



THE HONG KONG COLLEGE OF ANAESTHESIOLOGISTS
FINAL FELLOWSHIP EXAMINATION (INTENSIVE CARE)
LONG ANSWER PAPER

2 Questions

Monday 26 July 2021 (1:00 pm - 3:00 pm)

NOTICE

- (A) Write your answers to the two questions in separate books.
- (B) Read the questions carefully, and in view of the time available, balance your answers to encompass points of great importance without going into needless detail.
- (C) Record your number on the cover of each book and hand in all books.
- (D) Use ink or ball-point pen.

QUESTION 1

A 58 year old gentleman presented with acute vertigo, headache, vomiting and inability to stand and walk properly for one to two days. He has a history of old cerebral infarct, hypertension, diabetes mellitus, atrial fibrillation for several years. He is currently on aspirin 100mg daily, atenolol 100mg daily, amlodipine 5mg daily, enalapril 10mg daily, metformin 1g bd, apixaban 5mg bd.

Physical examination revealed ataxia and horizontal gaze palsy.

Urgent non-contrast CT scan brain revealed a 5cm X 4cm X 3.5cm right cerebellar hematoma. You are the consultant on call and asked to admit this patient by your Accident & Emergency Department colleagues to the high dependency unit (HDU) because of his poor mental status.

Question A

The patient has a Glasgow Coma Scale (GCS) of 8/15, SpO₂ 96% on O₂ 2L/min via nasal canula, respiratory rate of 22/min, heart rate of 110/min irregular, blood pressure of 220/110mmHg.

- (1) Give five possible causes for his intracerebral hemorrhage? (10 mark)
- (2) Briefly outline your initial management for this patient. (20 marks)
- (3) What are the strategies to control intra cranial pressure in this patient? (5 marks)

Question B

His GCS was decreasing to 5/15 shortly after admission to HDU.

- (1) What are possible CT brain features you may see to account for his deterioration in conscious state? (5 marks)
- (2) How would you reverse the anticoagulation status of patient on Novel oral anticoagulants (NOACs) prior to emergency neuro-surgical intervention? (10 marks)
- (3) What are mechanisms for hydrocephalus after intraventricular hemorrhage? (5 marks)

Question C

You prepared to insert a central line for the patient.

- (1) What are the advantages for ultrasound guidance for insertion of a central line? (10 mark)
- (2) How can you prevent central line related infection? (10 mark)

Question D

The patient was deeply comatosed with GCS 3/15 after his neuro-surgical intervention. His wife is a kidney transplant recipient and very supportive for his organ donation.

- (1) What are the indications for confirmatory tests for brain death? (5 marks)
- (2) How would you optimize the support of a patient awaiting organ procurement? (15 marks)
- (3) What are the possible hormonal therapies in organ donor? (5 marks)

QUESTION 2

You receive an urgent consultation from the Orthopaedic Ward. Upon assessment the details are as follows.

It's 57 years old man who presented 4days ago with fever and left foot pain. He sustained injury to the left big toe 3weeks back and the wound failed to heal. Clinical diagnosis of left big toe gangrene and surrounding cellulitis was made. MRI showed osteomyelitis and extensive intramuscular abscess. He was started on IV Ceftriaxone 2g daily. Wound swab grew Methicillin Susceptible Staphylococcus Aureus (MSSA). He was afebrile and in good condition preoperatively. His COVID-19 test is negative. This morning he underwent ray amputation of the left big toe with extensive wound debridement under spinal anaesthesia. Intra operative finding was wet gangrene of left big toe.

Post op back in ward he is complaining of sudden onset shortness of breath and epigastric pain.

Past Medical History:-

- Type 2 Diabetes mellitus for 7 years
 - Sitagliptin/Metformin50/1000 bd
 - Gliclazide 120mg om
 - Empagliflozin 25mg om
- Hypertension for 7 years
 - Atenolol 100mg om
 - Amlodipine 10mg om
- Gastritis
 - Esomeprazole 40mg om PRN

Social:-

- ADL independent
- Retired engineer
- Non smoker, non drinker

No allergies

On examination:

70kg

Afebrile Temperature 35.8C

In great distress

Central nervous system

GCS 15/15

Spinal anaesthesia is wearing off and able to move lower limbs

Respiratory system

RR 50/min, SpO2 99% on room air

No audible wheezes

Lungs clear with good air entry bilaterally

Preoperative CXR - unremarkable

Cardiovascular system

Tachycardia 135/min, BP 135/80 mmHg, heart sounds dual no murmurs
No peripheral oedema
Delayed capillary refill
Poor skin turgor

12-lead ECG done in ward - sinus tachycardia with V4-V6 T wave inversion

Gastro Intestinal Tract

Abdomen soft, scaphoid non tender but complain severe epigastric pain
Still fasted

Question A

Give 5 possible differential diagnosis, justify your answer and outline how you would investigate.
(20 marks)

Question B

Outline your immediate management. (20 marks)

Preliminary investigations

Bedside echocardiography- hyper dynamic left ventricular function, EF 70%, normal chamber dimensions, no regional wall motion abnormalities, normal right ventricular function, no filling defects seen in right and left pulmonary arteries. Inferior Vena Cava normal size with 50% collapse on inspiration

Arterial blood gas - pH 7.03, pCO₂ 2.1kPa, pO₂ 16.5kPa , lactate 1.0 mmol/L, HCO₃ 3.0 mmol/L

Na	130 (136-145mmol/L)
K	4.5 (3.5-5.1mmol/L)
Chloride	105 (98-107mmol/L)
Phosphate	0.69 (0.81-1.45 mmol/L)
Mg	0.86 (0.66-0.99 mmol/L)
Urea	6.07 (2.76 - 8.07 mmol/L)
Creatinine	57 (59-104 umol/L)

Blood sugar 7.4 mmol/L

Blood Beta Hydroxybutyrate 5mmol/L

Hb 12.8 g/dL, WCC 16.6 x 10⁹, platelet count 338

Amylase 116 U/L (28-100)

LFT - unremarkable

CXR - unremarkable

Question C

- (1) What is the diagnosis? (4 marks)
- (2) What is the most likely cause for this diagnosis? (2 mark)
- (3) Give another 2 possible precipitating causes in this patient (2 mark)
- (4) What is his anion gap? (2 mark)

Question D

Describe in detail your management for this patient. (30 marks)

Question E

Write notes of the following medications including mechanism of action, indication, advantages and important side effects. (Details of pharmacokinetics are not needed.) (20 marks)

- (1) Metformin
- (2) Gliclazide
- (3) Sitagliptin
- (4) Empagliflozin