THE HONG KONG COLLEGE OF ANAESTHESIOLOGISTS

FINAL FELLOWSHIP EXAMINATION (INTENSIVE CARE)
SHORT ANSWER PAPER

15 Questions

Monday 10 July 2023
9:00 am - 11:30 am

NOTICE

(A) Write your answers to the 15 questions in separate books.

(B) It is not necessary to rewrite the question in your answer book.

(C) You should answer each question in ten minutes or less.

(D) The questions are worth equal marks.

(E) Record your number on the cover of each book and hand in all books.

(F) Use ink or ball-point pen

Question 1

i) What are the clinical effects and mechanism of action of High Flow Nasal Oxygen (HFNO)? (6 marks)
ii) List the clinical indications for HFNO (4 marks)

Question 2

A 50-year-old lady was admitted to your ICU with massive haemoptysis. The source of bleeding is likely from the left lung.

i) What are the principles of airway management in massive haemoptysis? (1 mark)
ii) List 3 methods of lung isolation techniques (3 marks)
iii) Briefly explain pros and cons of the methods listed in part ii. (6 marks)

Question 3

Regarding nutrition of critically ill patients

i) What are the theoretical advantages of targeting a higher protein intake for critically ill patients? (4 marks)
ii) What are the reasons why high protein intake may not improve patient outcomes? (4 marks)
iii) Name 4 special groups of ICU patients whom you may target a higher protein intake compared to the general ICU patients. (2 marks)

Question 4

A 45-year-old woman was admitted to the surgical ward with a 2 day history of upper abdominal pain and vomiting. Her GCS was E3V4M5, febrile 38.7C, heart rate 120/min, blood pressure 90/45mmHg, SpO2 91% via non-rebreathing mask. She was diagnosed with acute pancreatitis.

i) List the causes of hypotension in acute pancreatitis. (2 marks)
ii) List 3 causes of elevated A-a gradient in this patient. (1.5 marks)
iii) The triglyceride level is found to be elevated to 45mmol/L. Outline the specific management. (1.5 marks)
iv) List the complications of acute pancreatitis (5 marks)

Question 5

A 55-year-old male with a recent history of ischaemic heart disease underwent percutaneous coronary intervention 2 weeks ago. He was admitted to your ICU with a history of fever, confusion and oliguria 2 days ago and was started on renal replacement therapy for hyperkalemia. Since admission his platelet count has been persistently below $40 \times 10^6 L^{-1}$

i) List the likely causes for his thrombocytopenia. (3 marks)
ii) Outline your specific investigations for the causes of his thrombocytopenia. (4 marks)
iii) You are suspecting Thrombotic Thrombocytopenic Purpura (TTP). List your treatment options for his TTP (3 marks).

Question 6

A 50-year-old man with a history of asthma, diabetes mellitus and alcoholism presented to hospital with hypotension, dyspnoea and fever. Blood tests revealed a lactate level of 12mmol/L and severe metabolic acidosis.

i) List the possible causes of lactic acidosis in this patient. (3 marks)
ii) Discuss the role of sodium bicarbonate in the management of lactic acidosis (7 marks)

Question 7

Compare and contrast the pharmacology of 1) Loop diuretics, 2) Thiazides, 3) Potassium-sparing diuretics and 4) Carbonic anhydrase inhibitors in terms of

i) Site of action (2 mark)
ii) Mechanism of diuretic effect (4 marks)
iii) Effect on serum sodium (1 marks)
iv) Effect on serum potassium (1 mark)
v) One major indication in ICU (2 marks)

Please tabulate your answer.

Question 8

Outline the sources of infections and causative organisms in renal transplant patients in the following time periods.

i) First month post-transplant (3.5 marks)
ii) First to sixth month post-transplant (4 marks)
iii) After the sixth month post-transplant (2.5 marks)

Question 9

i) What are the clinical features and potential complications of cocaine intoxication? (4 marks)
ii) Outline the management of acute cocaine intoxication (including investigations and treatment). (6 marks)

Question 10

A patient is suffering from ventricular fibrillation (VF) in ICU.

i) List the initial management steps. (3 marks)
ii) Outline the treatment strategies if VF is refractory to your initial management. (7 marks)

Question 11

i) List symptoms and signs of hypocalcemia (4 marks)
ii) List causes of hypocalcemia (5 marks)
iii) How would you calculate the corrected Ca level for hypoalbuminaemia? (1 marks)

Question 12

i) Provide 4 reasons for using an illness severity scoring system in your ICU (2 marks)
ii) List causes of increased standard mortality ratio (SMR) in a particular ICU. (8 marks)

Question 13

Describe a stepwise approach for treating raised intracranial pressure in severe traumatic brain injury and include the rationale behind each treatment in your answer. (10 marks)

Question 14

Discuss the role of video laryngoscopy (VL) in critical care setting.

Question 15

A randomized controlled trial was conducted to study the effectiveness of an antioxidant (drug X) in reducing the mortality of sepsis patients in ICU. Two hundred patients were recruited in the study. One hundred patients in the experimental group received drug X and one hundred patients in the control group received placebo. The primary outcome was 30-day survival.

In the experimental group 70 patients survived but 10 patients had stopped taking drug X due to adverse effects. Of the 30 patients who died in the experimental group 10 patients also had stopped taking the drug X due to adverse effects.

Results:

	Survivor	Non-survivor	
Drug X	70 (drug X was stopped in 10 patients due to adverse effect)	30 (drug X was stopped in 10 patients due to adverse effect)	100
Placebo	50	50	100
	120	80	200

Calculation formulas:

	Events	Non-events
Experimental group	Experimental events (a)	Experimental non-events (b)
Control group	Control events (c)	Control non-event (d)

Experimental Event Rate (EER) = a / (a+b)
Control Event Rate (CER) = c / (c+d)
Absolute Risk Reduction (ARR) = |CER – EER |
Number Needed to Treat (NNT) = 1 / ARR

i) Calculate the EER, CER, ARR and NNT based on per-protocol (PP) analysis and intention-to-treat (ITT) analysis? (8 marks)

30-day survival as primary outcome				
	EER	CER	ARR	NNT
Per-protocol analysis				
Intention-to-treat analysis				

ii) What are the differences between PP analysis and ITT analysis? (2 marks)

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