilia management: soft tissue haematomas need bed-rest and Factor VIII. DDAVP stimulates the immediate release of Factor VIII:C and von Willebrand factor (vWF) from endothelial cell stores and avoids the risks of factor transfusions.

However, repeat doses are only fully effective when given about 48 hours later. It has no effect on Factor IX:C levels (Christmas disease). Compared to Factor VII, a larger volume of Factor IX diffuses into the extravascular tissues and the half-life of infused Factor IX is longer than that of Factor VIII.

Question 44

A. TRUE B. FALSE C. FALSE D. FALSE E. TRUE

Subacute sclerosing panencephalitis is thought to be caused by reactivation of measles virus often 6 or more years after primary infection, producing slow deterioration and usually leading to death.

Creutzfeldt-Jakob disease is a spongiform encephalopathy thought to be caused by a prion (an 'infective' particle that appears to consist entirely of protein and no DNA or RNA). It is related to bovine spongiform encephalopathy (BSE) and scrapie in sheep. The infective agent is ingested and, after an incubation period of years, clinical features (seizures, dementia, gait disturbance) develop. Recently, a new variant of spongiform encephalopathy has been identified that may have developed by cross-species transmission of BSE; the evidence for this is scant. CSF gammaglobulins are not elevated.

Progressive multifocal leukoencephalopathy is an infection caused by the Creutzfeldt-Jakob virus and produces progressive demyelination - CSF total protein may be increased but gammaglobulins are normal.

Question 45

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Other causes of deterioration include pregnancy, thyrotoxicosis, sepsis, aminoglycosides, CNS depressants, D-penicillamine, hypokalaemia.

Question 46

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Sarcoidosis is a non-caseating granulomatous disorder of unknown aetiology. On the basis of radiology it is divided into 4 stages (0 = normal CXR, 1 = bilateral hilar lymphadenopathy (BHL), 2 = BHL and infiltration of lung parenchyma, 3 = pulmonary infiltration without BHL).

Any organ system may be affected; heart failure is usually due to cardiac infiltration.

Lofgren's syndrome is the association of BHL, erythema nodosum, anterior uveitis and joint pains and up to 80% will show spontaneous remission. Heerfordt syndrome is bilateral parotid enlargement, facial palsy and uveitis. Lacrimal involvement gives sicca syndrome.

Diagnosis: serum ACE is raised in 65% of patients with active disease and correlates with

disease activity, but it is non-specific and is raised in a number of other conditions also (TB, asbestosis, silicosis, lymphoma). The CD4:CD8 ratio is increased. Tuberculin test is negative in most patients and the Kveim test is positive in 85% of acute disease and 35% of chronic disease (and up to 40% of patients with Crohn's disease). Transbronchial biopsy is positive in the majority of patients with BHL. Hypercalcaemia is due to increased production of 1,25-vit D3 by the sarcoid macrophages.

Treatment: corticosteroids are indicated for uveitis, CNS sarcoidosis, significant pulmonary involvement. Hypercalcaemia also responds to steroids. Benefits in cardiac sarcoid are variable.

Question 47

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

The biochemical picture of pyloric stenosis (mimicked to some extent by bulimia) consists of metabolic alkalosis with respiratory compensation and dehydration.

Question 48

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Section of the femoral nerve produces loss of sensation over the medial aspect of the thigh and leg (medial femoral cutaneous and saphenous nerves). Quadriceps is paralysed and there is loss of extension of the knee joint. Deep peroneal nerve loss produces foot drop due to the unopposed action of tibialis posterior causing inversion of the foot. The only cutaneous loss is over the first interdigital cleft. Section of the obturator nerve rarely causes cutaneous anaesthesia but adduction is limited to those fibres of adductor magnus supplied by the sciatic nerve. The tibial nerve innervates the skin over the back of the leg and the lateral border of the foot through its sural branch.

Question 49

A. TRUE B. TRUE C. TRUE D. TRUE E. FALSE

Acutely, cocaine produces a stimulated euphoric feeling in the user. Other features include irritability, acute anxiety, paranoid ideation, hypertension, tachycardia, cardiac dysrhythmias, dilated pupils (responsive to light), dry mouth, aggression, hallucination (typically formication - tactile sensations on the skin), increased deep-tendon reflexes and respiratory arrest in overdose. Chronic use, in addition, produces impaired concentration, erectile and ejaculatory dysfunction, hypersomnia, psychotic symptoms (persecutory delusions, ideas of reference, etc.), nasal septal perforation from snorting, endocarditis from intravenous use and seizures from overdose.

Question 50

A. FALSE B. FALSE C. TRUE D. FALSE E. TRUE

Jervell-Lange-Nielson syndrome: autosomal recessive; associated with deafness.

Romano-Ward: autosomal dominant, 3 different mutations:

- Chromosome 3 - sodium channel;
- Chromosome 7 - potassium channel;
- Chromosome 11 - mutation unknown.

~10% of affected individuals have a normal QT interval.

Effective therapy: beta-blocker therapy, cervical sympathectomy (left-side mainly) and prophylactic pacing reduce the risk of syncopal episodes.

Poor prognostic features are:

- Positive family history of syncope or sudden death;
- QTc > 0.54 s;
- Congenital deafness;
- AV block;
- Documented ventricular arrhythmias.

Other causes of long QT interval:

- Metabolic - hypocalcaemia, hypomagnesaemia;
- Drugs - quinidine, disopyramide, amiodarone, sotalol, terfenadine, chlorpromazine.

Question 51

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Stimulation of the right vagus nerve slows the rate of sinus node depolarisation whilst stimulation of the left vagus nerve delays atrioventricular conduction. The myocardium has a very high oxygen extraction ratio and venous blood from the heart always has a low oxygen content. Exercise and tachycardia increase the myocardial oxygen demand and result in coronary vasodilatation, increasing oxygen delivery. Stenoses prevent this and diminish the coronary flow reserve. Hyperbaric oxygen conversely causes coronary vasoconstriction. Adenosine causes coronary (and peripheral arteriolar) vasodilatation. However, it has a very short half life and needs to be injected directly into the coronary arteries for this effect.

Question 52

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Pulmonary involvement in rheumatoid arthritis may precede the onset of arthritis. Commonly it produces pleural adhesions and effusions (typically the effusion has low glucose). Obliterative bronchiolitis is a rare but recognised complication and may respond to steroid therapy. Stridor is due to involvement of the cricoarytenoid joints and may be accompanied by dyspnoea and occasionally obstruction necessitating tracheostomy. Rheumatoid nodules, single or multiple, may occur in the lungs and frequently cavitate. Caplan's syndrome occurs in patients exposed to coal or other inorganic dusts. There is massive pulmonary fibrosis and nodule formation. Pulmonary fibrosis is less common but occurs with chronic disease.

Question 53

A. TRUE B. FALSE C. FALSE D. FALSE E. TRUE

Anaphylactic shock may be precipitated by an allergic reaction to a drug. Features are profound vasodilatation and hypotension, urticaria, bronchospasm. Mediators are histamine (acting via H₁ not H₂ receptors), bradykinin and other mast-cell-derived vasodilators. For shock, immediate intramuscular adrenaline is the preferred treatment and patients will require fluids, intravenous inotropes, H₂ antagonists, corticosteroids and inhaled bronchodilators.

Question 54

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

Dissecting thoracic aortic aneurysms carry a very high mortality: if untreated, 50% die within 48 hours, up to 70% within 1 week and 90% within 3 months. Patients are commonly men aged 40-70 (Afrocarribean > Caucasian). Risk factors include hypertension, trauma, coarctation of the aorta, pregnancy, connective tissue disorders (Marfan's, Ehlers-Danlos), SLE, relapsing polychondritis, congenitally bicuspid aortic valve, Turner's or Noonan's syndromes.

Abdominal aortic aneurysms (AAA) carry a low risk of rupture if <5 cm in diameter, but any symptoms suggesting possible rupture (e.g. abdominal discomfort) should prompt careful evaluation for surgery, whatever the size. Ruptured AAA carries a mortality of >50%. Syphilitic aortitis occurs in the late stages of infection (tertiary syphilis). Cardiovascular involvement ranges from uncomplicated aortitis to ascending aortic aneurysms, aortic regurgitation and calcific stenosis of the coronary ostia. The more remote the primary treponemal infection, the less reliable is the VDRL test for syphilitic aortitis (it is more likely to be negative) and FTA or RPR are better tests. Treatment is with penicillin and surgery as appropriate.

Question 55

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

The t-test is used to compare two variables that have a normal distribution and the sample sizes do not have to be the same. A statistically significant result may not be clinically significant and thus it is difficult to say whether one drug is superior to the other - the magnitude of the response needs to be taken into account and there has to be evidence that the effect observed is indeed due to the drug and not confounding variables (e.g. more women in one group, different starting blood pressures, etc.). Confounding variables have to be controlled for, e.g. diabetes and insulin resistance is associated with hypertension and this may influence the response of these patients to the drugs. In observational studies the groups being compared are pre-defined (e.g. with or without the disease) - examples include case-control, cross-sectional and cohort studies. This is an example of an experimental study where the groups are defined by the investigator. Randomisation into treatment or control groups should eliminate selection bias. Single blind studies are ones where either the investigator or patient is unaware of the treatment given. In double-blind studies, neither know.

Question 56

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Somatostatin is a tetradecapeptide synthesised by the "D"-cells of the pancreatic islets. It is also found in the hypothalamus, the stomach and small intestine and in the myenteric and submucosal neural plexuses. It stimulates gastric emptying but inhibits almost everything else (release of insulin, gastrin, CCK, secretin, pancreatic polypeptide, motilin, and VIP from the GI tract). As a result it inhibits gastric acid and pepsin secretion, pancreatic and biliary secretion and coeliac blood flow. Somatostatin from the hypothalamus inhibits GH and LH secretion from the anterior pituitary.

Question 57

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

Renin is released from the juxtaglomerular apparatus in response to decrease in renal blood flow (e.g. pressure changes in the afferent arteriole, sympathetic tone within the renal arterioles), increased chloride (low Na) and osmotic changes in the distal tubule via macula densa and local prostaglandin synthesis. It converts angiotensinogen to angiotensin I; this is converted to angiotensin II by ACE (mainly in the lungs). Angiotensin II stimulates aldosterone release by the zona glomerulosa of the adrenal cortex; other effects include peripheral vasoconstriction and stimulation of thirst.

Increase in serum renin is seen in renal artery stenosis, congestive cardiac failure,

hypovolaemia, hypotension, certain drugs (diuretics, ACE inhibitors, spironolactone) and Addison's disease. Serum renin is reduced by beta-blocker therapy, ANP or angiotensin II infusion. Hypertension may be associated with a low, normal or high renin.

Question 58

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Patients with primary polydipsia most commonly present with fitting due to severe hyponatraemia. Up to 80% have underlying schizophrenia. Generally associated with a low plasma osmolality (~275 mOsm/kg cf. nephrogenic diabetes insipidus where the plasma osmolality rarely falls below 295 mOsm/kg). Diagnosis is by water deprivation test: the normal response is to concentrate the urine (urine osmolality > 800 mOsm/kg); in patients with psychogenic polydipsia the urine osmolality may rise slightly but unless they are contained and prevented access to water scrupulously, the rise is less than normal. In diabetes insipidus the urine remains abnormally dilute (urine osmolality < 400 mOsm/kg).

Persistent hypokalaemia can damage the renal tubules and results in polyuria due to nephrogenic diabetes insipidus. Other causes of this include hypercalcaemia, lithium, demeclocycline and intrinsic renal disease..

Question 59

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

In addition, tall R waves are also seen following posterior myocardial infarction ('upside down' q wave), right ventricular hypertrophy, Friedreich's ataxia and hypertrophic cardiomyopathy.

Question 60

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Diazepam is metabolised to nordiazepam which is further metabolised to oxazepam, both of which are still active benzodiazepines. Amitriptyline is metabolised to nortriptyline which is still an active tricyclic antidepressant. Zidovudine is an inactive pro-drug and is metabolised to zidovudine triphosphate which is the active drug. Other drugs with active metabolites include heroin and codeine (to morphine), propranolol (to 4-hydroxy propranolol), imipramine (to desmethylinipramine). Pro-drugs that require activation include cortisone (to hydrocortisone), prednisone (to prednisolone), cyclophosphamide (to phosphoramide mustard), azathioprine (to mercaptopurine) and enalapril (to enalaprilat).

Exam 3

Question 1 The following statements are true:

- A. In aminoglycoside-induced renal failure full recovery is usually complete within a few weeks of stopping the drug
- B. In analgesic-nephropathy there is an increased incidence of transitional cell carcinoma
- C. A metabolic acidosis can develop with amiloride treatment
- D. Light-chain nephropathy is diagnostic of multiple myeloma
- E. Renal failure is a common end-stage of medullary sponge kidney disease

Question 2 The following are associated with gastrointestinal bleeding:

- A. Dermatitis herpetiformis
- B. Pseudoxanthoma elasticum
- C. Acanthosis nigricans
- D. Psoriasis
- E. Neurofibromatosis

Question 3 Tests used in the diagnostic evaluation of neuromuscular junction diseases include:

- A. Serum creatine kinase
- B. Tensilon test
- C. Acetylcholine receptor antibody
- D. Beta-adrenergic receptor antibody
- E. Repetitive stimulation on EMG

Question 4 Central causes of vertigo include:

- A. Ménière's disease
- B. Benign positional vertigo
- C. Acoustic neuroma
- D. Vestibular neuronitis
- E. Multiple sclerosis

Question 5 The following disorders are associated with bilateral renal enlargement:

- A. Amyloidosis
- B. Renal artery stenosis
- C. Acute interstitial nephritis
- D. Nephrocalcinosis
- E. Radiation nephritis

Question 6 Regarding carcinoma of the lung:

- A. Radiotherapy is the treatment of choice for adenocarcinomas
- B. Exposure to petroleum products increases risk of alveolar cell carcinoma
- C. Adenocarcinomas are commonly peripheral in the lung parenchyma
- D. Alveolar cell carcinoma may be of multicentric origin
- E. Squamous cell tumours metastasise early

Question 7 Intracranial aneurysms:

- A. Are linked to the presence of hypertension in the majority of patients
- B. Are seldom familial
- C. Are associated with polycystic kidney disease
- D. Are multiple in approx. 10-20% of patients
- E. Are most frequently found on the posterior communicating artery

Question 8 An elevated PaCO₂ may be found with:

- A. Severe kyphoscoliosis
- B. Mild uncomplicated asthma
- C. Barbituate overdose
- D. Raised intracranial pressure
- E. Early stages of cryptogenic fibrosing alveolitis

Question 9 The following poisons are matched to the appropriate therapy:

- A. Carbon monoxide hyperbaric oxygen
- B. Organophosphates atropine and pralidoxime
- C. Beta-blocker phentolamine
- D. Methanol ethanol
- E. Tricyclic antidepressants phenytoin

Question 10 The following are associated with pulmonary granulomata:

- A. Sarcoidosis
- B. Histoplasmosis
- C. Chicken pox pneumonia
- D. Berylliosis
- E. Farmers' lung

Question 11 Drugs used in the treatment of Parkinson's disease include:

- A. Amantadine
- B. Benztropine
- C. Chlorpromazine
- D. Selegiline
- E. L-DOPA

Question 12 Diseases associated with pyoderma gangrenosum include:

- A. Diabetes mellitus
- B. Ulcerative colitis
- C. Chronic myeloid leukaemia
- D. Rheumatoid arthritis
- E. Pustular psoriasis

Question 13 Wegener's granulomatosis is associated with:

- A. Asymptomatic pulmonary lesions
- B. Hearing loss
- C. Corneal ulceration

- D. Impaired oesophageal motility
- E. Collapse of the bridge of the nose

Question 14 The following associations are correct:

- A. Sjögren's syndrome antibodies to SS-A
- B. Systemic sclerosis antibody against DNA topoisomerase I
- C. CREST syndrome anticentromere antibody
- D. Dermatomyositis anti-Jo-1 antibody
- E. Mixed connective tissue disease antibody to U1-RNP

Question 15 The following may be used to control the ventricular rate in atrial fibrillation:

- A. Quinidine
- B. Sotalol
- C. Digoxin and verapamil
- D. Amiodarone
- E. Disopyramide

Question 16 Congenital adrenal hyperplasia:

- A. Is most commonly due to 11-hydroxylase deficiency
- B. Causes precocious puberty in girls
- C. Due to 21-hydroxylase deficiency is associated with hypertension
- D. May be treated with dexamethasone
- E. Is characterised by high cortisol levels

Question 17 The following are recognised causes of type II respiratory failure:

- A. Encephalitis
- B. Acute pulmonary oedema
- C. Fascio-scapular humeral muscular dystrophy
- D. Flail chest
- E. Pulmonary embolism

Question 18 The following are recognised features of autoimmune chronic active hepatitis:

- A. Hypergammaglobulinaemia
- B. High titre anti-mitochondrial antibodies
- C. Fibrosing alveolitis
- D. Deforming symmetrical polyarthritis
- E. Coombs' positive haemolytic anaemia

Question 19 The following tests help differentiate stridor from asthma:

- A. Peak expiratory flow rate (PEFR)
- B. Ratio of FEV1 to FVC
- C. Flow/volume loop
- D. Bronchoscopy
- E. Total lung capacity (TLC)

Question 20 Fanconi's syndrome is characterised by:

- A. Aminoaciduria
- B. Hyperkalaemia
- C. Glycosuria
- D. Hypercalcaemia
- E. Phosphaturia

Question 21 The following are associated with a raised CSF protein:

- A. Pyogenic meningitis
- B. Parkinson's disease
- C. Guillian-Barré syndrome
- D. Benign intracranial hypertension
- E. Carcinomatosis

Question 22 In Takayasu's syndrome:

- A. Carotid sinuses are abnormally sensitive
- B. Visual symptoms are prominent
- C. Heart failure is rare
- D. Claudication of the jaws occurs
- E. Bowel ischaemia is common

Question 23 The following are recognised causes of thrombocytopenia:

- A. Pernicious anaemia
- B. Porphyria
- C. HIV infection
- D. Hereditary telangiectasia
- E. Systemic lupus erythematosus

Question 24 A diagnosis of dementia rather than acute confusion is supported by:

- A. A clear consciousness
- B. Diurnal variation
- C. Hyperactivity
- D. Gradual onset
- E. Visual hallucinations

Question 25 The following are recognised adverse effects of NSAIDs on the kidney:

- A. Nephrotic syndrome
- B. Increased sodium wasting
- C. Hyperreninaemic hypertension
- D. Papillary necrosis
- E. Hypokalaemia

Question 26 The following are associated with aortic regurgitation:

- A. Coarctation of the aorta
- B. Relapsing polychondritis
- C. Hypertension

- D. Ankylosing spondylitis
- E. Takayasu's arteritis

Question 27 The following are associated with the development of chondrocalcinosis:

- A. Acromegaly
- B. Homocystinuria
- C. Hypophosphatasia
- D. Hyperparathyroidism
- E. Haemochromatosis

Question 28 The following contribute to hyperkalaemia in patients with mild-moderate renal failure:

- A. Increased potassium intake
- B. Hypoaldosteronism
- C. Impaired renal potassium excretion
- D. Fall in GFR to <30% of normal
- E. Erythropoietin therapy

Question 29 The following are recognised abnormalities in schizophrenic patients:

- A. MRI demonstrates frontal lobe atrophy
- B. Atrophy of the auditory cortex is associated with persistent auditory hallucinations
- C. Increased cerebral ventricular size is associated with poor neuroleptic response and predominance of negative symptoms
- D. PET studies show low metabolic rates in the basal ganglia
- E. Atrophy of the ventral medial nucleus of the hypothalamus is associated with appetite changes

Question 30 In psoriatic arthritis:

- A. The skin rash always precedes the joint manifestations by some years
- B. 15% of patients have sacroiliitis
- C. Involvement of the terminal interphalangeal joints is a common feature
- D. Involvement of larger joints is usually symmetrical
- E. Hydroxychloroquine is a useful treatment

Question 31 Mycoplasma pneumoniae:

- A. Is associated with an autoimmune haemolytic anaemia
- B. May be diagnosed by culture from throat swab
- C. Is associated with an aseptic meningitis
- D. Causes hepatosplenomegaly
- E. May be complicated by erythema nodosum

Question 32 Motor neurone disease:

- A. Commonly presents with upper limb wasting and lower limb spasticity
- B. Is more common in women than men
- C. Responds to treatment with beta-interferon
- D. May involve the brainstem without clinical limb involvement

E. Is associated with a painful sensory neuropathy

Question 33 The following conditions have been linked to DNA triplet repeats:

- A. Cerebellar ataxia
- B. Friedreich's ataxia
- C. Kennedy's disease
- D. Fragile X syndrome
- E. Familial Mediterranean Fever

Question 34 Recognised features of macroglobulinaemia include:

- A. Epistaxis
- B. Retinal haemorrhage
- C. Lymphadenopathy
- D. Hepatosplenomegaly
- E. Nystagmus

Question 35 Generalised pruritis may be caused by:

- A. Low serum iron
- B. Cirrhosis of the liver
- C. Lymphoma
- D. Secondary syphilis
- E. Pregnancy

Question 36 Neurological manifestations of AIDS:

- A. Progressive multifocal leukoencephalopathy (PML) is caused by human papillomavirus
- B. Candida is a major cause of retinitis
- C. Lymphoma in the CNS carries a mean prognosis of 8-12 weeks
- D. Peripheral neuropathy is often asymmetric
- E. HIV-induced dementia is reversible with zidovudine

Question 37 Disseminated intravascular coagulation:

- A. Is often characterised by a neurological presentation
- B. Responds to heparin therapy in the majority of cases
- C. May be caused by an ABO incompatible transfusion
- D. Is characterised by raised fibrinogen levels
- E. Produces thrombocytopenia

Question 38 Regarding prolactinomas:

- A. The majority are macroadenomas
- B. There is tumour expansion in 80% of cases followed for >5 years
- C. Men commonly present with galactorrhoea
- D. Levels of oestradiol and progesterone are usually low
- E. They are associated with an increased incidence of osteoporosis

Question 39 A patient treated with digoxin is likely to develop digoxin toxicity if also given:

- A. Amphotericin B

- B. Cholestyramine
- C. Nifedipine
- D. Quinidine
- E. Amiodarone

Question 40 Concerning oral manifestations of HIV/AIDS:

- A. Acyclovir is used in the treatment of herpes zoster
- B. Caries occurs with increased frequency
- C. Non-Hodgkin's lymphoma usually presents as an intraoral white patch
- D. Lumps due to human papilloma virus infection are especially seen in patients with sexually transmitted disease
- E. Naevus-like patches are a recognised side effect of treatment with zidovudine

Question 41 In hypertrophic cardiomyopathy:

- A. The genetic defect is a point mutation at a single locus on chromosome 14
- B. Dual chamber pacing can reduce the outflow tract gradient and improve symptoms
- C. Non-sustained ventricular tachycardia is a marker for sudden death risk
- D. Patients with recurrent VF may require implantation of a cardioverter defibrillator
- E. Squatting makes the systolic murmur louder

Question 42 Systemic sclerosis is associated with:

- A. Wheezing
- B. Alveolar cell carcinoma
- C. Oesophageal varices
- D. Restrictive lung defect
- E. Recurrent chest infections

Question 43 Concerning thyroid storm:

- A. Propranolol is contraindicated if there are signs of cardiac failure
- B. Carbimazole should be started early
- C. Oral potassium iodide should be given
- D. Steroids may be of value
- E. Radioactive iodine is an effective treatment in this setting

Question 44 In Cushing's syndrome:

- A. Profound hypokalaemia is usually associated with an adrenal tumour
- B. Failure to suppress with low-dose dexamethasone supports the diagnosis
- C. Patients with ectopic ACTH usually suppress with high-dose dexamethasone
- D. The most useful screening test is a 24-hour urinary free cortisol
- E. Metyrapone inhibits 11-beta-hydroxylase and reduces cortisol production

Question 45 The following are common side effects of lithium:

- A. Ataxia
- B. Symptomatic hypothyroidism
- C. Polyuria
- D. Leukocytosis

E. Seizures

Question 46 In acute poisoning:

- A. Activated charcoal increases the elimination of theophylline
- B. Haemodialysis is ineffective for antifreeze ingestion
- C. Protein-bound drugs are removed effectively by haemodialysis
- D. Due to aspirin, simple infusion of sodium bicarbonate is as effective as forced alkaline diuresis
- E. Gastric lavage is of no value more than 5 hours after tricyclic ingestion

Question 47 Concerning drugs used for the treatment of hyperlipidaemia:

- A. 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors reduce cardiac morbidity and mortality post myocardial infarction
- B. Cholestyramine increases the expression of hepatic LDL receptors
- C. Rhabdomyolysis is a recognised side-effect of treatment with 3-hydroxy-3-methylglutarylcoenzyme A reductase inhibitors
- D. 3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors are very effective in homozygous familial hypercholesterolaemia
- E. Fibrates lower triglyceride levels by inhibiting lipoprotein lipase

Question 48 In a well-hydrated, normal individual, the following changes are to be expected 1 hour after changing from the supine to the upright position:

- A. Rise in haematocrit
- B. Fall in venous serum colloid osmotic pressure
- C. Rise in serum vasopressin concentration
- D. Fall in diastolic blood pressure
- E. Fall in rate of urine flow

Question 49 Paget's disease:

- A. There is increased osteoclastic and osteoblastic activity
- B. May present with joint pain and stiffness
- C. Serum acid phosphatase may be elevated
- D. A fall in urinary hydroxyproline and serum alkaline phosphatase with calcitonin predicts pain relief with continued therapy
- E. Sclerosis carries a higher risk of osteogenic sarcoma than porosis

Question 50 Hyponatraemia in a 50-year-old man may be due to:

- A. Conn's syndrome
- B. Nephrotic syndrome
- C. Small cell lung carcinoma
- D. Cirrhosis of the liver
- E. Hypopituitarism

Question 51 Q fever:

- A. The causative agent is a single stranded DNA papovavirus
- B. Is often associated with a granulomatous hepatitis
- C. Subclinical infection is common in the teenage general population
- D. Requires a course of iv penicillin
- E. Can be diagnosed on blood culture

Question 52 In the following causes of metabolic alkalosis, urinary chloride excretion is low:

- A. Bartter's syndrome
- B. Excessive diuretic abuse
- C. Surreptitious vomiting
- D. Primary hyperaldosteronism
- E. Cushing's syndrome

Question 53 In Familial Mediterranean Fever:

- A. The disease does not occur before puberty
- B. Recurrent attacks of arthritis are likely to cause permanent joint damage
- C. The ESR is nearly always raised in an attack
- D. Amyloidosis is unusual in Jewish patients
- E. Colchicine reduces the frequency and severity of the attacks

Question 54 The following statements about the cranial nerves are true:

- A. The oculomotor nerve has the longest intracranial course of all the cranial nerves
- B. The cell bodies of the optic nerve lie in the ganglion layer of the retina
- C. The lingual nerve carries taste fibres from the circumvalate papillae of the tongue
- D. The glossopharyngeal nerve carries taste fibres from the posterior third of the tongue
- E. The vagus nerve supplies cutaneous nerve fibres to the external acoustic meatus

Question 55 Concerning a characteristic that is normally distributed in the population:

- A. The mode and median are the same
- B. The population is normal
- C. The mean is greater than the median
- D. Approx 5% of the population will be greater than 2 standard deviations above the mean
- E. Approx 1% of the population will be greater than 3 standard deviations below the mean

Question 56 Regarding hypersensitivity reactions:

- A. Type II (membrane-bound antigen) is involved in graft rejection
- B. Serum sickness is a type III reaction
- C. Tuberculin reaction is a type III reaction
- D. C1-esterase deficiency is a type I reaction
- E. Contact dermatitis is an example of a type IV reaction

Question 57 The following zoonoses are linked to the appropriate animal host:

- A. Leptospirosis cattle
- B. Yersinia pestis domestic cats
- C. Tularemia sheep

- D. Toxocariasis dogs
- E. Hydatids dogs

Question 58 In a patient with broad complex tachycardia:

- A. Presence of any Q wave in V6 in LBBB pattern tachycardia is strongly suggestive of ventricular tachycardia
- B. P-waves just after every QRS complex are diagnostic of ventricular tachycardia
- C. Variation of the tachycardia cycle length by >10 ms between adjacent beats usually excludes ventricular tachycardia
- D. In a RBBB pattern tachycardia, if the R' is taller than the R wave it is likely to be supraventricular
- E. If no pre-excitation is seen on ECG during sinus rhythm, then it is not an atrio-ventricular reentrant tachycardia

Question 59 The following are likely to cause serious complications during pregnancy:

- A. Mitral stenosis
- B. Secundum atrial septal defect
- C. Ventricular septal defect with normal pulmonary artery pressure
- D. Isolated aortic regurgitation.
- E. Primary pulmonary hypertension

Question 60 Radiological abnormalities of the skeleton are seen in:

- A. Sickle cell disease
- B. G6PDH deficiency
- C. Vitamin C deficiency
- D. Haemophilia
- E. Thalassaemia

Exam 3:

Answers

Question 1

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Aminoglycoside-induced renal failure typically takes days to manifest and it may take months to recover renal function. Analgesic nephropathy is a chronic interstitial nephritis with papillary necrosis initially recognised in patients taking the NSAID phenacetin. It can result in chronic renal failure, recurrent UTIs, renal calculi and defects in urine acidification and sodium excretion. Patients have an increased risk of transitional cell carcinoma of the uroepithelium. Amiloride inhibits a sodium channel in the collecting duct and so decreases acid secretion. Other diuretics promote loss of sodium and chloride and may also result in acidosis. Light-chain nephropathy may occur with multiple myeloma but is also seen with lymphomas. Medullary sponge kidney disease is characterised by dilatation of the renal collecting tubules. Features include hypercalciuria, renal calculi, recurrent UTIs and haematuria. Renal failure is rare.

Question 2

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Dermatitis herpetiformis is a bullous skin disorder associated with gluten sensitive enteropathy

(coeliac disease) and Vitamin K malabsorption.

Pseudoxanthoma elasticum is a disorder of elastin (AR or AD) and the fragile arterioles are prone to spontaneous minor bleeds. Other features of this condition include flexural 'xanthomalike' lesions due to lax skin. Breaks in Bruch's membrane give typical retinal changes – angioid streaks; patients get premature atherosclerosis.

Acanthosis nigricans produces darkened, velvety thickened skin flexures and neck and multiple warty papillomata may be profuse. It is associated with carcinoma of the stomach (and insulin resistance).

Neurofibromatosis can affect any nerve and the neurofibromas may be found in both the small and large bowel.

Question 3

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

The tensilon test is diagnostic for myasthenia gravis: pretreat the patient with atropine to prevent bradycardias and nausea, then test the effects of iv edrophonium and placebo (saline) on muscle power. The test is positive if edrophonium improves power. The false negative rate is approx. 10% due to muscle wasting.

AChR-Ab has ~90% sensitivity; ~70% in pure ocular myasthenia. False positives seen in firstdegree relatives and rheumatoid arthritis patients on D-penicillamine.

The EMG finding of post-tetanic inhibition suggests myasthenia while post-tetanic potentiation occurs with Eaton-Lambert syndrome.

Question 4

A. FALSE B. FALSE C. FALSE D. FALSE E. TRUE

Ménière's disease presents with vertigo, tinnitus and deafness and is thought to be caused by idiopathic dilatation of the endolymph. Treat with prochlorperazine.

Vestibular neuronitis commonly follows a viral infection in younger patients and vascular disease in the elderly. Usually abrupt onset with severe nausea with any movement. May be followed by benign positional vertigo.

Central causes of acute vertigo include multiple sclerosis, brainstem infarct, cerebellar damage (CVA, trauma, etc.), drugs (phenytoin, alcohol). May be seen with Wernicke's encephalopathy.

Question 5

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Bilateral renal enlargement is seen with polycystic kidney disease, medullary sponge disease, amyloidosis, acromegaly, acute interstitial nephritis, acute GN, acute tubular necrosis, acute urate nephropathy and radiation nephritis. Renal artery stenosis is associated with a shrunken kidney on the side of the lesion with compensatory hypertrophy of the contralateral kidney.

Question 6

A. FALSE B. FALSE C. TRUE D. TRUE E. FALSE

The risk of adenocarcinoma is increased by exposure to petroleum products, chromium, iron oxide, arsenic, coal tar and radiation. Small-cell lung carcinoma (SCLC or oat cell tumours) and squamous cell tumours are more radiosensitive than adenocarcinoma. 10-15% of patients who undergo radiotherapy develop radiation pneumonitis within 3 months of treatment. Most develop fibrosis but this takes years to develop. Squamous tumours metastasise late in the natural history

while SCLC and large-cell cancers (poorly differentiated) spread early.

There is increasing evidence linking genetic mutations (oncogene overexpression or tumour suppressor gene inactivation) in lung cancers:

Overexpression: *myc* (90% of SCLC and 40-50% of non-SCLC), *c-erbB1* (up to 90% of SCLC and 20-50% of non-SCLC), *c-erbB2* (up to 45% of adenocarcinoma, 25% of squamous tumours), *K-ras* (30% of adenocarcinomas);

Tumour suppressor gene inactivation: *rb1* (80% of SCLC and 20% of non-SCLC), *p53* (up to 80% of SCLC and 50% of non-SCLC), RAR-beta (retinoic acid receptor beta, up to 50% of non-SCLC).

Question 7

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

The risk factors for developing intracranial aneurysms are increasing age and smoking. They are also seen in association with coarctation of the aorta, renal artery stenosis, Ehlers Danlos syndrome, polyarteritis nodosa, Wegner's granulomatosis and infective endocarditis. 90% arise from the anterior communicating artery. Mycotic aneurysms from septic emboli tend to be peripheral (smaller vessels 'distal' in the vascular tree) and multiple.

Question 8

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

An elevated $p\text{CO}_2$ is not synonymous with respiratory failure. Respiratory failure is defined as $\text{PaO}_2 < 8 \text{ kPa}$; type I is essentially ventilation-perfusion mismatch and PaCO_2 is $< 6.5 \text{ kPa}$; while in type II, PaCO_2 is raised and the problem is due to pure hypoventilation.

Clinical signs of CO_2 retention include papilloedema, miosis, hypertension, flapping tremor, hyporeflexia, muscle twitching, sweating, headache, bounding pulse and retinal vein distension; if $\text{CO}_2 > 120 \text{ mmHg}$, then coma and extensor plantars.

Question 9

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

For beta-blocker overdose, try atropine, glucagon infusion and temporary pacing. Tricyclic overdose may require iv neostigmine to counteract the anticholinergic effects and a beta blocker for treatment of SVTs. Other antidotes include desferrioxamine for iron, calcium EDTA and dimecaprol for lead poisoning, dimecaprol for heavy metal poisoning, ethanol for ethylene glycol, dicobalt edetate for cyanide; digoxin-specific antibody for digoxin, naloxone for opiates, N-acetylcysteine for paracetamol, Fuller's earth for paraquat, vitamin K for warfarin.

Question 10

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Interstitial nodules on CXR may also be due to miliary TB, mitral stenosis, malignancy (teratoma), hydatid disease, lymphangitis carcinomatosa, alveolar cell carcinoma, pneumoconiosis. Granulomata are seen in Wegner's, Churg Strauss, fungal pneumonias and histiocytosis X.

Question 11

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Amantadine is a non-specific dopamine receptor antagonist; side-effects include an

amphetamine-like effect which may result in insomnia.

Benzotropine/benzhexol are anticholinergic drugs that are used for relief of bradykinesia or tremor.

Selegiline is a MAO-B (monoamine oxidase type B) inhibitor and trials show that it delays disability in patients with Parkinson's disease.

L-DOPA is usually combined in preparations with a peripheral dopa-decarboxylase inhibitor (Madopar = L-dopa + benserazide; Sinemet = L-dopa + carbidopa) to reduce the side-effects.

Dopamine is antagonised by phenothiazines such as chlorpromazine. Psychosis in patients with Parkinson's disease may respond to clozapine.

Question 12

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Other associations include any myeloproliferative disorder, UC (50% of patients with pyoderma have UC; it is an indicator of disease severity) and Crohn's. Treatment: topical steroids.

Diabetes mellitus is associated with necrobiosis liopodica (seen in <1% of diabetics but up to 60% of patients with NL have diabetes), infections (staphylococcal, non-clostridial gas gangrene, fungal), vitiligo (organ-specific autoimmunity), fat hypertrophy (recurrent injection at same site) and lipoatrophy with purified insulins. Granuloma annulare consist of rings of raised papules that blanch (pressure shows beaded ring of white dermal patches). Eruptive xanthomas may occur and the skin develops a waxy character. Other skin reactions may be due to the drugs used to treat diabetes (e.g. sulphonyl ureas are associated with *Erythema multiforme*, phototoxicity).

Question 13

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Wegener's is a small-vessel granulomatous vasculitis that may involve the upper respiratory tract (sinuses, pharynx), lungs, eyes and kidneys. Other clinical features include serous otitis media, scleritis, episcleritis and corneal ulceration. Pulmonary involvement may produce cough, haemoptysis or be entirely asymptomatic. Renal involvement results in glomerulonephritis and hypertension and eventually renal failure. >80% of patients with Wegener's are ANCA positive and absence of this makes the diagnosis unlikely.

Question 14

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

The following connective tissue diseases are associated with specific serological markers:

- SLE - dsDNA antibodies, Sm antibodies (associated with development of membranous glomerulonephritis) and PCNA antibodies. These are often accompanied by hypocomplementaemia and are predictive of renal involvement with SLE. Drug-induced SLE is associated with homogenous ANA in the majority;
- Sjögren's syndrome is associated with nucleolar ANA (as is scleroderma);
- Mixed connective tissue disease is associated with anti-U1-ribonuclear protein.
- Anti-topoisomerase 1 (Scl-70) and the Ku antibody are specific for scleroderma; CREST syndrome - anticentromere antibody, Sicca syndrome - Ro (SSA) and La (SSB) antibodies;
- Polymyositis - Jo-1 antibody, often in association with lung fibrosis.

Question 15

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Quinidine is a class Ia antiarrhythmic with good oral bioavailability. 80% is protein bound causing the resulting drug reactions (displacing warfarin and digoxin, etc). The main indication for use is atrial arrhythmias. It has a slight vagolytic effect and may accelerate the ventricular rate in AF unless digoxin is given concomitantly.

Disopyramide has both class Ia and III activity and an anticholinergic effect. For similar reasons to quinidine it should not be used for AF alone.

Question 16

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

Congenital adrenal hyperplasia is most commonly due to 21-hydroxylase deficiency (90%); less commonly 11-hydroxylase or 3-beta-hydroxysteroid dehydrogenase deficiency. All are autosomal recessive, can cause male precocious puberty, have a low serum cortisol (and high ACTH) and have large adrenals on CT scanning. Clinical features depend on the enzyme defect:

- 21-hydroxylase deficiency produces vomiting, dehydration (salt-losing picture in over 70%; not HYPERTENSION), virilization in girls; boys display precocious puberty or ambiguous genitalia (increase in 17-hydroxyprogesterone)

- 11-hydroxylase deficiency produces raised 11-deoxycortisol (acts as a mineralo-corticoid to produce hypertension and low potassium similar to Conn's syndrome) in addition to virilization;

- incomplete masculinization (hypospadias with cryptorchidism) is seen with 3-beta-hydroxysteroid dehydrogenase deficiency.

Treat with glucocorticoids (and mineralocorticoids as necessary) aiming to normalize ACTH and 17-OH progesterone levels.

Question 17

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

Respiratory failure ($\text{PaO}_2 < 8 \text{ kPa}$) is divided into two types: Type I is characterised by ventilation perfusion mismatch and patients have a $\text{PaCO}_2 < 6.5 \text{ kPa}$, while type II is characterised by alveolar hypoventilation and patients have a $\text{PaCO}_2 > 6.5 \text{ kPa}$. In practice the hypoxia may be due to a combination of V/Q mismatch, hypoventilation, diffusion abnormality and decreased FIO_2 .

Question 18

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Autoimmune chronic active hepatitis is an antibody-mediated autoimmune disease with a female preponderance. It is also associated with pernicious anaemia and thyroiditis. Immunology: ANA and SMA +ve (antimitochondrial antibody is found in primary biliary

cirrhosis). Presentation varies: 25% present as acute hepatitis; others may be asymptomatic or present with features of chronic liver disease, fever, migratory arthritis and pleurisy. Associated with fibrosing alveolitis, Sicca syndrome. The condition is divided into type I ('lupoid-type' hepatitis) and type II, depending on the antigen implicated in sustaining the inflammation - actin in type I and one of the isozymes of cytochrome P450 in type II. Treat with prednisolone and if necessary azathioprine.

Question 19

A. FALSE B. FALSE C. TRUE D. TRUE E. FALSE

The peak expiratory flow rate (PEFR) is usually reduced by both pathologies. However, in patients with stridor, the PEFR is usually disproportionately reduced as compared to the FEV₁ (i.e. the ratio FEV₁/PEFR is often >10 in stridor). The flow volume loop in patients with stridor shows a plateau ('decapitation') of expiratory flow but no change in the inspiratory flow. Asthmatic patients typically show high initial expiratory flow, but collapse of medium and large airways produces an abrupt drop in the early expiratory phase.

Question 20

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Fanconi's syndrome results from defective tubular reabsorption of amino acids, glucose, phosphate and bicarbonate. This results in hypophosphataemic rickets, a renal tubular acidosis and thus a hyperchloraemic acidosis. The acidosis results in potassium wasting and serum K⁺ is often low. Patients have polyuria and in children this may produce dehydration. In addition, there is vomiting and vitamin D-resistant rickets.

Question 21

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Other causes of raised total protein in the CSF include chronic ethanol intake, amyloid, diabetes mellitus, acoustic neuroma and sagittal sinus thrombosis, but all are very rare.

Benign intracranial hypertension is commonly a disease of obese young women taking the oral contraceptive pill. Other drugs implicated are tetracyclines and hypervitaminosis A. Clinical features include papilloedema and headaches but no dilatation of the ventricles on CT scan of the brain. Treated by repeated lumbar puncture, steroids and/or shunt.

Question 22

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Takayasu's syndrome is a rare large-vessel non-granulomatous vasculitis of unknown aetiology. It is more common in Japan for unknown reasons. Vasculitis involves the aortic arch and large vessels, resulting in pain, claudication (e.g. mesenteric claudication, jaw claudication, etc). In the acute phase, there is systemic upset with acute inflammatory response which settles with corticosteroid therapy. Stroke and congestive cardiac failure result from severe hypertension.

Question 23

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

The causes of thrombocytopenia may be divided into those with increased platelet consumption, decreased platelet production or abnormal platelet distribution (hypersplenism).

Increased platelet consumption: idiopathic thrombocytopenic purpura (ITP), drug-induced (quinine, sulphonamides, heparin, gold compounds, D-penicillamine), SLE, lymphoproliferative disease, HIV-associated, post-transfusion purpura, DIC, septicaemia, TTP, hereditary;

Decreased platelet production: marrow hypoplasia (chemotherapy, chloramphenicol, phenytoin, gold compounds, idiopathic aplastic anaemia, TAR (thrombocytopenia with absent radii), malignant invasion of bone marrow (leukaemia, carcinoma (breast, lung, renal, stomach, prostate) and myelofibrosis), dysmyelopoietic syndromes (folate, B₁₂ deficiency, myelodysplastic syndromes);

Hypersplenism: Any cause of splenomegaly (e.g. liver disease, lymphoproliferative disease, tropical splenomegaly, etc.).

Question 24

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

Acute confusional states are generally associated with deterioration in the evening, increased (or decreased) motor activity, impaired attention, anxiety, suspicion and agitation. The central feature is impaired consciousness with acute (hours) or sub-acute (days) onset. Causes include infection (UTI, pneumonia, skin infections), drugs (sedatives), alcohol withdrawal, metabolic upset (hypoxia, deranged electrolytes, hypo- or hyper-glycaemia), head injury (subdural haematoma) and stroke.

Dementia produces global cognitive impairment in the presence of clear consciousness. Causes include vascular (multi-infarct dementia) Alzheimer's disease, chronic alcohol intake, infection (HIV, PMLE - JC virus, SSPE - measles virus, cysticercosis, syphilis), vitamin deficiency (thiamine, B₁₂, folate), hypothyroidism, normal pressure hydrocephalus, Parkinsonism, Pick's disease, Creutzfeldt-Jakob disease, etc.

Question 25

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

NSAIDs have a number of adverse effects on the kidney. By inhibiting prostaglandin synthesis they may precipitate acute ischaemic renal failure, sodium retention (leading to or exacerbating hypertension and heart failure), water retention (enhanced action of ADH and increased medullary tonicity) and hyporeninaemic hypoaldosteronism (causing hyperkalaemia). NSAIDs are associated with an acute allergic interstitial nephritis that can result in renal failure and proteinuria. Analgesic nephropathy results in papillary necrosis and chronic renal failure.

Question 26

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Aortic regurgitation may be due to primary disease of the valve or secondary to stretching of the aortic ring due to dilatation of the aortic root. Congenital AR is seen with bicuspid aortic valves, supraaortic stenosis and high VSDs causing prolapse of the valve leaflets. The valve may be affected by rheumatic fever, infection, SLE or rheumatoid arthritis, collagen vascular diseases such as pseudoxanthoma elasticum and mucopolysaccharidoses. Aortic root diseases causing dilatation include dissection, syphilis, Marfan's, long-standing hypertension, coarctation, seronegative spondyloarthritides (Reiter's, psoriatic, ankylosing spondylitis), relapsing polychondritis and giant cell arteritis.

With chronic aortic regurgitation, the left ventricle will dilate if the patient is not followed up carefully. The diastolic murmur of AR gets shorter with increasing severity as it takes less time for the aortic and left ventricular diastolic pressures to equalise. In acute-onset AR (e.g. infective endocarditis), the patient may experience severe left ventricular failure even with a ventricle of normal size as the chamber does not have time to dilate.

Question 27

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Chondrocalcinosis is calcification of the articular cartilage. It is seen predominantly in the knees, wrists (triangular ligament), intervertebral discs and symphysis pubis.

Hypophosphatasia is a condition where there is a deficiency of alkaline phosphatase and patients cannot break down pyrophosphate. This results in dwarfism with disproportionately short limbs (also seen with achondroplasia and Ellis van Creveld syndrome). In haemochromatosis, the iron acts as an enucleating agent and promotes calcification of the cartilages. Another cause of chondrocalcinosis is alkaptonuria.

Question 28

A. TRUE B. TRUE C. FALSE D. FALSE E. TRUE

In mild-moderate renal failure, there is no intrinsic defect in the kidney's ability to excrete potassium and patients are able to maintain adequate potassium balance. However, hypoadosteronism

impairs the renal potassium handling and contributes to hyperkalaemia. It is only when the glomerular filtration rate (GFR) falls below 20ml/min (10-20% of normal) that this becomes a factor. Erythropoietin therapy is associated with a rise in serum potassium.

Question 29

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

Although there is some cerebellar atrophy, particularly atrophy of the vermis, in schizophrenia, the only consistent abnormality appears to be in the frontal and temporal areas, reflected by both increased ventricular size and widening of the fissures and sulci. In schizophrenic patients, MRI demonstrates frontal and pre-frontal atrophy and this is confirmed at autopsy. PET studies show low metabolic rates for the basal ganglia and intriguingly, these normalise with neuroleptic therapy.

Question 30

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Clinically, psoriatic arthritis may be divided into five overlapping subgroups:

1. Asymmetric oligo/monoarthritis (the most common presentation);
2. Mainly distal interphalangeal joint involvement, usually asymmetric and accompanied by nail changes (pitting, onycholysis, etc.);
3. Rheumatoid-like but seronegative (joint disease mimics skin disease and both improve together);
4. Arthritis mutilans (marked destruction of affected joints, e.g. telescoping digits, etc.);
5. Ankylosing spondylitis-type with sacroiliitis (50-60% are HLA-B27 positive).

Chloroquine precipitates pustular exacerbation of skin conditions and should not be used in patients with psoriasis.

Question 31

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Pneumonia caused by the organism *Mycoplasma pneumoniae* usually has a long incubation period and presents as an URTI and tracheobronchitis that later progresses to a lower respiratory tract infection. The extrapulmonary manifestations include headaches (sometimes aseptic meningitis), arthralgia, ear pain (bullous myringitis), erythema multiforme, myocarditis, and pericarditis. 'Cold' haemolytic anaemia occurs due to anti-I autoantibody. Diagnosis is by serology (complement-fixing antibody). The organism is resistant to beta-lactams.

Question 32

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

The commonest presentation of motor neurone disease is upper limb fasciculation and spastic gait (amyotrophic lateral sclerosis). 25% of patients have mainly lower motor neurone changes (progressive muscular atrophy) and carry a better prognosis. 25% present with progressive bulbar palsy and either flaccid, spastic or combined bulbar symptoms. Patients in this group usually die before their limbs are involved.

There is no effective therapy (beta-IFN is used for selected patients with multiple sclerosis).

Recently, riluzole (an 'anti-excitotoxic agent') has been reported to prolong tracheostomy-free survival in patients with amyotrophic lateral sclerosis, slow the deterioration in muscle strength and prolong survival. However, only 2 randomised trials have been reported and further data is awaited.

There are usually no sensory symptoms (rarely, subclinical involvement is seen on nerve conduction studies) and it never affects extra-ocular movements (III, IV and VI).

Question 33

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

DNA triplet repeats have

been described in

Friedreich's ataxia

(frataxin gene, chr 9), fragile X syndrome (FMR-1 gene), the related fragile X-E syndrome, Kennedy's syndrome (X-linked spinal and bulbar muscular atrophy and partial androgen insensitivity), myotonic dystrophy (a cyclic AMP-dependent serine-threonine protein kinase on chr 19), Huntington's disease (Huntington gene on chr 4), spinocerebellar ataxia type I (ataxin gene, chr 6), dentato-rubro-pallido-luysian atrophy (chr 12) and Machado-Joseph disease (chr 14). The mechanism by which these repeats cause disease is unknown but they probably affect mRNA processing.

Question 34

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Waldenstrom's macroglobulinaemia is a malignant lymphoplasmaproliferative disorder that produces large monoclonal IgM paraprotein. Presentation is insidious with fatigue, bleeding (gums, nosebleeds), blurred vision and symptoms of hyperviscosity (dizziness, headache, vertigo, tinnitus, retinal haemorrhages). Hepatosplenomegaly and peripheral lymphadenopathy are common. Peripheral neuropathy (sensory and motor) may be seen. Unlike multiple myeloma, bone pain is rare. Chemotherapy is usually necessary and hyperviscosity may require plasmapheresis. Median survival is ~5 years.

Question 35

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Causes of generalised pruritis include:

Systemic diseases: CRF, thyrotoxicosis, neoplasm, polycythaemia, pregnancy, anxiety and depression (secondary syphilis is generally asymptomatic);

Skin disease: scabies, Lichen planus, drug reaction, atopic dermatitis, dermatitis herpetiformis and thyroid disease.

Question 36

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Progressive multifocal leukoencephalopathy (PML) is caused by the papovavirus JC. Retinitis may be caused by *candida*, CMV or *Toxoplasma gondii*. Other neurologic complications of HIV infection include: dementia, meningitis (aseptic or cryptococcal), subacute diffuse encephalitis, space-occupying lesions (cerebral toxoplasmosis, lymphoma), myelitis (CMV, HSV type 2) and symmetrical peripheral neuropathy.

Question 37

A. FALSE B. FALSE C. TRUE D. FALSE E. TRUE

Stroke is a rare presenting feature of DIC and is more commonly seen in TTP (thrombotic thrombocytopenic purpura). The causes of DIC are legion. Treatment should be aimed at the underlying cause (sepsis-meningococcus, Gram negative septicaemia, Staphylococcal septicaemia, malignancy-mucin-secreting adenocarcinoma, prostate cancer, promyelocytic leukaemia, liver failure, obstetric disaster - abruptio placentiae, amniotic fluid embolism, eclampsia, etc.). Treatment:- supportive, heparin may be useful in promyelocytic leukaemia, meningococcal septicaemia, TTP and where thrombosis is potentially life-threatening (large leg DVT, pulmonary embolism, peripheral gangrene). Other measures include replacement of clotting factors (FFP and purified antithrombin III), ε-aminocaproic acid or aprotinin (+heparin) for life-threatening bleeding.

Question 38

A. FALSE B. FALSE C. FALSE D. TRUE E. TRUE

The majority of prolactin-secreting pituitary tumours are microadenomas. If followed over many years, most are static in size; 25% regress; 25% expand (especially with pregnancy). Men commonly present with reduced libido and impotence while women present with menstrual irregularity, amenorrhoea, infertility or galactorrhoea. Impaired GnRH secretion causes low sex hormones and this may lead to osteoporosis. Treatment depends on size and symptoms. Bromocriptine is a partial agonist at dopamine receptors and inhibits prolactin release from the tumour cells. If there are local pressure effects (falling visual acuity), surgery is recommended.

Question 39

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Digoxin toxicity may be precipitated by either displacement from protein binding (e.g. quinidine, amiodarone, etc.) or by inhibiting tubular secretion of digoxin (calcium channel blockers, nifedipine, verapamil). Metabolic imbalance (such as hypokalaemia, hypomagnesaemia, hypercalcaemia, hypoxia or hypothyroidism) can also trigger toxicity. Amphotericin can produce severe hypokalaemia and hypomagnesaemia and thus precipitate digoxin toxicity.

Question 40

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

Acyclovir is the treatment of choice for herpes zoster and herpes simplex infections. Other lesions strongly associated with HIV infection include: periodontal disease, oral candidiasis, hairy

leukoplakia, Kaposi's sarcoma. Non-Hodgkin's lymphoma classically presents as a midline ulcer. The differential diagnosis of white patches on the oral mucosa includes candida, hairy leukoplakia, carcinoma, trauma and stomatitis nicotinia.

Question 41

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Many mutations can produce hypertrophic cardiomyopathy (HCM) - beta-myosin heavy chain gene on chr 14 (~20-30%), cardiac troponin T on chr 1, alpha-tropomyosin on chr 11. The outflow tract gradient is dynamic and may improve with pacing.

As the LV is stiff, atrial activity is important and dual chamber pacing is preferred. Adults have a 2-3% risk of sudden death and non-sustained VT is the only marker proven to be of predictive value. Squatting (passive leg elevation, handgrip) reduces the murmur by increasing the afterload and temporarily reducing cardiac output. Standing from squatting, GTN, etc. increases the murmur.

Question 42

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

Almost all patients with systemic sclerosis develop some degree of pulmonary fibrosis. Severe disease may result in reticulo-nodular appearances on chest X-ray progressing to the 'honeycomb lung'. Lung function tests show a restrictive pattern and impaired gas transfer. Recurrent chest infections follow disorders of oesophageal motility and aspiration. Patients carry an increased risk of alveolar cell carcinoma.

Question 43

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

Thyroid storm refers to severe hyperthyroidism and is a medical emergency. The initial treatment should be with propylthiouracil: this is better than carbimazole as it stops peripheral conversion of T₄ to T₃. This should be followed with IV iodide, 1 hour after PTU has been given. Steroids are usually given to try to prevent Addisonian crisis (which may be masked by the severe thyrotoxicosis); they also inhibit T₄ release and peripheral conversion. Other measures include fluids, fanning, tepid sponging, etc.

Causes of thyrotoxicosis: Graves' disease, toxic nodule, metastases of follicular carcinoma of the thyroid (can make T₄), Hashimoto's (lymphocytic) thyroiditis (in the acute phase), acute viral thyroiditis, extrinsic compression of thyroid by mass, amiodarone and struma ovarii (TSH secreting ovarian carcinoma).

Question 44

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

Cushing's syndrome results in loss of the diurnal rhythm of cortisol secretion and produces a persistently elevated serum (and 24 hour urine) cortisol.

Adrenal tumours usually do not suppress with dexamethasone. Serum ACTH is undetectable. In Cushing's disease (i.e. adrenal hyperplasia due to excess pituitary ACTH secretion), there may be some suppression of the serum cortisol with high-dose dexamethasone but usually not to normal values. Serum ACTH is elevated but less than in ectopic ACTH production.

Hypokalaemia suggests ectopic ACTH secretion (and is often associated with mild alkalosis). Only 10-30% of patients with ectopic ACTH secretion suppress with high-dose dexamethasone.

Metirapone inhibits 11-beta-hydroxylase (a step in the synthesis of cortisol) and results in a loss in the negative feedback of cortisol on the pituitary. This produces a rise in ACTH secretion and a rise in urinary 17-oxogenic steroids (17-OGS). In pituitary Cushing's, metirapone produces a large rise in urinary 17-OGS: in ectopic ACTH secretion or adrenal tumours, although serum cortisol levels fall, there is usually no increase in urinary 17-OGS.

Patients with depression and alcoholism may exhibit 'pseudo-Cushing's' - this is thought to be due to an increase in release of CRF by the hypothalamus. They will increase 24-hour urine cortisol, loss of diurnal secretion of cortisol; low-dose dexamethasone may fail to suppress the serum cortisol but this will almost invariably suppress with high-dose dexamethasone.

Question 45

A. FALSE B. FALSE C. TRUE D. TRUE E. FALSE

Remember to distinguish between side effects of a drug (i.e. with long-term use) from toxic effects due to overdose. Common side effects of lithium (with levels <1.0 mmol/l) include nausea, fine tremor, polyuria (nephrogenic DI), polydipsia, weight gain, leukocytosis, and metallic taste in mouth. Rarer side effects include goitre, hypothyroidism (biochemical abnormalities may occur without symptoms), hypokalaemia and exacerbation of psoriasis. Toxic effects of lithium (i.e. levels >1.3 mmol/l) include blurred vision, ataxia, dysarthria, anorexia, coarse tremor, vomiting, muscle weakness, hyperreflexia, oliguria, seizures, syncope, coma and death. Toxicity may be precipitated by ACE inhibitors, thiazides, NSAIDs, metronidazole, SSRI antidepressants and diltiazem (even with normal levels).

Question 46

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

Theophylline poisoning produces vomiting, restlessness and agitation, tachycardia, dilated pupils, haematemesis and tachyarrhythmias. Hypokalaemia and hyperglycaemia may be found. Elimination may be enhanced by activated charcoal. Correction of hypokalaemia is effective in reducing the risk of tachyarrhythmias. Other drugs effectively cleared by charcoal include aspirin, carbamazepine, dapsone, phenobarbitone and quinine.

Haemodialysis is effective in removing salicylates, phenobarbitone, methanol, ethylene glycol and lithium. Forced alkaline diuresis is no longer recommended for salicylates and bicarbonate infusion is as effective. Haemodialysis is effective for salicylates. Tricyclics delay gastric emptying time and thus gastric lavage should still be attempted.

Question 47

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

3-hydroxy-3-methylglutaryl-coenzyme A reductase inhibitors (HMG CoA reductase inhibitors e.g. simvastatin) decrease hepatic cholesterol synthesis, which in turn leads to increased synthesis of LDL receptors and thus increased clearance of LDL. They have been shown to reduce mortality in patients following an acute MI (4-S study). An idiosyncratic side-effect is rhabdomyolysis.

Patients with homozygous familial hypercholesterolaemia cannot make LDL receptors and so these drugs are relatively ineffective in these patients.

Cholestyramine sequesters bile acid in the intestine and prevents its reabsorption. The result is decreased absorption of cholesterol and diversion of endogenous cholesterol into bile acid synthesis in the liver. This leads to increased LDL receptors on hepatic cells and increased

removal of LDL from the blood.
Fibrates stimulate lipoprotein lipase.

Question 48

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

The effects of gravity on the distribution of blood flow are most marked in the standing position. The transmural pressure in the dependent veins increases and the dependent venous volume increases by ~500 ml. Cardiac filling pressure falls by several cmH₂O and stroke volume (and pulse pressure) declines. In healthy individuals the cardiopulmonary and carotid sinus reflexes restore the blood pressure; there is an increase in heart rate and cardiac contractility (sympathetic activity) with vasoconstriction of peripheral vascular beds, all within 1-2 min of standing. Capillary filtration in dependent tissues increases producing a 5-10% fall in plasma volume over the next hour. Salt and water excretion by the kidney diminishes due to a rise in serum renin, angiotensin II, vasopressin and aldosterone in combination with the reflex renal vasoconstriction.

Question 49

A. TRUE B. TRUE C. TRUE D. TRUE E. FALSE

The aetiology of Paget's disease is still unknown. There is increased remodelling of bone with areas of bone deposition (sclerosis) and areas of resorption. Enlarged bones are painful and easily fractured. There is an increased risk of osteogenic sarcoma in both sclerotic and porotic areas. Treatment is with analgesics, disodium etidronate (to reduce bone turnover) or calcitonin (derived from salmon; side effects include flushing, nausea, diarrhoea, vomiting; may develop resistance due to antibodies to the foreign protein).

Question 50

A. FALSE B. TRUE C. TRUE D. TRUE E. TRUE

Nephrotic syndrome causes a dilutional hyponatraemia. Hypopituitarism produces adrenal failure and so sodium depletion (low sodium with raised potassium and urea).

Causes of hyponatraemia may be divided into pseudo- and true-hyponatraemia:

1. Pseudo-hyponatraemia: The presence of other agents in the plasma causes an apparent reduction in sodium, but the actual plasma sodium in the 'plasma-water' compartment remains normal, e.g. hypertriglyceridaemia, raised gammaglobulins (e.g. myeloma), hyperglycaemia or another osmotic agent (mannitol, ethanol, etc.).
2. True-hyponatraemia: This may be due to sodium depletion or water excess. Sodium depletion may result from renal losses (e.g. diuretic excess, osmotic diuresis in hyperglycaemia, Addison's disease, intrinsic renal disease - nephrocalcinosis, medullary cystic disease), GI losses (e.g. diarrhoea, fistula losses, villous adenoma of colon, bowel obstruction) or skin losses (e.g. heat exposure with inadequate salt replacement). Water excess and dilutional hyponatraemia may be iatrogenic (over-replacement with 5% dextrose without saline) or due to cardiac failure, cirrhosis of the liver, nephritic syndrome, hypothyroidism and SIADH (syndrome of inappropriate ADH secretion).

Causes of SIADH: Malignancy (small-cell lung cancer, pancreas, prostate, adrenal, lymphoma, leukaemia, etc.); intra-cranial causes (malignancy - primary or secondary, CVA, head injury, meningoencephalitis, abscess, intracranial haemorrhage, vasculitis, etc.); chest (pneumonia, TB, abscess, aspergillosis, etc.); drug-induced (e.g. chlorpropamide, opiates, phenothiazines, carbamazepine); and metabolic diseases (e.g. porphyria).

Question 51

A. FALSE B. TRUE C. FALSE D. FALSE E. FALSE

Q fever is caused by *Coxiella burnetii*, a rickettsia. The organism is very hardy and resistant to dehydration. Transmission is by inhalation of infected dust, droplets or occasionally tick bites. Presenting features include fever, myalgia, headache and granulomatous hepatitis. Complications include endocarditis (often involving the aortic valve) or meningoencephalitis in children. Diagnosis is by serology; phase I antigens suggest chronic infection while phase II antigens suggest the acute phase. Tetracycline is used to try to prevent chronicity and does not appear to speed recovery from the acute infection. Prolonged treatment (often in combination with rifampicin) is necessary for chronic infection.

Question 52

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

All forms of metabolic alkalosis have a low serum chloride level. Urinary chloride is low when alkalosis is associated with hypovolaemia. Hypovolaemia stimulates ADH secretion and both sodium and chloride are conserved by the kidney. Urine chloride is normal or increased in primary hyperaldosteronism, Bartter's syndrome and Cushing's syndrome.

Question 53

A. FALSE B. FALSE C. TRUE D. FALSE E. TRUE

Familial Mediterranean Fever (recurrent polyserositis) is common in Sephardic Jewish communities. Clinical features are fever, arthritis (mono-articular, non-deforming) and abdominal or chest pains from pleurisy and attacks lasts up to 1 week. In the acute phase, ESR, WBC and plasma fibrinogen levels are raised. The best test is plasma dopamine beta-hydroxylase activity. Complications: Jewish patients are more likely to become amyloid. Treatment: colchicine for prophylaxis.

Question 54

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

The abducens nerve is longer than the oculomotor nerve and is particularly susceptible to damage with raised intracranial pressure. The oculomotor nerve supplies all the extraocular muscles except the superior oblique (IVth) and the lateral rectus (VI cranial). The optic nerve arises from the ganglion cell layer of the retina. It leaves the orbit through the optic canal and passes into the middle cranial fossa medial to the internal carotid artery. It is separated from the pituitary by the cavernous sinuses and the diaphragma sellae. The lingual nerve carries general sensory and taste fibres from the anterior two thirds of the tongue (i.e. anterior to the circumvallate papillae). These fibres are carried in the chorda tympani nerve. The circumvallate papillae and the mucus membrane posterior to them are supplied by the glossopharyngeal nerve. The vagus nerve carries general visceral sensory fibres from the palate, pharynx, larynx, heart, lungs and alimentary tract. It has a small somatic sensory supply to the posterior part of the external acoustic meatus and the tympanic membrane by its auricular branch.

Question 55

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

In a normal distribution (Gaussian distribution), the mean, median and mode are the same. The standard deviation gives a measure of the spread of the distribution - the smaller the SD the more tightly grouped the variables (and the 'narrower' the bell-shaped curve).

Approximately 68% of values lie within 1 SD of the mean (i.e. 2.5% will be greater than the mean and 2.5% will be less than the mean). Very few lie beyond 3 SD ($< 1:1000$).

Data may be skewed to the left (negative or downward skew) or to the right (positive or upward skew). In data that is skewed to the left, the mean is 'pulled towards' the values in the left tail of the distribution and therefore is not representative of the bulk of the data (the mean is less than the median which is less than the mode).

Question 56

A. FALSE B. TRUE C. FALSE D. FALSE E. TRUE

Type I reactions (immediate) - IgE, IgG4, basophils and mast cells (e.g. atopic diseases - asthma, hay fever and anaphylaxis).

Type II reactions (cell-bound antigen) - membrane-bound IgM/G causing cell lysis or opsonisation (e.g. transfusion reactions, autoimmune haemolytic anaemias, ITP, Goodpasture's and Graves' disease).

Type III reactions (immune complex deposition) - caused by IgA/G immune complexes (e.g. Arthus reaction, serum sickness, SLE, Henoch-Schönlein and glomerulonephritis).

Type IV reactions (delayed type) - T-cell, macrophage mediated (e.g. graft rejection, tuberculin and graft versus host disease).

Question 57

A. TRUE B. FALSE C. FALSE D. TRUE E. TRUE

Zoonoses are diseases where the definitive host is an animal other than man, but the pathogen can cause disease when transmitted to humans. Some common zoonoses are: Dogs - toxocariasis (*T. canis*), hydatids (echinococcus - sheep and cattle are only intermediate hosts), leptospirosis (*L. canicola*), blastomycosis, pasteurella infections (bites), rabies, *Yersinia enterocolitica*; Cattle - brucellosis (esp. *B. melitensis*), Q fever (*Coxiella burnetti*), leptospirosis (*L. hardjo*); Goats, sheep - anthrax (*B. anthracis*); Cats - Cat scratch disease, tularemia, toxoplasmosis (*T. gondii*), rabies, *Yersinia enterocolitica*; Rats - 'plague' (*Y. pestis*), leptospirosis (*L. icterohaemorrhagiae*).

Question 58

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

Variation of RR interval is typically seen in SVTs (varying vagal tone on the AV node) but minor variation (up to 20 ms) may also occur in VT. Absence of pre-excitation in sinus rhythm does not exclude atrioventricular re-entry tachycardia ('hidden' accessory pathway).

- Features strongly suggestive of VT are:
- Fusion beats or capture beats (diagnostic);
- Evidence of AV dissociation (seen in ~25%);
- Evidence of atrial capture, i.e. VA conduction with 2:1 or 3:1 VA block;
- QRS concordance in chest leads. If the predominant deflection of the QRS is positive this is highly suggestive of VT. Negative concordance is less so;
- QRS >140 ms (3.5 small sq) especially with normal duration in sinus rhythm;
- Marked left axis deviation (negative in II);

- In patients with previous LBBB or RBBB, a different QRS morphology in tachycardia suggests VT.

Question 59

A. TRUE B. FALSE C. FALSE D. FALSE E. TRUE

Pregnancy is associated with marked haemodynamic changes. The blood volume increases substantially. The heart rate, stroke volume and cardiac output increase while systemic blood pressure and vascular resistance fall (diastolic BP > systolic producing a wide pulse pressure). Patients with mitral stenosis may deteriorate significantly during gestation due to the fixed flow obstruction. The increased heart rate and cardiac output with the decrease in colloid osmotic pressure predispose to pulmonary oedema. Aggressive diuretic therapy is contraindicated as it may decrease uterine perfusion pressure. VSD and ASD are usually well tolerated in pregnancy, even among patients with large left-right shunts. However, the degree of pulmonary hypertension should guide management as marked reduction in blood pressure during or after delivery may result in reversal of the shunt. Aortic regurgitation is also well tolerated (as is mitral regurgitation) probably as the systemic vascular resistance falls. Pregnancy in patients with primary pulmonary hypertension is associated with a high mortality, probably due to right ventricular ischaemia and failure, increased arrhythmias and pulmonary embolism.

Question 60

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

Skeletal changes include maxillary hypertrophy and skull changes (extramedullary haematopoiesis) and osteomyelitis. Haemophilia causes chronic osteoarthritis. Sub-periosteal haemorrhages are seen in scurvy (Vitamin C deficiency).

Exam 4

Question 1 Regarding statistical tests:

- A. Non-parametric tests are used to compare proportions between two groups
- B. Parametric tests are used for data that is normally distributed
- C. A paired t-test is used to compare two unmatched groups, one receiving active treatment and one receiving placebo
- D. In a cross-over trial the Chi-square test is appropriate
- E. The null hypothesis is usually that placebo has no effect on the treatment group

Question 2 The following are significantly associated with oesophageal carcinoma:

- A. Caustic oesophageal stricture
- B. Lead poisoning
- C. Achalasia of the cardia
- D. Tylosis
- E. Chronic iron deficiency

Question 3 The antiarrhythmic drug flecainide:

- A. Reduces mortality in myocardial infarction survivors with high-frequency ventricular extrasystoles
- B. Given intravenously, can convert 20-30% of patients with acute onset lone atrial fibrillation to sinus rhythm
- C. Acts primarily on the slow rectifier potassium channel
- D. Exhibits 'use-dependence' in ion-channel binding
- E. Reduces tachycardia incidence in Wolff-Parkinson-White syndrome by modulating the conduction within the AV node.

Question 4 A patient has the following electrolytes. Na⁺ 112 mmol/l, K⁺ 3.2 mmol/l, urea 3.0 mmol/l, plasma osmolarity 254 mOsm. Urine osmolarity 550 mOsm. Possible causes include:

- A. Astrocytoma
- B. Primary adrenal failure
- C. Acute intermittent porphyria
- D. Demeclocycline therapy
- E. Nephrotic syndrome

Question 5 Light sensitivity may be a feature of:

- A. Discoid lupus erythematosus
- B. Dermatomyositis
- C. Acute intermittent porphyria
- D. Tetracycline therapy
- E. Guttate psoriasis

Question 6 Recognised causes of a pericardial effusion include:

- A. Coxsackie B virus infection
- B. Thyrotoxicosis
- C. Addison's disease
- D. Hodgkin's disease

E. Chronic renal failure

Question 7 The following statements are true:

- A. Angiotensin-converting enzyme inhibitors reduce mortality in congestive cardiac failure
- B. Angiotensin-converting enzyme inhibitors reduce plasma renin activity
- C. Aldosterone can be suppressed in some hypertensive patients by dexamethasone
- D. The oedema associated with administration of nifedipine is associated with an increase in body weight
- E. In hypertensive patients, measurement of renal vein renin activity is a good predictor of response to captopril

Question 8 Regarding overdose, haemodialysis would be effective in removing the following drugs:

- A. Digoxin
- B. Pethidine
- C. Amitriptyline
- D. Propranolol
- E. Salicylate

Question 9 Bartter's syndrome is typically:

- A. X-linked
- B. Responsive to indomethacin
- C. Associated with hypokalaemia
- D. Associated with hypertension
- E. Asymptomatic until the third decade

Question 10 Recognised causes of episodic disturbances in consciousness include:

- A. Spontaneous hypoglycaemia
- B. Vertebrobasilar ischaemia
- C. Basilar artery migraine
- D. Transient global ischaemia
- E. Epilepsy

Question 11 In gout:

- A. Urate crystals are found in asymptomatic joints
- B. Overproduction of urate is the most common cause
- C. Bony erosion of the first MTP joint may occur
- D. Aluminium toxicity may precipitate an attack
- E. Uric acid renal stones are radio-opaque

Question 12 The following statements about localizing intracranial lesions are true:

- A. Midline cerebellar lesions limb ataxia
- B. Frontal lesions memory loss
- C. Brain stem lesions long tract signs
- D. Cerebello-pontine angle tumours trigeminal neuralgia
- E. Cerebellar hemisphere lesions truncal ataxia

Question 13 The following statements are true:

- A. Necrolytic migratory erythema is a manifestation of glucagonomas
- B. Somatostatinomas are associated with gallstones
- C. Carcinoid tumours arise from alpha cells of pancreatic islets
- D. Gastrinomas may be associated with hypercalcaemia
- E. Verner-Morrison syndrome is associated with achlorhydria

Question 14 Cigarette smoking is implicated in the causation of:

- A. Thyroid cancer
- B. Bronchial cancer
- C. Cervical cancer
- D. Bladder cancer
- E. Colon cancer

Question 15 The following are true:

- A. C1-esterase levels are low in angioedema
- B. Immune complex levels are elevated in active tuberculosis
- C. CH50 is low in active systemic lupus erythematosus
- D. There is polyclonal hypergammaglobulinaemia in sarcoidosis
- E. Burkitt's lymphoma is associated with a 7, 11 chromosome translocation

Question 16 The following may be used in the treatment of diabetes insipidus:

- A. DDAVP
- B. Chlorothiazide
- C. Chlorpropamide
- D. Metformin
- E. Lithium

Question 17 The following are correctly matched to the metabolic process they are involved in:

- A. Pyridoxal phosphate (B6) synthesis of DNA
- B. Nicotinic acid electron transport
- C. Cholecalciferol (D3) calcium metabolism
- D. Folic acid DNA synthesis
- E. Thiamine (B1) synthesis of amino acids[acid&1E61;]

Question 18 Dilated cardiomyopathy:

- A. Secondary to alcohol abuse, presents predominantly with right heart failure
- B. Occurring peripartum is associated with a high risk of recurrence in subsequent pregnancy even after complete resolution post-partum
- C. Occurs only with anthracycline doses above 400 mg/m²
- D. Is the presenting feature of HIV infection in 1% of cases
- E. With a LVED dimension of >7 cm is an indication for cardiac transplantation

Question 19 Tests used in the diagnosis of proximal myopathy include:

- A. Serum creatine kinase-MB isoenzyme
- B. CT scan of the thigh

- C. Electromyography
- D. Muscle biopsy
- E. Steroid challenge

Question 20 The following drugs are associated with acute interstitial nephritis:

- A. Diclofenac sodium
- B. Carbamazepine
- C. Erythromycin
- D. Losartan
- E. Allopurinol

Question 21 The following are associated with calcification on the chest radiograph:

- A. Varicella zoster
- B. Mitral stenosis
- C. Farmer's lung
- D. Silicosis
- E. Asbestos exposure

Question 22 The following associations are correct:

- A. High steppage gait Parkinson's disease
- B. Waddling gait peripheral neuropathy
- C. Festinant gait Guillian Barré syndrome
- D. Cerebellar ataxia multiple sclerosis
- E. Spastic-ataxic gait hemiplegia

Question 23 The following are deterred from donating blood in the UK:

- A. Men who have had sex with prostitutes
- B. Individuals whose partners are from sub-Saharan Africa
- C. Glue sniffers
- D. Individuals whose partners have had sex with prostitutes
- E. Those who received blood products before 1982

Question 24 The following factors predispose to the development of dissecting aortic aneurysm:

- A. Hypertension
- B. Marfan's syndrom.
- C. Hypercholesterolaemia
- D. Bicuspid aortic valve
- E. Pregnancy

Question 25 The following statements concerning the treatment of rheumatoid arthritis are true:

- A. Liver function tests are a sensitive indicator of methotrexate-induced hepatotoxicity
- B. Methotrexate will produce a faster clinical response than parenteral gold
- C. Ibuprofen is more efficacious than naproxen
- D. Pre-existing proteinuria contraindicates starting gold therapy
- E. Stridor is an indication for systemic steroids

Question 26 T-lymphocytes:

- A. Are the principle mediators of the type I hypersensitivity reaction
- B. Are CD3 positive
- C. IL-15 induces T cell activation and TNF production
- D. Memory T lymphocytes are CD45RO positive
- E. Naive T cells circulate through tissues screening for antigen

Question 27 Haemolytic anaemia:

- A. Precipitated by cold, is usually due to an IgM antibody
- B. May complicate malignant hypertension
- C. In PNH is due to a red-cell-membrane defect
- D. Is associated with raised serum haptoglobins
- E. Complicating primaquine therapy is typically Coombs' positive

Question 28 Regarding aortic stenosis:

- A. An ejection click is common in calcific aortic stenosis
- B. Subvalvular stenosis is not associated with aortic regurgitation
- C. In supra-valvular stenosis, the facies may be characteristic
- D. May be a cause of unequal upper limb pulses
- E. Normal coronary arteries should prompt a search for a non-cardiac cause for chest pain

Question 29 The following statements about HLA-B27 are true:

- A. Is inherited as an autosomal recessive trait
- B. Increased incidence in those with rheumatoid arthritis
- C. Increased incidence in patients with uveitis and no rheumatoid disease
- D. Sacroiliitis increases the probability that the diagnosis is ankylosing spondylitis
- E. 90% of Caucasians with ankylosing spondylitis are HLA-B27 positive

Question 30 de Quervain's thyroiditis is characterised by:

- A. An elevated ESR
- B. A bacterial aetiology
- C. Increased technetium-99 uptake on radioisotope scanning
- D. Transient hypothyroidism
- E. Circulating anti-thyroid antibodies

Question 31 The following are recognised complications of chronic renal failure:

- A. Dementia
- B. Hepatitis E
- C. Infertility
- D. Arthropathy
- E. Gout

Question 32 The following receptor systems are linked to the correct secondary messenger system:

- A. Nicotinic acetylcholine receptor direct control of an ion channel
- B. Beta adrenergic receptor direct control of ion channels

- C. Insulin receptor direct control of a protein phosphorylase
- D. Oestrogen receptor G protein-mediated increase in cyclic AMP
- E. Muscarinic receptor (acetylcholine) direct control of a protein phosphorylase

Question 33 Membranous glomerulonephritis:

- A. Is the pathology seen in Goodpasture's syndrome
- B. Is associated with hypocomplementaemia
- C. Is associated with *Plasmodium vivax* malaria
- D. Responds to high-dose steroid therapy
- E. The majority of patients develop chronic renal failure

Question 34 A positive ANCA:

- A. Is associated with acute Churg-Strauss syndrome
- B. In microscopic PAN can be associated with pulmonary haemorrhage
- C. Is common with D-penicillamine therapy
- D. pANCA recognises proteinase-3
- E. cANCA are rarely found in the non-vasculitides

Question 35 The anion gap:

- A. Is calculated from plasma concentrations of sodium, bicarbonate and phosphate
- B. Is usually <17
- C. Is increased with paraproteinaemia
- D. Is high in ketoacidosis
- E. May be normal in patients with a pancreatic fistula

Question 36 The carotid sinus:

- A. Is located at the origin of the internal carotid artery
- B. Contains receptors that are sensitive to blood pH
- C. Is innervated by the glossopharyngeal nerve
- D. Causes peripheral vasodilation when stimulated
- E. Becomes hypersensitive, particularly in young women

Question 37 Legionnaire's disease:

- A. Person-to-person spread is common
- B. Is more frequent in smokers
- C. Is typically a short, mild illness
- D. SIADH is a recognised complication
- E. May be caused by *Legionella micdadei*

Question 38 Regarding joint effusions:

- A. May be associated with hypertrophic pulmonary osteoarthropathy
- B. Synovial fluid white cell count of $100 \times 10^9/l$ is diagnostic of septic arthritis
- C. A low synovial glucose level is common in rheumatoid arthritis without sepsis
- D. Crystals may be found in non-inflamed joints in gouty patients
- E. Haemosiderin-laden synovial cells are found in haemochromatosis

Question 39 In chronic lymphocytic leukaemia:

- A. The malignancy is usually of B-cell origin
- B. The terminal phase is usually due to acute leukaemia
- C. Lymphadenopathy is uncommon
- D. There is associated hypogammaglobulinaemia
- E. The incidence of secondary malignancy is increased

Question 40 The following are contraindications to ECT:

- A. Puerperal psychosis
- B. Depression with suicidal ideation
- C. Manic depression
- D. Raised intracranial pressure
- E. Severe depression with weight loss

Question 41 The following statements about mitochondrial diseases are true:

- A. The diseases are transmitted via the maternal genome
- B. May be associated with ophthalmoplegia
- C. May present as a hypercatabolic state
- D. Are linked to mutations on the maternal X chromosome
- E. Are not associated with heteroplasmy

Question 42 The following are recognized causes of a raised fasting serum triglyceride level:

- A. High ethanol intake
- B. Propanolol
- C. Nifedipine
- D. Chronic renal failure without proteinuria
- E. Cholestyramine

Question 43 The polymerase chain reaction:

- A. Converts RNA to DNA for analysis for mutations
- B. Requires prior knowledge of the entire sequence of the gene of interest
- C. On a sample of peripheral blood from a pregnant mother can be used to sex the infant
- D. Increases the copy number of a region of the gene of interest for further analysis
- E. Utilises a heat-stable, bacterial, DNA-dependent DNA polymerase

Question 44 In Cushing's syndrome due to adrenal carcinoma:

- A. Virilization is common
- B. Diurnal variation in cortisol levels remains
- C. Plasma ACTH may be normal
- D. There is an exaggerated ACTH response to corticotrophin releasing factor (CRF)
- E. Metirapone should be administered pre-operatively

Question 45 The following are required for normal clot formation:

- A. Vitamin K
- B. Calcium
- C. Plasmin

- D. Thrombin
- E. Proteolysis

Question 46 *Legionella pneumophila*:

- A. Is the causative organism of Pontiac fever
- B. Infection is associated with encephalopathy and headache
- C. Pneumonia is associated with hyponatraemia and hypophosphataemia
- D. Tetracycline is the treatment of choice
- E. Infection is associated with lymphocytosis

Question 47 Acute myeloid leukaemia in adults:

- A. Chemotherapy produces remission in the majority of patients
- B. In remission, expected median survival is 5-6 years
- C. Promyelocytic (M3) is associated with microangiopathic haemolytic anaemia
- D. In remission, can be treated with ABO-incompatible bone marrow transplantation
- E. Bone marrow transplantation in relapse has a poorer outcome than when in remission

Question 48 Indications for long-term low-flow oxygen therapy include:

- A. Age less than 70 years
- B. $\text{PaO}_2 < 7.3$ kPa on air
- C. Respiratory muscle weakness
- D. Cyanotic congenital heart disease
- E. Obstructive sleep apnoea

Question 49 The following are common causes of hepatic granulomata:

- A. Tuberculosis
- B. Q fever
- C. Schistosomiasis
- D. Sarcoidosis
- E. Lead poisoning

Question 50 The following personality constellations predict the development of schizophrenia in later life:

- A. Poor socialization, cruelty to animals, fire-setting
- B. Overcompliance, overconformity and overachievement
- C. Shyness, withdrawal, social awkwardness, lack of close personal relationships
- D. Extreme dependency on parents and family
- E. Sexual abuse as a child

Question 51 The following lower oesophageal sphincter tone:

- A. Coffee
- B. Theophylline
- C. Smoking
- D. Metoclopramide
- E. Beta-agonists

Question 52 In meningitis:

- A. *Staphylococcus epidermidis* is a common cause in patients with ventriculo-atrial shunts
- B. Steroids are useful in the prevention of neurological sequelae in acute bacterial meningitis
- C. Steroids are of benefit in tuberculous meningitis
- D. Due to listeria, erythromycin is the drug of choice
- E. Due to *Cryptococcus neoformans*, meningism is less common than confusion and depressed consciousness

Question 53 Bulimia nervosa is associated with:

- A. Stealing
- B. Promiscuity
- C. Substance abuse
- D. Aggressive behaviour
- E. Extreme guilt

Question 54 A small pupil is characteristic of:

- A. IIIrd nerve palsy
- B. Horner's syndrome
- C. Tabes dorsalis
- D. Optic neuritis
- E. Holmes-Adie pupil

Question 55 Concerning Nelson's syndrome:

- A. There is marked hyperpigmentation
- B. Treatment of choice is bilateral adrenalectomy
- C. The patient presents with bitemporal hemianopia
- D. It may follow post-partum haemorrhage
- E. Recurrent hypoglycaemia is common

Question 56 Concerning lung manifestations of HIV/AIDS:

- A. Palatal Kaposi's are strongly associated with intrathoracic Kaposi's sarcoma
- B. Reduction in TLCO is the most sensitive marker of *Pneumocystis carinii* pneumonia
- C. Transbronchial biopsy carries a higher risk of complications in HIV-positive individuals
- D. Mycobacterium avium intracellulare infection is rare in those with CD4 counts $>0.1 \times 10^9/l$
- E. Cytomegalovirus is an important cause of pneumonitis in HIV-positive individuals

Question 57 The following are true:

- A. The karyotype in Klinefelter's syndrome is 46XX
- B. Male pseudohermaphroditism results from a failure to activate testosterone to dihydrotestosterone
- C. True hermaphroditism has a 46XX/46XY karyotype
- D. Castration is indicated in patients with testicular feminization syndrome
- E. Patients with Turner's syndrome respond to cyclical GnRH injections

Question 58 Human herpes virus-6 (HHV-6):

- A. Is a DNA virus
- B. Infection typically produces high fever in adults
- C. Viral persistence is uncommon
- D. Is the cause of roseola infantum in children
- E. Can be detected by PCR in Kaposi's sarcoma lesions

Question 59 The following are safe in pregnancy:

- A. Lisinopril
- B. Antiepileptics
- C. Warfarin
- D. Aspirin
- E. Methyl dopa

Question 60 Erythema nodosum:

- A. Nodules commonly affect the extensor aspects of legs
- B. Ulceration of lesions occurs in a minority
- C. When associated with bilateral hilar lymphadenopathy, is due to sarcoidosis
- D. Is commonly associated with arthralgia
- E. May follow measles infection

Exam 4: Answers

Question 1

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

Parametric tests like the t-test or Pearson's coefficient of linear correlation assume the data has a normal distribution. The unpaired t-test is used for comparing independent groups while the paired t-test is used for groups where there is pairing (i.e. there is a matched control for every person in the treatment group). In cross-over trials, the patient acts as his/her own control in the different treatment arms of the trial and the paired t-test is the appropriate test. The Chi-square is a non-parametric test (as is the Wilcoxon, Sign, Mann-Whitney U, Spearman's Rank correlation, etc.) and is typically used to compare proportions between two groups (e.g. the proportion of patients cured with treatment X compared to the control treatment).

Question 2

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Other associations include Barrett's oesophagus (columnar metaplasia of the oesophageal epithelium; a pre-malignant change), alcohol (predisposes to other mucosal tumours, e.g. bladder and colorectal), coeliac disease (classically lymphomas but may get any GI tumour) and Plummer Vinson syndrome. Tylosis is an AD-inherited disease characterised by hyperkeratosis of palms and soles and high risk of oesophageal tumours.

Question 3

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

Flecainide is a Type Ic antiarrhythmic drug and binds to activated sodium channel with a long half-life and so demonstrates use-dependence. In the CAST study (Cardiac Arrhythmia Suppression Trial) patients with >6 ventricular premature complexes per hour received

flecainide i.v.; the drug increased mortality in this group of patients. It is very effective (70-80%) in cardioverting patients in acute AF back into sinus rhythm: use with caution in patients with impaired left ventricular function as it is negatively inotropic. In WPW it acts by slowing conduction through the accessory pathway rather than the AV node.

Question 4

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

The abnormalities are low sodium (severe), low potassium, low serum osmolarity and an inappropriately concentrated urine. The diagnosis is SIADH (syndrome of inappropriate ADH release). In primary adrenal failure (Addison's disease), there is renal loss of sodium with hyponatraemia, but with hypovolaemia, raised potassium and urea. Nephrotic syndrome results in dilutional hyponatraemia and the urine osmolarity is usually lower.

Antidiuretic hormone, ADH (=vasopressin) is synthesised by the paraventricular and supraoptic regions of the hypothalamus. Release is usually controlled by the serum osmolarity (normal range 282-292 mOsm). Inappropriate release is seen in a variety of conditions: malignancy (small-cell lung cancer, pancreas, prostate, adrenal, lymphoma, leukaemia, carcinoid, etc.); intracranial causes (malignancy - primary or secondary, CVA, head injury, meningoencephalitis, abscess, intracranial haemorrhage, vasculitis, etc.; chest (pneumonia, TB, abscess, aspergillosis, etc.); drug-induced (e.g. chlorpropamide, opiates, phenothiazines, carbamazepine); and metabolic e.g. severe pain, porphyria).

Treatment: fluid restriction, demeclocycline, hypertonic saline (very cautiously) and occasionally glucocorticoids. Too-rapid correction of the hyponatraemia may result in central pontine myelinolysis. Search for and try to treat the underlying cause of SIADH (and in elderly patients always exclude hypothyroidism and pneumonia).

Question 5

A. TRUE B. FALSE C. FALSE D. TRUE E. TRUE

Causes of light sensitivity include:

Phototoxic drugs - tetracyclines, sulphonamides, chlorpromazine, amiodarone, psoralens, nalidixic acid, frusemide; Photoallergenic drugs - chlorpromazine, sulphonamides;

Porphyrias - erythropoietic, variegate and porphyria cutanea tarda -NOT acute intermittent porphyria.

Any patient with erupting psoriasis, e.g. showing Koebner phenomenon, may react adversely.

Also affected are SLE and rosacea, Casal's necklace is the name given to the light exposed areas of patients with pellagra (nicotinic acid deficiency - dermatitis, diarrhoea, dementia).

Question 6

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Causes of a pericardial effusion include:-

- Cardiac rupture or trauma (myocardial infarction, iatrogenic e.g. post cardiac surgery, catheterisation, pacing, etc);
- Aortic dissection;
- Spontaneous bleed (anticoagulation, uraemia, thrombocytopenia);
- Malignant disease;
- Idiopathic pericarditis;
- Uraemia;

- Infections (bacterial, tuberculosis, viral, fungal);
- Radiation;
- Hypothyroidism;
- Systemic lupus erythematosus (SLE);
- Chronic salt and water retention of any cause (heart failure, nephrotic syndrome, hepatic cirrhosis);
- Pregnancy;
- Idiopathic.

Question 7

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Angiotensin-converting enzyme inhibitors (ACE inhibitors) have been shown to reduce mortality in congestive cardiac failure and following myocardial infarction. ACE inhibitors inhibit the conversion of angiotensin-I to angiotensin-II, a potent vasoconstrictor. They also result in inhibition of the feedback mechanisms which suppress plasma renin levels – thus plasma renin levels are greatly elevated in patients receiving ACE inhibitors.

One form of secondary hypertension is glucocorticoid suppressible. In these patients the 5'-regulatory region of 11-beta-hydroxylase is linked to aldosterone synthase. Suppression of ACTH by dexamethasone inhibits aldosterone synthesis and reduces blood pressure in these patients.

Renal artery stenosis reduces the blood flow to the kidney and stimulates renin secretion. This in turn leads to high levels of angiotensin-II which drives the hypertension. Inhibition of angiotensin-II production using an ACE inhibitor will reduce blood pressure.

Question 8

A. FALSE B. FALSE C. FALSE D. FALSE E. TRUE

The volume of distribution (VD) of the drug determines how effective dialysis will be in removing the drug from the body. Drugs for which haemodialysis is effective include salicylates, phenobarbitone, methanol, ethylene glycol and lithium. Digoxin, opiates, tricyclics and lipid soluble beta-blockers have a very large VD. More effective supportive measures are antidigoxin antibody/atropine/correction of hypokalaemia for digoxin; naloxone for pethidine; beta blockers for arrhythmias from tricyclics, pacing/glucagon/isoprenaline for propranolol.

Haemoperfusion is effective for short and medium acting barbiturates, chloral hydrate, meprobamate and theophylline.

Activated charcoal should be given for aspirin, carbamazepine, dapsone, phenobarbitone, quinine and theophylline.

Question 9

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Bartter's syndrome (AR) usually presents as failure to thrive in childhood. There is hyperplasia of the juxtaglomerular apparatus and primary hyperreninaemia, resulting in hypokalaemic, hypochloraemic metabolic alkalosis but normal BP (unlike patients with Liddle's syndrome - hypertensive, pseudohyperaldosteronism). Urine prostaglandin, potassium and chloride excretion are elevated. Bartter's usually responds to diet, spironolactone, NSAIDs (PG synthetase inhibitors) and propranolol. Hypertension is sensitive to angiotensin II receptor antagonists (e.g. losartan).

Question 10

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Other causes include: postural hypotension, carotid sinus hypersensitivity, cardiac dysrhythmia, micturition syncope, raised intracranial pressure (especially when coughing or sneezing), hyperventilation and anxiety, drug or alcohol ingestion.

Question 11

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

Urate crystals are found in the synovial fluid of patients with hyperuricaemia. In an acute attack, the crystals are found within the infiltrating polymorphonuclear cells. Recognised causes of acute attacks of gout may be divided into:

1. Reduced excretion of urate: alcohol, low-dose aspirin, cyclosporin A, thiazides, lead, renal failure;
2. Increased production of uric acid: malignancy, HGPRT deficiency (Lesch-Nyhan syndrome), glycogen storage diseases (e.g. von Gierke, Gaucher's etc), severe diabetes mellitus, hypertriglyceridaemia.

Question 12

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Lesions of the cerebellum cause ataxia: hemisphere lesions affect the limbs while midline lesions produce truncal ataxia..

Frontal lobe lesions cause signs and symptoms easily remembered as 'the As' (anosmia, apathy, amnesia, aphasia, atrophy(optic)). Occasionally, frontal meningiomas present with mass effect producing the Foster-Kennedy syndrome (papilloedema, visual field defect, incontinence, spastic paraparesis and the release reflexes - grasp, pout, palmar-mental reflex).

Lesions of the dominant parietal lobe produce receptive dysphasia, Gerstman's syndrome.

Nondominant parietal lesions produce dressing apraxia, constructional apraxia, etc. Anterior parietal lesions produce sensory inattention, while more posterior lesions produce visual inattention and visual field defects.

Temporal lobe lesions may produce superior quadrantanopia, Wernicke's and uncinate fits.

Occipital lesions present with cortical blindness.

Question 13

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Clinical features of glucagonomas include anaemia, stomatitis, diarrhoea, diabetes mellitus, venous thromboses and mental disturbance. Necrolytic migratory erythema is characteristic and responds to zinc. Treatment: octreotide, insulin, warfarin and streptozotocin.

Somatostatin is produced from the

D cells in the pancreatic islets.

Clinically, patients present with

gallstones, subclinical DM,

steatorrhoea and achlorhydria

APUD cells cause carcinoid tumours and these may arise in the intestine, terminal ileum or even the appendix. Symptoms arise when the tumour metastasises to the liver as first-pass metabolism of the products is lost. Flushing, diarrhoea, abdominal pains, wheezing, right heart lesions and

pellagra may ensue. Treatment is with octreotide (side effects: steatorrhoea, gallstones, etc.), surgery to reduce tumour burden and embolisation of feeding arteries in the liver. Verner-Morrison syndrome = VIPoma = WDHA syndrome (watery diarrhoea, hypokalaemia, acidosis - if diarrhoea is very severe and achlorhydria). Fasting VIP levels are always very high. 90% respond to streptozotocin.

Question 14

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Cigarette smoking has been linked to an increased risk of carcinoma of lung, cervix, bladder and oesophagus. Passive smoking increases the risk of carcinoma of the lung by 1.5 times.

Question 15

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Hereditary angioedema is an autosomal dominant condition caused by C1-esterase inhibitor deficiency. Acquired angioedema may occur in the paraneoplastic syndrome due to an autoantibody against C1-esterase inhibitor. Clinical features include attacks of laryngeal and subcutaneous oedema, abdominal pain, vomiting and diarrhoea. Precipitants include stress, menstruation, infection, oestrogen therapy and ACE inhibitors.

Chronic granulomatous diseases (such as tuberculosis and sarcoidosis) are associated with an increase in both cellular and humoral immunity. There is polyclonal hypergammaglobulinaemia and, in tuberculosis, circulating immune complexes are increased.

CH50 is a marker of total haemolytic complement activity. SLE is associated with low serum complement C3 levels and thus CH50 will be reduced. Other conditions associated with low C3 levels include infective endocarditis and glomerulonephritis (mesangiocapillary and poststreptococcal).

Cryoglobulinaemia is typically associated with normal C3 but reduced C4 and CH50.

Burkitt's lymphoma is a B-cell-derived tumour associated with EBV infection and the most common chromosomal abnormality is a t(8,14) translocation.

Question 16

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Chlorpropamide, carbamazepine, thiazides and ethacrynic acid all increase sensitivity of tubules to ADH. Chlorpropamide is ineffective for nephrogenic diabetes insipidus but is effective in incomplete central diabetes insipidus. Lithium (along with demeclocycline and amphotericin B) are recognised causes of nephrogenic diabetes insipidus.

Question 17

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Nicotinic acid is synthesised from niacin (found in plants, fish, offal or synthesised from tryptophan) and can be converted to nicotinamide (part of NAD and NADP). The latter two act as hydrogen acceptors in oxidative reactions and thus in electron transport. Cholecalciferol requires hydroxylation at the 1- and 25-position to generate the active 1,25-dihydroxycholecalciferol, the active form of Vitamin D. Folic acid is metabolised to tetrahydrofolate which serves as an intermediate carrier of hydroxymethyl, formyl and methyl groups, necessary for purine and pyrimidine biosynthesis. Many antimetabolites and

immunosuppressive drugs (e.g. methotrexate) depend on inhibition of these reactions. Pyridoxal phosphate (B6) is involved in amino acid metabolism. Thiamine is involved in the glycolytic pathway and the pentose phosphate shunt.

Question 18

A. FALSE B. TRUE C. FALSE D. TRUE E. FALSE

Alcoholic cardiomyopathy commonly presents with left-sided failure (breathlessness on exertion, orthopnoea, paroxysmal nocturnal dyspnoea). Beri-beri due to thiamine deficiency presents with high output cardiac failure and right-sided signs ('wet' beri-beri). Peripartum cardiomyopathy - recurrence risk 20% even with complete resolution. Dilated cardiomyopathy is seen in 1-2% of patients on doxorubicin and 4-5% on daunorubicin. Classically occurs with anthracycline doses >450 mg/m² but may occur with less. Cardiomyopathy is the presenting feature in 1% of HIV infected patients and about 10% develop dilated cardiomyopathy and up to 50% have cardiac involvement on investigation.

Question 19

A. FALSE B. FALSE C. TRUE D. TRUE E. FALSE

The electromyography (EMG) response to nerve stimulation is decreased in myasthenia, increased in Eaton Lambert syndrome, 'dive bomber' in myotonia and fibrillation (i.e. denervation hypersensitivity) in polymyositis.

Muscle biopsy is performed to assess the degree of lymphocytic infiltration (seen in polymyositis, polyarteritis and metabolic muscle diseases - glycogen storage).

Causes of proximal myopathy include:

Congenital: Duchenne, Becker's (X-linked), fascio-scapulo humeral dystrophy, myotonic dystrophy (autosomal dominant); Acquired: 'PACEPODS' - polymyositis, alcohol, cancer, endocrine (thyroid, Cushing's, acromegaly, metabolic diseases, e.g. McArdle's), periodic paralysis, osteomalacia, drugs (clofibrate, chloroquine), sarcoid.

Question 20

A. TRUE B. TRUE C. FALSE D. FALSE E. TRUE

Drugs that are recognised causes of acute interstitial nephritis include penicillin (and other betalactam antibiotics), sulphonamides, rifampicin, ethambutol, NSAIDs, diuretics (thiazides and loop diuretics), allopurinol, carbamazepine, methyl dopa and cimetidine. Acute interstitial nephritis responds to stopping the drug and steroid therapy. Chronic interstitial nephritis is associated with lithium, phenacetin and cisplatin.

Question 21

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Other causes include tuberculosis, pneumoconiosis, sarcoidosis, eggshell calcification in lymph nodes in silicosis and malignancy.

Question 22

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

Parkinsonism produces a shuffling gait with flexed trunk - festinant gait.

Peripheral neuropathy and Guillian-Barré syndrome result in foot drop and a high-stepping gait which will be wide based if there is sensory loss.

Multiple sclerosis commonly produces a spastic-ataxic gait due to the combination of longtract and cerebellar lesions.

A waddling gait is seen with proximal myopathies.

Question 23

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Other relative contraindications include practising homosexuals and individuals who feel they require an HIV test.

Question 24

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Risk factors for developing dissection of the thoracic aortic aneurysm include: hypertension, trauma, coarctation of the aorta, pregnancy, connective tissue disorders (Marfan's, Ehlers-Danlos), SLE, relapsing polychondritis, congenitally bicuspid aortic valve, Turner's or Noonan's syndromes, and syphilis.

Dissecting thoracic aortic aneurysms carry a very high mortality.

If untreated 50% die within 48 hours, up to 70% within 1 week and 90% within 3 months.

Patients are commonly men aged 40-70 (Afrocaribbean > Caucasian). Clinical features may point to the site of dissection. Aortic incompetence, inferior infarction on the ECG (right coronary ostial involvement), cardiac tamponade and Marfanoid habitus suggest ascending aortic involvement.

Asymmetric upper limb pulses and stroke suggest arch involvement.

Descending aortic involvement results in haemothorax or pleural effusions, absent or reduced femoral pulses and renal failure.

Question 25

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

Methotrexate will produce a faster clinical response than parenteral gold therapy or penicillamine and side effects include neutropenia, nausea and vomiting and opportunistic infections.

Cumulative doses may lead to hepatic fibrosis but LFTs are not sensitive for this complication.

Liver biopsies are required at the start of therapy and at yearly intervals. The fibrotic changes tend not to progress if the drug is halted. Stridor is due to involvement of the cricoarytenoid joints and may be accompanied by dyspnoea and occasionally obstruction.

Treatment is with corticosteroid and, if necessary, tracheostomy.

Question 26

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

T lymphocytes are divided into subtypes on the basis of cell-surface markers as well as functional characteristics. All T cells express CD3 on their surface; this is in close relation to the T cell receptor and is involved in T cell activation. CD4-positive T cells are termed helper T cells and are further divided into TH1 and TH2 on functional characteristics. TH1 cells primarily enhance immune responses and secrete IL-1, gamma-IFN, IL-12 and TNF. They promote T cell proliferation and macrophage activation. TH2 cells secrete IL-4, IL-5, IL-6, IL-10 and IL-13 and are involved primarily in enhancing humoral immune responses (B cell activation, Ig class switching, etc.). IL-15 has been shown to induce T cell activation and TNF production, especially in patients with rheumatoid arthritis. CD45RO is a cell-surface marker for memory T

cells: these are the subgroup that circulates through the tissues screening for antigen. CD45RA is a marker for naive T cells.

Question 27

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

PNH (paroxysmal nocturnal haemoglobinuria) is an acquired clonal red-cell-membrane defect characterised by increased RBC fragility. The diagnostic test is susceptibility to lysis by acidified serum C₁ (Hams test). Clinical features include Coombs' negative haemolytic anaemia, haemoglobinuria (typically first voided specimen), acute abdominal pain, venous thromboses and gallstones. Treatment involves supplementation of iron, B₁₂ and folate; occasionally steroids or androgens reduce haemolysis. Patients should be anticoagulated to try to prevent venous thromboses. 5-10% develop acute myeloid leukaemia

Cold haemolysis is seen in a number of conditions including lymphomas, infectious mononucleosis, mycoplasma pneumonia and paroxysmal cold haemoglobinuria (Donath-Landseiner antibody).

Coombs' test identifies RBC coated with immunoglobulin (Ig) and C'. Coombs' positive haemolysis frequently occurs secondary to an underlying disease (SLE, chronic lymphocytic leukaemia, Hodgkin's lymphoma or ovarian teratoma) or drug reaction (methyl dopa, hydralazine, penicillin, insulin, quinine, isoniazid, sulphonamide, sulphonyl ureas and rifampicin). Primaquine causes haemolysis in patients with G6PD deficiency (other drugs causing this are: dapsone, sulphonamides, Vit K (water-soluble preparation), probenecid, quinine and chloramphenicol). This is not antibody-mediated and is Coombs' negative.

Question 28

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Aortic stenosis may occur at the level of the valve, above (supravalvular) or below the valve (subvalvular). On auscultation, the first heart sound is usually soft. An ejection sound (heard best at the apex) is heard if the valve is mobile and bicuspid and is rarely present in elderly calcified valves. A2 may be inaudible if the valve is calcified and there may be reverse splitting of S2 due to prolonged left ventricular ejection.

Subvalvular stenosis may be due to a discrete fibromuscular ring, septal hypertrophy (as in hypertrophic cardiomyopathy), anomalous attachment of the mitral valve leaflet, etc., and is often associated with aortic regurgitation.

Supravalvular stenosis is associated with Williams' syndrome (autosomal dominant with variable penetrance). Associations are 'elfin' facies, hypercalcaemia and hypervitaminosis D, peripheral pulmonary artery stenosis, pulmonary valve stenosis, aortic regurgitation, mesenteric artery stenosis and thoracic aortic aneurysms.

Unequal upper limb pulses are seen in coarctation of the aorta which is associated with bicuspid aortic valve. However, aortic stenosis does not CAUSE unequal limb pulses. Angina may occur with normal coronary arteries due to an imbalance in myocardial oxygen supply (shorter diastole with longer systole, impaired coronary perfusion, etc.) vs demand (cardiac hypertrophy, increased cardiac work).

Question 29

A. FALSE B. FALSE C. TRUE D. FALSE E. TRUE

HLA-B27 is a single-chain polypeptide of the Class I major histocompatibility complex. These MHC proteins are expressed as autosomal co-dominant traits. Class I proteins like B27 are found on all cells of the body. B27 is very rare in W. Africa as compared to the Caucasian population. >90% of patients with ankylosing spondylitis are B27 positive as are 40-50% of patients with acute anterior uveitis, 90% of patients with balanitis/urethritis and 90% of patients with Reiter's disease (asymmetrical oligoarthritis, painless oral and genital ulcers, conjunctivitis). Other diseases associated with HLA-B27 include the arthropathies of patients with inflammatory bowel disease (e.g. UC), psoriatic arthropathy of the ankylosing spondylitis type, juvenile chronic arthritis, chronic balanitis and prostatitis, 'frozen shoulder' and asbestosis.

Question 30

A. TRUE B. FALSE C. FALSE D. FALSE E. TRUE

de Quervain's thyroiditis is characterised by a tender goitre, F:M = 2:1, giant cells on biopsy, cold radioisotope (Tc-99) scan and the aetiology is probably viral (not bacterial).

Other types of thyroiditis:

1. Hashimoto's (F>>M, diffuse painless goitre full of lymphocytes on biopsy; associated with HLA-DR5 and anti-thyroid antibodies; approx. 80% of patients will get hypothyroidism later);
2. Ridel's (fibrosis of thyroid; associated with other fibrosing diseases, e.g. retroperitoneal fibrosis, Peyronie's disease, sclerosing cholangitis; approx. 50% of patients will get hypothyroidism later);
3. Post-partum thyroiditis (F>M, similar to Hashimoto's with painless goitre, transient thyrotoxicosis, transient hypothyroidism and lymphocytes in biopsy).

Question 31

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

In patients with CRF, dementia occurs due to aluminium toxicity. Long-term haemodialysis is associated with an increased risk of hepatitis B and C infection (hepatitis E is transmitted by the faeco-oral route and is similar to hepatitis A in its clinical manifestations). Hypogonadism and infertility are common. Arthropathy may result from deposition of amyloid (failure to clear beta-2-microglobulin by haemodialysis). Patients with CRF have hyperuricaemia but this does not commonly result in acute gout.

Question 32

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

There are four main ways that signals from the exterior of a cell (hormones, drugs, etc.) exert their effect on the cell. The most rapid (milliseconds) is by the receptor directly opening (or closing) an ion channel (e.g. nicotinic acetylcholine receptor). The second is by coupling of the receptor to G-proteins and influencing protein phosphorylation or ion channels via secondary messengers, e.g. the beta adrenergic receptor and the muscarinic receptor (acetylcholine). In the third mechanism the receptor directly phosphorylates the target protein (often another cellular phosphorylase or phosphatase) - the insulin receptor displays tyrosine kinase activity. Fourthly, oestrogen and other steroid hormone receptors bind the compound and translocate to the nucleus where they directly affect mRNA synthesis.

Question 33

A. FALSE B. FALSE C. FALSE D. FALSE E. FALSE

Membranous glomerulonephritis results from deposition of circulating immune complexes in the subepithelial space. It may be idiopathic or due to a variety of antigens - associations include drugs (gold, penicillamine, high-dose captopril), infections (hepatitis B, syphilis, *Plasmodium malariae*), paraneoplastic, sarcoidosis and autoimmune disease (especially SLE). Complement levels are usually normal. Clinical features include proteinuria, nephrotic syndrome, hypertension and hyperlipidaemia. One-third develop spontaneous remission, one-third go on to develop CRF and one-third remain nephrotic. Steroids are not very effective and other agents (e.g. chlorambucil) are usually required.

Question 34

A. TRUE B. TRUE C. FALSE D. FALSE E. TRUE

ANCA (anti-neutrophil cytoplasmic antibody) is a marker of systemic vasculitis (e.g. Wegener's, rapidly progressive glomerulonephritis, Kawasaki disease and Churg-Strauss syndrome). This may be divided into pANCA and cANCA on the basis of the staining pattern. These have distinct antigen specificities:

pANCA (peri-nuclear) reacts against myeloperoxidase or elastase and is rarely seen in Wegener's disease. It may occur with severe infections (HIV, infective endocarditis, amoebic abscesses, etc.), inflammatory bowel disease (ulcerative colitis, Crohn's), malignancy, primary biliary cirrhosis, anti-GBM disease, SLE, rheumatoid arthritis;

cANCA recognises neutrophil alpha-proteinase-3 and >80% of patients with Wegener's are positive for this. It is also seen in microscopic polyarteritis. The ANCA has not yet been shown to be pathogenic but the levels mimic the disease activity.

Patients with Churg-Strauss syndrome may have either form of ANCA - 25% are pANCA positive, 50% cANCA positive and the rest are ANCA negative.

Question 35

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

The anion gap is calculated by $\text{Na}^+ - \text{Cl}^- - \text{HCO}_3^-$ (not phosphate); the normal range is 8-12 mEq/l Cl^- , not PO_4^{3-} . High

anion-gap metabolic acidosis is seen with uraemia, ketoacidosis, lactic acidosis and overdose with aspirin, methanol, ethylene glycol and

paraldehyde. A low anion gap is seen with hypoalbuminaemia, paraproteinaemia, hypercalcaemia, hypermagnesaemia and lithium intoxication.

Acidosis in the presence of a normal anion gap (bicarbonate loss, hyperchloraemic) is seen in renal tubular acidosis, GI losses (diarrhoea, pancreatic/biliary fistula). Bicarbonate loss through the GI tract and urine (RTA) is increased with acetazolamide.

Question 36

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

The carotid sinus is a thin-walled dilatation at the origin of the internal carotid artery. Afferent nerve fibres form the carotid sinus nerve and then pass via the glossopharyngeal nerve (IXth cranial nerve) to the cell bodies located in the petrous ganglion. Central axons pass from this ganglion to the nucleus tractus solitarius in the brainstem. The receptors are sensitive to pressure and stretch (not pH). Stretch of the carotid sinus (by increased arterial pressure) produces a burst of impulses which then slow down and results in reflex bradycardia and hypotension (discovered

by Hering in 1923). Carotid sinus hypersensitivity is a rare condition characterised by intense vagal discharge, AV block, hypotension and syncope. Dual chamber pacing carries the best chance of maintaining the BP. It is not a common cause of syncope in young women!

Question 37

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

Legionnaire's disease is caused by *Legionella pneumophila* and occasionally *L. micdadei*. The organism thrives in water-containing reservoirs; there is no documented person-to-person spread. Clinical features include high fever, gastrointestinal upset, headache and encephalopathy. LFTs are abnormal and patients develop hyponatraemia, hypophosphataemia and renal failure. Diagnosis is by direct fluorescence on pleural fluid or lung biopsy or silver stain on sputum or retrospectively by serology (takes 2 weeks). Pontiac fever is a self-limiting tracheobronchitis caused by the same organism. Treatment: erythromycin +/- rifampicin for 2 weeks.

Question 38

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

The normal WBC in synovial fluid is $<0.2 \times 10^9/l$ with $<30\%$ neutrophils and this is the level seen in non-inflammatory arthropathies (e.g. osteoarthritis). In inflammatory conditions the total WBC increases and the majority of the cells are now polymorphs. However, the actual count may vary from patient-to-patient and is not in itself diagnostic (septic arthritis - $5-500 \times 10^9/l$, $>80\%$ PMN; gout $2-200 \times 10^9/l$, 60% PMN; rheumatoid arthritis $2-100 \times 10^9/l$, $>50\%$ PMN, etc.). The synovial fluid glucose is usually low in Reiter's, septic arthritis and rheumatoid arthritis. Synovial complement levels are elevated in Reiter's, but low in rheumatoid arthritis, SLE, gout and sepsis. Patients with haemochromatosis typically have iron deposition within the synovial cells of the joint space; haemosiderin-laden macrophages are characteristic of haemarthroses.

Question 39

A. TRUE B. FALSE C. FALSE D. TRUE E. TRUE

Chronic lymphocytic leukaemia (CLL) is most frequently ($\sim 90\%$) of B cell origin. Often the diagnosis is made by chance when an abnormal peripheral blood film is reported on routine blood count. Patients may be asymptomatic for years until the disease progresses and lymphadenopathy, hepatosplenomegaly and symptoms of anaemia and bone marrow failure develop. Cell-mediated immunity is impaired and $\sim 65\%$ develop hypogammaglobulinaemia resulting in recurrent sinus and chest infections. Acute transformation is rare (cf. CML) and progression results in marrow failure, recurrent severe infections and very rarely Richter's syndrome (high grade lymphoma). The incidence of skin cancers is increased.

Question 40

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

ECT is the treatment of choice for puerperal psychosis. It is beneficial in patients with severe depression resistant to medical therapy, depression accompanied by dehydration or weight loss, drug-resistant mania, depression with suicidal ideation, delusions or psychotic symptoms. Contraindications include patients unfit for general anaesthesia, known ischaemic heart disease or stroke, or raised intracranial pressure. In young adults, prominent anxiety symptoms are usually associated with a poor outcome with ECT; in the elderly, agitation and anxiety

predict a good outcome.

Question 41

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

The paternal mitochondria contained in the tail of the sperm are lost prior to fertilization and thus no paternal mitochondria are passed to the zygote. Thus mitochondrial diseases are transmitted via the maternal genome. The clinical features are varied: Kearns-Sayre syndrome progressive external ophthalmoplegia, retinitis pigmentosa, complete heart block, raised CSF protein; MERRF - myoclonic epilepsy ragged red fibres (on biopsy), myopathy, lactic acidosis; hypermetabolic proximal myopathy - may mimic thyrotoxicosis, heat intolerance, fever, proximal myopathy, etc. The mitochondrial DNA is separate from the chromosomal DNA and is not located in the nucleus. Heteroplasmy describes the coexistence of normal mitochondria (or cells) with abnormal. The ratio of normal to abnormal mitochondria transmitted to the fetus will determine the phenotype and thus mitochondrial diseases typically display a 'threshold effect'.

Question 42

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Beta-blockers decrease catabolism of triglycerides and thus result in raised levels. Chronic renal failure causes a decrease in hepatic lipoprotein lipase. Cholestyramine and other anion exchange resins sequester bile acids in the small bowel preventing their reabsorption. The intrahepatic bile salt pool is reduced and more cholesterol is absorbed from the plasma reducing LDL-cholesterol but exacerbating hypertriglyceridaemia.

Question 43

A. FALSE B. FALSE C. TRUE D. TRUE E. TRUE

The polymerase chain reaction is used to amplify a region of a gene of interest for analysis for mutations and sequencing. It utilises a bacterial enzyme that is thermostable (i.e. can survive temperatures of 95°C for up to an hour) and functions as a DNA-dependent DNA polymerase. It is essential to know part of the sequence of the gene (but not the full sequence) to allow synthesis of short oligonucleotides (primers), one complementary to each of the two strands of the DNA. The basic procedure involves heating the sample to 95°C to denature the DNA. The sample is then cooled to allow the primers to anneal to the DNA. These serve as start sites for the polymerase that synthesises a strand complementary to the DNA. The procedure is then repeated for several (30-40) cycles. PCR has been used for prenatal diagnosis and can be performed on single cells (fetal cells have been found in the peripheral blood of pregnant women).

Question 44

A. TRUE B. FALSE C. FALSE D. FALSE E. TRUE

Any cause of Cushing's syndrome results in loss of the diurnal rhythm of cortisol secretion and produces a persistently elevated serum (and 24-hour urine) cortisol. Serum ACTH is undetectable with adrenal tumours; an exaggerated response to CRF administration is seen in pituitary-dependent Cushing's syndrome. Adrenal tumours usually do not suppress with dexamethasone (low or high dose). Metyrapone inhibits 11-beta-hydroxylase (a step in the synthesis of cortisol) and results in a loss in the negative feedback of cortisol on the pituitary. This produces a rise in ACTH secretion and a rise in urinary 17-oxogenic steroids (17-OGS). It

may be used in the diagnosis of Cushing's syndrome: in pituitary Cushing's, metyrapone produces a large rise in urinary 17-OGS while in ectopic ACTH secretion or adrenal tumours, although serum cortisol levels may fall, there is usually no change in urinary 17-OGS excretion. Prior to surgery, it is important to reduce cortisol levels to 300-400 nmol/l and metyrapone (or aminogluthemide) may be used.

Question 45

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Vitamin K-gamma carboxylates prothrombin and coagulation factors VII, IX and X. Calcium is required to stabilise the enzyme complexes generated during the coagulation cascade.

Thrombin converts fibrinogen to fibrin to form the clot. Plasmin is required for clot lysis.

Question 46

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Legionnaire's disease is caused by *Legionella pneumophila*. The organism thrives in water-containing reservoirs and the outbreak in Philadelphia that claimed the lives of several members attending a Foreign Legion convention was traced to the air conditioning unit. There is no documented person-to-person spread Clinical features include high fever, gastrointestinal upset, headache and encephalopathy. LFTs are abnormal and patients develop hyponatraemia, hypophosphataemia and renal failure.

Diagnosis is by direct fluorescence on pleural fluid or lung biopsy or silver stain on sputum or retrospectively by serology (takes 2 weeks). Pontiac fever is a self-limiting tracheobronchitis caused by the same organism. Treatment: erythromycin +/- rifampicin for 2 weeks.

Question 47

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Acute myeloid leukaemia is classified according to morphological criteria into FAB classes M1-M7. After initial diagnosis and stabilization, the primary goal is to try to establish remission.

Promyelocytic leukaemia is associated with disseminated intravascular coagulation (DIC) resulting in microangiopathic haemolytic anaemia. Of patients <50 yrs of age, ~80% enter remission, but survival is only 1-2 years without further therapy. Maintenance or consolidation chemotherapy can improve disease-free survival, but best results are obtained following allogenic bone marrow transplantation (BMT). ABO incompatibility is not a contraindication to BMT and only requires RBC depletion from the graft to prevent transfusion reaction.

Question 48

A. FALSE B. TRUE C. FALSE D. FALSE E. FALSE

Long-term oxygen therapy has been shown to prolong survival of patients with cor pulmonale or severe COAD. Department of Health guidelines: patients with $\text{PaO}_2 < 7.3 \text{ kPa}$ on air, $\text{pCO}_2 > 6 \text{ kPa}$, $\text{FEV}_1 < 1.5$ and $\text{FVC} < 2$ litres, on two occasions at least 3 weeks apart after appropriate bronchodilators have been administered. There is no evidence for low-flow oxygen therapy for other disorders.

Question 49

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

Q fever is a very rare cause (too rare for MRCP). Other causes include syphilis, brucella,

histoplasmosis, toxocariasis, CMV, EBV, Crohn's, primary biliary cirrhosis, beryllium, phenylbutazone, allopurinol, sulphonamides and Hodgkin's disease Primary biliary cirrhosis (PBC) is of unknown aetiology and affects middle-aged females far more than males (F:M 9:1). Clinical features include itching, hepatosplenomegaly, cholestasis, pigmentation, clubbing, xanthomata, arthralgia, osteomalacia and osteoporosis, and portal hypertension. Diagnosis: cholestatic LFTs, antimitochondrial antibody is positive in 95%, serum IgM is raised. The autoimmune antigen is thought to be the pyruvate dehydrogenase complex (M2 antigen) and a positive ELISA to this is diagnostic. Liver biopsy shows widespread induction of HLA class II on the hepatocytes, ductal inflammation and cholestasis, granuloma formation, piecemeal necrosis, fibrosis and copper deposition in the end stage. Treatment: symptomatic, cholestyramine for itching, sclerotherapy for varices, Vitamins A, D and K. Azathioprine may help. Transplant if possible.

Question 50

A. FALSE B. FALSE C. FALSE D. FALSE E. FALSE

There is no evidence for a 'schizophrenic' personality, particularly one that reliably predicts later development of schizophrenia However, it is often possible to obtain a history from some schizophrenics of shyness, extreme dependency, lack of close personal relationships, anti-social pre-morbid personality, overcompliance and conformity or social withdrawal.

Question 51

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Lower oesophageal sphincter tone is increased by gastrin, cholinergic drugs, metoclopramide, coffee and a protein meal. It is lowered by secretin, beta-agonists, smoking, theophylline and prostaglandins.

Question 52

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Steroids have not been shown to be of use in acute bacterial infection. They reduce morbidity and mortality in tuberculous meningitis with raised intracranial pressure, focal signs and high protein in CSF.

Cryptococcal meningitis is seen in immunosuppressed patients (e.g. those with AIDS, diabetes mellitus, on systemic steroid treatment, lymphoproliferative disorders).

Causes of lymphocytic meningitis include TB, *cryptococcus*, *leptospirosis*, Lyme disease, syphilis, *brucella* and viral meningitis.

Question 53

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Bulimia nervosa consists of ravenous overeating followed by guilt, depression and anger at oneself for doing so. Individuals usually hide their eating. Meals are interrupted by sleep, abdominal pain, social interruption or self-induced vomiting and patients attempt to lose weight vigorously (dieting, exercise, enemas, etc.). Stealing behaviour and substance abuse (cathartics, diuretics, stimulants) occur concomitantly.

Question 54

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

The pupil is dilated in IIIrd nerve palsy (compressive lesion), Holmes-Adie syndrome (myotonic pupil - often unilateral and poorly responsive to light; associated with reduced or absent ankle and knee reflexes), midbrain lesions, congenital syphilis, anticholinergic treatment (atropine), cocaine intoxication.

Causes of Horner's syndrome include Pancoast's tumour (apical lung carcinoma involving sympathetic chain), iatrogenic (sympathectomy), syringomyelia, lateral medullary syndrome, Shy Drager syndrome (causes Parkinsonism with postural hypotension and atonic bladder). Other causes of small pupil include myotonic dystrophy, pontine lesions, acute iritis, opiates and organophosphates. The Argyll-Robertson pupil is seen in neurosyphilis - the pupil is unreactive to light but reacts to accommodation (a similar phenomenon may be seen in DM).

Question 55

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

Nelson's syndrome is a rare condition that follows bilateral adrenalectomy. There is loss of the feedback inhibition by cortisol on the pituitary and an increase in secretion of ACTH and MSH (melanocyte stimulating hormone); the latter produces hyperpigmentation. Pituitary radiotherapy after adrenalectomy may prevent it.

Sheehan's syndrome is pituitary necrosis following post-partum haemorrhage and hypovolaemia. Symptoms are those of pan-hypopituitarism with loss of LH/FSH (loss of libido, amenorrhoea, impotence, etc.), TSH (hypothyroidism), ACTH (Addison's - recurrent hypoglycaemia), GH and prolactin.

Question 56

A. TRUE B. TRUE C. TRUE D. TRUE E. FALSE

Kaposi's sarcoma is commonly seen in homosexual patients with AIDS and faeco-oral contact seems to predispose for this. It is occasionally seen in intravenous drug users with AIDS but rarely occurs in haemophiliacs with AIDS. Kaposi's lesions on the palate are strongly associated with intrathoracic Kaposi's sarcoma. There is recent evidence that a novel Herpes virus (HHV-8) may be involved in the pathogenesis of Kaposi's sarcoma. A reduced gas transfer (TLCO) is sensitive but not specific. Mycobacterial infections are rare until the CD4 count falls below $0.06 \times 10^9/l$. Approx. 50% of HIV-positive individuals develop this infection before they die. The presentation is non-specific; hepatomegaly and anaemia are the most common findings. Treatment is not curative and is required for life (e.g. rifampicin, ethambutol, clarithromycin). Prophylaxis is with ansamycin (rifabutin).

CMV causes pneumonitis in immunosuppressed individuals but rarely occurs without other pathogens in HIV Treatment is with gancyclovir but is rarely very effective.

Question 57

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

The karyotype in Klinefelter's syndrome is 47XXY and patients typically exhibit decreased upper-body to limb ratio, raised LH and FSH and are infertile.

Male pseudohermaphroditism is caused by 5-alpha reductase deficiency: there is a failure to activate testosterone to dihydrotestosterone which is only a weak androgen. The boys exhibit ambiguous genitalia until puberty when the increase in levels of circulating androgens are sufficient to masculinize the genitalia.

True hermaphroditism is due to dizygotic fusion and patients have a 46XX/46XY karyotype.

Testicular feminization syndrome is due to an X-linked defective androgen receptor; castration is indicated to prevent malignancy.

Patients present in infancy or early childhood with inguinal hernia or later in adolescence with breasts, short vagina and primary amenorrhoea

Question 58

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

Human herpes virus-6 (HHV-6), like the other members of the Herpes virus family (CMV, EBV, etc.) is a DNA virus. Infection in children is associated with roseola infantum (exanthem subitum) – a self-limiting infection. In adults, infection typically results in a glandular feverlike syndrome, but fever is uncommon. Other features include non-tender cervical adenopathy and atypical lymphocytosis. The virus persists in the salivary glands. In the immunosuppressed, HHV-6 is associated with severe encephalitis and/or pneumonia with a high mortality. (HHV-8 is associated with Kaposi's sarcoma, not HHV-6).

Question 59

A. FALSE B. FALSE C. FALSE D. TRUE E. TRUE

Drugs can harm the fetus by altering organ development in the first trimester of pregnancy or inhibiting organ function later in gestation. ACE inhibitors impair fetal renal function and are associated with oligohydramnios and neonatal anuria. Methyldopa is the safest drug for the treatment of blood pressure in pregnancy. Low-dose aspirin is used in patients with preeclampsia.

Warfarin can cause fetal intracranial haemorrhage and is associated with chondrodysplasia punctata. Carbamazepine and phenytoin can both cause early neonatal haemorrhage (vitamin K deficiency related) and are teratogenic (carbamazepine - CNS, limb and cardiac; phenytoin - craniofacial, limb; valproate - neural tube).

Question 60

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Causes include Crohn's, UC, sarcoid, TB, streptococcal infections, cat-scratch fever, syphilis, Yersinia, toxoplasma, leprosy, lymphogranuloma venereum and coccidiomycosis infections. Also: rheumatic fever (rare), drugs (sulphonamides, penicillin, OCP, salicylates, barbiturates), pregnancy and Behcet's disease.

Exam 5

Question 1 In a patient with ischaemic heart disease:

- A. Dyspnoea following prolonged angina suggests severe left ventricular disease
- B. An atrial sound may be audible only during an attack of angina
- C. A fall in BP on exercise suggests severe coronary artery disease
- D. Tachycardia induced by pacing is more likely to produce pain than exercise
- E. Pain at rest without a rise in serum enzymes may be due to coronary artery spasm

Question 2 Digoxin toxicity is:

- A. Precipitated by hypomagnesaemia
- B. Due to an idiosyncratic reaction to the drug
- C. Aggravated by hypokalaemia
- D. More likely in patients taking drugs which induce hepatic enzymes
- E. Is predictable from the plasma level of the drug

Question 3 The following are recognised side-effects of neuroleptic drugs:

- A. Oculogyric crisis
- B. Catatonia
- C. Akathisia
- D. Tardive dyskinesia
- E. Parkinsonism

Question 4 The following predispose to anaerobic lung infections:

- A. Diabetes
- B. Pulmonary fibrosis
- C. Alcoholism
- D. Old age
- E. Poor dentition

Question 5 Treatment of acute gout includes:

- A. Intra-articular steroids
- B. Colchicine
- C. Allopurinol
- D. Paracetamol
- E. Probenecid

Question 6 The following statements concerning anticoagulants and antithrombotic agents are true:

- A. Low molecular weight heparins are more likely to stimulate platelet aggregation than standard (unfractionated) heparin
- B. Hirudin is a potent inhibitor of thrombin
- C. Antibodies to GPIIb/IIIa receptors inhibit platelet aggregation
- D. Antibodies to alteplase prevent its re-use within 6 months of receiving it
- E. Aspirin is contraindicated in patients receiving thrombolysis

Question 7 The following are recognised associations:

- A. Thrombocytosis and CLL
- B. Thalassaemia major and increased total body iron
- C. Aplastic anaemia and Down's syndrome
- D. Polycythaemia and hydronephrosis
- E. Myelofibrosis and gout

Question 8 Babies born to HIV-positive mothers:

- A. Have a higher rate of congenital malformations
- B. In the UK have a higher risk of prematurity
- C. Are more likely to become HIV positive if they are the first of twins to be delivered vaginally
- D. Risk infection through breast milk
- E. May acquire HIV infection transplacentally

Question 9 Adrenal tumours:

- A. May be associated with multiple endocrine neoplasia type I
- B. When found incidentally are usually non-functioning
- C. Are usually malignant if >2 cm in diameter
- D. Plasma sodium is useful in screening for hormone production
- E. Are incidental findings in ~1% of CT scans

Question 10 In chronic myeloid leukaemia:

- A. Diagnosis relies on demonstrating a 9, 22 chromosome translocation
- B. Further chromosome translocations herald a change in disease character
- C. Bone marrow transplantation in remission may be curative
- D. Myelofibrosis may result
- E. Busulphan therapy delays the onset of blast transformation

Question 11 Regarding hepatic encephalopathy:

- A. EEG shows 2 Hz classic spike and wave pattern
- B. Blood ammonia levels are found in 90%
- C. Bromocriptine may be of benefit
- D. Flumazenil is contraindicated
- E. Branched chain amino acid preparations are effective

Question 12 Alpha-adrenergic stimulation results in:

- A. Decreased insulin secretion in response to a glucose load
- B. Axillary sweating
- C. Bronchoconstriction
- D. Lipolysis
- E. Vasodilatation

Question 13 Lesions of the hypothalamus:

- A. Are a cause of hypothermia
- B. Can cause hypoprolactinaemia
- C. Can cause anorexia

- D. May be associated with bitemporal hemianopia
- E. Are seen with neurosarcoidosis

Question 14 The following treatments are effective in the management of acute mania:

- A. Lithium carbonate
- B. Tricyclic antidepressants
- C. Carbamazepine
- D. Clonazepam
- E. ECT

Question 15 The following statements concerning asbestosis are true:

- A. Pleural plaques are pre-malignant
- B. It produces pulmonary nodules and fibrosis
- C. Carcinoma of the bronchus is a recognised complication
- D. Is commonly associated with a positive anti-nuclear antibody
- E. It produces finger clubbing and fine end inspiratory crepitations in the lung bases

Question 16 Causes of painful visual loss include:

- A. Central retinal artery occlusion
- B. Temporal arteritis
- C. Central retinal vein occlusion
- D. Optic neuritis
- E. Diabetic third nerve palsy

Question 17 Reversible causes of dementia include:

- A. Hypothyroidism
- B. Syphilis
- C. Collagen vascular disease
- D. Haemodialysis dementia in patients with chronic renal failure
- E. Normal pressure hydrocephalus

Question 18 The following are true:

- A. Chenodeoxycholic acid is an effective treatment in primary biliary cirrhosis
- B. Iron chelation therapy is the primary therapy for haemochromatosis
- C. Corticosteroids are useful in treating primary sclerosing cholangitis
- D. EBV hepatitis carries a high risk of subsequent hepatocellular carcinoma
- E. Octreotide is as effective as injection sclerotherapy in controlling bleeding varices acutely

Question 19 Hypocalcaemia is a recognised feature of:

- A. Acute renal failure
- B. Acute pancreatitis
- C. Di George syndrome
- D. Pseudohypoparathyroidism
- E. Thyrotoxicosis

Question 20 Somatic gene therapy is a potential therapeutic technique in:

- A. Adenosine deaminase deficiency
- B. Thalassaemia
- C. Diabetes mellitus
- D. Haemophilia A
- E. Sickle-cell disease

Question 21 Cystic fibrosis:

- A. Diagnosis is established with sweat sodium >40 mEq/l
- B. Is inherited in an autosomal recessive manner
- C. Diabetes occurs in 25%
- D. Is the commonest cause of recurrent bronchopulmonary infections in childhood
- E. Both males and females are infertile

Question 22 The following are transmitted by blood:

- A. Malaria
- B. Giardia
- C. Epstein Barr virus
- D. *Treponema pallidum*
- E. HTLV-1

Question 23 Hepatitis A infection may lead to:

- A. Hepatic encephalopathy
- B. Chronic liver disease
- C. Gallstones
- D. FitzHugh-Curtis syndrome
- E. Arthritis

Question 24 The following are true:

- A. Clonal analysis of mature blood cells indicates that myeloproliferative disorders generally arise in the pluripotent stem cell
- B. B-lymphocyte malignancies are associated with clonal immunoglobulin gene rearrangements
- C. Granulocyte-macrophage colony stimulating factor induces maturation of the leukaemic cells in CML
- D. Retinoids are useful for the treatment of pro-myelocytic leukaemia
- E. Anaemia due to zidovudine is refractory to treatment with recombinant erythropoietin

Question 25 The following are true regarding psoriasis:

- A. Erythroderma is a recognised complication of initial steroid therapy
- B. In acute pustular psoriasis, fever and leukocytosis imply secondary bacterial infection
- C. Guttate psoriasis is often precipitated by an upper respiratory infection
- D. Chloroquine is effective in psoriatic arthropathy
- E. Discoid psoriasis typically affects the extensor aspects of elbows and knees

Question 26 The following are true about IgA nephropathy:

- A. Commonly presents as the nephrotic syndrome

- B. Immunofluorescent studies of the renal biopsy establish the diagnosis
- C. Haematuria is common
- D. Its recurrence in renal allografts usually leads to graft failure
- E. Prognosis is favourable in most patients

Question 27 Polyarteritis nodosa:

- A. Amphetamine abuse can be a precipitating event
- B. Raised ANA is commonly found
- C. Hypertension accompanies renal impairment
- D. Pulmonary angiography is likely to reveal microaneurysms
- E. Chronic cutaneous manifestations sometimes occur in the absence of visceral involvement

Question 28 In primary hyperparathyroidism:

- A. Hypercalcaemia may be associated with a normal PTH level
- B. >80% of patients have a solitary parathyroid adenoma
- C. Hypertension is a recognised association
- D. An elevated fasting gastrin level suggests a diagnosis of MEN type 1
- E. Cutaneous moniliasis is a recognised association

Question 29 Characteristic features of multiple myeloma include:

- A. Raised serum alkaline phosphatase
- B. Renal failure
- C. Immune paresis
- D. Hypocalcaemia
- E. Cold spots on an isotope bone scan

Question 30 Bicuspid aortic valves:

- A. Are associated with coarctation of the aorta
- B. Calcification is uncommon
- C. Incompetence is more common than stenosis
- D. Are associated with Turner's syndrome
- E. Are a feature of Marfan's syndrome

Question 31 Selective IgA deficiency:

- A. Is associated with bronchiectasis
- B. Is associated with malabsorption from the GI tract
- C. Intravenous immunoglobulin is the treatment of choice
- D. Is associated with an increased incidence of chronic active hepatitis
- E. Displays X-linked recessive inheritance

Question 32 Deficiency of:

- A. Zinc causes acrodermatitis enteropathica
- B. Vitamin A causes bone pain and perifollicular bleeding
- C. Iron causes brittle nails
- D. Niacin causes Casal's necklace
- E. Copper causes disordered keratinisation of hair

Question 33 Myotonic dystrophy:

- A. Has an autosomal recessive mode of inheritance
- B. Is associated with diabetes mellitus
- C. Is associated with hypogammaglobulinaemia
- D. Has a characteristic EMG pattern
- E. Results in type I respiratory failure

Question 34 Zidovudine:

- A. Inhibits replication of HTLV 1
- B. May cause marrow suppression
- C. Is beneficial in patients with asymptomatic HIV infection
- D. Is eliminated predominantly by renal excretion
- E. Is a cause of polymyositis

Question 35 Complex partial epilepsy:

- A. Is the most common form of epilepsy following prolonged febrile convulsions as a child
- B. Frequently presents in childhood
- C. Is best treated with sodium valproate
- D. May have an aura of abdominal discomfort
- E. Is a form of petit mal

Question 36 Exophthalmic Graves' disease:

- A. Is always associated with thyrotoxicosis
- B. Is best assessed by CT scan of the orbits
- C. Is usually associated with circulating antithyroid antibodies
- D. Occurs in at least 50% of patients with thyrotoxic Graves' disease
- E. Is associated with elevated urinary glycosaminoglycan levels

Question 37 The following statements are correct:

- A. High HDL levels are associated with increased risk of coronary artery disease
- B. ApoE4 is associated with coronary artery disease in epidemiologic studies
- C. Lipoprotein Lp(a) is strongly associated with coronary artery disease
- D. Fish oils inhibit the release of endothelium-derived relaxing factor (EDRF)
- E. EDRF production is impaired in atherosclerotic plaques

Question 38 Macrocytosis may be caused by:

- A. Alcoholism
- B. Gluten-sensitive enteropathy
- C. Methotrexate therapy
- D. Hypothyroidism
- E. Pregnancy

Question 39 The following are characteristic of Behçet's syndrome:

- A. Meningoencephalitis
- B. Erosive arthritis
- C. Mucosal ulceration of ileum

- D. Recurrent thrombophlebitis
- E. Painless vaginal ulcers

Question 40 The following statements regarding antimicrobials are true:

- A. Flucloxacillin is resistant to beta-lactamases
- B. Most cephalosporins are excreted unchanged by the kidney
- C. Neomycin used topically may be absorbed sufficiently to cause ototoxicity
- D. Sulphonamides may cause the Stevens-Johnson syndrome
- E. Co-trimoxazole is the treatment of choice for *Pneumocystis pneumonia*

Question 41 Whipple's disease:

- A. PAS positive macrophages are present in the duodenum
- B. Is associated with amyloid deposition
- C. Neurological manifestations may respond to antibiotic therapy
- D. Presents with steatorrhoea and abdominal pain
- E. Responds to sulphasalazine

Question 42 Each of the following is associated with the appropriate autoantibody:

- A. Congenital heart block and anti-La
- B. Myositis and anti-nuclear protein (ANP)
- C. Pancreatitis and insulin receptor antibody
- D. Eaton-Lambert syndrome and anti-acetylcholine receptor antibodies
- E. Recurrent abortions and anti-phospholipid antibody

Question 43 In patients with:

- A. Chronic AF associated with rheumatic heart disease has a 5-fold increased risk of embolic stroke in the absence of anticoagulation
- B. Chronic AF, the need for anticoagulation following cardioversion is obviated if a TOE shows no evidence of atrial thrombus
- C. Paroxysmal atrial fibrillation, dual chamber pacing is contraindicated
- D. Atrial fibrillation associated with WPW syndrome, verapamil is contraindicated
- E. AF not converted to sinus rhythm by external cardioversion, internal cardioversion using electrode catheters may be effective

Question 44 In constrictive pericarditis:

- A. Ascites is often out of proportion to the degree of dependent oedema
- B. Pedal oedema is a prominent feature
- C. Pleuritic pain is often present
- D. A pansystolic murmur which increases on inspiration is characteristic
- E. Prominent 'v' waves are present in the neck

Question 45 The following causes of glomerulonephritis are associated with hypocomplementaemia:

- A. IgA nephropathy
- B. SLE
- C. Post-streptococcal glomerulonephritis

- D. Wegener's granulomatosis
- E. Minimal change disease

Question 46 The following statements concerning the correlation coefficient (r) between two variables are true:

- A. r is the square root of the variance of the group
- B. $r = -0.9$ suggests there is no correlation between the two variables
- C. $r = 0.001$ suggests a highly significant result
- D. $r = 0.4$ with $p < 0.005$ suggests there is no significant relationship between the two variables
- E. The number of observations of the two groups should be the same

Question 47 The following are normal findings on the ECG:

- A. PR interval of 0.22 s
- B. Mean frontal QRS axis of -40° c.
- C. R wave in aVL of 12 mm
- D. Right bundle branch block
- E. Q wave in lead III

Question 48 Coronary artery stents:

- A. Reduce the need for emergency CABG after failed angioplasty
- B. Are most effective in small (<3 mm) arteries
- C. Require life-long anticoagulation
- D. Preclude the use of nuclear magnetic resonance imaging
- E. Can easily be seen on a lateral chest film

Question 49 Regarding drugs used in treatment of HIV infection:

- A. The drugs have not produced any overall increase in median survival in patients with AIDS
- B. Lamivudine is associated with fewer side effects than the other nucleoside analogues
- C. Ritonavir is a non-nucleoside reverse transcriptase inhibitor
- D. Zidovudine started during primary HIV infection delays disease progression and development of minor opportunistic infections
- E. Zidovudine is contraindicated in HIV-positive women who are pregnant

Question 50 Causes of pulmonary cavitation include:

- A. Aspiration pneumonia
- B. Invasive aspergillosis
- C. Septic emboli
- D. Pneumocystis carinii pneumonia
- E. Churg-Strauss syndrome

Question 51 Polymyalgia rheumatica:

- A. Is associated with elevated creatinine kinase
- B. Commonly presents with stiffness and tenderness of proximal muscles
- C. Serum alkaline phosphatase may be elevated
- D. Is associated with temporal arteritis in up to 50%
- E. ESR is the single most useful investigation

Question 52 Recognised features of lactic acidosis include:

- A. Is most commonly due to accumulation of the L-isomer of lactate
- B. Complicates metformin therapy
- C. Should be suspected in high anion-gap acidosis where there is no uraemia or diabetic ketoacidosis
- D. Serum lactate concentrations of >5 mmol/l are diagnostic
- E. Is associated with short bowel syndrome

Question 53 Adult polycystic kidney disease:

- A. Is linked to the short arm of chromosome 16
- B. Renal cysts are present from birth
- C. Subclinical pancreatic cysts are present in the majority of patients
- D. Is associated with mitral valve prolapse
- E. Is associated with diverticulosis of the colon

Question 54 Progressive gait disability in elderly individuals may be due to:

- A. Normal pressure hydrocephalus
- B. Cervical spondylosis
- C. Subdural haematoma
- D. Carotid stenosis
- E. Subacute combined degeneration of the cord

Question 55 The following therapies may be of use in treating patients with phobias:

- A. Expressive psychotherapy
- B. Monoamine oxidase inhibitor therapy
- C. Systematic desensitization
- D. Biofeedback
- E. ECT

Question 56 The following statements regarding the aorta are true:

- A. The ascending aorta has no branches
- B. The ascending aorta lies intrapericardially
- C. The arch of the aorta is connected to the left pulmonary artery in normal individuals
- D. The descending thoracic aorta gives branches to the bronchi
- E. The abdominal aorta ends at the body of the first lumbar vertebra

Question 57 After recovery of consciousness following a closed head injury:

- A. The patient may not remember the blow on the head
- B. The period of retrograde amnesia shrinks as the recovery continues
- C. The period of post-traumatic amnesia shrinks as recovery continues
- D. Permanent anosmia is a recognised complication
- E. If no fits occur in the first 3 months following injury, there is no risk of post-traumatic epilepsy

Question 58 The following statements about drug metabolism are true:

- A. First-order metabolism applies to most drugs in clinical use

- B. In zero-order kinetics, the half life is independent of drug concentration
- C. The rate of metabolism is proportional to drug concentration in first-order metabolism
- D. Phenytoin, in the therapeutic dose range, is eliminated by first-order metabolism
- E. Alcohol metabolism is an example of zero-order kinetics

Question 59 Lyme disease:

- A. Is a rickettsial disease
- B. Cranial nerve palsies are common
- C. The skin rash present is erythema multiforme
- D. Is transmitted by rat fleas
- E. The arthritis is clinically indistinguishable from juvenile chronic arthritis

Question 60 Distal renal tubular acidosis:

- A. Nephrocalcinosis is rare
- B. Aminociduria and glycosuria are common
- C. Urinary phosphate excretion is increased
- D. Osteomalacia is common
- E. Is seen in Fanconi's syndrome

Exam 5: Answers

Question 1

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

In patients with ischaemic heart disease, myocardial oxygen demand exceeds supply. With prolonged angina, there is impaired diastolic relaxation and eventually impaired systolic contraction resulting in overall reduction in left ventricular function. Clinical evidence of heart failure develops when the remainder of the normal myocardium is unable to maintain cardiac output. However, dyspnoea on exercise does not suggest severe left ventricular disease, but may just reflect severe reduction in exercise-induced vasodilatation and a limited residual coronary flow reserve. A fall in BP on exercise occurs for similar reasons. The patients may develop a third heart sound during episodes of angina as the ventricle is 'stiffer'. Tachycardia from any cause can precipitate angina.

Question 2

A. TRUE B. FALSE C. TRUE D. FALSE E. FALSE

Digoxin toxicity may be precipitated by:

1. Metabolic imbalance - hypokalaemia, hypomagnesaemia, hypercalcaemia, hypoxia, hypothyroidism;
2. Drug interactions - either displacement from protein binding (e.g. quinidine, amiodarone, etc.) or by inhibiting tubular secretion of digoxin (calcium channel blockers, nifedipine, verapamil);
3. Other predisposing factors - old age, renal failure, cardiac amyloid, pre-existing cardiac disease. Toxicity may cause pulsus bigeminus, bradycardias, AV block, SVTs and ventricular arrhythmias. Patients notice nausea, vomiting, abdominal pain, xanthopsia (yellow vision), confusion and blurred vision. Treatment: stop digoxin and correct electrolyte abnormalities. Phenytoin for tachyarrhythmias and atropine or pacing for bradyarrhythmias. Antidigoxin antibodies or dialysis may be required.

Question 3

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Extrapyramidal syndromes are common with the high potency neuroleptic agents. These include acute dystonic reactions (torticollis, opisthotonos and oculogyric crises - treat with benztropine or procyclidine), neuroleptic-induced catatonia (mutism, withdrawal, rigidity, waxy flexibility - responds to stopping the neuroleptic and sometimes to amantadine), akathisia (motor restlessness), tardive dyskinesia (fasciculation of the tongue, facial and tongue hyperkinesias, chewing, grimacing, choreoathetoid movements - if diagnosed early may be reversible, but become irreversible with time), drug-induced Parkinsonism (responds to standard therapy for Parkinson's disease, which can then be tailed off).

Other side effects include neuroleptic-malignant syndrome, anticholinergic effects, orthostatic hypotension, ventricular arrhythmias, cholestatic jaundice, lens and corneal pigmentation (chlorpromazine, thioradazine) and blurred vision.

Question 4

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Anaerobic lung infections are predominantly caused by microaerophilic streptococci, and *bacteroides* species and *nocardia*. Risk factors include diabetes, alcoholism, old age, poor dentition, carcinomatosis, mechanical ventilation (ITU patients), achalasia and neuromuscular swallowing difficulties. Treat with penicillin and metronidazole.

Question 5

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

An acute attack may be treated with NSAIDs and/or colchicine. A short course of corticosteroids (oral or injected into the inflamed joint - once infection is excluded) produces symptomatic relief. Allopurinol should not be given in the acute stages as it increases the pain and inflammation. Paracetamol is usually inadequate in the early stages. Probenecid increases renal excretion of urate and may be used for long-term prophylaxis but exacerbates symptoms in an acute attack. Other drugs to avoid in gouty patients (i.e. drugs that inhibit urate excretion) are thiazides, ethambutol, low-dose salicylates and cyclosporin A.

Question 6

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Standard heparin is a mixture of sulphated glycosaminoglycans with a range of molecular weights from 3,000 to 40,000. Low molecular weight heparin is produced from this and has a molecular weight range of 3,000-8,000. These compounds bind antithrombin-III but not thrombin. They are less prone to non-specific effects such as promoting platelet aggregation but are as effective as standard heparin in anticoagulating the patient.

Hirudin is the most potent naturally occurring (in leeches) inhibitor of thrombin. Recombinant hirudin is now available and is being investigated in the treatment of unstable angina and myocardial infarction.

GP IIb/IIIa receptors on platelets are critical for platelet aggregation. Fab fragments of monoclonal antibodies against this protein inhibit aggregation and are being investigated in the treatment of unstable angina, prevention of restenosis following angioplasty and a number of other clinical situations.

Alteplase is a recombinant tissue-type plasminogen activator based on the human sequence;

unlike streptokinase it is not antigenic. It may be used in patients with antibodies to streptokinase. Aspirin combined with thrombolytic agents has been shown to reduce mortality in the early period post myocardial infarction.

Question 7

A. FALSE B. TRUE C. FALSE D. TRUE E. TRUE

Thrombocytosis (an elevated platelet count) is commonly seen as a response to acute or chronic illness (reactive thrombocytosis - platelet counts $500-1000 \times 10^9/l$), e.g. with malignancies or chronic inflammation (rheumatoid arthritis). Other causes include iron deficiency and splenectomy. In myeloproliferative diseases, there may be autonomous production, e.g. chronic myeloid leukaemia (not CLL), polycythaemia rubra vera and essential thrombocytosis; in these conditions this may be associated with abnormal platelet function. (CLL causes an autoimmune thrombocytopenia.)

Iron overload can be divided into primary (as in haemochromatosis) or secondary. Causes of acquired iron overload include ineffective erythropoiesis (e.g. thalassaemia, sickle cell disease, sideroblastic anaemia, etc. where iron overload is due to increased dietary absorption as well as blood transfusion). Minor degrees of iron overload are also seen in alcoholic liver disease and porphyria cutanea tarda. For haemochromatosis, therapeutic venesection is an effective treatment; others require parenteral iron chelation therapy (desferrioxamine).

Aplastic anaemia is characterised by peripheral blood pancytopenia due to bone marrow failure. About half are idiopathic. The commonest cause is drug/toxin-induced - chloramphenicol, sulphonamides, anticonvulsants, chlorpropamide, propylthiouracil, carbimazole, phenothiazines, aspirin, gold compounds, D-penicillamine, carbon tetrachloride, benzene, DDT and radiation. Other causes include infection (e.g. hepatitis C, parvovirus, tuberculosis, rarely CMV or EBV). Fanconi's anaemia is a congenital disorder with hypoplastic kidneys, hypoplastic thumb and radii, microcephaly and mental retardation. Down's syndrome carries an increased risk of acute myeloid leukaemia, not aplastic anaemia.

Erythrocytosis has been associated with renal cysts, hydronephrosis, nephrotic syndrome, diffuse renal parenchymal disease and Bartter's syndrome and is seen in up to 15% of renal transplant recipients. Other causes of secondary erythrocytosis include smoking, chronic pulmonary disease, cyanotic heart disease, Pickwickian syndrome, high altitude, adrenal cortical hypersecretion and occasionally with exogenous androgen therapy.

Question 8

A. FALSE B. FALSE C. TRUE D. TRUE E. TRUE

Vertical transmission of HIV occurs in approx. 15% of HIV-positive pregnancies. Note: the anti-HIV antibody is an IgG isotype and can cross the placenta. Thus all newborns from HIV-positive mothers will be positive for the antibody - though not necessarily infected with the virus. No developmental abnormalities have been associated with transplacental passage of virus.

However, in developing countries, there is a detrimental effect on pregnancy through maternal ill health. There is some evidence that vaginal delivery carries a higher risk of transmission of HIV than caesarian section and in one study, first-born twins were at higher risk than their sibling. There is no increased risk of HIV transmission in subsequent pregnancies. HIV can be cultured from breast milk and can be transmitted to newborns via this route.

Zidovudine therapy for the mother before and during delivery and to the newborn infant for 6 weeks reduces the risk of perinatal transmission of infection from 26% to 8%.

Question 9

A. TRUE B. TRUE C. FALSE D. FALSE E. TRUE

Adrenal tumours are incidental findings in about 1% of abdominal CT scans. If >6 cm in diameter, there is a 90% risk of malignancy; small tumours are usually benign. Most tumours are non-functional but patients should be screened to exclude Conn's syndrome, pheochromocytoma or Cushing's (serum electrolytes, postural drop in blood pressure, urine catecholamines (and VMA or metanephrines)).

Multiple endocrine neoplasia type 1 (Werner's syndrome) is the association of parathyroid adenomas (90%), pituitary adenomas (60%) and pancreatic tumours (50%). Other features not in the definition include adrenal tumours (40%) and thyroid carcinoma (20%). The gene is found on chr 11 and the disorder exhibits dominant inheritance. Family members should be screened by a fasting serum calcium (raised in affected individuals).

Question 10

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

The Philadelphia chromosome (Ph') consists of a reciprocal translocation of chromosomal material between chr 9 and 22 [t(9;22)]. This seems unique for CML but may occasionally be seen with other myeloproliferative diseases. Ph' negative CML may have the same molecular defect, but patients usually have a worse prognosis with more resistant disease and earlier evolution to accelerated phase.

A low leukocyte alkaline phosphatase is a unique finding in CML and usually rises once the patient enters the chronic stable phase. Raised serum uric acid reflects increased cell turnover. Elevated vitamin B₁₂ binding protein (mainly TC-I which is synthesised by the white cells) is also found and correlates with the degree of leukocytosis. Acceleration to acute leukaemia or myelofibrosis is associated with accumulation of other chromosomal abnormalities. Busulphan or hydroxyurea control the white cell count but do not delay the onset of accelerated phase - bone marrow transplantation may be curative.

Question 11

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Clinical features of hepatic encephalopathy include inverted sleep-wake cycle, slurred speech, constructional apraxia, flap, fetor, brisk reflexes, increased tone and rigidity. It may be precipitated in patients with cirrhosis by infection, electrolyte imbalance, high protein intake (related to the release of ammonia) and some drugs. Blood ammonium levels are raised. The EEG is abnormal with slow delta waves and it never returns to normal (other causes of delta waves on the EEG include CO₂ retention, uraemia, B₁₂ deficiency and hypoglycaemia).

Treatment is with low protein diet, laxatives, purgatives and neomycin (debatable now) and drugs that may be of benefit are flumazenil (benzodiazepine antagonist) and bromocriptine.

Question 12

A. TRUE B. TRUE C. FALSE D. FALSE E. FALSE

There are at least two kinds of α adrenergic receptor: the α_1 receptors are found on vascular smooth muscle cell membranes and stimulation produces vasoconstriction; α_2 receptors are found on the presynaptic nerve terminals and arterioles of human skin together with α_1 receptors. On the presynaptic terminals, activation reduces neurotransmitter release. The effects of alpha stimulation e.g. with noradrenaline) results in vasoconstriction and hypertension, decreased

insulin secretion in response to a glucose load and axillary sweating. Lipolysis is β -adrenergic receptor mediated.

Question 13

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Appetite, sleep, body temperature and thirst are controlled by the hypothalamus and lesions may affect any of these functions. Lesions of the hypothalamus may be caused by tumour (e.g. craniopharyngioma, glioma), granuloma (TB, sarcoid), histiocytosis X, spread of radiation to pituitary and trauma. The hypothalamus produces dopamine which inhibits prolactin release from the pituitary: lesions of the hypothalamus will result in HYPERprolactinaemia

Question 14

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

The initial task is to sedate the patient to quiet the agitation. Neuroleptics (e.g. phenothiazines) are usually used in the first instance. Lithium carbonate is effective (80% in reported series) and is beneficial both in the acute phase and as a prophylactic agent. Neuroleptics may be required in addition in the acute phase. Carbamazepine and clonazepam are effective in patients who do not respond to lithium. Rarely, barbiturates and ECT may be used when neuroleptics fail to produce enough sedation.

Question 15

A. FALSE B. FALSE C. TRUE D. FALSE E. TRUE

Pleural plaques imply exposure to asbestos and are not pre-malignant. Other markers of exposure include recurrent pleural effusions, mesothelioma, primary lung carcinoma or interstitial lung disease (asbestosis). Interstitial fibrosis affects the mid and lower lung zones and may be accompanied by finger clubbing. Nodules are rarely (if ever) seen with asbestosis. Asbestos exposure is associated with an increased risk of adenocarcinoma of the lung and the risk is markedly increased in smokers as compared to non-smokers.

Question 16

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Other causes of painful visual loss include acute glaucoma and migraine. Retinal vein occlusion is usually not painful. Diabetic IIIrd nerve palsy does not cause visual loss on its own.

Question 17

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Syphilis causes generalised paresis of the insane (GPI) and symptoms can be arrested, but not reversed, by penicillin. Dementia is due to deposition of aluminium and amyloid in the brain and is not usually reversible. Other reversible causes of dementia include B₁₂/folate deficiency and thiamine deficiency (partially reversible), intracranial tumour (if operable), subdural haematoma, intracranial cysticercosis (partially reversible).

Normal pressure hydrocephalus is thought to result from partial obstruction of CSF flow from the subarachnoid space resulting in dilatation of the ventricles without signs of raised intracranial pressure. A CSF shunt may reverse intellectual deterioration in these patients.

Question 18

A. FALSE B. FALSE C. FALSE D. FALSE E. TRUE

In PBC, the bile salts are directly toxic to the bile duct epithelium, especially at high concentrations. Urso- (not cheno-) deoxycholic acid has been shown to be an effective therapy in this situation. Venesection is the mainstay of therapy in haemochromatosis; cardiac haemochromatosis may respond to high-dose desferrioxamine.

Primary sclerosing cholangitis (PSC) affects males and females equally (unlike PBC) and most patients have concomitant ulcerative colitis (but only 1-2% of UC get PSC). Biochemically there is marked elevation of bilirubin, alkaline phosphatase and polyclonal rise in immunoglobulins, and patients may be cANCA positive (antigen - neutrophil alpha-proteinase 3). Treatment: surgical drainage, balloon dilatation of biliary strictures, liver transplantation and antibiotics. Steroids are not indicated.

Hepatocellular carcinoma is associated with hepatitis B and C, aflatoxin, Wilson's disease (serum copper and caeruloplasmin low but urine copper raised), and stilboestrol treatment of carcinoma of the prostate. EBV has not been linked to this. AFP >1000 is diagnostic. 30% of variceal bleeders die with their first bleed, 70% have recurrent bleeds. Octreotide is a longer acting analogue of somatostatin and reduces portal pressures by causing veno-dilatation (the exact mechanism is unknown). It is almost as good as injection sclerotherapy.

Question 19

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Other causes of hypocalcaemia include chronic renal failure, phosphate therapy, hypomagnesaemia (alcoholism, diabetes, diuretics, amphotericin, aminoglycosides, cyclosporin, cisplatin, malabsorption, diarrhoea, Conn's syndrome), massive blood transfusion, vitamin D deficiency or resistance. Di George syndrome is congenital parathormone deficiency and is associated with mental retardation, cataracts, calcified basal ganglia and organ-specific AI disease.

Primary hypoparathyroidism is a failure of the parathyroid glands. It may be autoimmune and is associated with other autoimmune diseases such as hypothyroidism, pernicious anaemia, hypogonadism and Addison's disease. Pseudohypoparathyroidism is an end-organ unresponsiveness to PTH. It is associated with short metacarpals and metatarsals and round face and biochemically the patients are similar to those with primary hypoparathyroidism (low calcium, normal or raised phosphate) but with normal or raised alkaline phosphatase and PTH. Patients with pseudo-pseudohypoparathyroidism have the morphological features of pseudohypoparathyroidism but normal calcium.

Question 20

A. TRUE B. TRUE C. FALSE D. TRUE E. TRUE

Somatic gene therapy (i.e. addition of a gene to the somatic cells of tissues rather than the germ line) is ideally suited for monogenic disorders caused by loss of gene function where even partial restoration of the protein will greatly ameliorate the symptoms, as this form of gene therapy is unlikely to restore the levels of the protein to normal. Adenosine deaminase deficiency, haemoglobinopathies, in particular thalassaemia major, and haemophilia fit these criteria. Patients with diabetes mellitus require controlled release of insulin and gene therapy is unlikely to provide the answer. Islet cell transplantation into the portal vein is more promising as it preserves the microenvironment of the beta cells of the islet and allows controlled temporal

release of insulin.

Question 21

A. FALSE B. TRUE C. FALSE D. TRUE E. FALSE

Cystic fibrosis is an autosomal recessive disorder with a carrier frequency of 1:25 of the Caucasian population. The defect is a mutation on chromosome 7 in the gene encoding a chloride channel. The most common identified (68%) mutation is called delta F 508 (amino acid number 508 mutated in the protein sequence). This results in defective transport of Cl and water across epithelia in the body. The presenting feature in neonates is often meconium ileus or chest infections. Diabetes mellitus occurs in 5%, steatorrhoea in 85% and cirrhosis in 5%. Sweat sodium >60 mEq/l in children. Men are infertile (azospermic) as vas and epididymis do not develop and females are fertile but go on to develop secondary amenorrhoea. Colonisation with *Pseudomonas cerpacia* heralds clinical decline as the organism is very difficult to eradicate.

Question 22

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Infective agents known to be transmitted by blood include:

Viruses: hepatitis A, B and C, delta agent, CMV, parvovirus B19, HTLV 1 and HTLV 2, EBV, herpes simplex, HIV-1 and HIV-2; Parasites: trypanosomes, toxoplasma, filaria and leishmania.

Question 23

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

Hepatitis A is an RNA virus spread by the faeco-oral route and is nearly always a self-limiting illness - abrupt onset of high fever, short-lived elevation of transaminases and early appearance of IgM anti-HepA virus. Occasionally in adults the disease is more severe and can produce fulminant hepatic failure with high mortality (encephalopathy within 8 weeks of symptoms).

Chronic liver disease and arthritis are features of hepatitis B and C.

FitzHugh-Curtis syndrome is due to chlamydia infection (fever, perihepatitis, shoulder-tip pain and friction rub over the liver, adnexal tenderness and occasionally endocarditis). Other chlamydial infections are NSU (*C. trachomatis* types D-K - Reiter's syndrome and pelvic inflammatory disease may follow), Lymphogranuloma venereum (LGV) (*C. trachomatis* types 1-3 - painful lymphadenopathy, proctitis, fistula to vagina or bladder) and Chlamydial pneumoniae (Psittacosis - *C. psittaci* or TWAR agent - *C. pneumoniae*). Treat with tetracycline (resistant to erythromycin).

Question 24

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Analysis of chromosomal rearrangements has confirmed that myeloproliferative disorders generally arise in the pluripotent stem cell. Although the 'malignant' cell may be of myeloid lineage, similar gene defects are evident in the erythroid and megakaryocyte lineages.

Rearrangements of the immunoglobulin genes to bring the genes of the variable, joining and constant regions within close proximity are an early event in B cell maturation. Analysis of B cell malignancies often shows some or all of the rearrangements have taken place, allowing identification of the 'maturation status' of the malignant clone. GM-CSF is responsible for the proliferation and differentiation of monocyte and granulocyte precursors. However, the leukaemic cells in CML display a 'maturation block' and do not respond to this therapy. The

malignant clone in pro-myelocytic leukaemia still retains responsiveness to retinoic acid derivatives and these have been used successfully to induce differentiation in patients with this form of leukaemia. However, relapse following treatment with retinoids is associated with resistance to retinoids. Anaemia due to zidovudine is due to a toxic effect on the bone marrow and does respond to EPO therapy.

Question 25

A. FALSE B. FALSE C. TRUE D. FALSE E. TRUE

Erythroderma is a generalised exfoliative dermatitis that produces heat loss, high output failure, protein loss (keratin) causing hypoalbuminaemia, dehydration, hypocalcaemia and folate deficiency. It may be precipitated in patients with psoriasis by steroid withdrawal. Other causes of erythroderma are drugs (gold, indomethacin, allopurinol, phenytoin, sulphonylurea and captopril).

Acute pustular psoriasis is characterised by fever, malaise, nausea; neutrophilia is common. Secondary infection may occur. Pustules are sterile.

Chloroquine precipitates psoriasis. Other precipitants include lithium, hormonal, e.g. childbirth, emotional stress, trauma, sunlight (sometimes).

Flexural psoriasis is seen in axilla, submammary and anogenital folds (cause of pruritis ani).

Treatment modalities: Topical: coal tar, dithranol, steroids, UV-B, salicylic acid. Systemic: methotrexate, hydroxyurea, retinoids, cyclosporin A, psoralens (for PUVA). Side effects of retinoids include dry mucous membranes, thin skin, hair loss, benign intracranial hypertension (especially if also taking tetracyclines), hepatitis and photosensitivity. Avoid pregnancy for 2 years.

Question 26

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

IgA nephropathy (Berger's disease) is the commonest primary glomerulonephritis. Presenting features include haematuria, proteinuria, nephrotic syndrome, rapidly progressive glomerulonephritis with renal failure and crescent formation and/or hypertension. It is associated with cirrhosis, gluten-sensitive enteropathy, Dermatitis herpetiformis and Mycosis fungoides. Following transplantation, IgA deposits can occur in the transplanted kidney but rarely lead to recurrent disease. Only 20% go on to develop CRF over 20 years.

Question 27

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

Polyarteritis nodosa is a necrotizing vasculitis affecting medium-sized arteries. It is commoner in males (M:F 4:1) and is associated with HBsAg and has been linked to prior amphetamine abuse. Clinical features include systemic features (fever, malaise, arthralgia), renal disease (hypertension, haematuria, proteinuria and intrarenal aneurysms), pulmonary disease (asthma and infiltrates = Churg-Strauss syndrome), cardiac disease (pericarditis, coronary arteritis, heart failure), neurological disease (mononeuritis multiplex, seizures, hemiplegia and psychosis), GI disease (malabsorption, intestinal claudication or infarction), skin lesions (livedo reticularis, purpura, vasculitic infarcts, urticaria), otitis media and hairy cell leukaemia. Arterial aneurysms are found in mesenteric and renal arteries and rarely in the pulmonary circulation.

Question 28

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Primary hyperparathyroidism most commonly presents as (or is diagnosed because of) asymptomatic hypercalcaemia: a normal PTH in the presence of hypercalcaemia is inappropriate and suggests hyperparathyroidism. Symptoms from hypercalcaemia may be non-specific (abdominal pains, constipation, depression), or result from renal calculi, pancreatitis, peptic ulcer (calcium causes gastrin release - thus hypergastrinaemia is not specific for MEN type I). Bone disease (cysts or fractures) may occur. Hypertension may occur and although initially due to hypercalcaemia, does not always respond to lowering the serum calcium level. Urinary calcium, cAMP and hydroxyproline excretion are all increased and there may be a mild hyperchloraemic metabolic acidosis.

Most commonly due to a single adenoma (90%). MEN type I produces parathyroid hyperplasia in association with pituitary adenoma and pancreatic islet cell tumours. In MEN type IIa and IIb, parathyroid tumours are associated with medullary thyroid carcinoma and phaeochromocytoma. Cutaneous moniliasis, vitiligo and cataracts are features of HYPOparathyroidism

Question 29

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Multiple myeloma is a neoplastic proliferation of a plasma cell clone resulting in production of monoclonal protein (either intact immunoglobulin or just light chains). Presenting features include bone pain, weakness, fatigue, anaemia, renal insufficiency, recurrent infections, herpes zoster, bleeding and neurological involvement. Renal impairment may be due to 'myeloma kidney' where distal tubules become obstructed by casts of Bence-Jones protein, or hypercalcaemia, amyloidosis, sepsis or secondary to drug therapy for the myeloma. Serum electrophoresis typically shows a paraprotein with reduction of normal immunoglobulins. Skeletal survey demonstrates 'punched-out' lesions which appear as 'cold' spots on isotope bone scans. Increased osteoblast activity results in raised bone alkaline phosphatase (as in Paget's disease), but in multiple myeloma, ALP is usually normal as osteoblast activity is reduced and osteoclasts are activated.

Question 30

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

Bicuspid aortic valve is the commonest congenital abnormality of the heart. The valve may remain functionally normal throughout childhood and adult life but more commonly develops calcific thickening (accounting for up to 50% of calcific aortic stenosis in adults). Associated conditions include aortic dissection (even years after successful aortic valve replacement) and coarctation of the aorta. Occasionally bicuspid valves may develop progressive regurgitation without stenosis.

Patients with Turner's syndrome have an 45XO karyotype generated through chromosomal nondisjunction and clinically appear as pre-pubertal females (unless they receive HRT). Other features that may occur include short-webbed neck (54%), cubitus valgus at the elbow, shieldlike chest with wide-spaced nipples, hypoplastic nails, short 4th metacarpals, high arched palate, lymphoedema, renal abnormalities (horseshoe kidney), hypertelorism, coarctation of the aorta, ASD, VSD and aortic stenosis. Noonan's syndrome has some of the features of the Turner phenotype but patients develop a right-sided cardiac lesion (pulmonary stenosis) and have a 46XX karyotype.

Patients with Marfan's syndrome are at high risk of developing cystic medial degeneration of the aorta leading to progressive dilatation of the aortic root, aortic dissection and aortic regurgitation. Mitral valve prolapse and incompetence may occur. Bicuspid aortic valves are not a feature.

Question 31

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

Selective IgA deficiency is commonly sporadic and not inherited (incidence 1:600). Clinical features vary from asymptomatic (incidental finding) to recurrent chest infections and bronchiectasis and chronic diarrhoeal disease similar to coeliac disease. There is an increased incidence of other autoimmune disorders, e.g. SLE, chronic active hepatitis, RA, thyroiditis and pernicious anaemia. There may be an associated IgG subclass deficiency, but levels of IgG and IgM are usually normal. Intravenous immunoglobulin is not the preferred treatment as low quantities of IgA in the preparation may trigger an anaphylactic reaction. X-linked recessive immunodeficiency syndromes include Bruton's agammaglobulinaemia, Wiskott-Aldrich syndrome and chronic granulomatous disease.

Question 32

A. TRUE B. FALSE C. TRUE D. TRUE E. TRUE

Features of zinc deficiency include acrodermatitis enteropathica, alopecia, poor wound healing, impaired taste sensation and photophobia. Vitamin C deficiency (not Vit A) results in scurvy - fatigue, weakness, arthralgia, gingivitis, poor wound healing, purpura, subperiosteal haemorrhages. Vitamin A deficiency is associated with night-blindness, Bitot's spots and hyperkeratosis. Clinical manifestations of iron deficiency include anaemia, koilonychia, atrophic glossitis, angular stomatitis, candidiasis and pica. Niacin deficiency results in pellagra - diarrhoea, dermatitis and dementia. Other features include glossitis and Casal's necklace (dermatitis in the exposed area around the neck). Copper deficiency results in hypochromic, microcytic anaemia and disordered keratinisation.

Question 33

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

Myotonic dystrophy has an autosomal dominant inheritance. Age of onset is typically 20-30 years. Clinical features include classical face (long, haggard appearance) and myotonia (tonic spasm of muscle) on percussion. Patients exhibit distal limb and shoulder girdle weakness. Other features include frontal balding, cataracts, cardiac conduction defects and dilated cardiomyopathy, end organ resistance to insulin (DM) and gonadotrophins (atrophy of testes or ovaries), type II respiratory failure (hypoventilation), low IQ. Treatment: phenytoin, quinine and procainamide may reduce myotonia. Screen family with EMG and provide genetic counselling.

Question 34

A. TRUE B. TRUE C. FALSE D. FALSE E. TRUE

Zidovudine is a nucleoside reverse transcriptase inhibitor that is active against all human retroviruses (HTLV1 and 2, HIV 1 and 2). It is a pro-drug and requires phosphorylation to zidovudine triphosphate for activity. It penetrates the blood brain barrier. Other nucleoside reverse transcriptase inhibitors include didanosine (DDI), lamivudine (3TC), stavudine (d4T)

and zalcitabine (DDC). Zidovudine is metabolised in liver. Side effects include anaemia, leukopenia, nausea, vomiting, headache, rash, fever, myalgia, liver disorders, etc.

Question 35

A. TRUE B. FALSE C. FALSE D. TRUE E. FALSE

Temporal lobe epilepsy is the commonest form of epilepsy following prolonged febrile convulsions. MRI scans on such patients show temporal lobe fibrosis which is thought to be the pathological epileptic focus. TLE is rare in childhood. Treatments: carbamazepine, vigabatrin or lamotrigine.

Note in the classification of seizure types: 'Partial' = one hemisphere involved; 'General' = both hemispheres involved (e.g. tonic-clonic 'grand mal' seizures); 'Simple' = no impairment of consciousness (e.g. focal motor seizure). Partial seizures and simple seizures may secondarily generalise with both hemispheres becoming involved.

TLE is a form of complex, partial seizure. Petit mal is a generalised seizure and not a complex partial seizure (like TLE).

Question 36

A. FALSE B. TRUE C. TRUE D. TRUE E. TRUE

Thyroid eye disease is associated with specific autoantibodies that produce retro-orbital inflammation and lymphocytic infiltration of the extraocular muscles. Antibodies against the thyroid may also be present although the patient is not always biochemically or clinically hyperthyroid. Main impairment is in up and lateral gaze. Treatment: eyedrops, Fresnel prisms, retro-orbital/systemic steroids, lateral tarsoraphy, muscle transposition, orbital decompression, cyclosporin, orbital radiotherapy and sometimes plasmapheresis.

In Graves' disease, T4 is responsible for lid lag and retraction, diarrhoea, linear growth acceleration in children and AF. Acropachy and proptosis are not related to the T4 levels. Other findings are hypercalciuria (not hypercalcaemia) and periosteal new bone formation.

Causes of uniocular proptosis: contralateral Horner's (i.e. a misdiagnosis), axial proptosis along the axis of the eyeball (optic nerve glioma, meningioma, Graves') vs non-axial (lymphoma, metastasis to orbit, pseudotumour oculi (seen with Riedel's thyroiditis), cavernous sinus pathology, Wegener's disease).

Question 37

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Serum HDL levels are inversely correlated with morbidity and mortality from coronary artery disease. Apo E4 and Lp (a) levels are strongly correlated to coronary artery disease. EDRF (also known as nitric oxide) is released by fish oils (they promote synthesis of NO). NO inhibits aggregation of platelets, increases cyclic GMP and is released in response to shear stresses on endothelial cells. In high concentration, NO is cytotoxic and may be the final common pathway for the development of dilated cardiomyopathy.

Question 38

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Gluten enteropathy causes B₁₂/folate deficiency. Other causes of macrocytosis include phenytoin, AZT, azathioprine, myelodysplasia and paroxysmal nocturnal haemoglobinuria (PNH).

Question 39

A. TRUE B. FALSE C. TRUE D. TRUE E. FALSE

Behçet's syndrome is more common in patients from Turkey and China and produces painful oral and genital ulceration and iritis; uveitis and visual disability is almost invariable. Aetiology is unknown. It is associated with HLA-B12 and -B5. Other features include a non-erosive arthritis, erythema nodosum, pathergy (skin ulceration and sepsis following trauma or venepuncture), abdominal pain and diarrhoea, headache, confusion, aseptic meningitis, psychosis, coma, cranial nerve palsies, seizures, spinal or cerebellar syndromes and papilloedema. There are no specific diagnostic tests and there is evidence of an acute-phase response.

The differential diagnosis of orogenital ulcers includes Reiter's, Behçet's, Crohn's, pemphigus, Erythema multiforme, HSV and syphilis.

Question 40

A. TRUE B. TRUE C. TRUE D. TRUE E. TRUE

Stevens-Johnson syndrome is most commonly precipitated by a drug (sulphonamides, penicillin, some sedatives) but also occurs with viral infections (orf, Herpes simplex), and some malignancies. Characterised by fever, arthralgia, myalgia, pneumonitis, uveitis, vesicles on the oro-genital mucosa and conjunctiva, with 'target' lesions on the skin. Treatment: topical calamine, steroids (topical and systemic in severe cases).

Question 41

A. TRUE B. TRUE C. TRUE D. TRUE E. FALSE

Whipple's disease commonly presents as malabsorption in middle-aged men (~50 years), with systemic symptoms such as fever, malaise, peripheral lymphadenopathy and arthritis; the heart, lung and brain may also be involved. The diagnosis is by PCR for the organism *Trophelma whippoli* on infected tissues or peripheral blood. On electron microscopy, the bacillus may be visible in infected tissues. Treat with chloramphenicol (to cross blood-brain barrier); alternatively, penicillin/streptomycin.

Question 42

A. FALSE B. TRUE C. FALSE D. FALSE E. TRUE

Congenital complete heart block is associated with anti-Ro antibodies in the mother (crosses the placenta to affect the developing fetal cardiac conduction tissue); anti-La antibodies are associated with the sicca syndrome. Anti-RNP is associated with myositis and mixed connective tissue disease. Anti-insulin receptor antibodies are associated with insulin resistance and acanthosis nigricans. Other antibody-disease associations of note are anti-glomerular basement membrane and glomerulonephritis, anti-dsDNA and SLE, Jo1 antibody and polymyositis, and anti-TSH receptor antibody (TSI) and Graves' disease.

Question 43

A. FALSE B. FALSE C. FALSE D. TRUE E. FALSE

Chronic AF associated with rheumatic heart disease carries a 17-fold increased risk of embolic stroke and anticoagulation is mandatory. Anticoagulation is always required for a period after cardioversion (except if AF is of short duration) as mechanical recovery and atrial contractions often take days-weeks to recover.

Transoesophageal echocardiography provides between views of the left atrial appendage and left atrium than conventional transthoracic ECHO. If there is no intracardiac thrombus, DC cardioversion may be performed without prolonged precardioversion anticoagulation. In pre-excited AF (i.e. atrial fibrillation in patients with accessory pathways, e.g. WPW), verapamil, adenosine and digoxin are contraindicated as they may accelerate the rate of AF; flecainide or DC-cardioversion is the therapy of choice. Internal cardioversion is effective in ~33% when external cardioversion has failed.

Question 44

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Chronic constrictive pericarditis and restrictive cardiomyopathy present with symptoms and signs of right and left ventricular failure. Right-sided signs are prominent with elevation of the JVP (prominent x and y descents, Kussmaul's sign), hepatomegaly, ankle oedema and ascites. Pulsus paradoxus (fall in BP on inspiration is not common (cf. tamponade)).

Question 45

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Reduced levels of C3 are commonly seen with glomerulonephritis due to SLE, cryoglobulinaemia, post-streptococcal glomerulonephritis, shunt nephritis, infective endocarditis and mesangiocapillary glomerulonephritis. Levels are usually normal in minimal change disease, membranous GN, IgA nephropathy, PAN, Henoch-Schönlein purpura, Wegener's granulomatosis and Goodpasture's disease.

Question 46

A. FALSE B. FALSE C. FALSE D. FALSE E. TRUE

The correlation coefficient (Pearson's coefficient of linear correlation) describes the strength of the linear relationship between the two variables (i.e. how close to a straight line the points lie). The value of r can vary from -1 to +1; a negative value indicates a negative correlation (e.g. CD4 count with age) while a positive value indicates a positive correlation. Values from -0.2 to +0.2 are said to have negligible association, 0.2-0.5 a weak association, 0.5-0.8 a moderate association and 0.8-1.0 a strong association. The r value may suggest a strong association but the result may not be statistically significant due to sample size; the p value describes the statistical significance of the association.

The regression equation derived from the two variables may be used to predict one from the other. The square root of the variance of the data is defined as the standard deviation. Correlations are made on pairs of observations and thus the number in each group is identical.

Question 47

A. FALSE B. FALSE C. TRUE D. TRUE E. TRUE

The normal PR interval should be >0.11 s and <0.20 s. A short PR interval is seen with preexcitation e.g. Wolff-Parkinson-White or Lown-Ganong-Levine syndrome). The normal QRS axis is -30 to +90 degrees. Left axis deviation is seen with left anterior hemiblock, inferior MI, pre-excitation (WPW or LGL), hyperkalaemia, tricuspid atresia, ostium primum atrial septal defect and right ventricular pacing. Right axis deviation is seen with RV hypertrophy, acute pulmonary embolism, cor pulmonale, secundum ASD, RBBB, Fallot's tetralogy and total anomalous pulmonary venous drainage.

Voltage criteria for left ventricular hypertrophy (none is absolute): R wave (aVF) >20 mm, S(V1) + R (V6) >35 mm, R wave in V4, V5 or V6 >27 mm, S wave in V1, V2 or V3 >30 mm, any R + any S >45.

RBBB is a normal finding in up to 10% of individuals. A normal Q wave is <0.04 s wide and <25% of the total QRS complex.

Question 48

A. TRUE B. FALSE C. FALSE D. FALSE E. FALSE

Coronary artery stents are used to treat dissections during balloon angioplasty and to improve the results of conventional angioplasty. Stent occlusion is much commoner in arteries of <3 mm diameter. Short-term anticoagulation (3 months) was originally used but current protocols show that aspirin alone or aspirin + ticlopidine (another antiplatelet agent) are as effective as warfarin in preventing stent occlusion acutely with less bleeding complications and reduced hospital stay. MRI is not contraindicated -but artefacts may occur due to the metal of the stent. Most stents are very difficult to see on conventional CXR.

Question 49

A. FALSE B. TRUE C. FALSE D. TRUE E. FALSE

Since anti-HIV drugs became widely available there has been an increase in median survival of asymptomatic HIV-positive patients by 8-14 months and of patients with AIDS by about 20%. Drugs available fall into three classes: Nucleoside analogues (e.g. zidovudine-AZT, didanosine-ddI, zalcitabine-ddC, stavudine-d4T and lamivudine-3TC) require activation within the cell and then inhibit reverse transcriptase and terminate viral replication; protease inhibitors (e.g. ritonavir, indinavir, saquinavir) prevent viral maturation; and non-nucleoside inhibitors of reverse transcriptase (e.g. delavirdine, loviride and nevirapine) are still in trial. Of the nucleoside analogues, lamivudine appears to be the best tolerated although pancreatitis and peripheral neuropathy have been reported. The protease inhibitors inhibit cytochrome P450 enzymes and increase the plasma concentration of benzodiazepines, terfenadine, cisapride, astemizole and rifabutin. Ritonavir solution contains 43% ethanol and should not be given with metronidazole (disulfiram-reaction). Primary HIV infection is associated with a burst of viral replication and zidovudine therapy for 6 months delays disease progression and the development of minor opportunistic infections. Given to pregnant mothers antepartum and during delivery, and to the newborn for 6 weeks, zidovudine has been shown to reduce the risk of perinatal HIV transmission from 26% to 8% and should be offered to all HIV-positive pregnant women.

Question 50

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Other causes include tuberculosis, staphylococcal infection, klebsiella, actinomyces, vasculitis (PAN, Wegener's) and malignancy (squamous cell carcinoma).

Question 51

A. FALSE B. TRUE C. TRUE D. FALSE E. TRUE

Patients with polymyalgia are typically >50 years and present with proximal muscle tenderness and weakness; shoulder and pelvic muscle stiffness are worse in the mornings. Other features include anorexia, weight loss and low-grade fevers. Investigations: ESR > 50 mm/h; elevated alkaline phosphatase and gamma-GT; normal creatine kinase, EMG and muscle biopsy. The

condition responds to low-dose steroids. 50% of patients with temporal arteritis have symptoms of polymyalgia and 50% of patients with polymyalgia have temporal arteritis on biopsy.

Question 52

A. TRUE B. TRUE C. TRUE D. FALSE E. FALSE

Lactic acidosis results from accumulation of lactic acid sufficient to cause changes in blood pH. Normal concentrations are 0.6-1.2 mmol/l but this may rise to 10 mmol/l after severe physical exercise, rapidly returning to normal on stopping exertion. The causes are divided into Type A - precipitated by any cause of severe tissue hypoxia (e.g. haemorrhagic shock or MI with severe LVF), and Type B - no features of tissue hypoperfusion except as a late event, and is due to disturbed metabolism of lactate (e.g. liver disease, uraemia, debilitated patients, diabetics given metformin, some leukaemias, etc.). The natural isomer is L-lactate and the body is unable to metabolise the D-isomer. Rarely, alterations in gut flora in patients with short-gut syndrome can result in absorption and accumulation of this isomer and acidosis (clinically - confusion, ataxia, nystagmus, stupor; treated with i.v. bicarbonate, thiamine and antibiotics to alter gut flora).

Question 53

A. TRUE B. FALSE C. FALSE D. TRUE E. TRUE

APKD is an autosomal dominant disorder (type 1 is linked to chr 16 while type 2 is as yet unlinked). Cysts derive from all parts of the nephron and are absent at birth. Clinically (and on ultrasound) cysts are evident from approx. age 30 onwards. Presentation is with loin pain, haematuria, hypertension, UTI, anaemia or polycythaemia. Associations include hepatic cysts (>50% and more common in females), pancreatic cysts (only 10%), saccular aneurysms (especially in the cerebral circulation), cardiac valve disease (aortic incompetence, mitral valve prolapse), colonic diverticular disease and herniae. Rarer associations include Peutz-Jegher's syndrome, myotonic dystrophy and hereditary spherocytosis.

Question 54

A. TRUE B. TRUE C. TRUE D. FALSE E. TRUE

Normal pressure hydrocephalus produces dilatation of the ventricles on CT scanning without the classical signs of raised intracranial pressure. Clinical features include dementia, gait apraxia and incontinence early in the clinical course. Treat with a CSF shunt to prevent deterioration. Cervical spondylosis, subdural haematoma and subacute combined degeneration (B₁₂ deficiency) produce slowly progressive long-tract signs and a spastic gait. Carotid stenosis typically produces TIAs or stroke and not progressive gait disability.

Question 55

A. FALSE B. TRUE C. TRUE D. FALSE E. FALSE

Systematic desensitization eases the anxiety of the phobic patient when faced with the anxiety provoking stimulus or situation. MAOI are effective drug therapy for phobias. Biofeedback is a good non-specific technique for reducing anxiety but is not very effective in the management of phobias. Expressive psychotherapy and ECT are not useful for phobias.

Question 56

A. FALSE B. TRUE C. TRUE D. TRUE E. FALSE

The ascending aorta is ~5 cm long and ascends to the level of the sternal angle. It lies within the

sheath of fibrous pericardium (and hence dissection carries a high risk of haemopericardium and tamponade). The right and left coronary arteries arise from the anterior and left posterior coronary sinuses, respectively. The arch of the aorta arches over the root of the left lung. There is a fibrous connection to the left pulmonary artery (the ligamentum arteriosum) which is the fibrous remnant of the ductus arteriosus. The descending thoracic aorta gives 2-3 branches to the bronchi together with posterior intercostal, subcostal, oesophageal and diaphragmatic branches. The abdominal aorta bifurcates into the common iliac arteries at the level of the fourth lumbar vertebra.

Question 57

A. TRUE B. TRUE C. FALSE D. TRUE E. FALSE

After closed head injury with loss of consciousness, there is commonly a period of retrograde amnesia which shrinks with time. The duration of post-traumatic amnesia does not shrink with time. Other recognised sequelae include benign postural vertigo, 'punch-drunk' syndrome (dementia with extrapyramidal and long tract signs), chronic subdural haematoma and hydrocephalus

Question 58

A. TRUE B. FALSE C. TRUE D. FALSE E. TRUE

In first-order kinetics, the rate of elimination of a drug is dependent on the concentration of the drug and this applies to the majority of drugs in clinical use (the concentration of the drug in plasma falls in an exponential manner). Zero-order (or saturation kinetics) refers to the situation where the rate of elimination is independent of concentration and the drug levels fall at a constant rate. Examples of this are ethanol and salicylate. Phenytoin elimination is first-order at low concentrations and then zero order.

One consequence of zero-order metabolism is that the duration of action of the drug is more dependent on the dose and another is that once the maximum rate of elimination is reached, in theory the concentration of the drug in the body can increase indefinitely with no steady-state level being achieved.

Question 59

A. FALSE B. FALSE C. TRUE D. FALSE E. FALSE

Borrelia burgdorferi is a spirochete (rickettsia cause Rocky Mountain spotted fever, Q fever and typhus). The disease is tick borne (the Ixodes tick). The skin rash, erythema chronicum migrans, is usually the first feature of infection and lasts 3 days to 3 months. Systemic features (malaise, lymphadenopathy, arthralgia, neck stiffness) develop next. Neurological involvement is seen in ~15% (cranial nerve palsies, meningism, mononeuritis, peripheral neuropathy). Cardiac involvement (in 10%) results in heart block, myocarditis or pericarditis. 60% of patients will have recurrent oligoarthritis. Penicillin is the treatment of choice. In uncomplicated. Lyme disease, the rash alone can be treated with tetracycline.

Question 60

A. FALSE B. FALSE C. TRUE D. FALSE E. FALSE

Distal RTA (type I) is characterised by an inability to excrete normal amounts of acid in the distal renal tubule. Urine pH is high (>5.3) even in the presence of acidosis. Typically there is

increased urinary loss of phosphate and patients are prone to nephrocalcinosis and renal tract calculi. Osteomalacia is rare. Plasma bicarbonate and potassium are usually low. Associated conditions include chronic active hepatitis, Sjögren's syndrome, drug-induced interstitial nephritis (e.g. lithium, amphotericin B, etc.) and cirrhosis. Treatment is with oral bicarbonate. Fanconi's syndrome is an example of proximal RTA (type 2). This is associated with defective reabsorption of amino acids and glucose by the proximal tubule.