



RACP
Specialists. Together

RACP sample Divisional Written Examination questions

Adult Medicine Clinical Applications and Medical Sciences questions 1–30

Note:

These are sample questions. Full examinations have 170 items and are split into two papers: Clinical Applications (100 questions) and Medical Sciences (70 questions). EMQs appear at the end of each paper.

QUESTION 1

Individuals with which thyroid disorder are most likely to be euthyroid following effective radioactive iodine treatment (RAI)?

- A. Autonomous nodule.
- B. Graves disease.
- C. Non-toxic goitre.
- D. Thyroid cancer.

QUESTION 2

A 69-year-old man presents with erectile dysfunction. He is found to have a low testosterone level and subsequently a high prolactin level.

The following are his full pituitary function tests:

Cortisol – 8.00 am	428 nmol/L	[125–695]
Insulin-like growth factor-1 (IGF-1)	110 µg/L	[45–192]
Prolactin	77,453 mIU/L	[53–360]
Luteinising hormone (LH)	2.2 IU/L	[0.8–7.6]
Follicle-stimulating hormone (FSH)	2.9 IU/L	[0.7–11.1]
Testosterone – total	4.9 nmol/L	[9.0–25]
Thyroxine, free	15.3 pmol/L	[10.5–21.2]
Thyroid-stimulating hormone (TSH)	1.8 mIU/L	[0.35–3.6]

An MRI scan reveals a right-sided pituitary macroadenoma, measuring 16 × 19 × 20 mm in diameter, with superior extension towards the right optic nerve and a pituitary stalk that is mildly deviated to the left. Formal visual field testing reveals no deficit.

What is the appropriate first-line treatment of his macroadenoma?

- A. Dopamine agonist therapy.
- B. External beam radiotherapy.
- C. Somatostatin analogue therapy.
- D. Transsphenoidal decompression surgery.

QUESTION 3

A 60-year-old male is started on atorvastatin 40 mg daily for hypercholesterolaemia. Three months later, he develops myalgia. His muscle power and creatine kinase (CK) are normal. His atorvastatin is stopped and his symptoms resolve. After 1 month, he develops bilateral proximal muscle weakness and his CK is 4000 U/L [40–300]. Quadriceps muscle histology shows myofibre necrosis, a small number of infiltrating macrophages and prominent MHC-1 staining.

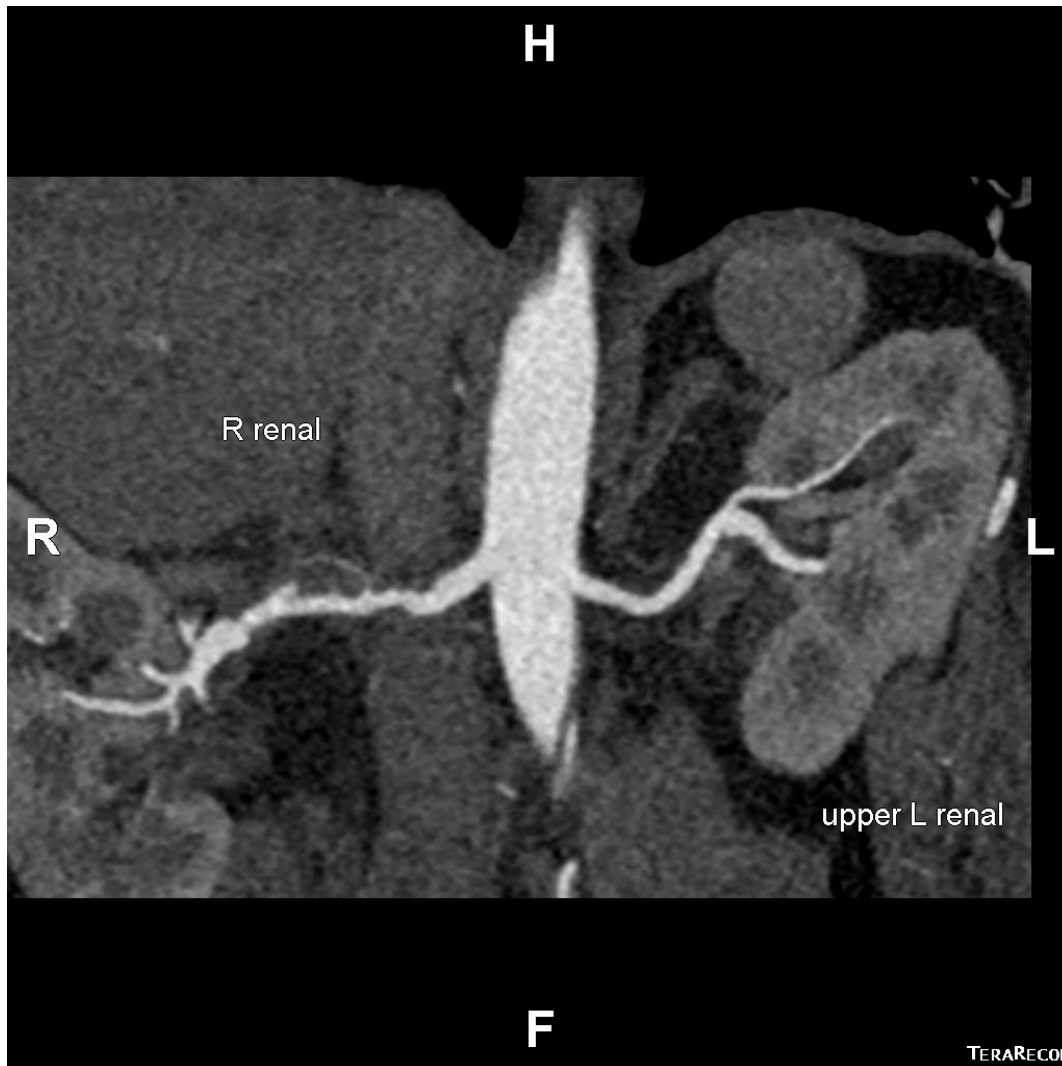
What is the diagnosis?

- A. Immune-mediated necrotising myopathy.
- B. Inclusion body myositis.
- C. Polymyositis.
- D. Statin-induced toxic myopathy.

QUESTION 4

A 37-year-old woman is found by her general practitioner to have hypertension and undergoes a series of investigations for secondary causes.

A CT scan of the kidneys with intravenous contrast is performed (as shown).



What is the diagnosis?

- A. Atherosclerotic renal artery stenosis.
- B. Fibromuscular dysplasia.
- C. Polyarteritis nodosa.
- D. Renal artery dissection.

QUESTION 5

A 64-year-old man presents with haemoglobin of 185 g/L [130–175] and haematocrit (HCT) of 53%. He is found to be positive for the *JAK2* V617F mutation.

In addition to venesection, which pharmacologic therapy is the most appropriate management?

- A. Aspirin.
- B. Hydroxyurea (hydroxycarbamide).
- C. Hydroxyurea (hydroxycarbamide) and aspirin.
- D. Ruxolitinib and aspirin.

QUESTION 6

High levels of what soluble cytokine marker can be used to help diagnose haemophagocytic lymphohistiocytosis?

- A. CD25.
- B. CD62 ligand.
- C. Fas ligand.
- D. Tumour necrosis factor.

QUESTION 7

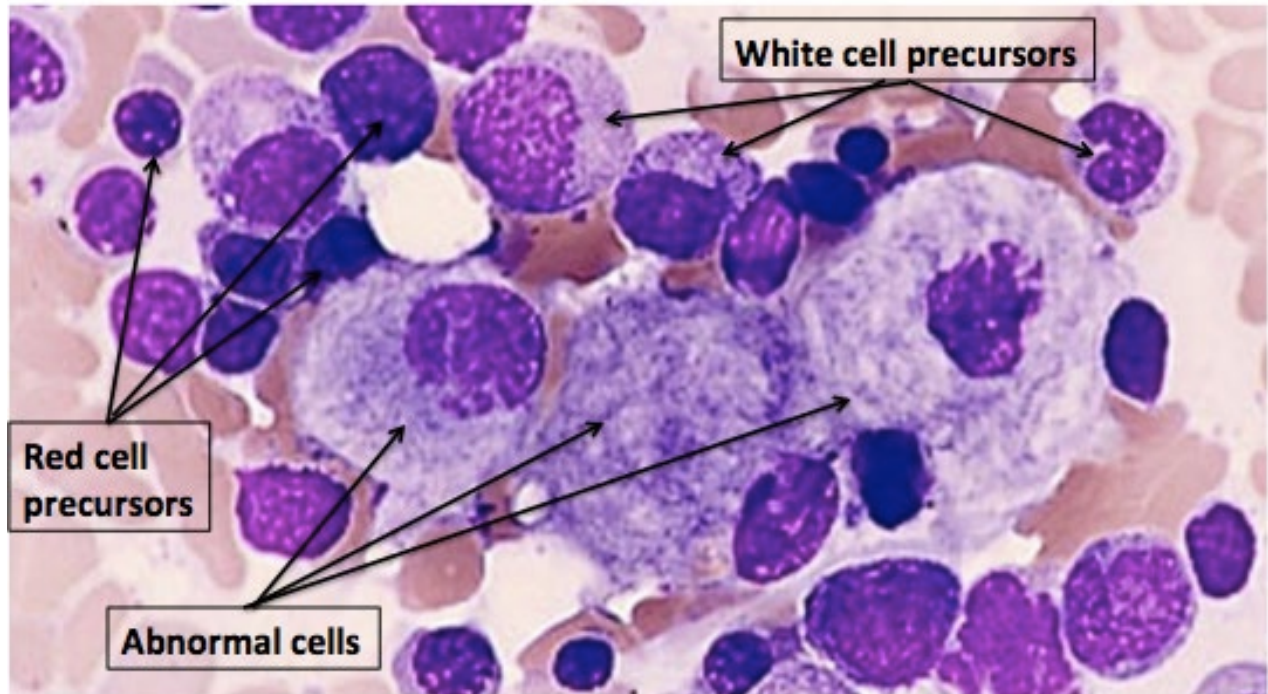
What is the most common cause of fluid drainage problems in a peritoneal dialysis patient?

- A. Constipation.
- B. Fibrin clots.
- C. Peritonitis.
- D. Ultrafiltration failure.

QUESTION 8

A 23-year-old woman presents with longstanding splenomegaly and chronic bony pain. She does not have weight loss, night sweats, lymphadenopathy or a history of travel outside Australia.

A bone marrow biopsy demonstrates many large abnormal cells with cytoplasm full of fibrillar material (as shown).



An x-ray of her distal femurs is reported as showing an Erlenmeyer flask deformity (as shown).



What is the diagnosis?

- A. Fabry disease.
- B. Gaucher disease.
- C. Glycogen storage disease.
- D. Haemophagocytic lymphohistiocytosis.

QUESTION 9

What is the minimum concentration of bone marrow plasma cells required for the diagnosis of suspected myeloma?

- A. 5%.
- B. 10%.
- C. 15%.
- D. 20%.

QUESTION 10

A 28-year-old man presents to the medical oncology clinic post orchidectomy. His pre-operative testis cancer tumour markers were abnormal. The histopathology report states the tumour was a pT1 pure seminoma.

Which tumour marker, other than lactate dehydrogenase (LDH), would have been elevated in this man?

- A. Alpha-fetoprotein (α FP).
- B. Beta-human chorionic gonadotrophin (β HCG).
- C. Cancer antigen 125 (Ca 125).
- D. Carcinoembryonic antigen (CEA).

QUESTION 11

A fit and well 76-year-old woman is found to have abnormal thyroid function test results (shown below) on routine testing, with no interval change observed after 3 months.

	February	May	
Thyroid-stimulating hormone (TSH)	8.7	9.1	[0.35–3.60 mIU/L]
Thyroxine, free	15	16.7	[10.5–21.2 pmol/L]
Triiodothyronine, free	4.8	4.1	[2.1–7.8 pmol/L]

In light of these findings, what is the most appropriate next step?

- A. Annual thyroid function test (TFT) monitoring.
- B. Selenium supplementation.
- C. Start levothyroxine (thyroxine).
- D. Thyroid ultrasound.

QUESTION 12

A 29-year-old woman with bipolar affective disorder wishes to get pregnant.

Which medication or class of medications would be the most appropriate to prevent a manic relapse while avoiding teratogenicity?

- A. Antipsychotics.
- B. Benzodiazepines.
- C. Lithium.
- D. Mood stabilisers.

QUESTION 13

An 80-year-old man presents with symptoms that are consistent with major depression. Insomnia and anorexia are prominent features. He has hypertension, which has been difficult to control, and has had a number of recent falls. He had a bleeding peptic ulcer 12 months ago. He has a history of electrolyte abnormalities when acutely unwell.

Which antidepressant is most likely to improve his insomnia and anorexia?

- A. Citalopram.
- B. Mirtazapine.
- C. Nortriptyline.
- D. Venlafaxine.

QUESTION 14

A 70-year-old prostate cancer patient with bony metastases presents with hypercalcaemia.

Laboratory results reveal:

Serum corrected calcium	2.78 mmol/L	[2.20–2.55]
Parathyroid hormone	7.5 pmol/L	[1.7–7.3]
Spot urinary calcium–creatinine ratio	0.41 mmol/mmol	< 0.61

What is the most likely mechanism for the hypercalcaemia?

- A. Direct bone erosion.
- B. Extra-renal production of 1,25(OH)₂D.
- C. Hyperparathyroidism.
- D. Parathyroid hormone-related peptide (PTHrP).

QUESTION 15

The metabolites of azathioprine that are clinically quantified include 6-thioguanine nucleotide (6-TGN) and 6-methylmercaptopurine (6-MMP).

What is the typical impact of the addition of concomitant allopurinol on the concentrations of these metabolites?

- A. 6-TGN decrease, 6-MMP increase.
- B. 6-TGN increase, 6-MMP increase.
- C. 6-TGN increase, 6-MMP decrease.
- D. No change to 6-TGN or 6-MMP.

QUESTION 16

Sleep is divided into rapid eye movement (REM) sleep and non-REM sleep.

What typical finding on electromyography characterises REM sleep?

- A. Atonia.
- B. Fibrillation.
- C. Myotonia.
- D. Periodic limb movements.

QUESTION 17

A 64-year-old with large cell lymphoma requires cyclophosphamide, doxorubicin, vincristine, prednisone and rituximab. Before commencement of chemotherapy, the patient is screened for hepatitis B and found to have the following results:

Hepatitis B surface antigen (HBsAg)	Negative
Hepatitis B core antibody (HBcAb)	Positive
Hepatitis B surface antibody (HBsAb)	Positive
Hepatitis B viral load	Undetectable

With regard to the hepatitis B results, what is the most appropriate next step before chemotherapy?

- A. Antiviral therapy.
- B. Check hepatitis B e antibody.
- C. Hepatitis B vaccination.
- D. No further treatment.

QUESTION 18

The following ECG rhythm strip shows ventricular tachycardia with some capture beats.



When does a capture beat occur?

- A. When a sinus beat and a ventricular beat coincide to produce a hybrid complex.
- B. When the distance from the beginning of the QRS to the nadir of the S-wave is > 100 ms.
- C. When the RSR' complex has a taller left 'rabbit ear'.
- D. When the sinoatrial node triggers the ventricles to produce a QRS complex of normal duration.

QUESTION 19

What is the greatest benefit of antipsychotics in delirium?

- A. Normalise a patient's sleep/wake cycle.
- B. Reduce hyperactive behaviour.
- C. Reduce the severity of the delirium.
- D. Shorten the duration of the delirium.

QUESTION 20

A 23-year-old presents with a sudden onset of fevers, myalgias, rigors and conjunctival suffusion 3 days after swimming in freshwater lakes during a triathlon in Malaysia.

What is the likely causative organism?

- A. *Aeromonas*.
- B. *Entamoeba histolytica*.
- C. *Leptospira*.
- D. *Vibrio vulnificus*.

QUESTION 21

Dupilumab is a monoclonal antibody that blocks the interleukin 4 (IL-4) receptor alpha subunit.

Other than IL-4, which cytokine uses this target for signalling?

- A. Interleukin 5 (IL-5).
- B. Interleukin 13 (IL-13).
- C. Interleukin 17 (IL-17).
- D. Interleukin 22 (IL-22).

QUESTION 22

In a patient with macrocytic anaemia, what is the most specific test for pernicious anaemia?

- A. Intrinsic factor antibodies.
- B. Methylmalonic acid.
- C. Parietal cell antibodies.
- D. Serum vitamin B12.

QUESTION 23

In the small intestine, lactase breaks down lactose into glucose and what other component?

- A. Dextrose.
- B. Galactose.
- C. Maltose.
- D. Sucrose.

QUESTION 24

Which type of genetic analysis is performed to make a diagnosis of Huntington disease?

- A. Array comparative genomic hybridisation (CGH).
- B. Exome sequencing.
- C. Polymerase chain reaction (PCR) with fragment sizing.
- D. Sanger sequencing.

QUESTION 25

What is the major mechanism by which hydroxyurea (hydroxycarbamide) reduces vaso-occlusive events in sickle cell disease?

- A. Altered gene expression at beta-globin locus.
- B. Cell cycle arrest of sickle cells.
- C. Improved platelet rheology.
- D. Reduced endothelial nitric oxide.

QUESTION 26

What is the predominant pathology seen in the kidney in primary antiphospholipid antibody syndrome?

- A. Acute tubular necrosis.
- B. Immune complex deposition.
- C. Tubulointerstitial scarring.
- D. Vascular occlusion.

QUESTION 27

Winging of the scapula is most commonly due to weakness of the muscle supplied by which nerve?

- A. Axillary.
- B. Dorsal scapular.
- C. Long thoracic.
- D. Suprascapular.

QUESTION 28

What is the predominant inhibitory neurotransmitter in the brain?

- A. Acetylcholine.
- B. Gamma aminobutyric acid.
- C. Glutamate.
- D. Glycine.

QUESTION 29

What receptor is the principal site of action of dexmedetomidine?

- A. 5-HT_{2A}.
- B. Alpha-2 adrenergic.
- C. Glutamate *N*-methyl-D-aspartate (NMDA).
- D. Glycine.

QUESTION 30

Selection of biological therapy for metastatic colorectal cancer (CRC) depends on the tumour's RAS (rat-sarcoma virus) status and the location of the colorectal cancer within the large bowel (left or right).

In CRC patients, with which RAS status and location does cetuximab, a monoclonal epidermal growth factor receptor (EGFR) antibody, have the greatest survival advantage?

	RAS status	Location of CRC
1	Wild type	Left
2	Wild type	Right
3	Mutated	Left
4	Mutated	Right

- A. 1.
- B. 2.
- C. 3.
- D. 4.

[END OF EXAMINATION]