



COLLEGE OF INTENSIVE CARE MEDICINE OF AUSTRALIA AND NEW ZEALAND

SECOND PART WRITTEN EXAMINATION

Wednesday 12th March 2025

MORNING PAPER

- (A) Write your answers in the blue books provided. **Each** question should be answered in a separate booklet. Please **DO NOT** write two short answer questions in the same booklet.
- (B) Start each answer on a **new booklet** and indicate the **question number**. It is not necessary to rewrite the question in your answer book.
- (C) You should aim to answer each question in **ten** minutes.
- (D) **All** questions are worth ten marks each in total.
- (E) Record your **candidate number** and each **question number** on the cover of each book, page, and hand in all booklets.

GLOSSARY OF TERMS

- Critically evaluate:** Provide and explain the evidence available relating to a topic.
- Outline:** Provide a summary of the important points.
- List:** Provide a list.
- Compare and contrast:** Provide a description of similarities and differences. You may tabulate your answer.
- Assessment:** Generic term that implies determining an underlying diagnosis, encompassing; history, clinical examination, and relevant investigations.
- Management:** Generic term that implies determining an overall management plan, encompassing; resuscitation, definitive treatment, initial and ongoing monitoring with supportive treatment.
- Discuss:** Explain the underlying key principles. Where appropriate, this should include controversies and/or advantages and disadvantages.
- Explain:** Make plain or known in detail.

NOTE

Where laboratory values are provided, abnormal values are marked with an asterisk (*).

Answer Each Question in a Separate Booklet

Question 1

Compare and contrast direct laryngoscopy with video laryngoscopy for intubation in the ICU.

(10 marks)

Question 2

You have been asked to review a new “Drug X” as to whether it should be added to the ICU formulary. It is administered over 7 days for cardiogenic shock to improve ejection fraction (EF). The following study data has been provided:

	Outcome	
	Improved EF	Unchanged EF
Drug X (n=100)	96	4
Placebo (n=100)	92	8

For this set of data:

- Calculate and explain the odds ratio (OR) (2 marks)
- Calculate and explain the relative risk reduction (RRR) (2 marks)
- Calculate and explain the number needed to treat (NNT) (2 marks)
- List the additional information that would aid your decision-making regarding the addition of the drug to the ICU formulary (4 marks)

Question 3

A 56-year-old male was trapped for a prolonged period from the waist down between his slow rolling 4-wheel drive car and a brick wall. On presentation, he has a heart rate of 150 beats/minute and a systolic blood pressure of 80 mmHg. He has obvious bruising extending from his lower abdomen to just above his knees. There is blood at his penile meatus.

- List the likely injuries (3 marks)
- Outline your blood product and fluid administration over the first 24 hours (4 marks)
- List the complications you would anticipate in this patient during the first 72 hours (3 marks)

Answer Each Question in a Separate Booklet

Question 4

Regarding key performance indicators in the intensive care unit:

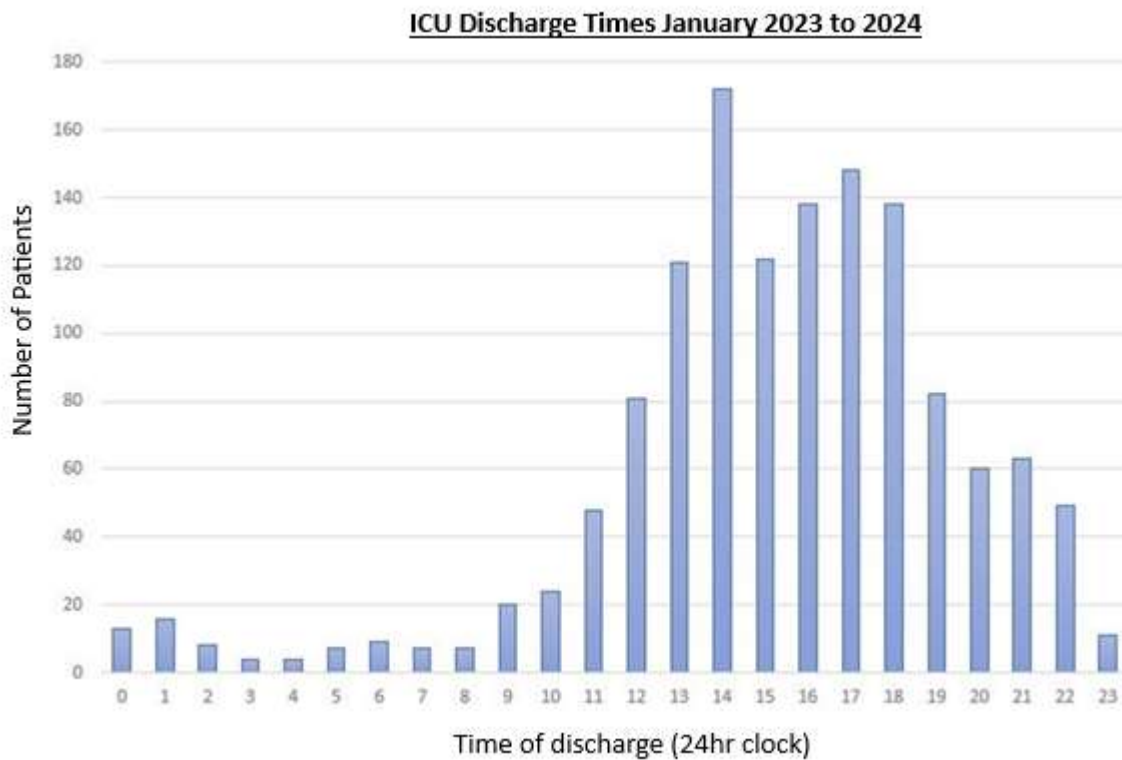
- a) List **eight** potential consequences of ICU exit block on a hospital, staff and patients

(4 marks)

Below is a histogram of ICU discharge times for a single ICU.

- b) Interpret the graph and outline the potential significance of this graph on patient care

(6 marks)



Answer Each Question in a Separate Booklet

Question 5

The following blood tests were obtained from a trauma patient with stable haemodynamic parameters on day 3 of ICU.

Parameter	Patient	Reference
Haemoglobin	63 g/L*	130-175
Haematocrit	0.22*	0.40-0.52
MCV	98 fL	80-99
MCH	29 pg	27-33
Platelets	496 x 10⁹/L*	150-400
WBC	20.0 x 10⁹/L*	4-11
Neutrophils	13.6 x 10⁹/L*	1.9-7.5
Lymphocytes	2.2 x 10 ⁹ /L	1.0-4.0
Meta/myelocytes	1.3 x 10⁹/L*	0.0-0.06
Nucleated RBC	0.1 x 10⁹/L*	
Reticulocytes	162 x 10⁹/L*	10-100
Fibrinogen	4.3 g/L*	1.5-4.0
Sodium	142 mmol/L	135-145
Potassium	3.8 mmol/L	3.5-5.2
Urea	15.1 mmol/L*	3.2-7.7
Creatinine	115 µmol/L*	50-110
Glucose	9.6 mmol/L*	3.5-7.7
Calcium	2.0 mmol/L*	2.2-2.6
Phosphate	0.9 mmol/L	0.8-1.5
Magnesium	1.0 mmol/L	0.6-1.2
Protein	51 g/L*	64-83
Albumin	24 g/L*	32-48
Bilirubin	79 µmol/L*	2-20
Bilirubin (conjugated)	47 µmol/L*	0-5
Alkaline Phosphatase	58 U/L	30-150
Gamma GT	507 U/L*	10-50
AST	287 U/L*	10-50
ALT	101 U/L*	0-40
LDH	282 U/L*	110-120
CRP	139mg/L*	<5

- a) Outline and explain the key abnormalities (4 marks)
- b) Discuss the additional investigations you would request to assess anaemia in this patient (3 marks)
- c) Describe the management of anaemia in this patient (3 marks)

Answer Each Question in a Separate Booklet

Question 6

With respect to iatrogenic drug withdrawal (IDW) of medicines prescribed as part of intensive care management:

- a) Explain why critically ill patients are vulnerable to IDW (4 marks)
- b) Outline the clinical presentation (2 marks)
- c) Outline the management and prevention of IDW (4 marks)

Question 7

Briefly outline the clinical examination features of the following:

- a) Basal ganglia infarct (3 marks)
- b) High (C5) spinal cord injury (4 marks)
- c) Critical illness myopathy (3 marks)

Answer Each Question in a Separate Booklet

Question 8

Regarding patient self-inflicted lung injury (P-SILI):

- a) Outline the pathophysiology for P-SILI (4 marks)
- b) Discuss the strategies to minimise P-SILI in ICU patients (6 marks)

Question 9

A 23-year-old patient is admitted with a severe traumatic brain injury and a suspected pituitary injury.

With respect to a potential hypothalamic- pituitary injury in this patient:

- a) Outline your assessment (6 marks)
- b) Outline your management (4 marks)

Answer Each Question in a Separate Booklet

Question 10

The ICU resident has been asked to review a patient on a general medical ward and has called you at home for advice. They are about to evaluate a 48-year-old morbidly obese patient who has mild hypotension and a provisional diagnosis of right leg cellulitis.

- a) Outline the assessment you would instruct your junior resident to perform (they have no echocardiography/ ultrasound skills) (6 marks)

- b) Discuss the factors that would influence your decision to admit this patient to your ICU (4 marks)

Question 11

A 67-year-old patient is admitted to the ICU with a presumptive diagnosis of community-acquired pneumonia (CAP). On day 5 they remain intubated and ventilated for persistent hypoxic respiratory failure.

- a) Outline **six** factors that may predict a poor response to antibiotics in CAP (3 marks)

- b) Outline your assessment of this patient with respiratory failure that is refractory to standard treatment for CAP. (7 marks)

Answer Each Question in a Separate Booklet

Question 12

- a) Define systolic anterior motion (SAM) of the mitral valve (2 marks)
- b) List the risk factors for SAM (3 marks)
- c) Outline the specific management of SAM causing hemodynamic instability in a patient post cardiac surgery (5 marks)

Question 13

With respect to ovarian hyperstimulation syndrome (OHSS)

- a) List **four** risk factors for this syndrome (2 marks)
- b) Outline the examination features and key investigation results consistent with severe OHSS (8 marks)

Question 14

- a) Outline the dosing adjustments in a patient with septic shock and moderate to severe renal dysfunction (without dialysis) for the following drug groups: (6 marks)
- i. Aminoglycosides
 - ii. Beta lactams
 - iii. Carbapenems
 - iv. Glycopeptides
- b) Outline the factors that influence antimicrobial drug dosing for the critically ill patient on renal replacement therapy (4 marks)

Answer Each Question in a Separate Booklet

Question 15

15.1 The following arterial blood gas and biochemistry results are from a patient with cardiac and respiratory disease and recent profuse vomiting.

Parameter	Patient	Reference
FiO ₂	0.4	
pH	7.5*	7.35 – 7.45
PaO ₂	58.0 mmHg (7.6 kPa)	
PaCO ₂	47 mmHg* (6.2 kPa*)	35 – 45 (4.6 – 6.0)
HCO ₃	34.8 mmol/L*	22 – 27
Base Excess	10.2 mmol/L*	-2.0 – +2.0
Sodium	137 mmol/L	135 – 145
Potassium	2.5 mmol/L*	3.5 – 5.0
Chloride	92 mmol/L*	95 – 105

- a) Explain the acid-base status (1 marks)
- b) List the potential causes of the acid-base abnormalities in this patient (3 marks)

15.2 A 35-year-old female with pre-eclampsia is admitted to the ICU following an emergency Caesarian section under general anaesthesia for failure to progress during labour at 38 weeks gestation. Arterial blood gas, full blood count and electrolytes post extubation are as follows:

Parameter	Patient	Reference
FiO ₂	0.5	
pH	7.31*	7.35 – 7.45
PaO ₂	150 mmHg (19.7 kPa)	
PaCO ₂	42 mmHg (5.5 kPa)	35 – 45 (4.6 – 6.0)
HCO ₃	20.1 mmol/L*	22 – 27
Base excess	-5 mmol/L	-2.0 – +2.0
Sodium	137 mmol/L	135 – 145
Potassium	4.3 mmol/L	3.5 – 5.0
Chloride	106 mmol/L*	95 – 105
Haemoglobin	110 g/L*	125 – 165
White cell count	19.8 x 10⁹/L*	4.0 – 11.0
Neutrophils	17.3 x 10⁹/L*	1.8 – 7.5
Lymphocytes	2.5 x 10 ⁹ /L	1.5 – 4.0

- a) Explain the acid-base status (2 marks)
- b) Calculate and interpret the A-a gradient (2 marks)
- c) What is the likely significance of the anaemia and the leukocytosis (2 marks)

End of Morning Paper