

FExNet 2026

Collated SAQs: Endocrine Emergencies

QUESTION BOOKLET

22 short-answer questions covering the ACEM Fellowship endocrine emergency curriculum — diabetic emergencies (paediatric DKA with cerebral oedema, adult DKA, hyperosmolar hyperglycaemic state, insulin pump failure), thyroid emergencies (thyroid storm, myxoedema coma, new Graves workup, amiodarone-induced thyrotoxicosis, hyperthyroidism in pregnancy), adrenal emergencies (primary and secondary adrenal crisis, Cushing's syndrome), severe hypoglycaemia (sulfonylurea, deliberate insulin overdose, post-bariatric and fasting workup), pituitary apoplexy, pheochromocytoma crisis, calcium emergencies (severe hypercalcaemia of malignancy, post-thyroidectomy hypocalcaemia), and sodium/water disturbances (SIADH, diabetes insipidus).

Stems are written in detailed prose with abbreviations spelt out in full on first use.

22 questions • 225 marks

ACEM-aligned format. Sub-questions labelled a) b) c). Mark allocations indicative; references cited in the Answer Booklet. Question and answer indexes are clickable.

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Question 1 | Paediatric Diabetic Ketoacidosis and Cerebral Oedema (11 marks)

A 5-year-old boy weighing 18 kilograms is brought by his mother to your emergency department with a two-day history of fever, vomiting, and progressive lethargy. There is no prior history of diabetes mellitus. On arrival: temperature 38.8 °C, heart rate 145 beats per minute, blood pressure 90/40 millimetres of mercury, respiratory rate 40 breaths per minute, peripheral oxygen saturation 91 percent on room air, Glasgow Coma Score 13 (eye 3, verbal 4, motor 6). A venous blood gas shows pH 7.18, partial pressure of carbon dioxide 21 millimetres of mercury, bicarbonate 8 millimoles per litre, base excess -18.5, sodium 140, potassium 5.7, chloride 98, glucose 38 millimoles per litre, ketones (beta-hydroxybutyrate) 5.8 millimoles per litre.

a) State the diagnosis AND give the 2 biochemical criteria from ISPAD that confirm it (3 items). (3 marks)

b) Outline 5 priorities in the first-hour management of this child per ISPAD / APLS guidelines, including specific fluid and insulin doses. (5 marks)

c) Two hours into treatment the child becomes drowsy with a Glasgow Coma Score of 9, develops a headache, and his heart rate drops from 140 to 65 beats per minute. State the diagnosis AND name 2 specific treatments. (3 marks)

Question 2 | Adult Severe Diabetic Ketoacidosis (11 marks)

A 28-year-old man with known Type 1 diabetes mellitus presents to your emergency department with two days of vomiting, polyuria, polydipsia, and abdominal pain. He has stopped his insulin because he was vomiting. On arrival: Glasgow Coma Score 14, heart rate 130 beats per minute, blood pressure 95/60 millimetres of mercury, respiratory rate 28 breaths per minute (deep), temperature 37.0 °C. Venous blood gas: pH 7.06, partial pressure of carbon dioxide 14 millimetres of mercury, bicarbonate 4 millimoles per litre, base excess –25, sodium 130, potassium 5.6, chloride 95, glucose 32 millimoles per litre, beta-hydroxybutyrate 6.8 millimoles per litre, creatinine 180 micromoles per litre, lactate 2.4.

a) Name 3 features that classify this episode as **severe** DKA (ADS / JBDS criteria). (3 marks)

b) Outline your fluid and insulin management in the first 2 hours per ADS Australian Diabetes Society 2024 guidance (5 items). (5 marks)

c) List 3 complications of DKA treatment to anticipate and prevent. (3 marks)

Question 3 | Hyperosmolar Hyperglycaemic State (12 marks)

A 78-year-old woman from a residential aged-care facility is brought to your emergency department with a three-day history of progressive lethargy, confusion and reduced oral intake. Past history: Type 2 diabetes mellitus on metformin and gliclazide, hypertension, mild dementia, recent urinary tract infection treated 1 week ago. On arrival: Glasgow Coma Score 10, heart rate 120 beats per minute, blood pressure 90/55 millimetres of mercury, respiratory rate 22 breaths per minute, temperature 38.3 °C, mucous membranes dry, skin turgor poor. Venous blood gas: pH 7.34, partial pressure of carbon dioxide 36, bicarbonate 20, sodium 152, potassium 4.8, chloride 110, glucose 48 millimoles per litre, ketones 0.4, creatinine 210 micromoles per litre, urea 22, lactate 2.1.

- a)** Define hyperosmolar hyperglycaemic state per JBDS / ADS criteria (4 biochemical features) AND calculate the effective serum osmolality. (4 marks)

- b)** Outline 5 differences in management from diabetic ketoacidosis. (5 marks)

- c)** List 3 likely precipitants of HHS in this patient. (3 marks)

Question 4 | Thyroid Storm (12 marks)

A 48-year-old woman with known Graves' disease on carbimazole presents to your emergency department with fever, agitation and palpitations 2 days after extraction of an infected molar. She has missed her carbimazole for the past 2 weeks. On arrival: Glasgow Coma Score 13 (agitated, confused), temperature 39.8 °C, heart rate 168 beats per minute (atrial fibrillation), blood pressure 100/55 millimetres of mercury, respiratory rate 28, peripheral oxygen saturation 93 percent on room air. Examination: lid lag, diffuse goitre with bruit, fine tremor, brisk reflexes, bibasal crepitations.

a) Name 3 components of the Burch-Wartofsky Point Scale that support a diagnosis of thyroid storm. (3 marks)

b) Outline 6 specific pharmacological treatments in the correct sequence with doses, including the rationale for any specific timing. (6 marks)

c) List 3 differential diagnoses to consider. (3 marks)

Question 5 | Myxoedema Coma (11 marks)

A 75-year-old woman is brought to your emergency department in winter after being found at home obtunded by her family. Past history: long-standing hypothyroidism on thyroxine which she has stopped taking for 'several months'. On arrival: Glasgow Coma Score 9, temperature 32.1 °C, heart rate 48 beats per minute, blood pressure 85/50 millimetres of mercury, respiratory rate 8 breaths per minute, peripheral oxygen saturation 89 percent on room air. Examination: dry coarse skin, periorbital puffiness, hoarse voice, delayed reflex relaxation, non-pitting oedema. Venous blood gas: pH 7.28, partial pressure of carbon dioxide 65, bicarbonate 30, sodium 122, potassium 4.2, glucose 2.8 millimoles per litre.

a) Name 4 clinical or biochemical features that support a diagnosis of myxoedema coma. (4 marks)

b) Outline 5 priorities in initial management. (5 marks)

c) List 2 differential diagnoses other than myxoedema coma. (2 marks)

Question 6 | Primary Adrenal Crisis (Addisonian Crisis) (11 marks)

A 32-year-old man with known Addison's disease (primary autoimmune adrenal insufficiency) on hydrocortisone 20 mg / 10 mg / 10 mg and fludrocortisone 100 micrograms daily presents to your emergency department with 3 days of vomiting and diarrhoea. He has not taken his oral steroids due to vomiting. On arrival: Glasgow Coma Score 14, heart rate 130 beats per minute, blood pressure 78/40 millimetres of mercury, respiratory rate 24, temperature 38.5 °C, capillary refill 4 seconds. Initial bloods: sodium 124, potassium 6.2, glucose 2.6 millimoles per litre, creatinine 160, haemoglobin 168 grams per litre (haemoconcentration).

a) Name 4 biochemical or clinical features that support a diagnosis of adrenal crisis. (4 marks)

b) Outline 5 priorities of management. (5 marks)

c) State 2 sick day rules every patient with chronic adrenal insufficiency must follow. (2 marks)

Question 7 | Severe Sulfonylurea-Induced Hypoglycaemia (10 marks)

A 72-year-old woman with Type 2 diabetes mellitus and chronic kidney disease (estimated glomerular filtration rate 28 millilitres per minute per 1.73 square metres) on glibenclamide 10 mg daily is brought to your emergency department after a witnessed seizure at home. Paramedics administered intramuscular glucagon 1 milligram followed by 10% dextrose 200 millilitres intravenously, with a rise in blood sugar level from 1.4 to 5.6 millimoles per litre. On arrival in your resuscitation bay she is rousable but drowsy (Glasgow Coma Score 13), her blood sugar level is now 3.2 millimoles per litre.

a) Name 4 features specific to sulfonylurea hypoglycaemia that influence management. (4 marks)

b) Outline 4 ongoing management priorities. (4 marks)

c) List 2 other ED differentials for refractory hypoglycaemia. (2 marks)

Question 8 | Pheochromocytoma Crisis (11 marks)

A 38-year-old man presents to your emergency department with sudden-onset severe headache, chest pain, palpitations, sweating and a sense of impending doom. He has had three similar but milder episodes over the past 6 months. On arrival: heart rate 130 beats per minute, blood pressure 240/130 millimetres of mercury, temperature 37.6 °C, respiratory rate 22, profuse diaphoresis, pallor. Electrocardiogram shows sinus tachycardia with lateral ST depression. Bedside echocardiogram demonstrates a moderately reduced left ventricular ejection fraction with anterior wall hypokinesis.

- a)** State the suspected diagnosis AND list 2 features that argue for it over essential hypertension. (3 marks)

- b)** Outline 5 immediate management steps for this crisis, with specific drug doses. (5 marks)

- c)** List 3 syndromes associated with pheochromocytoma. (3 marks)

Question 9 | Pituitary Apoplexy (10 marks)

A 55-year-old man presents to your emergency department with sudden-onset severe occipital headache, followed by vomiting and diplopia. He is on no regular medications. On arrival: Glasgow Coma Score 14, heart rate 110, blood pressure 85/55 millimetres of mercury, temperature 36.0 °C. Examination: bitemporal field defect on confrontation, right-sided ptosis with a dilated pupil that does not react to light, restricted right eye adduction and elevation, no neck stiffness. CT head shows a haemorrhage within an enlarged pituitary fossa with no subarachnoid blood.

a) State the diagnosis AND name 2 clinical features that support it. (3 marks)

b) Outline 5 immediate management priorities. (5 marks)

c) Name 2 differential diagnoses for the presentation. (2 marks)

Question 10 | Severe Hypercalcaemia of Malignancy (11 marks)

A 68-year-old woman with metastatic breast carcinoma presents to your emergency department with 4 days of progressive lethargy, confusion, constipation and polyuria. Past history: bony metastases on letrozole and denosumab (which she stopped 3 months ago). On arrival: Glasgow Coma Score 12, heart rate 110, blood pressure 95/55 millimetres of mercury, respiratory rate 18, temperature 36.7 °C, mucous membranes very dry, urine output 50 millilitres per hour. Initial bloods: corrected calcium 3.85 millimoles per litre (reference 2.10-2.60), albumin 28 grams per litre, phosphate 1.6, creatinine 220 micromoles per litre, urea 18, potassium 3.2.

- a)** Calculate the corrected calcium AND name 2 ECG features of severe hypercalcaemia. (3 marks)

- b)** Outline 6 specific treatments with doses and expected time to onset. (6 marks)

- c)** List 2 mechanisms by which malignancy causes hypercalcaemia. (2 marks)

Question 11 | Severe Hypocalcaemia Post-Thyroidectomy (10 marks)

A 42-year-old woman presents to your emergency department on day 2 after a total thyroidectomy for multinodular goitre. She describes peri-oral tingling, paraesthesia in the hands and feet, muscle cramps, and one brief generalised tonic-clonic seizure en route. On arrival: Glasgow Coma Score 15, heart rate 95, blood pressure 130/80 millimetres of mercury, temperature 37.0 °C. Carpopedal spasm is demonstrated after blood pressure cuff inflation for 2 minutes. Bloods: total calcium 1.40 millimoles per litre (corrected 1.50), ionised calcium 0.71 millimoles per litre, magnesium 0.42, phosphate 2.10, parathyroid hormone <0.3 picomoles per litre.

a) Name 3 clinical signs or ECG features of severe hypocalcaemia. (3 marks)

b) Outline 5 management priorities including drug doses. (5 marks)

c) List 2 other ED causes of severe hypocalcaemia. (2 marks)

Question 12 | Syndrome of Inappropriate Antidiuretic Hormone (10 marks)

A 68-year-old man with a 50 pack-year smoking history presents to your emergency department with a 1-week history of confusion, lethargy, and nausea. On arrival: Glasgow Coma Score 13, heart rate 78, blood pressure 130/80 millimetres of mercury, temperature 36.8 °C. Examination: euvolaemic (mucous membranes moist, no oedema, JVP not raised, normal skin turgor). Bloods: sodium 118 millimoles per litre, potassium 4.0, urea 2.5 millimoles per litre, creatinine 60, serum osmolality 248 milliosmoles per kilogram, urine osmolality 480 milliosmoles per kilogram, urine sodium 65 millimoles per litre, TSH and morning cortisol normal.

a) Name 4 diagnostic criteria for SIADH (Bartter & Schwartz). (4 marks)

b) Outline 4 management priorities for this patient. (4 marks)

c) List 2 categories of causes of SIADH. (2 marks)

Question 13 | Diabetes Insipidus (10 marks)

A 35-year-old woman who underwent transsphenoidal resection of a non-functioning pituitary adenoma 2 days ago is referred to your emergency department with profound thirst and polyuria. She reports drinking and passing approximately 8 litres of urine over the last 24 hours. On arrival: Glasgow Coma Score 15, heart rate 110, blood pressure 100/65 millimetres of mercury, dry mucous membranes. Bloods: sodium 156 millimoles per litre, potassium 4.2, creatinine 90, glucose 5.5 millimoles per litre, serum osmolality 320 milliosmoles per kilogram, urine osmolality 95 milliosmoles per kilogram, urine specific gravity 1.001.

- a)** Name 3 features that confirm diabetes insipidus AND specify whether central or nephrogenic. (3 marks)

- b)** Outline 5 management priorities for this patient. (5 marks)

- c)** List 2 causes of nephrogenic diabetes insipidus. (2 marks)

Question 14 | Hyperthyroidism Evaluation in the Emergency Department (10 marks)

A 45-year-old woman is referred to your emergency department by her general practitioner with newly abnormal thyroid function tests performed for investigation of palpitations, tremor and 6 kg unintentional weight loss over 3 months. She is afebrile and haemodynamically stable. Thyroid function tests: TSH <0.01 milliunits per litre (suppressed), free T4 56 picomoles per litre (elevated), free T3 22 picomoles per litre (elevated).

a) List 4 examination findings that would support thyrotoxicosis. (4 marks)

b) Complete the table — biochemical pattern for **primary** vs **secondary** hyperthyroidism, AND give 2 specific causes of each. (4 marks)

c) List 2 differentiating tests for the cause of primary hyperthyroidism. (2 marks)

Question 15 | Deliberate Insulin Overdose (10 marks)

A 22-year-old female health-care worker is brought to your emergency department by ambulance following a witnessed deliberate self-injection with an unknown amount of insulin glargine (long-acting analogue) approximately 1 hour ago. On arrival: Glasgow Coma Score 7, heart rate 110 beats per minute, blood pressure 110/70 millimetres of mercury, respiratory rate 14, temperature 36.4 °C, peripheral oxygen saturation 98 percent on room air. Bedside blood sugar level 1.6 millimoles per litre. Empty insulin pen and suicide note found at the scene.

a) Name 3 features of insulin overdose that differ from sulfonylurea poisoning. (3 marks)

b) Outline 5 priorities of management. (5 marks)

c) List 2 disposition considerations specific to this patient. (2 marks)

Question 16 | Insulin Pump Failure in Type 1 Diabetes (9 marks)

A 17-year-old girl with Type 1 diabetes mellitus on an insulin pump presents to your emergency department with nausea, vomiting and abdominal pain over the past 12 hours. Her pump has displayed a 'no delivery' error for the past 8 hours and she has been unable to contact her diabetes service. On arrival: alert, heart rate 115, blood pressure 110/70, respiratory rate 24, temperature 36.8 °C. Capillary blood glucose 24 millimoles per litre, capillary blood ketones 3.2 millimoles per litre. Venous blood gas: pH 7.28, partial pressure carbon dioxide 32, bicarbonate 16, base excess -9, sodium 134, potassium 3.7, glucose 24, lactate 1.8.

a) Name 3 features that distinguish pump-failure DKA from typical DKA. (3 marks)

b) Outline 4 immediate management priorities. (4 marks)

c) State 2 sick day rules for patients with type 1 diabetes. (2 marks)

Question 17 | Amiodarone-Induced Thyrotoxicosis (10 marks)

A 64-year-old man on amiodarone 200 milligrams daily for 18 months (prescribed for paroxysmal atrial fibrillation) presents to your emergency department with palpitations, weight loss of 6 kilograms, heat intolerance and worsening dyspnoea over 6 weeks. On arrival: heart rate 140 beats per minute (atrial fibrillation), blood pressure 110/70, respiratory rate 22, peripheral oxygen saturation 93 percent on room air, mild fine tremor, lid lag, no goitre, bibasal crackles. Thyroid function tests: TSH <0.01 milliunits per litre, free T4 65 picomoles per litre, free T3 18 picomoles per litre.

- a)** Complete the table — name 2 mechanisms by which amiodarone causes thyrotoxicosis and give 1 distinguishing feature for each. (4 marks)

- b)** Outline 4 treatment priorities including drug choices. (4 marks)

- c)** Name 2 amiodarone-related thyroid considerations apart from thyrotoxicosis. (2 marks)

Question 18 | Secondary Adrenal Insufficiency from Steroid Withdrawal (9 marks)

A 58-year-old woman with polymyalgia rheumatica, previously on prednisolone 10 milligrams daily for the past 18 months, presents to your emergency department with progressive weakness, nausea and dizziness over 2 weeks. Her rheumatologist stopped prednisolone abruptly 3 weeks ago because she had achieved disease remission. She also has a urinary tract infection diagnosed by her GP yesterday and was commenced on trimethoprim. On arrival: heart rate 105 beats per minute, blood pressure 88/52 millimetres of mercury, temperature 37.8 °C, respiratory rate 18, capillary refill 3 seconds. Initial bloods: sodium 131 millimoles per litre, potassium 4.3 (normal), glucose 3.2 millimoles per litre.

a) Name 3 features that distinguish secondary from primary adrenal insufficiency. (3 marks)

b) Outline 4 management priorities for this patient. (4 marks)

c) List 2 other medications/situations causing iatrogenic HPA suppression. (2 marks)

Question 19 | Hyperthyroidism in Pregnancy (10 marks)

A 28-year-old woman at 16 weeks gestation in her first pregnancy presents to your emergency department with palpitations, tremor and a 4 kilogram weight loss despite normal appetite. She has a previous history of Graves' disease in remission for 4 years off treatment. Her GP has performed thyroid function tests today: TSH <0.01 milliunits per litre, free T4 50 picomoles per litre (elevated), free T3 18 picomoles per litre (elevated), TSH-receptor antibody titre 8.0 international units per litre (elevated). On arrival: heart rate 110, blood pressure 130/80, respiratory rate 18, afebrile, mild lid lag, no goitre.

- a)** Name 4 differential diagnoses for new hyperthyroidism in pregnancy AND state which is most likely for this patient. (4 marks)

- b)** Outline 4 specific management considerations in pregnancy. (4 marks)

- c)** Name 2 risks of untreated hyperthyroidism in pregnancy. (2 marks)

Question 20 | Cushing's Syndrome — Emergency Department Presentation (9 marks)

A 42-year-old man presents to your emergency department with progressive weight gain over 12 months, easy bruising, lower back pain, and new diagnosis of diabetes mellitus and hypertension in the past 6 months. On arrival: heart rate 88, blood pressure 180/105 millimetres of mercury, temperature 36.8 °C, body mass index 38. Examination: facial plethora and rounded ('moon') facies, supraclavicular and dorsocervical fat pads, central obesity with thin extremities, wide purple striae over abdomen and thighs, proximal myopathy, multiple ecchymoses, fungal skin infection in groin. Random capillary blood glucose 18 millimoles per litre, potassium 2.9 millimoles per litre.

- a)** List 3 clinical features that have high discriminatory value for Cushing's syndrome. (3 marks)

- b)** Outline 4 initial investigations to confirm diagnosis AND determine cause. (4 marks)

- c)** List 2 immediate ED treatment priorities. (2 marks)

Question 21 | Post-Bariatric Hypoglycaemia (9 marks)

A 38-year-old woman is brought to your emergency department after a witnessed loss of consciousness while shopping. She had a Roux-en-Y gastric bypass 3 years ago with 50 kilograms weight loss. The episode occurred approximately 90 minutes after a meal of muffin and orange juice. Paramedics documented a capillary blood glucose of 1.8 millimoles per litre; she regained consciousness after intravenous 10% dextrose. On arrival: alert, blood sugar level 5.4 millimoles per litre, previously similar episodes treated as 'low blood sugar' with snacks.

a) State the likely diagnosis AND give 2 features supporting it. (3 marks)

b) Outline 4 management strategies (acute and long-term). (4 marks)

c) List 2 other ED considerations for non-diabetic hypoglycaemia. (2 marks)

Question 22 | Fasting Hypoglycaemia Workup (9 marks)

A 28-year-old office worker presents to your emergency department by ambulance following a witnessed loss of consciousness at work in the morning before breakfast. Paramedics documented a capillary blood glucose of 1.2 millimoles per litre with rapid recovery after 50 millilitres of 50% dextrose intravenously. She has had two similar fasting episodes in the past 6 months. She is not diabetic, takes no medications, and denies recent dieting, alcohol, or self-administered insulin. On arrival: alert, blood sugar level now 6.8 millimoles per litre, examination unremarkable. She is 65 kilograms with a body mass index of 24.

a) List 4 critical investigations to send at the time of hypoglycaemia (paired specimens). (4 marks)

b) Construct a diagnostic algorithm — based on the results, name 3 possible diagnoses. (3 marks)

c) Outline 2 disposition / safety considerations. (2 marks)
