COLLEGE OF INTENSIVE CARE MEDICINE
OF AUSTRALIA AND NEW ZEALAND

SECOND PART EXAMINATION

EXAM REPORT

August / October 2024

This report is prepared to provide candidates, tutors, and Supervisors of Training (SOTs) with information regarding the assessment of candidates' performance in the CICM Second Part General Examination. This report is for use as an educational resource and includes a guide as to expected content of the answers for the written section. Trainees/SIMGs should discuss the report with their supervisors and educators so that they may prepare appropriately for future examinations. Trainees/SIMGs should not rely solely on writing practice answers to previous exam questions for exam preparation and should first establish a strong knowledge base from clinical learning and studying relevant texts, journals, and on-line resources.

The exam comprises a written section and an oral section. The written section consists of two papers, comprised of 15 short answer questions each. The pass mark for the written section is derived by the Angoff method and for this sitting was set at **51.79%.** The oral section consists of eight interactive vivas and two separate clinical hot cases. The vivas were completed in Sydney over two consecutive days (Thursday 24th and Friday 25th October) and the hot cases were completed in Sydney (Wednesday 23rd October).

The tables below provide an overall statistical analysis as well as information regarding performance in the individual sections. A comparison with data from the five previous exams is provided.

In all sections of the exam the candidate must demonstrate performance consistent with that of a trainee who is ready to enter the transition year of the CICM training program, by demonstrating they have the ability for safe, effective, independent practice as an Intensivist. Candidates who are not at this level are encouraged to defer their attempt at the exam.

Overall Performance	2024.2	2024.1	2023.2	2023.1	2022.2	2022.1
Presenting for written (Including SIMG)	108	76	81	66	52	38
Carrying a written pass or exempted from a previous attempt	17	20	11	8	29	24
SIMG written exempt	3	4	2	2	3	4
Total number presenting (written + carry + SIMG)	125	96	92	74	81	62
Invited to orals (passed written section)	53	45	47	24	23	21
Total number invited to the oral section	70	65	58	32	52	45

Analysis of Performance in Individual Sections	2024.2	2024.1	2023.2	2023.1	2022.2	2022.1
Successful in the written section	53/108	45/76	47/81	24/66	23/52	21/38
	49%	**59%**	**58%**	**36%**	**44%**	**55%**
Successful in the Hot case section	43/70	31/65	32/58	18/32	27/51	21/45
	61%	**48%**	**55%***	**56%**	**53%**	**47%**
Successful in both Hot cases	24/70	17/65	17/58	13/32	16/51	14/45
	34%	**26%**	**29%**	**41%**	**31%**	**31%**
Successful in the Viva section	51/70	53/65	48/58	27/32	44/51	40/45
	73%	**82%**	**83%**	**84%**	**86%**	**88%**

Sectional Pass Rates	2024.2		2024.1		2023.2		2023.1		2022.2	
Hot cases	**Pass rate**	**Highest individual mark**	**Pass rate**	**Highest individual mark**	**Pass rate**	**Highest individual mark**	**Pass rate**	**Highest individual mark**	**Pass rate**	**Highest individual mark**
Hot case 1	60%	85%	48%	90%	53%	83%	56%	85%	49%	85%
Hot case 2	49%	80%	51%	80%	53%	85%	56%	90%	59%	90%
VIVAs*							**Day 1**	**Day 2**	**Week 1**	
Viva 1	64%	88%	77%	90%	76%	85%	56% / 65%	63% / 80%	84% / 80%	
Viva 2	50%	68%	74%	90%	67%	79%	94% / 80%	88% / 86%	65% / 83%	
Radiology Viva 3	67%	80%	54%	70%	48%	76%	75% / 83%	63% / 62%	69% / 74%	
Procedure Viva 4	49%	93%	71%	90%	74%	88%	81% / 78%	56% / 74%	59% / 75%	
Viva 5	73%	90%	62%	85%	76%	90%	44% / 74%	81% / 70%	84% / 81%	
Viva 6	81%	93%	58%	97%	79%	91%	63% / 64%	63% / 64%	76% / 82%	
Viva 7	46%	75%	85%	94%	83%	79%	75% / 80%	88% / 75%	92% / 90%	
Communication Viva 8	67%	91%	72%	83%	53%	85%	44% / 88%	75% / 75%	63% / 90%	

Vivas 1, 2, 3 and 4 were examined on Thursday and Vivas 5, 6, 7 and 8 were examined on Friday.

Oral Section Pass Rates	2024.2	2024.1	2023.2	2023.1	2022.2	2022.1
Candidates who passed the written section and passed the overall exam	39/53	37/45	34/47	17/24	20/52	12/38
	74%	**82%**	**72%**	**71%**	**38%**	**32%**
All candidates invited to oral section and passed the overall exam (written + carry + SIMG)	46/70	50/65	40/58	23/32	36/51	29/45
	66%	**77%**	**69%**	**72%**	**71%**	**64%**
Overall Pass Rate	46/125	50/96	40/92	23/74	36/79	29/62
	37%	**52%**	**43%**	**31%**	**46%**	**47%**

EXAMINERS' COMMENTS

Written Paper

49% of the Second Part examination candidates who sat the August 2024 written section were invited to the oral section. Candidates who did not qualify for an invitation did so for one or more of the following reasons:

- Insufficient knowledge of the topic in question.
- Insufficient detail and/or depth of the answer.
- Poorly structured answer.
- Inadequate reference to supportive evidence where relevant.
- Failure to answer the question asked.
- Omission of all or part of the question.

Candidates that failed questions most often gave insufficiently detailed answers that were not at the level expected of a transitional fellow. Candidates often gave generic "proforma" answers that did not deal with the specific issues or scenario outlined in the question.

Candidates are advised to read the questions carefully and thoroughly and ensure they answer the specific question asked and address all parts of each question. Examiners commented that candidates had not appeared to consider the mark distribution in some multi-part questions, spending too little time on the more important sections. Candidates are reminded to make sure their writing is legible and to avoid using non-standard abbreviations. Candidates are also reminded that professional conduct is assessed throughout the exam process and that inappropriate comments written on the answer paper are not acceptable.

The examination report is now referenced to the syllabus to aid the candidate in directing their study more effectively. A selection of marking rubrics to complement the SAQ discussion have been published to guide trainees, SOTs, and educational advisors in the requirements of the assessment process and the standard of written content expected of the transitional fellow.

Candidates are strongly encouraged to consider feedback and advice from SOTs and educational advisors when considering the appropriate time for them to attempt the Second Part Examination.

Content Coverage and weighting of the SP syllabus

The CICM T18 (2025) document details the Second Part Examination construction, content and weighting of the SP syllabus. The aim of this resource is to ensure all CICM SP examination sittings are fair, consistent and aligned with the syllabus.

The T18 document applies for all Second part examination sittings commencing 2025, however the written paper has followed the principles outlined in T18 (2025) for the past two SP examination sittings as the syllabus was developed and released for the 2024 sittings.

The last two SP written examination sittings are published below to demonstrate the application of the T18 (2025). Knowledge of the syllabus coverage and weighting will help candidates, tutors and SOTs understand the scope of the examination, act as an educational resource and focus their preparation efforts accordingly.

Coverage of the Syllabus Domains of Content.

The Second Part examination written section will cover >65-70% of the syllabus domains per sitting.

	2024.1	**2024.2**
Syllabus domain coverage	74%	74%

Levels of Understanding

L2 Conditions and topics will comprise no more than 30% of the written paper in total (90 marks out of 300 marks) and L2 conditions and topics will not form the primary focus of individual vivas

Levels of understanding	**2024.1**	**2024.2**
Level 1	88%	92%
Level 2	12%	8%

Categories of the SAQs

SAQs will examine candidates at different cognitive levels e.g., ability to recall, understand, apply, analyse and evaluate knowledge based on Blooms taxonomy

Categories of SAQs	**2024.1 - SAQ totals**	**2024.2 - SAQ totals**
Clinical Dx/ Assessment	10	9
Clinical Management	9	9
Interpretation of Investigations	5	5
Evaluations of Evidence	2	3
Professional behaviour	1	1
Equipment / Procedure	3	3

SECOND PART WRITTEN EXAMINATION

(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 may 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 (*****).

Question 1

a) List the risk factors for the development of classic (non-exertional) heatstroke.

(3 marks)

b) Outline the complications of classic (non-exertional) heat stroke, AND for each complication provide your specific management.

(7 marks)

Syllabus topic/section:

2.1.14 Environmental Injuries and Toxicology in ICU: Thermal injury: L1

Discussion:

Classic heatstroke is a multi-system disorder with a variety of risk factors encompassing societal, environmental, physiological and pathological causes. Candidates that did well in part a were able to provide a range of risk factors across these different domains in a structured approach.

Most candidates presented their answer to part b) by organ systems and were able to give a reasonable amount of information with this structure. The haematological and hepatic systems were frequently omitted in answers that had lower scores despite being more common complications than some of those listed. Rhabdomyolysis was almost universally included by candidates but tends to be less common in this situation as it occurs with exertional rather than classic heatstroke. Active cooling remains the mainstay of treatment for heatstroke and in preventing or managing complications. However, it was frequently omitted or lacking in detail from answers that scored less highly. Candidates who scored higher marks included detail around the management of the various complications as well as the methods to actively cool the patient in a detailed, prioritised, tiered approach to management.

Angoff score for this SAQ	4.86
Highest candidate score achieved (averaged)	7.75

Question 2

a) Discuss the potential mechanisms contributing to Cardiac Surgery-associated Acute Kidney Injury (CS-AKI).

(6 marks)

b) List measures aimed at reducing the risk of CS-AKI in the ICU post-operative period.

(4 marks)

Syllabus topic/section:

2.1.7 Renal Intensive Care: Renal failure: L1
2.1.18 Peri-operative issues in Intensive Care: Cardiac Surgery: L1

Discussion:

Passing this question required a structured and detailed approach to a common ICU issue.

Part a): Answers that included *discussion* of the actual mechanisms of renal injury scored more highly than just *listing* the causes or risk factors. CS-associated AKI includes both intra- and post-operative factors, so discussion of the various mechanisms of bypass-associated renal injury, intra-op hypoperfusion and post-cardiotomy low CO state were all expected. Above-standard answers also included nephrotoxins, vasodilatory shock, SIRS, embolic phenomena, and/or factors associated with decreased renal reserve.

A number of candidates used the pre-renal, renal and post-renal framework for part a) which actually didn't serve very well in this question as it tended to narrow the breadth of information presented, resulted in confusion about pre-renal vs intra-renal mechanisms, or led to undue focus on renal tract obstruction (a very uncommon cause of CS-AKI). More successful structures included pre, intra and post-op mechanisms; patient, procedure and medication-related mechanisms, or listing of the mechanisms with subheadings and explanations.

Part b) required specifics of patient management in this context, rather than generic statements like "maintain the MAP or euvolaemia". Such generic statements without including *what* or *how* MAP and euvolemia are to be maintained are beneath the standard required to demonstrate the independent practice of a trainee who will progress to a transitional fellow.

Some information on the specific nephrotoxins to avoid, how to assess and manage volume status, the haemodynamic parameters to target, as well as the fluids, vasopressors or inotropes used to achieve these targets was expected for at standard. For those that covered these basics well, extended-pass answers included finer points like glycaemic control, renally adjusted drug dosing, experimental therapies and/or bundles of care.

The marking rubric is included to aid the candidate's future study.

Rubric

	Below standard	At standard	Above standard
Discuss the potential mechanisms of CS-AKI **6 marks**	Poorly structured answer missing key points in "at standard" level **0-2.5 marks**	Prioritised answer which discusses most of the mechanisms of CS-AKI; Must include renal hypoperfusion during CPB and low cardiac output states post operatively. **3-4.5 marks**	**At standard criteria, plus** more detailed discussion of mechanisms **5-6 marks**
LIST Measures to prevent AKI in post-operative period in ICU **4 marks**	Does not mention haemodynamic optimisation. Does not demonstrate an understanding of strategies to reduce risk. **0 -1.5 marks**	Includes some details of what is involved in haemodynamic optimisation, mentions choice of fluids and avoidance of nephrotoxins **2 -2.5 marks**	**At standard criteria plus** shows clear understanding of post-op ICU interventions to reduce the risk of AKI after cardiac surgery in ICU. May mention novel interventions under investigation **3-4 marks**

Angoff score for this SAQ	5.36
Highest candidate score achieved	8.5

Question 3

You are the Intensivist working at a regional hospital. A 45-year-old patient has presented with a head injury following an assault. The GCS is 7/15 (E2 V2 M3) and a CT scan shows an acute subdural haematoma. The retrieval team will arrive in 4 hours to transport the patient to a neurosurgical centre.

a) Outline your management of the patient until the retrieval team arrives.

(6 marks)

b) Outline the principles of a safe and effective clinical handover of this patient to the retrieval team.

(4 marks)

Syllabus topic/section:

2.2.1 Communication and collaboration in ICU: Handover and referrals

Discussion:

Most candidates did reasonably on part a), but many were let down by part b). Some candidates did better in part b), but very few candidates performed well in both sections of this question.

Candidates that scored less well in part a) simply listed targets without any detail or rationale for those chosen, or they over focused on a single aspect eg how to intubate. Good answers had structure (usually by system) and included specific management aspects and targets that related back to ICP control. Good answers also included an awareness of the regional location and the limitations this posed on ICP monitoring. Several candidates did not mention broader trauma issues like C spine management as part of their answer.

Candidates that scored less well in part b) tended to limit the answer to repetition of the management outlined in part a) for the handover, but didn't include the location, personnel or non-technical features required for a safe handover. Answers that scored higher marks in part b) included communication for safety (the accurate and careful exchange of information between clinicians) and used a formalised or non-formalised structure to aid this (for example ISBAR, MIST or AMPLE).

Angoff score for this SAQ	5.64
Highest candidate score achieved	8

Question 4

Choose **ONE** of the following minimally invasive continuous cardiac output (CCO) monitoring devices used in critically ill patients as an alternative to the Pulmonary Artery Catheter (PAC).

For **either** PiCCO **OR** FloTrac **OR** LiDCOplus:

a. Outline the measurement principles used to generate CCO.

(4 marks)

b. Explain how the device is calibrated.

(2 marks)

c. Discuss the limitations of its use in clinical practice.

(4 marks)

Syllabus topic/section:

2.1.4 Cardiovascular Intensive Care: Haemodynamic monitoring: L1

Discussion:

Candidates scored poorly in this question due to a lack of understanding of the topic and the principles of continuous cardiac output (CCO) monitoring. Many candidates didn't answer the question that was asked or interpreted the question incorrectly and provided information about all 3 devices rather than just 1 device which was explicitly stated in the question with underlining and bolded. Candidates are advised to read the instructions carefully for maximum time efficiency.

The question required candidates to understand that these devices use analysis of the pulse pressure waveform and a proprietary algorithm to generate a CCO and some (PiCCO/LiDCO) combine this with thermodilution.

Candidates that scored well in this question understood the basic principles of pulse pressure waveform analysis as outlined above, internal vs external calibration, and that limitations relate to the various elements of a device. These limitations include the actual line (art or CVC), transducer system, thermodilution techniques and patient specific factors (pulse waveform analysis is not validated in certain patient populations like ECMO or post pneumonectomy). Candidates that considered the individual components of a device were able to use this to structure their answer for all 3 parts of the question.

The marking rubric is included to aid the candidate's future study.

Rubric

	Below standard	At standard	Above standard
PiCCO **a) Principles** **(4 marks)**	No or incorrect understanding that analysis of the arterial pressure waveform is combined with transpulmonary thermodilution. No or minimal awareness of a proprietary algorithm. **0-1.5 mark**	Basic understanding that analysis of the arterial pressure waveform is combined with transpulmonary thermodilution. Awareness of a proprietary algorithm to generate CCO from the patient specific thermodilution generated CO. **2-3 marks**	Detailed understanding of how analysis of the arterial pressure waveform is combined with transpulmonary thermodilution. Awareness of the proprietary algorithm and some recognition it is affected by haemodynamic changes (HR and aortic compliance). **3.5-4 marks**
b) Calibration **(2 marks)**	No or incorrect understanding of how PiCCO is calibrated. **0-0.5 mark**	Understands calibrated via transpulmonary thermodilution to generate a patient specific CO. **1-1.5 marks**	Detailed understanding including externally calibrated via transpulmonary thermodilution and thermistor tipped catheter. Needs recalibrating periodically or when haemodynamic changes occur. **2 marks**
c) Limitations **(4 marks)**	Incorrect or no recognition of the limitations in clinical practice. Recognises that there are factors affect accuracy of either thermodilution or arterial waveform. **0-1.5 mark**	Recognises that factors affecting accuracy of both thermodilution and arterial waveform are limitations to its use. Minimal detail for each of the above and/or lacking awareness of specific populations it can't be used in. **2-3 marks**	Understands -Factors affecting accuracy of thermodilution (technique/pathological conditions) -Factors affecting accuracy of arterial waveform (vasomotor tone/SVR and technical factors affecting arterial line transducer) -PWA can't be used in certain populations (VV and VA ECMO, pneumonectomy, IABP etc) -Aware that PiCCO not correlated in Off Pump CABG and needs recalibrating as Above **3.5-4 marks**
FloTrac **a) Principles** **(4 marks)**	No or incorrect understanding that uses analysis of the pulse pressure characteristics. No or incorrect understanding of proprietary algorithm. **0-1.5 mark**	Basic understanding that uses analysis of pulse pressure characteristics and a proprietary algorithm to produce CO. **2-3 marks**	Good understanding that uses analysis of pressure waveform characteristics on a beat-to-beat basis and a proprietary algorithm that incorporates changes in arterial compliance and resistance. **3.5-4 marks**

b) Calibration **(2 marks)**	No or incorrect understanding of how FloTrac is calibrated **0-0.5 mark**	Understands calibrated prior to use with a population data set as reference. **1-1.5 marks**	Detailed understanding including internally calibrated using a population and haemodynamic data set. **2 marks**
c) Limitations **(4 marks)**	Incorrect or no recognition of the limitations in clinical practice. Recognises that either technical or patient factors affect accuracy of arterial waveform and are limitations to its use. **0-1.5 mark**	Recognises that technical and patient factors affect accuracy of arterial waveform and are limitations to its use. Minimal detail for each of the above and/or lacking awareness of specific populations it can't be used in. **2-3 marks**	Understands -Factors affecting accuracy of arterial waveform can be both physiological (vasomotor tone/SVR) and technical (affecting arterial line transducer) -PWA can't be used in certain populations (VV and VA ECMO, pneumonectomy, IABP etc) -Aware that FloTrac not correlated in vasodilated states (sepsis and liver failure) or in patients not represented in the population data sets. **3.5-4 marks**
LiDCO **a) Principles** **(4 marks)**	No or incorrect understanding that analysis of the arterial pressure waveform is combined with transpulmonary thermodilution. No or incorrect understanding of proprietary algorithm. **0-1.5 mark**	Basic understanding that analysis of the arterial pressure waveform is combined with transpulmonary lithium thermodilution. Awareness of a proprietary algorithm to generate CCO from the patient specific lithium thermodilution generated CO. **2-3 marks**	Detailed understanding of how analysis of the arterial pressure waveform is combined with transpulmonary thermodilution to generate CCO. Awareness of the proprietary algorithm and some recognition it is affected by arterial compliance. **3.5-4 marks**
b) Calibration **(2 marks)**	No or incorrect understanding of how LiDCO is calibrated **0-0.5 mark**	Understands calibrated via transpulmonary lithium thermodilution to generate a patient specific CO. **1-1.5 marks**	Detailed understanding including externally calibrated via lithium transpulmonary thermodilution and lithium sensor tipped catheter. Needs recalibrating periodically or when haemodynamic changes occur. **2 marks**

c) Limitations **(4 marks)**	Incorrect or no recognition of the limitations in clinical practice. Recognises that factors affect accuracy of either thermodilution or arterial waveform are limitations to its use. **0-1.5 mark**	Recognises that factors affecting accuracy of both thermodilution and arterial waveform are limitations to its use. Minimal detail for each of the above and/or lacking awareness of specific populations it can't be used in. **2-3 marks**	Understands -Factors affecting accuracy of thermodilution (technique/pathological conditions) -Factors affecting accuracy of arterial waveform (vasomotor tone/SVR and technical factors affecting arterial line transducer) -PWA can't be used in certain populations (VV and VA ECMO, pneumonectomy, IABP etc) -Aware that LiDCO overestimates CO in patients receiving lithium therapy and with certain muscle relaxants and needs recalibrating as above. **3.5-4 marks**

Angoff score for this SAQ	4.14
Highest candidate score achieved	7

Question 5

A 34-year-old patient presents to the emergency department with a suspected recreational drug overdose and is intubated for a low Glasgow Coma Scale (GCS). There is no past medical history of note. On day 3, the patient is de-sedated, extubated, and subsequently assaults the bedside nurse.

The patient is re-sedated and re-intubated.

Discuss your management plan for de-sedating and extubating this patient.

(10 marks)

Syllabus topic/section:

2.1.8 Neurological Intensive Care: Acute behavioural disturbances: L1
2.1.19 Intensive care Procedures: Intubation

Discussion:

This was a very practical question asking for an approach to a relatively common ICU problem. Candidates that did not provide a structure to their answer frequently missed important elements that would normally be considered when extubating a patient with a history of aggression and safety risks to self and staff. Candidates that did well in this question considered the potential reasons for his post-extubation aggressive behaviour, including organic, psychiatric and toxidrome factors, addressed the logistical issues when considering a second extubation, understood the importance of staff and patient safety and had a back-up plan in case it failed.

Both pharmacological and non-pharmacological strategies when extubating the patient should be considered. For an above standard answer, it was important to include some details about the different pharmacological options that might be used. Please see the below rubric for examples of the elements required. Please note that this is not the only structure/ headings possible. Many differently structed answers with equal content gained the same marks.

The marking rubric is included to aid the candidate’s future study.

Rubric

	Below standard	At standard	Above standard
Considers **underlying reasons for aggression** in previous extubation **(2 marks)**	Fails to consider reasons for failed extubation Doesn't consider staff or patient safety Lack of a back-up plan if fails extubation **0-0.5 marks**	Considers some potential underlying reasons for behaviour **1-1.5 marks**	**At standard plus** Considers a broad range of underlying reasons including medical/ psychiatric & toxidrome **2 marks**
Staff Safety **(3 marks)**	None or inaccurate consideration. **0-1 marks**	Partial consideration to items listed in the column on above standard **1.5-2marks**	Considers the points listed below Considers logistics • Staff Numbers • Day /night timing • Unit activities Plan for additional safety measures e.g. Security **2.5-3.0 marks**
Patient safety and plan for smooth emergence **(3 marks)**	None or inaccurate Considerations **0-1 marks**	Consideration of some pharmacological and non-pharmacological techniques **1.5-2marks**	Considers non-pharmacological and pharmacological techniques for smooth emergence Considers contacting specialty services for advice where applicable. **2.5-3.0 marks**
Team Plan **(2 marks)**	None or inaccurate considerations **0-1 marks**	Mention made of a backup plan but no mention of team preparedness. **1 mark**	Team communication of detailed backup plan for aggressive emergence **1.5-2 marks**

Angoff score for this SAQ	4.68
Highest candidate score achieved	8.25

Question 6

a) A 69-year-old patient was intubated and ventilated for a reduced level of consciousness, with a 4-day history of neurological deterioration. Lumbar puncture was performed.

Cerebrospinal fluid (CSF) analysis revealed:

Parameter	Patient	Reference
Polymorphonuclear cells	0 x 10^6/L	Range: 0 cells
Mononuclear cells	3 x 10^6/L	Range: 0-5 cells
Red blood cells	1640 x 10^6/L*	10-20
No bacteria seen. Blood stained.		
Protein Level CSF	7.35 g/L*	0.15-0.45

i. List **TWO** causes for the raised CSF red blood cells in this patient.

(2 marks)

ii. List **FOUR** likely causes for the raised CSF protein level in this patient.

(2 marks)

b) A 38-year-old patient is ventilated due to severe Influenza A with superimposed bacterial pneumonia. The patient has a BMI of 58 and no other comorbidities. These are the blood results on day 5.

Full blood count	Patient	Reference
Haemoglobin	67g/L*	120-160
Mean Cell Volume	104pg*	80-99
White Cell Count	10.2x 10^9/L	4-11
Platelet Count	242x 10^9/L	150-350

Coagulation	Patient	Reference
INR	1.2	0.9-1.3
APTT	40 sec*	27-38.5
Fibrinogen	6.2 g/L*	2-4

Biochemistry	Patient	Reference
Sodium	138mmo/L	135-145
Potassium	4.2mmol/L	3.5-5.2
Glucose	17.5mmol/L*	3.5-7.7
Vitamin B12	307pg/mL	80-675
Folate	23nmol/L*	>7
Creatine kinase	1058 U/L*	55-170

For **each** of the following four abnormalities:

1. Macrocytic anaemia
2. Hyperfibrinogenaemia
3. Hyperglycaemia
4. High creatine kinase (CK)

i. List **TWO** likely causes in this patient.

(2 marks)

ii. List **TWO** further tests you might order to explain each abnormality and provide your rationale.

(4 marks)

Syllabus topic/section:

2.1.8 Neurological Intensive Care: Interpretation of cerebrospinal fluid: L1
2.1.5 Respiratory Intensive Care: Pneumonia: L1
2.1.11 Haematological and Oncological Intensive Care: Anaemia: L1

Discussion:

Part a) was a straightforward question with most candidates successfully listing the causes of high protein and red blood cells within CSF.
Part b) was answered less well with many candidates providing less than the requested number of causes, tests or rationale. In addition, the answer required the candidate to consider the likely causes in the described patient. Candidates are reminded to read the question carefully.

Angoff score for this SAQ	6.41
Highest candidate score achieved	9.25

Question 7

Choose **ONE** of the following ICU illness severity scoring systems:

1. Australian and New Zealand Risk of Death (ANZROD)

or

2. Acute Physiology and Chronic Health Evaluation (APACHE) III/IV

For your chosen scoring system:

a) List the key components.
(2 marks)

b) Outline the current applications / usage in intensive care.
(5 marks)

c) List the limitations of your chosen illness severity scoring system.
(3 marks)

Syllabus topic/section:

2.1.2 Decision Making: Severity scoring and outcome prediction: L1

Discussion:

This question focused on the core topic of ICU scoring systems. We recommend that candidates have good knowledge of the principles and details of common ICU severity scoring systems. The question was generally answered well if candidates took a broad approach.

Part a) required a list of the key components (acute physiological scores, age and chronic health conditions) rather than an extensive list of the individual acute physiological components. Many candidates missed simple marks by not mentioning the 24-hour timeframe for the data acquisition of the physiological scores or the impact of relevant chronic conditions.

Part b) was answered well if candidates provided a detailed *outline* of several applications rather than a superficial list. Candidates also did well if they used broad headings (safety and quality, clinical or research for example) and then added detail with subheadings to ensure they included a breadth of applications. Please note the glossary terms outline vs list.

Part c) required a simple list, and candidates scored well if they could provide several limitations.

The marking rubric is included to aid the candidate's future study.

Rubric

	Below standard	At standard	Above standard
a) Key Components **(2 marks)**	Only included 0-2 components or didn't recognise that physiology scores are within 24 hours of ICU admission or included incorrect components **0-0.5 marks**	Included all 3 components and noted physiology should be within 24 hours. Also included some detail around chronic health conditions **or** the physiological variables **1 mark**	**At standard plus** Included all 3 components plus some detail around chronic health conditions **and** physiological variables. Also included some of the info specific to the chosen scoring system to score full marks **1.5 - 2 marks**
b) Current Applications/ Clinical Usage **(5 marks)**	Recognises a couple of applications with some detail to each OR Superficial knowledge of 3 different areas **0-2 marks**	Demonstrates sound knowledge of the applications with an understanding of most of the components listed. Does not need to include all 4 areas but understands that they are used in benchmarking, outcome prediction and research **2.5-3.5 marks**	Demonstrates advanced knowledge of applications with good detail. Coverage of ALL applications is not required for advanced marks, but should be a broad range across the categories with good understanding demonstrated **4-5 marks**
c) Limitations **(3 marks)**	Only a couple of limitations are identified, or incorrect factors are included **0-1 mark**	A reasonable number of limitations are identified with minimal detail included **1.5-2 marks**	Majority of the limitations are identified with some detail included **2.5-3 marks**

Angoff score for this SAQ	4.5
Highest candidate score achieved	8.25

Question 8

8.1 A 25-year-old pregnant patient, G3P2 and 30/40 gestation with a 5-day history of anorexia, nausea and vomiting presents to hospital after a convulsion and is transferred immediately to your intensive care unit. The following blood results are obtained:

Full blood count	**Patient**	**Reference**
Haemoglobin	177 g/L*	120-160
White Cell Count	25.4 x 10^9/l *	4.0 -11 .0
Platelet Count	29 x 10^9/l*	150-350
Biochemistry	**Patient**	**Reference**
Sodium	127mmol/L*	135-145
Potassium	2.3 mmol/L*	3.5-5.2
Chloride	84 mmol/L*	95 - 105
Bicarbonate	28 mmol/L*	22 - 32
Urea	29 mmol/L*	3.0-8.0
Creatinine	354 µmol/L*	45-90

Coagulation	**Patient**	**Reference**
International normalised ratio (INR)	1.1	0.9-1.3
Prothrombin time	15 secs	12 – 16.5
APTT (Activated partial prothrombin time)	28 secs	27- 38.5
Fibrinogen	5.7 g/L*	2.0 – 4.0
D-Dimer	16.8 mg/L*	< 0.5

Explain the **MAJOR** abnormalities in this patient.

(4 marks)

8.2 With respect to the coagulation status of a third trimester pregnant patient compared to that in the nonpregnant state, indicate the change you would anticipate for each test listed below:

a) Platelet count
b) Factor V, Vll, 'X, X levels
c) Fibrinogen level
d) Protein S level

(2 marks)

QUESTION 8 Continued on Next Page

8.3 A 30-year-old who is 34 weeks pregnant (G1PO) has presented with nausea and vomiting for 3 days with right upper quadrant pain. On examination the patient is confused, jaundiced with a blood pressure of 120/70 mmHg. The following are results from a venous blood sample taken on admission:

Parameter	**Patient**	**Reference**
Sodium	138 mmol/L*	135-145
Potassium	3.8 mmol/L*	3.5-5.0
Urea	15 mmol/L*	3.0-8.0
Creatinine	245 µmol/L *	45-90
Albumin	30 g/L *	35 - 50
Glucose	2.5mmol/L*	3.5 – 6.0
Total Bilirubin	142 µmol/L *	<26
Alkaline Phosphatase	293 U/L	30 – 110
Aspartate transferase (AST)	99 U/L*	< 35
Alanine transferase (ALT)	88 U/L*	< 35
Glutamyl transferase (GGT)	67 U/L*	< 40
Uric Acid	0.72 g/L*	0.15 – 0.5
LDH	180 U/L	110 - 250
International normalised ratio (INR)	2 .8*	0.9-1.3
APTT (Activated partial prothrombin time)	45 secs*	27-38.5
Platelets	123 x 10^9/L*	150 - 350

List **FOUR** likely differential diagnoses for the above clinical picture and explain your rationale for each.

(4 marks)

Syllabus topic/section:

2.1.11 Obstetric Intensive Care: Physiological changes related to pregnancy: L1

Discussion:

This question was an obstetric data question and was generally answered well by most candidates.

Question 8.1 required an explanation of the major abnormalities contextualised to the described patient. For example, severe hypokalaemia and hypochloraemia related to nausea and vomiting.

Question 8.2 was a pure knowledge recall question, and most candidates did well.

Question 8.3 explicitly asked for 4 differential diagnosis and a rationale for each. Many candidates missed marks by not providing the rationale eg the clinical and laboratory features that support the diagnosis, or by suggesting a differential diagnosis not relevant to case.

Angoff score for this SAQ	5.77
Highest candidate score achieved	9.25

Question 9

Critically evaluate role for red blood cell transfusion thresholds in critically unwell patients with gastrointestinal bleeding.

Your answer should include:

a) The criteria used for transfusion.
(2 marks)

b) Advantages and disadvantages of transfusion thresholds.
(3 marks)

c) Evidence for red blood cell transfusion thresholds in this population.
(3 marks)

d) My practice statement.
(2 marks)

Syllabus topic/section:

2.1.6 Gastrointestinal Intensive Care: Acute gastrointestinal bleeding: L1
2.5.1 Research and Evidence Based Practice in Intensive care: Critical appraisal of study types

Discussion:

This was a critical appraisal question regarding blood transfusion for upper gastrointestinal haemorrhage. In-depth knowledge of the specific evidence was not required. For example, quotation of journal and publication dates are not required but a summary of the evidence available *is* required for a passing mark.

Candidates scored well if they noted the glossary term *critically evaluate* and provided an expanded explanation rather than a simple list in part a).

The question was specifically about transfusion *thresholds* rather than transfusion. Many candidates could have improved their answer as they simply listed generic risks of transfusion thresholds without explanation or adaptation to the specific population asked for.

The principles behind landmark transfusion papers such as TRICC and TRISS remain core topics even if the nuances of specific studies relevant to upper GI haemorrhage are less well known. Good answers provided a broad overarching description of the current evidence for transfusion thresholds across the whole critical care population and then demonstrated the ability to adapt these principles to the specified sub-population.

The marking rubric is included to aid the candidate's future study.

Rubric

	Below standard	At standard	Above standard
a) Criteria used for transfusion **(2 marks)**	Scant details. Does not answer the question. **0-0.5 marks**	Clinical OR laboratory correct factors mentioned **1 mark**	Well thought out Structured with laboratory AND clinical factors **1.5-2 marks**
b) Advantages and disadvantages of transfusion thresholds **(3 marks)**	Not answering the question asked (talking about transfusion related risks rather than thresholds) Or inaccurate or wrong content **0-1 marks**	At least 2 relevant advantages and 2 relevant disadvantages for transfusion threshold *NB Advantages or disadvantages of RBC transfusion should gain no marks* **1.5- 2 marks**	Content with broad application ranging from individual considerations to population and research **2.5-3 marks**
c) Evidence for RBC Tx in GIT bleeding **(3 marks)**	Incorrect summary of research or incomplete **0-1 mark**	Summary of available research Note to examiners naming of the trials is not required to pass. A broad summary of major points is all that is required. **1.5-2 marks**	Can name the trials and provide more granular details to explain the basis of transfusion threshold guidelines **2.5-3 marks**
d) My practice statement **(2 marks)**	Incomplete or not applying research to clinical judgement **0-0.5 marks**	An indication of clinical application of research to practice **1 mark**	Is able to state when the threshold would be used in clincial practice and when they may not be applicable/ limitations of the thresholds requiring clincial judgement **1.5-2 marks**

Angoff score for this SAQ	4.5
Highest candidate score achieved	6.375

Question 10

Regarding thyroid storm:

a) Outline its clinical presentation. (3 marks)

b) List the relevant laboratory findings. (2 marks)

c) Outline the management of thyroid storm. (5 marks)

Syllabus topic/section:

2.1.9 Endocrine Intensive Care: Acute thyroid crises: L1

Discussion:

Good answers to part a) included a well organised list of clinical features including the presence of a high fever with neurological, cardiac and abdominal symptoms discussed in some detail. Good answers also noted the possibility of longer standing hyperthyroidism and it's features with possible triggers of storm.

Candidates mostly did well in part b) and were able to mention the expected T3, T4 and TSH result (of note thyroid storm is almost never due to secondary hyperthyroidism). Good answers also included some of the other likely laboratory abnormalities and that these are not specific. Some candidates wrote about non-laboratory-based tests such as ECHO and CT which did not score marks as the question specifically asked for laboratory ones.

Part c) of the question was less well answered by candidates. Candidates who did well were able to discuss the resuscitative and supportive measures as well as outlining the specific treatments and their rationale (the glossary headings for management). Supportive treatments needed to be targeted to the condition and good candidates linked the clinical presentation features from part a to their management plan.
Good answers discussed the timing of specific treatments (e.g. iodide after PTU and the rationale), included looking for a precipitant, and mentioned rescue therapies (PLEX, thyroidectomy). Excellent answers demonstrated superior subject grasp by discussion of areas of uncertainty or controversy - e.g. using beta blockers in patients at risk of decompensating shock or the use of amiodarone.

Angoff score for this SAQ	5.5
Highest candidate score achieved	8.375

Question 11

With respect to cytomegalovirus (CMV) infection in an immunosuppressed patient:

a) Outline the clinical features

(4 marks)

b) List appropriate diagnostic tests with expected findings

(4 marks)

c) List initial drug treatments

(2 marks)

Syllabus topic/section:

2.1.3 Sepsis and Infections: Rarer infections with specific ICU considerations: L1

Discussion:

Many candidates were able to score at standard and above. Candidates who did well outlined the specific clinical features and discussed the features of both a CMV syndrome and tissue-invasive CMV disease, although this distinction and terminology was not required to be at standard.

Part b) required the diagnostic tests (for example serology, PCR and tissue biopsy) along with the expected findings. Some candidates wrote a more generic list of investigations (for example CT scan, blood smear) which did not attract marks as the question required diagnostic tests.

Part c) was well answered by those who have an understanding and knowledge of the disease.

Those with a knowledge gap about the topic tended to have incomplete answers across all 3 the sections.

Angoff score for this SAQ	4.82
Highest candidate score achieved	8.5

Question 12

A 28-year-old patient has been admitted to ICU intubated and ventilated with septic shock and multiorgan failure secondary to a methicillin sensitive Staphylococcus aureus bacteraemia. There is no known background medical history. Specific management has included intravenous flucloxacillin in appropriate dosages.

At day 7 they are stable requiring moderate vasopressor support, with ongoing dialysis. There is a persistent fever. Surveillance blood cultures continue to grow a methicillin sensitive Staphylococcus aureus.

Explain your assessment of this patient with regard to the positive blood cultures.

(10 marks)

Syllabus topic/section:

2.1.3 Sepsis and Infections: Sepsis and septic shock: L1

Discussion:

Candidates that did well on this question recognised that it was an assessment of a patient with persistent MSSA bacteraemia without source control OR with an occult metastatic focus. Good answers provided a detailed examination to look for the potential sources and highlighted the significance of the investigation's requested by including the rationale for ordering them. For example, ECHO/TOE looking for endocarditis or MRI spine looking for epidural collection.

Some candidates interpreted the question as asking about a positive blood culture and therefore did not include a full assessment looking for other foci of infection. The question used the glossary of term “assessment”. Therefore, candidates needed to include information about the patient's history including risk factors for Staph bactereamias, a thorough examination specifically looking for source of recurrent staph, complications of septic shock and reversible elements of multiorgan failure with the relevant investigations to address this.

Candidates who scored poorly tended to have a very superficial approach to the examination and listed a large number of investigations without being more tailored to the specific question or including the rationale.

The marking rubric is included to aid the candidate’s future study.

Rubric

	Below standard	At Standard	Above standard
Approach assessment in regard to positive blood cultures **(10 marks)**	Insufficient assessment of specific patient described in stem. List only with no rationale for investigations provided. Basic / routine septic screen with not extended investigations. Omission of vital aspects of assessment (e.g. Staph risk factors, such as IVDU). Poorly structured. **0 – 4.5 marks**	Thorough approach with most assessments (general and specific to patient) outlined. *Given the persistent Staph, and the direction* ***to assess in regard to positive blood cultures:*** *need to have extended search for metastatic/other foci of disease to achieve the standard required.* *Ie not just generic septic screen answer.* some rationale provided. Not all assessments listed in 'expected information' are required for full marks, however some examples of further investigation based on history/exam findings would be expected. **5 -7 marks**	**At standard plus** Very clear approach containing the previous PLUS detailing the following - Lack of source control - Failure of antibiotics is not due to resistance or drug failure - Rationale for extended search for hidden/ undiscovered source of staph. - Extended septic screen (joint aspirations, WCC labelled CTs etc) **7.5 -10 marks**

Angoff score for this SAQ	5.77
Highest candidate score achieved	7.25

Question 13

A 60-year-old patient is admitted to ICU for severe hypoxemic respiratory failure 6 months after lung transplantation. The chest X-ray shows bilateral infiltrates.

a) List the likely causes of this presentation, providing specific examples.

(4 marks)

b) Outline your assessment of this patient to differentiate between these potential causes.

(6 marks)

Syllabus topic/section:

2.1.5 Respiratory Intensive Care: Respiratory Failure: L1
2.1.5 Respiratory Intensive Care: Lung Transplantation: L2

Discussion:

Candidates mostly did well in part a) and those that did particularly well had a good structure to their answer with causes divided into infectious and non-infectious. They provided a wide and appropriate list of relevant organisms that would be expected for an immunosuppressed patient, beyond just bacterial, viral and fungal. Candidates that did poorly failed to include non-infectious causes, in particular rejection or instead they mentioned GVHD or graft failure which are different processes.

Candidates that did well in part b) included details in the history about the transplant and immunosuppression and differentiated between the causes in their examination and investigations with an appropriate level of detail. Candidates that did poorly failed to consider transplant specific factors or listed a generic set of investigations without detail of how to differentiate between the causes. The instructions were specific as to this aspect of assessment required. Some candidates didn't include all sections of assessment as defined by the glossary (history, clinical examination, and relevant investigations) which unfortunately meant they didn't address all parts of the question.

Angoff score for this SAQ	5.23
Highest candidate score achieved	8.75

Question 14

a) Define central line associated bloodstream infection (CLABSI).

(2 marks)

b) Outline potential circumstances where salvage of the infected central line catheter may be preferable to removal. Include in your answer specific management of the catheter if salvage is attempted.

(8 marks)

Syllabus topic/section:

2.1.19 Intensive Care Procedures: Central venous catheter
2.1.3 Sepsis and Infections: Sepsis and septic shock: L1

Discussion:

This is a difficult clinical scenario which is sadly not unknown in complex long term critically ill patients. For part a) many candidates provided a definition for calculating CLABSI incidence for quality assurance rather than providing the clinical definition asked for.

In part b) candidates were able to provide the technical reasons why salvage may be preferred (coagulopathy, lack of access sites, quality of life issues overriding catheter re-insertion) but many could have extended their answers beyond technical difficulty when considering a decision about salvaging an infected line.

A few candidates outlined the role of the infecting micro-organism in such decision making and this depth of detail is to be commended. For example, a Coagulant negative staph or drug susceptible Enterobacteriaceae would be a consideration on embarking on salvage therapy whereas a presence of a fungal infection, MROS or Pseudomonas would be more likely to advocate for removal.

In managing a clinically infected line when salvage is being attempted, there was a lot of emphasis on infection control measures but insufficient specific detail about additional management or monitoring for potential complications/treatment failure with a salvage strategy (disseminated infection, thrombophlebitis, persistently positive BC). Details of specifics of Antibiotic lock therapy, systemic Antibiotic therapy (and timing) and guide wire exchange as a last resort were features of the above standard answer.

Angoff score for this SAQ	4.05
Highest candidate score achieved	6.375

Question 15

15.1 The following data refers to a 65-year-old patient with background of active rheumatoid arthritis, admitted to intensive care with septic shock.

Parameter	Patient value	Adult normal range
Haemoglobin	86g/L*	125-180
Serum ferritin	298 ug/L	15-300
Serum iron	7 umol/L*	9-27
Total iron binding capacity (TIBC)	52 umol/L	47-70
Transferrin saturation (Iron/TIBC x 100)	28%	16-40
Erythropoietin level	15 U/L	4-28
C-reactive protein (CRP)	321 mg/L*	<8

a) What abnormality is demonstrated in this patient? Explain your rationale.

(2 marks)

b) What is the pathogenesis of these changes?

(2 marks)

c) Outline the principles of management?

(1 mark)

15.2 The following data refers to a 48-year-old patient admitted electively to intensive care following extensive pelvic surgery for invasive endometrial cancer. The patient has remained in intensive care for 22 days due to complications, including acute kidney injury.

Parameter	Patient value	Adult normal range
Haemoglobin	66g/L*	125-180
Serum ferritin	14 ug/L*	15-300
Serum iron	3 umol/L*	9-27
Total iron binding capacity (TIBC)	86 umol/L*	47-70
Transferrin saturation (Iron/TIBC x 100)	9%*	16-40
Erythropoietin level	41 U/L*	4-28
C-reactive protein (CRP)	60 mg/L*	<8

a) What abnormality is demonstrated in this patient? Explain your rationale.

(2 marks)

b) List **TWO** potential causative factors in this patient.

(1 marks)

c) Outline the treatment(s) to correct the demonstrated abnormality and include any disadvantages and/or risks.

Syllabus topic/section:

2.1.13 Haematological and Oncological Intensive Care: Anaemia: L1

Discussion:

15.1 Many candidates scored extremely well. Excellent answers were discriminated by the additional detail provided for the explanation of the mechanism of the anaemia of chronic disease, and by correctly identifying that treatment is that of the underlying cause and there is a lack of benefit from EPO and iron supplementation in anaemia of inflammation (EPO level was also normal in the stem).

15.2 Some candidates identified the specific abnormalities correctly, but did not explain their rationale nor identify the unifying abnormality of iron deficiency anaemia.

Candidates often listed 2 different forms of the same pathology/causative factor (eg blood loss from both phlebotomy and surgical bleeding) or incorrect causative factors (iron removal by dialysis which does not cause iron deficiency because of the extremely small amount of elemental iron ions available for diffusion) rather than 2 different causative factors.

In the treatment section incorrect strategies were included by some, for example GCSF which is not a treatment for iron deficiency anaemia and EPO even though the EPO level in the stem was already elevated.

Many candidates also reflexively listed the advantages of the iron replacement strategies in their answer to part c), even though the question specifically asked for disadvantages and/or risks. Candidates are reminded to ensure they read the question carefully to ensure they are answering the question directly and not wasting time on providing information that unfortunately doesn't attract marks.

Angoff score for this SAQ	6.27
Highest candidate score achieved	9.625

Question 16

Regarding enteral feeding intolerance in the critically ill:

a) Outline the potential aetiologies.

(2 marks)

b) Outline the expected clinical signs and potential radiological findings.

(2 marks)

c) List **FOUR** major complications.

(2 marks)

d) Outline your specific management of a patient with enteral feeding intolerance.

(4 marks)

Syllabus topic/section:

2.1.6 Gastrointestinal Intensive Care: Enteral and Parenteral nutrition: L1
2.1.21 Applied pharmacology: Gastrointestinal

Discussion:

In general, most candidates were able to answer this question to a reasonable standard with good answers allocating judicious time to sub-sections that had just 2 marks each and answering the final sub-section on management (worth 4 marks) in more detail.

Candidates that did well in part a) provided a structured outline to their list of aetiologies which helped them to include a broad range of reasons.

Clinical signs consistent with feeding intolerance like distended abdomen, high gastric residual volumes and vomiting are common clinical signs that along with the radiological features on X-Ray and CT were expected. Some candidates completely omitted part b) of the question, it was unclear if this was due to misreading the whole question or lack of knowledge.

Candidates are reminded to read the question carefully and provide FOUR major complications as instructed. Additional complications beyond 4 did not attract marks.

Good answers for part d) included a structured approach to medications which treat both constipation and gut dysmotility, alternative feeding strategies (eg post pyloric) as well as treatment of the underlying cause and precipitating factors/complications.

Angoff score for this SAQ	5.41
Highest candidate score achieved	7.25

Question 17

Critically evaluate the use of veno-venous extracorporeal membrane oxygenation (V-V ECMO) for hypoxaemic respiratory failure in adults.

Your answer should include:

a) The criteria used to determine if a patient is a suitable candidate for V-V ECMO. (4 marks)

b) Advantages and disadvantages of V-V ECMO in this context. (3 marks)

c) The evidence for V-V ECMO in hypoxaemic respiratory failure. (3 marks)

Syllabus topic/section:

2.1.4 Cardiovascular Intensive Care: Mechanical supports ECMO: L1

Discussion:

Some candidates had a limited knowledge of VV ECMO and its physiological benefits and at times confused it with VA ECMO, particularly in part b).

Many candidates only provided the indications for VV ECMO in part a) and didn't include the contraindications that would also determine a candidate's suitability for VV ECMO.

In part b) some candidates included broad statements like "prevents death or worsening organ failure" rather than describing the specific advantages of reduced ventilatory pressure to prevent further lung injury or reduction in hypoxia by returning fully oxygenated blood and clearing CO2.

The last part of the question was generally poorly answered, with few candidates demonstrating knowledge of the evidence or the controversies and little appreciation of the differing interpretations of the trials.

Angoff score for this SAQ	5.41
Highest candidate score achieved	8.5

Question 18

With respect to antibiotic stewardship in intensive care:

a) Outline the principles.

(2 marks)

b) Discuss the advantages and disadvantages.

(8 marks)

Syllabus topic/section:

2.1.3 Sepsis and Infections: Antimicrobial use in ICU: L1

Discussion:

Overall, this question was answered well, with some candidates scoring very high marks. Some candidates spent a long time on part a) which was only worth 2 marks and candidates are reminded to focus their time according to the mark allocation and weighting.

Candidates who did well were aware of the National Safety and Quality Health Service National Standard and included both the purpose of an AMS team (the 4D's being one of the common acronyms for this-but specifying the 4Ds was not required to score full marks) and its structure (multi-disciplinary review of antibiotics in ICU). In part b) candidates who did poorly only included a small number of advantages and disadvantages with minimal discussion about each one, despite this part being worth 8 marks.

Angoff score for this SAQ	5.5
Highest candidate score achieved	9.25

Question 19

A 45-year-old intubated patient is admitted to the ICU post intentional poly-pharmacy overdose of antidepressants and antihypertensives 4 hours ago.

Outline the specific management of catecholamine resistant vasodilatory shock in this patient.

(10 marks)

Syllabus topic/section:

2.1.14 Environmental injuries and toxicology: Poisoning and drug intoxication: L1
2.1.4 Cardiovascular Intensive Care: Shock: L1

Discussion:
A structured answer to shock management which included a tiered response starting with vasopressin and steroids all the way through to methylene blue, addressing arrythmias (options for pacing) and ECMO for example was expected. It was also expected that candidates would include general supportive therapy with dialysis and rationale explained, i.e. normalisation of acid base balance, and electrolytes e.g. calcium, as well as specific therapies for the overdose.

Candidates who did well focussed on vasodilatory shock while considering an overlap with other forms of shock including cardiogenic due to the antihypertensive overdose. They also included antidotes for the common overdoses of these drugs as part of specific management is to treat the underlying cause while addressing the pathophysiology.

Although the question specified vasodilatory shock, given the history, it was important to look for an overlap with other forms of shock, (like cardiogenic from an antihypertensive drug overdose). However, the answer did not require a generic approach to shock nor a confirmation of vasodilatory shock and candidates who spent time on this aspect were less likely to score as highly.

Angoff score for this SAQ	5.09
Highest candidate score achieved	8.5

Question 20

a) Regarding the use of an intra-aortic balloon pump (IABP):

i. List the indications for use.

(2 marks)

ii. Outline the haemodynamic effects.

(4 marks)

iii. List the complications.

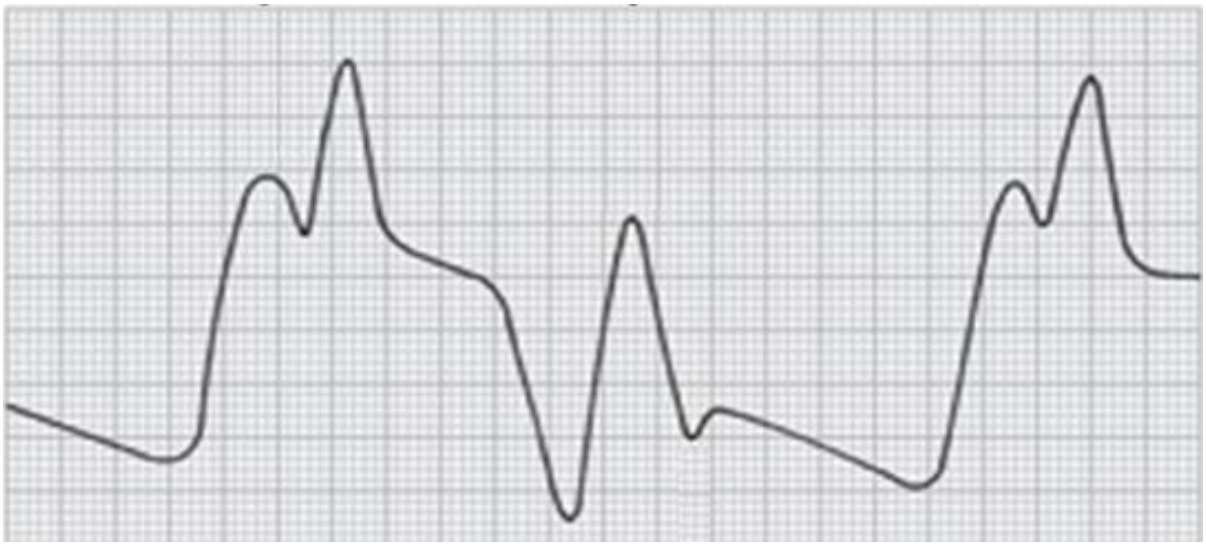
(2 marks)

b) Explain the haemodynamic consequences of each of the following IABP traces.

(both traces are at 1:2 augmentation).

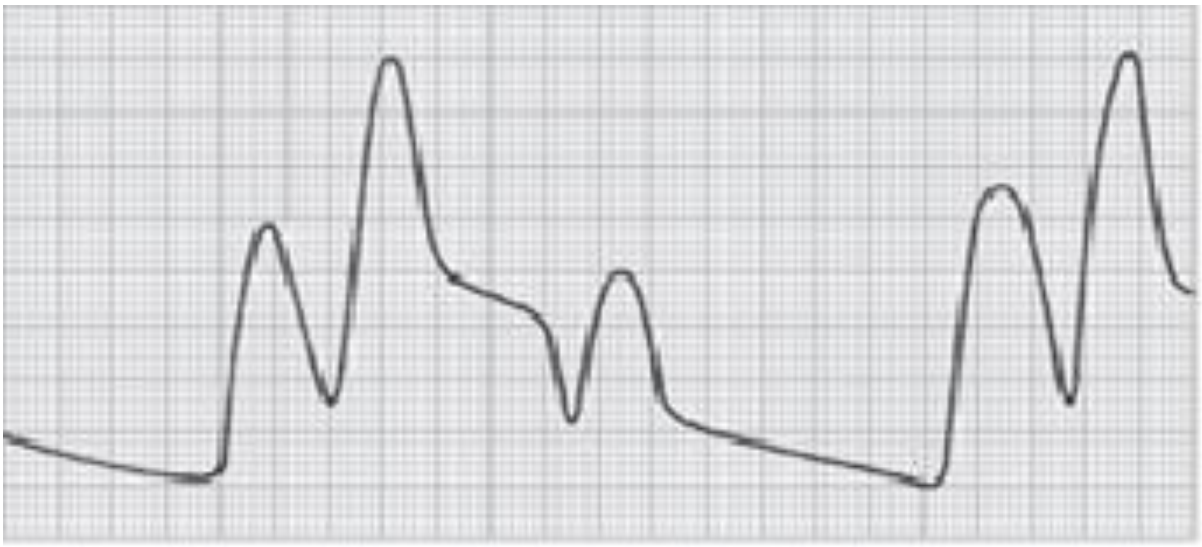
i.

(1 mark)



ii.

(1 mark)



Syllabus topic/section:

2.1.4 Cardiovascular Intensive Care: Mechanical supports IABP: L1

Discussion:

Listing the indications and complications was well done by candidates that knew the topic.

Candidates that did well for part ii) were able to outline the haemodynamic effects and relate them to the indications they had listed in part i). For example, describing how an IABP may be beneficial in acute MR or VSD provided candidates with a good structure to their answer. It also ensured they outlined the effects rather than just listing them which scored less marks as the question asked candidates to "outline (provide a summary of the important points) the haemodynamic effects" not just list them which some candidates did, and as a result scored lower marks.

A number of candidates mixed up the 2 traces in part b) or gave the right haemodynamic consequence but the wrong explanation and sometimes appeared to have written down the wrong word e.g. inflation instead of deflation or early instead of late. Due to the mark allocations in the question candidates could still achieve a pass without having to interpret the IABP traces correctly.

Angoff score for this SAQ	5.41
Highest candidate score achieved	8.25

Question 21

An adult patient is admitted to ICU following a seizure and is found to have severe hyponatraemia of unknown duration. The blood tests are as follows:

Parameter	Patient	Reference
Urea	35 mmol/L*	3.0-8.0
Creatinine	480 (µmol/L) *	45-90
Sodium	98 mmol/L*	135-145
Glucose	8 mmol/L*	3.5 - 6.0

a) List **SIX** risk factors for osmotic demyelination syndrome.

(2 marks)

b) Discuss your approach to correcting the hyponatraemia (prior to commencing renal replacement therapy) and provide your rationale.

(4 marks)

c) The patient becomes anuric. Outline how ongoing hyponatraemia alters your approach to renal replacement therapy.

(4 marks)

Syllabus topic/section:

2.1.7 Renal intensive care: Renal failure, renal replacement therapy: L1
2.1.7 Renal intensive care: Acid-base and electrolyte disorders: L1

Discussion:

Risk factors for demyelination syndrome were well recognised.

Candidates attracted more marks when they approached the discussion in part b) by starting with the underlying principles. Better answers addressed all the information in the stem (seizure, unknown duration of hyponatraemia and renal failure). By recognising the important risks of over correction of hyponatraemia in parts b) and c), it was expected that candidates could address safe target levels of sodium along with a safe, specific plan for achieving this correction. There are many acceptable approaches to correction of hyponatraemia. All approaches were given marks based on the depth and specificity of their answer and not on any single preferred approach.

Angoff score for this SAQ	5.18
Highest candidate score achieved	8

Question 22

Discuss the steps involved in performing a clinical audit.

(10 marks)

Syllabus topic/section:

2.3.1 Intensive care administration: Safety and quality: Clinical Audit

Discussion:

This question sought a discussion which requires some depth to the answers, including addressing the key principles and where appropriate, the advantages and disadvantages. Attention to structure is rewarded in a question such as this. Starting with a list of the steps involved provides the headings from which a discussion can flow but is not in itself enough to achieve high marks. Candidates that scored higher marks provided detail about the individual steps to explain the key principles.

Candidates who scored less well on this question wrote about how to implement a change management or quality improvement intervention rather than how to conduct a clinical audit. Whilst there is some overlap between them it meant candidates missed some of the key steps involved if they didn't address the question.

The marking rubric is included to aid the candidate's future study.

Rubric

Below standard	At standard	Above standard
Unable to list basic steps An audit conducted with this sort of structure would lack validity or fail for lack of support. Steps *listed* in name only, not discussed, explained, or explained incorrectly. **0-4.5 marks**	The basic elements to perform a clinical audit are included with a logical progression of steps Omitted elements would not derail an audit project that is otherwise guided by an experienced supervisor For the steps listed some sensible discussion of each step is required for a pass. **5-6.5 marks**	As **at standard** with: Steps listed with a detailed description, including the first and last steps (topic identification and re-audit). For each step, the outlined points are detailed, and specific strategies or methods are listed. These could include insight into organisational dynamics (eg. need for support from hospital admin), the question of ethics approval, effects of audit significance for practice change on sample calculation, strategies to improve the validity of the data collection instrument, etc. **7-10 marks**

Angoff score for this SAQ	4.91
Highest candidate score achieved	8

Question 23

Discuss the role of early (less than 24 hours) versus late (greater than 48 hours) CT brain imaging in intubated patients admitted to intensive care following out of hospital cardiac arrest. Include the following headings in your answer:

a) Rationale.

(4 marks)

b) Advantages and disadvantages.

(6 marks)

Syllabus topic/section:

2.1.4 Cardiovascular intensive care: Cardiac arrest: L1
2.1.8 Neurologic intensive care: Brain CT: L1
2.1.20 Radiology in intensive care

Discussion:

This question was specific to the role of CT brain in the context of an OOHCA. Candidates who limited their answer to the described clinical situation performed better than those who addressed the role of CT imaging in other scenarios.

Candidates who explained the implications of early vs late CT brain using the glossary of terms (rationale, advantages and disadvantages) scored higher marks.

Careful attention to the question, including underlining the key phrases and an application of the glossary of terms, can reduce the risk of answers diverting from what has been asked.

The marking rubric is included to aid the candidate's future study.

Rubric

	Below Standard	At Standard	Above Standard
a) Rationale **(4 marks)**	Provides no rationale Or Superficial rationale not specific to the context of OOHCA **0-1.5 marks**	Rationale must include identification of arrest associated with intracerebral event, AND identification of changes consistent with HIE (early and late) **2-2.5 marks**	As for "at standard and includes specific details of imaging findings and how they contribute to patient care **3-4 marks**
b) Advantages and disadvantages **(6 marks)**	Superficial or generic advantages/ disadvantages that are not context specific **0-2.5 marks**	Must address limited situations where CTH facilitates early neuroprognostication balanced with transport risk and delay to other therapy **3-4.5 marks**	As for at standard and includes place in context of other neuroprognostic assessment, specific scenarios where advantages outweigh disadvantages **5-6 marks**

Angoff score for this SAQ	4.68
Highest candidate score achieved	7.5

Question 24

A 53-year-old patient is admitted to the intensive care unit following an uneventful emergency clipping of a right middle cerebral artery aneurysm.

They are extubated the following morning with normal neurology. Six hours after extubation the urine output suddenly increases to over 400ml per hour.

a) List **FOUR** likely diagnoses.

(2 marks)

b) Outline your immediate assessment.

(4 marks)

c) Outline the management plan for the patient's polyuria.

(4 marks)

Syllabus topic/section:

2.1.8 Neurological intensive care: Subarachnoid haemorrhage: L1

Discussion:

Candidates who attended to all components of this question performed well. Addressing immediate assessment requires history, examination and investigations to be addressed. As assessment intends to define the diagnosis, better answers were informed by the list of likely diagnoses in part A. A comprehensive answer to a management question addresses resuscitation, definitive as well as supportive therapy and monitoring. Better answers addressed each of these.

Angoff score for this SAQ	5.41
Highest candidate score achieved	7.75

Question 25

Regarding prone positioning of patients with severe ARDS:

a) Discuss the physiological rationale for its use.

(6 marks)

b) List **FOUR** complications of prone positioning and provide a mitigation strategy for each complication.

(4 marks)

Syllabus topic/section:

2.1.5 Respiratory intensive care: Acute respiratory distress syndrome, Prone positioning: L1

Discussion:

Answers to part a) could be improved by familiarity with the glossary term 'discuss', and reference to the status of this topic in the syllabus (Level 1 for both ARDS and prone positioning). Discussion of Level 1 topics requires depth. A discussion asks candidates to address underlying key principles. A list of physiologic effects of prone positioning does not address the depth required, though it is a good springboard for a more in-depth discussion.

Many candidates answered Part b) well and this likely reflects the increased use of proning in clinical practice.

The marking rubric is included to aid the candidate's future study.

Rubric

	Below standard	At standard	Above standard
a) Discuss the physiological rationale of prone positioning with severe ARDS. **(6 marks)**	Incomplete/incorrect answer Does not include V/Q mismatch **0 – 2.5 marks**	Must include: Improved V/Q matching and any 2 other physiological effects at a minimum As the question is discuss listing alone is not sufficient to pass must include some detail **3 – 4.5 marks**	**At standard level plus** provides a more comprehensive response that is broad and covers most of the physiologic rationale linked to pathophysiology of ARDS with an increased level of detail **5- 6 marks**
b) List four complications and mitigation strategies **(4 marks)**	Provides less than 4 reasonable complications with mitigation strategies **OR** Provides 4 complications, without mitigation strategy **0-1.5 marks**	Provides 4 reasonable complications, **AND** Provides 4 well-described mitigation strategies with some omissions **2-3 marks**	Provides 4 reasonable complications, **AND** Provides 4-comprehensive mitigation strategies **3.5-4 marks**

Angoff score for this SAQ	6.05
Highest candidate score achieved	8

Question 26

A 60-year-old patient is admitted to ICU after a high-speed motor vehicle accident. Their injuries include a spinal cord injury associated with cervical vertebral fractures, multiple rib fractures, abdominal injuries and pelvic fractures. They have had a laparotomy and external fixation of pelvic fractures.

The cervical spine injury is managed with decompression and stabilisation. They remain intubated and ventilated.

Discuss the factors that would affect this patient's ability to wean from mechanical ventilation during their ICU admission.

(10 marks)

Syllabus topic/section:

2.1.13 Trauma Intensive Care - Severe and/or multiple trauma, spinal trauma: L1
2.1.5 Respiratory Intensive Care - Mechanical ventilatory support: L1

Discussion:

Many candidates did not discuss the spinal cord injury level in detail, and did not discuss implications of a complete or incomplete injury. Some candidates assumed lifelong ventilator dependence. Many candidates also discussed assessment and management issues that did not attract marks, whilst covering other relevant factors only superficially, eg "rib fractures affect weaning". Many answers focussed on analgesia or extubation somewhat in isolation.

It is again recommended that candidates read the question carefully and are familiar with the glossary terms. This question asked candidates to discuss, and this requires a level of detail rather than simply a list. Consideration of the multi-trauma injuries was necessary to attain more marks.

Candidates who did better demonstrated a structured approach and the impact of each injury on weaning.

The marking rubric is included to aid the candidate's future study.

Rubric

	Below Standard	At Standard	Above Standard
Discuss factors affecting patients' ability to wean	Poor structure failing to consider trauma related and other causes weaning from mech vent Minimal understanding of the impact of the level and extent of cervical cord injury on respiratory mechanics Omission of explanation of other contributory factors **0 – 4.5 marks**	Reasonable structure mentioning trauma and trauma unrelated factors Demonstrates good understanding of impact of Cervical cord injury on respiratory mechanics Includes some of the other trauma and non-trauma related factors contributing to weaning failure **5 - 7 marks**	**At standard plus** Good structure with comprehensive prioritised list of Cervical cord related/ other trauma related injuries and comorbidities contributing to failure to wean. Detailed explanation of the impact by each of the mentioned factors on respiratory mechanics and its clinical implications **7.5-10 marks**

Angoff score for this SAQ	5.14
Highest candidate score achieved	7

Question 27

With regards to fluid resuscitation in patients with septic shock:

a) Discuss **THREE** dynamic measures that may be used to assess volume responsiveness.

(6 marks)

b) Outline the potential complications of fluid over-resuscitation in this context.

(4 marks)

Syllabus topic/section:

2.1.3 Sepsis and Infections - Sepsis and Septic shock: L1
2.1.21 Applied Pharmacology in Intensive Care – Intravenous fluids
2.1.4 Cardiovascular Intensive Care - Haemodynamic monitoring: L1

Discussion:

Candidates are again reminded to be familiar with and follow the glossary terms, in this instance 'discuss' and 'outline'. Discuss requires detailing of the advantages and disadvantages of the nominated dynamic measures. Outline requires more than a simple list

Less successful answers in part a) listed non-dynamic measures for example CVP, or simply gave a fluid bolus, which did not attract marks.
Successful answers nominated Passive leg raise, various echo measurements, haemodynamic measurements affected by respiration and ventilator dynamic measures such as tidal volume challenges amongst others.

Candidates who scored more marks in part b) demonstrated a structured approach and were then less likely to omit details that attracted marks. The more successful candidates also timed their answers between parts a) and b) appropriately for the marks stipulated.

Angoff score for this SAQ	4.82
Highest candidate score achieved	9.5

Question 28

A two-week-old baby is brought to your general intensive care unit in extremis, pending transfer to a paediatric centre. The baby was born at term and discharged well on day 5 of life. For the past three days the baby has had progressive tachypnoea, lethargy and failure to feed, and has now presented after a seizure. The baby has been intubated in the emergency department.

Blood gas results taken breathing room air prior to intubation are below:

Parameter	Patient	Reference
pH	7.04*	7.35 - 7.45
pCO_2	14 mmHg (1.9 kPa) *	35 – 45 (4.6 – 6.0)
pO_2	80 mmHg (10.5 kPa)	
Bicarbonate	5 mmol/L*	22-28
Lactate	8 mmol/L*	<2
Glucose	0.9 mmol/L*	3.5-6.1
White cell count	14.7 x 10^9/L*	4.0-11.0
Alanine aminotransferase (ALT)	1600 U/L*	10-55
Aspartate aminotransferase (AST)	2200 U/L*	10-40

a) List the likely differential diagnoses for this patient.

(2 marks)

b) Outline your assessment to differentiate between these diagnoses.

(3 marks)

c) Outline the management of this patient.

(5 marks)

Syllabus topic/section:

2.1.17 Paediatrics: L2

Discussion:

Candidates who did well on this question were able to formulate a list of differentials, provide an assessment to help differentiate between the answers listed in part a), and then provide a general and specific plan of management. Some candidates were able to efficiently tabulate appropriate parts of their answer. Answers that included structure and a clear management plan of the listed abnormalities (e.g. hypoglycaemia) received more marks, as did those that referenced frequent liaison with a paediatric centre and specific treatments such as prostaglandin for potential duct dependent cardiac lesions.

Answers that did not attract as many marks omitted detail in part c) (50% of total marks for the question) Candidates should be aware of the marks allocated to different parts of each question and prioritise their timing accordingly for maximum time value. Some answers omitted important details such as omission of non-accidental injury (NAI) as a DDx in part a) and/or liaison with a paediatric centre. Some candidates also wrote detailed intubation specifics which did not attract marks as the stem outlined the intubation was already complete.

Angoff score for this SAQ	4.77
Highest candidate score achieved	9.25

Question 29

A 64-year-old patient is admitted to your ICU following coronary artery bypass grafting. Six hours following admission, the patient remains intubated and ventilated with increasing vasopressor requirements, noradrenaline increasing from 2mcg/min to 15mcg/min over 1 hour.

a) Outline your assessment of this patient to determine the cause of their hypotension.

(6 marks)

b) The patient has a cardiac arrest. Outline your management.

(4 marks)

Syllabus topic/section:

2.1.4 Cardiovascular Intensive Care Shock and cardiac arrest: L1
2.1.18 Peri-operative Issues in Intensive Care - Cardiac surgery: including sternotomy for bypass grafting, valve surgery and aortic surgery: L1

Discussion:

This question covers core/foundation knowledge and was generally completed to an adequate standard. Candidates who demonstrated a clear structure around their answer were rewarded. The better answers included a clear exploration of the elements of history, examination and Investigation that differentiated Obstructive, Vasodilatory, Hypovolaemic and Cardiogenic shock and provided specific detail to this end e.g. CXR and echo findings

Less satisfactory answers demonstrated a lack of structure and/or detail, or else significant omissions. While all candidates were able to reference the CALS approach for part b, the level of knowledge or detail provided varied.

Once again, candidates are reminded to follow the glossary of terms.

Angoff score for this SAQ	5.55
Highest candidate score achieved	8.5

Question 30

Regarding hospital-based Rapid Response Systems (RRS):

a) Provide a definition. (2 marks)

b) Discuss the key principles underpinning the RRS. (8 marks)

Syllabus topic/section:

2.1.1 Structure and Process - Rapid Response Systems / Critical Care Outreach: L1

Discussion:

Some candidates had difficulty in providing a definition of a rapid response system, instead providing a list of team members or else a discussion on how to finance and implement a system, which was not what the question asked for. Similarly, other candidates listed equipment used which was also not asked for. It was clear to the examiners that many candidates had been members of or taken part in a rapid response system but had not thought critically about the role/function of a rapid response system. A review of the CICM IC- 26 policy Minimum Standards for Intensive Care Unit Based Rapid Response Systems would aid in answering this question. Candidates are reminded CICM professional documents are examinable.

Candidates who achieved more marks understood the systems nature of a rapid response system and the principles underlying both generation of a call and the nature of the response, including potential systems issues.

The marking rubric is included to aid the candidate's future study.

Rubric

	Below standard	At standard	Above standard
Part (a) Definition **(2 marks)**	Unable to define or definition not pertinent **0-0.5 mark**	A reasonable definition that includes most of the main elements. **1-1.5 mark**	Comprehensive and accurate definition **2 marks**
Part (b) Key principles of RSS **(8 marks)**	None or one of the key components (measuring physiological signs, timely response and improving patient outcome) Discussion that is disorganised or not relevant. **0 – 3.5 marks**	Includes key components (measuring physiologic signs, timely response and improving patient outcomes) Basic to reasonable discussion, with some detail and structure. **4 – 5.5 marks**	Includes key components (measuring physiologic signs, timely response and improving patient outcomes) Well-organised and comprehensive discussion **6- 8 marks**

Angoff score for this SAQ	4.55
Highest candidate score achieved	7.5

The report continues on the next page.

SECOND PART ORAL EXAMINATION

CLINICAL "HOT CASES" SECTION

EXAMINERS' COMMENTS

The hot cases run for twenty minutes with an additional two minutes at the start of each case for the candidate to be given both a verbal and a written introduction to the case in question. This is to give candidates more opportunity to take in the relevant information and to plan a focussed approach to examination of the patient.

The following comments are a guide to the expected standard for performance in the hot cases:

- Candidates should demonstrate professional behaviour, treating the patient with consideration and respect.
- Candidates should address and answer the question asked of them in the introduction to the hot case.
- Candidates should interpret and synthesise information as opposed to just describing the clinical findings.
- Candidates need to seek information relevant to the clinical case in question.
- Candidates should be able to provide a sensible differential diagnosis and appropriate management plan. A definitive diagnosis is not always expected and, in some cases, may yet to be determined.
- Candidates should not rely on a template answer or key phrases but answer questions in the context of the clinical case in question.
- Candidates must be able to describe, with justification, their own practice for specific management issues.

Candidates who performed well in the hot cases, as in previous exams, were able to demonstrate the following:

- A professional approach showing respect and consideration for the patient.
- Competent, efficient, and structured examination technique and able to appropriately adapt the examination to suit the clinical case in question.
- Seeking of information relevant to the case.
- Appropriate interpretation and synthesis of their findings.
- Presentation of their conclusions in a concise and systematic fashion, addressing the issue in question.
- Listing of a differential diagnosis that is relevant to the clinical case in question.
- Appropriate interpretation of relevant investigations.
- Discussion of management issues in a mature fashion, displaying confident and competent decision-making.
- An appreciation of the complexities and key issues of the case.
- Overall performance at the expected level (transitional fellow).

Candidates who did not perform at the acceptable standard did so for reasons including the following:

- Missing or misinterpreting key clinical signs or confabulating signs on examination.
- Failure to perform a focussed examination relevant to the case in question.
- Incomplete or poor technique for examination of a system
- Causing pain, distress or potential harm to a patient due to rough technique or an inconsiderate examination.
- Poor synthesis of findings with limited differential diagnosis, sometimes compounded by missed key clinical signs on examination.
- Poor interpretation of imaging and data.

- Failure to demonstrate understanding of the key issues relevant to the case in question and a lack of insight into the problems.
- Inability to construct an appropriate management plan for the case in question.
- Hesitancy and/or uncertainty in stating a management plan.
- The need for significant prompting during the discussion with knowledge gaps.
- Limited time for discussion as a consequence of taking too long to present the clinical findings or to interpret basic data.
- Inability to convey the impression that they could safely take charge of the unit.

It is apparent that some candidates are very nervous, and this may adversely affect their exam performance. Candidates badly affected by nerves may benefit from sessions with a performance psychologist, drama coach, public speaking coach or similar.

Candidates are advised that they should not attempt the Second Part Examination until they can confidently examine patients, present the relevant clinical findings, synthesise all the information and discuss management issues at the appropriate level**, which is a trainee who is ready to enter the transition year of the CICM training program, by demonstrating they have the ability for safe, effective, independent practice as an Intensivist.** Candidates who have not yet attained this level of experience are strongly encouraged to defer their attempt at the exam. Candidates should practise hot cases from the commencement of their exam preparation. To this end, candidates are encouraged to do the following in their daily clinical practice as preparation for the hot cases:

- Seek the opportunity to take charge of the unit and be responsible for management decisions.
- Practise examination of individual systems.
- Treat every case to be assessed at work as a hot case, i.e., pose a relevant question (*e.g., 'Why is this patient not progressing?' 'What is the cause of the new fever?' 'Is this patient ready for extubation?*'), perform a focussed exam and then present your findings to a colleague.

SUMMARY OF CLINICAL "HOT CASES"

The clinical 'hot cases' require candidates to assess patients currently in the ICU, regarding answering specific questions around clinical assessment, including diagnosis, relevant investigations, and aspects of management. Five examples of clinical 'hot case' questions from this examination sitting are given below.

- *A 75-year-old man is Day 5 post bowel perforation and peritonitis with a bowel resection and stoma creation Day 1 He returned to theatre Day 3 for further bowel and stoma resection due to bowel ischemia He has a background history of a long standing T2 paraplegia. He is currently intubated and ventilated with an open abdomen. He is returning to theatre in 2 days' time for an attempted closure of the abdomen. How will you optimize him for the procedure?*

- *A 43year-old man is Day 8 after found unconscious at home. He has a background history of alcoholism and previous falls. He was extubated 5 days ago. How would you optimize this man for discharge to the ward?*

- *A 61-year-old man is Day 22 after presenting with an altered level of consciousness and progressive weakness 2' to an auto-immune encephalitis. He has no significant background medical history and is an Ex-smoker (mild). He is currently tracheostomized and ventilated. Please examine and formulate a plan for weaning*

- *A 63-year-old man is Day 12 ICU. He initially collapsed and was intubated and has a CT proven intracranial hemorrhage and interventricular extension with hydrocephalus. There is no significant background history*
  He is currently extubated and has had ongoing fevers throughout the stay, in the last 24 hours there has been an increased diaphoresis. Please identify possible sources of fever and diaphoresis.

- *A 61-year-old man is day 13 self-immolation burn injury with 10% TBSA involvement. He has a background history of alcohol dependance, hypertension and depression. He is currently intubated and ventilated on VV ECMO. Please assess for contributing factors of his respiratory failure.*

The clinical hot cases were examined at CICM accredited Intensive Care Units in Sydney, NSW on Wednesday 23rd October 2024.

The report continues on the next page.

VIVAS

The overall pass rate for the vivas was 73%, compared with 49% for the written paper and 61% for the hot cases. Failure to pass a viva was often due to knowledge gaps, poorly structured answers, and an inability to give the rationale for their responses. As in the discussion for the hot cases, candidates should not rely solely on generic statements, key-phrases, and template answers, and, instead, tailor their responses to the specifics of the question and be able to justify and expand their response. Candidates are encouraged to practise viva technique and to discuss patient management, including the rationale for their decisions, with senior colleagues. As with the hot cases, candidates who are very nervous or have a poor technique may benefit from training with a performance coach.

VIVA STEMS

DAY 1 – THURSDAY 24th OCTOBER 2024

Viva 1

A 29-year-old female primigravida at 36/40 gestation is involved in a high-speed motor vehicle crash. She has no known comorbidities.
You have been asked to assist the trauma team in the Emergency Department of your regional hospital. Your hospital has obstetric and neonatal services.
On arrival she is maintaining her own airway and has oxygen saturations of 96% on room air. Her heart rate is 112/min, and her blood pressure is 104/62mmHg. The GCS is 15/15. There are contusions and abrasions across the anterior abdominal wall. There are bilateral femoral deformities.

Outline the obstetric complications that may occur in this context and describe the features on assessment that would be consistent with these complications.

Syllabus topic/section:
2.1.12 Obstetric Intensive Care (L1)
2.1.13 Trauma Intensive Care - Abdominal and pelvic trauma(L1)
2.1.13 Trauma Intensive Care – Haemostatic management (L2)

VIVA summary:
Candidates were asked to address the implications and assessment of obstetric complications in a trauma patient and the details of maternal physiology with reference to physiological changes of haemodynamic instability. The viva continued to a discussion of the risks and benefits of trauma imaging and the assessment of foetal wellbeing.

Candidates did well if they: related trauma injuries to specific aspects of the pregnant patient. Candidates with successful demonstration of knowledge had a structure covering direct uterine trauma, hemorrhagic and embolic complications and were able to describe physiological changes of both trauma and pregnancy in the context of the stem provided. Candidates who were able to discuss in depth the management of a fractured pelvis including assessment of fetal distress and challenges of application of pelvic binding were rewarded.

Candidates achieved less marks if they: did not pay attention to the impact of third trimester complications and confined their answers to traumatic complications only. Answers that lacked depth and were limited to hemorrhagic control only without considering the fetus, complications of labour, and higher DVT risks scored fewer marks.

Maximum Score	8.75
Percentage Passed	64%

Viva 2

You are asked to review a 65-year-old who has just been admitted to your ICU with respiratory failure secondary to aspiration pneumonia.

They look exhausted and remain hypoxaemic despite high flow nasal oxygen at an FIO2 of 0.6.

They have a 2-month history of progressive slurring of speech, a hoarse voice and occasional visual disturbance with shoulder and trunk weakness.

Full blood count, biochemistry and CT brain are all unremarkable.

Briefly describe your immediate management priorities.

Syllabus topic/section:
2.1.8 Neurological Intensive Care: Myasthenia Gravis (L2)
2.1.5 Respiratory Intensive Care: Mechanical ventilatory support (L1)
2.1.19 Intensive Care Procedures: Intubation

VIVA summary:
A patient with Myasthenia Gravis (MG) who presents with respiratory failure and weakness. The viva explored the immediate management of the patient followed by the clinical examination and investigations that are needed to help establish the differential diagnoses for the presentation. The candidates were then given the diagnosis of MG and the rest of the viva focused on the specific management of the condition and their approach when the patient failed to wean from mechanical ventilation via a tracheostomy after 4 weeks of ICU care.

Candidates did well if they: Had an approach to the management and assessment that was broad initially but included features more specific to the patient described. For example, if they included a neurological assessment and considered the differentials of the patient's presentation as part of their priorities. Good answers also described the principles of an intubation plan but included general management of the patient in parallel with the need for airway management.

Candidates did well if their differential for the weakness was broad, and they were able to discuss the specific features and investigation for each diagnosis that they were considering.

In the final section good answers had a holistic approach to a slow ventilatory wean and were able to consider the confounding factors as well as discuss a team-based approach to weaning.

Candidates achieved less marks if they: Focused their management plan on the intubation without considering the neurological issues and potential differentials that might make NIV for example not suitable in this patient.

Didn’t include a broad range of differentials for the progressive weakness and were unable to provide the specific examination findings and investigation that would help differentiate between them. Candidates scored lower marks if they provided a list of neurological findings but without including the discerning features you would expect to see for each diagnosis.

As the viva progressed candidates that did less well were not as aware of the treatment options for MG and lacked a broad multi-disciplinary approach to weaning the patient from the ventilator, instead focusing on the specifics of the ventilation.

Maximum Score	6.75
Percentage Passed	50%

Viva 3 - Radiology Station

Syllabus topic/section:
2.1.20 Radiology in Intensive Care

VIVA summary:
The radiology station consisted of CXR x4, CT Brainx1, CT Abdo and Pelvisx1.

Candidates did well if they: took their time and answered systematically. This allowed the successful candidate to Identify multiple pathologies and were rewarded. Candidates are reminded that all images are picked for complexity and there is more than one pathology on the images. Do not become distracted by the most obvious pathology and abandon a structured approach.

Candidates describing line and tubes using the correct anatomical locations were rewarded.

Candidates achieved less marks if they: were disorganized, missing systems and hence failed to pick up pathology. Were unable to apply anatomical terminology to the images OR unable to apply theoretical knowledge to the images e.g. defining portal venous gas correctly but unable to recognize it. Missed malpositioned lines/ equipment.

Tips:
Answer the question asked. Practice interpreting radiology daily during ward rounds using correct terminology. Concentrate on the overall picture before diving into minutiae.

Maximum Score	8
Percentage Passed	67%

Viva 4 – Procedure Station

A 63-year-old patient was admitted to your ICU yesterday with hypoxaemic respiratory failure. The patient is intubated and ventilated with the following findings:

- FiO2 0.55
- Tidal volume = 360 ml (6 ml/Kg IBW)
- PEEP = 10 cmH2O
- Peak airway pressure = 28 cmH2O
- SpO2 = 91%

The patient presented with a 2-week history of progressive dyspnoea and non-productive cough. There is diffuse ground glass opacification with no evidence of consolidation on high resolution CT chest.
Past medical history is significant for type 1 diabetes and an islet cell transplant. The patient is on tacrolimus and prednisone.
They are being empirically treated for Pneumocystis jirovecii (PJP) pneumonia and a bronchoscopic bronchoalveolar lavage is being considered to confirm the diagnosis.

What are the advantages and disadvantages of bronchoscopy in this patient?

Syllabus topic/section:
2.1.19 Intensive Care Procedures: Bronchoscopy

VIVA Summary:

The viva explored the preparations for bronchoscopy and a bronchoscope simulator was used to enable the candidate to demonstrate competence in the identification of pulmonary anatomy and explain principles of use and manipulation of the bronchoscope.

Candidates were then asked to provide a differential diagnosis and assess and manage common post procedure complications.

Candidates did well if they: showed an obvious familiarity with a bronchoscope and were able to correctly identify the anatomical landmarks. Candidates received higher marks for correct identification of segmental anatomy, but this level of detail was not required to pass and identifying the lobar anatomy was sufficient. Candidates able to demonstrate familiarity with the segmental anatomy were rewarded with superior marks. More competent candidates also had an organized approach to questions.

Candidates achieved less marks if they: were unfamiliar or could not advance the bronchoscope competently and safely. The bronchoscope simulator is extremely high fidelity, and it was obvious to the observer as to the candidate's level of experience and comfort performing this procedure. The less successful candidate did not demonstrate knowledge or recognize lobar anatomy. Less successful candidates were uncertain of the safety considerations for the procedure.

Maximum Score	9.25
Percentage Passed	49%

DAY 2 – FRIDAY 25th OCTOBER 2024

Viva 5

A 48-year-old patient is 3 days post admission to your ICU following an out-of-hospital cardiac arrest after an intravenous drug overdose. The patient received prolonged CPR prior to return of spontaneous circulation.

The CT Brain on admission showed diffuse loss of grey-white differentiation. Sedation was ceased 24 hours ago.

The patient has remained comatose (GCS 3) with fixed dilated pupils, and in the previous 12- hours ceased triggering the ventilator. There is suspicion the patient may have progressed to brain death.

Discuss your approach to making a neurological determination of death (brain death) in this scenario.

Syllabus topic/section:
2.1.15 Organ and Tissue Donation in Intensive Care

VIVA summary: Candidates were asked to demonstrate familiarity of neurological determination of death and assessed on detailed knowledge of clinical assessment including the preconditions, the apnoea test and alternative methods of diagnosis of brain death. The logistics of donation after circulatory death were explored.

Candidates did well if they: displayed a thorough grounding in the ANZICS document. Given the importance of this topic in our practice, a detailed level of knowledge was required; were able to demonstrate familiarity with the logistics of both the apnea test and DCD

Candidates achieved less marks if they: were unfamiliar with the logistics of DCD and apnoea testing or displayed a very superficial knowledge. Many examiners commented that it was clear that some candidates had theoretical knowledge but had never participated in a DCD case or performed an apneoa test. Candidates are recommended to familiarize themselves with clinical practice as well as core documents.

Maximum Score	9
Percentage Passed	73%

Viva 6

A 68-year-old with background of chronic kidney disease is admitted to ICU for conservative management of a Stanford type B aortic dissection.

CT aortogram shows dissection flap within a 4cm aneurysm arising distal to the left subclavian artery and extending into the left external iliac artery.

On examination they are diaphoretic with ongoing back pain.

This patient is in sinus rhythm with a heart rate of 120 beats per minute and non-invasive blood pressure is 220 / 115 mm Hg.

What specific features will you look for on clinical examination in this patient?

Syllabus topic/section:
2.1.4 Cardiovascular Intensive Care: Aortic aneurysm and dissection (L1)
2.1.8 Neurological Intensive Care: Spinal cord disorders (L1)

Viva summary:
Viva progressed from clinical examination to specific management of the dissection in the first hour of intensive care with a focus on how candidates would manage the blood pressure. The viva then discussed indications for surgery in this situation and the complications of a TEVAR 24-48 hours post the procedure. The final part of the viva explored management strategies for spinal cord ischaemia and the complications of using a CSF lumbar drain in this setting.

Candidates did well if they: Had a structured approach to the clinical examination either by system or anatomically. It worked particularly well when candidates thought about the aorta and the effects of a dissection on each arterial branch as the dissection propagated forwards or backwards. This meant they included assessing for the cerebral and cardiac complications as well pulse discrepancies and lower body organ and extremity perfusion.

As the viva progressed candidates scoring more marks were able to manage the blood pressure elevation in a structured and tiered fashion with an understanding of the advantages and disadvantages of each drug that could be used. They were able to discuss the appropriate blood pressure targets to aim for and the specific issues for this patient. Good answers also included the general management that was required including appropriate monitoring and pain management.

The latter part of the viva focused on spinal cord ischaemia after TEVAR, and good answers demonstrated an understanding of the pathophysiology of this complication and ability to discuss management therapies and their complications, for example the use of a spinal drain.

Candidates achieved less marks if they: Did not have a structure for their clinical examination as this meant they missed relevant findings or didn't consider all the complications of a dissection that they should be assessing for.

As the viva progressed candidates scored less marks if they were unsafe in their approach to the blood pressure management or had a limited understanding of the drugs that they would use. They also scored less marks if they didn't recognise the complications of a TEVAR beyond the access ones that occur in the first 24 hours, or the management strategies used when spinal cord ischaemia developed.

Maximum Score	9.25
Percentage Passed	81%

Viva 7

You review a 32-year-old patient in the emergency department with a decreased level of consciousness GCS 6 (E2V1M3). They were found unresponsive at home after complaining of a severe headache for 2 days with associated nausea and vomiting. Currently they are intubated and ventilated.

Outline your most likely differential diagnoses with an assessment plan to differentiate between them?

Syllabus topic/section:
2.1.18 Neurological Intensive Care acute cerebrovascular injury (L1)
2.1.2 Decision making

VIVA Summary:

An unconscious patient with a broad differential diagnosis required candidates to display a comprehensive approach to the assessment. The viva progressed to management of an intracerebral haemorrhage with a superior sagittal and bilateral transverse sinus thrombosis.

Complications of a deteriorating clinical neurological state were explored and methods to treat evolving hydrocephalus with an increasing clot burden. The risks and benefits of anticoagulation and alternative management strategies such as clot retrieval, EVD in this context were explored.

Candidates did well if they: showed a structed approach to the differential diagnosis and assessment. Candidates are reminded that the glossary of terms definitions are still relevant in the oral section. Candidates did well if they were able to discuss neuroprotective measures including BP management targets, the role of serial imaging and seizure prophylaxis.

Candidates achieved less marks if they gave generic answers with no specific detail or justification, for example, in the stem, candidates who listed investigations without rationale for ordering did less well than candidates who were able to say why the investigations were ordered and how it would change management. Candidates did less well if they could not recommend a particular option for management and justify their answer.

Maximum Score	7.5
Percentage Passed	46%

Viva 8 – Communication Station

Eve is a 20-year-old journalism student who was admitted to the ICU, 3 weeks ago following a motor vehicle accident.

She has sustained multiple injuries, including severe traumatic brain injury. She had a complicated course in ICU requiring a decompressive craniectomy.

All her issues are resolving now, and she is requiring minimal ventilatory support. She remains GCS 6 with a recent EEG having excluded seizures. The medical consensus between the intensive care and the neurosurgery departments is to recommend a tracheostomy to allow more time for Eve's neurological recovery.

You are about to meet with Alex (Eve's parent) to discuss percutaneous tracheostomy.
This is your first meeting with Alex.

Syllabus topic/section:
2.2 Communication and collaboration in Intensive Care

VIVA Summary: candidates were asked to discuss issues surrounding consent, views and goals of treatment and explain any fears or misconceptions about the procedure and further treatment proposals. Candidates were expected to obtain a background understanding of Alex and provide information in a compassionate and clear manner without medical jargon.

Candidates did well if they: were sensitive to Alex's concerns, were able to explain the advantages and disadvantages of the tracheostomy objectively and address concerns. The successful candidate was not afraid to use silence appropriately and not rush the discussion to force a resolution.

Candidates achieved less marks if they: used medical jargon or jumped into tracheostomy explanation without establishing rapport. Failed to explore Eves wishes and were unable to explain the next steps. Forced the decision of Alex or provided false hope to the family.

The below viva rubric is provided to aid the candidate in preparation for the communication viva.

Domain	Below standard	At standard	Above standard	Score
General questioning and listening skills	Fails to demonstrate active listening and lacks understanding of questioning skills	-Introduction - Clarifies the relationship between patient and NOK - Sets goals for the meeting - Demonstrates active listening	-Good use of open-ended questions - Comprehensive introduction with clear goal setting -Active listening with good use of paraphrasing technique. - Seeks to understand priorities, social context, supports, relationships - Optimal use of silence.	
	0 - 1	1- 15	15 – 20	/ 20 marks
Rapport and empathy (Confer with actor)	Fails to establish rapport. Angers or alienates actor. Lack of empathy Expresses frustration	Establishes relationship but fails to develop connection. Demonstrates some empathy.	Clear sense that the NOK is listened to and understood Demonstrates clear concern for NOK Good rapport and sense of empathy Comfort exploring strong emotions without judgement or negative reaction Offers/asks to have someone else present to help support family	
	0-4	4-6	6-10	/ 10

Non-verbal communication and behavior (Confer with actor)	Alienating or inappropriate non-verbal communication.	Acceptable tone, body language, eye contact, facial expressions, use of silence.	Tone of voice Body language Eye contact Facial expressions ® all excellent Comfortable with silence	
	0-4	4-6	6-10	/10
Addressing specific issues within the scenario	inappropriate recommendation – agrees to palliation	Explores concerns around tracheostomy and patient's values. Agrees to schedule another meeting. Considers further input from other ICU specialists.	Establishes social context and stressors Attempts to understand Alex's reasons for not consenting tracheostomy. Sensitive exploration of values and preferences. Able to explain tracheostomy is NOT a barrier for palliation. Keeps the communication channel and option of tracheostomy open.	
	0- 10	10-20	20-30	/ 30
Appropriate language and explanation	Inappropriate choice of words/language.	Adequate explanation, some jargon.	Accurate, professional, consultant level explanation with little or no use of jargon Explains medical terms where required Checks understanding of actors Provides expert opinion when appropriate	
	0-5	5-10	10-15	/15
Follow up and next steps	No clear follow-up plan. Abrupt ending of conversation or deferring of responsibility	Suggest follow up but lacks details around the next meeting agenda.	Suggests follow up meeting Offer of appropriate ancillary support (social worker, etc.) Ensures all questions and concerns addressed	
	0-5	5-10	10-15	/15
Highly concerning error	YES	NO	NO	If YES max score = 40

Maximum Score	9.13
Percentage Passed	67%