COLLEGE OF INTENSIVE CARE MEDICINE
OF AUSTRALIA AND NEW ZEALAND

**SECOND PART EXAMINATION**

**EXAM REPORT**

**MARCH / MAY 2022**

This report is prepared to provide candidates, tutors and Supervisors of Training with information regarding the assessment of candidates' performance in the CICM Second Part Examination. Answers provided are not necessarily model answers but a guide as to what was expected and for use as an educational resource. Trainees should discuss the report with their tutors so that they may prepare appropriately for future examinations. Trainees should not rely solely on writing practice answers to previous exam questions for exam preparation, and first establish a strong knowledge base from learning at the bedside and studying relevant texts, journals and on-line sources.

The exam comprises a written section and an oral section. The written exam consists of two 2.5hr papers 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 50.8%. The oral exam consists of eight interactive vivas and two separate clinical "hot cases". The vivas and clinicals were completed face-to-face over two weeks in two cities (Melbourne and Sydney). Due to COVID and travel restrictions, some candidates based internationally, completed the vivas online and clinicals locally.

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

**In all sections of the exam the candidate has to demonstrate performance consistent with that of a junior consultant, i.e. demonstrate he/she has 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 | 2022.1 | 2021.2 | 2021.1 | 2020.2 | 2020.1 | 2019.2 |
|---|---|---|---|---|---|---|
| Presenting for written (Including SIMG) | 38 | 64 | 54 | 45 | 50 | 57 |
| Carrying a pass or exempted from a previous attempt | 24 | 26 | 25 | 2 | 11 | 7 |
| SIMG Exempt | 4 | 4 | 0 | 0 | 0 | 0 |
| Total number presenting (written + carry + SIMG) | 62 | 90 | 79 | 47 | 61 | 64 |
| Invited to orals (passed written section) | 21 | 46 | 40 | 29 | 37 | 34 |
| Total number invited to oral section | 45 | 70 | 66 | 31 | 48 | 40 |

| Analysis of Performance in Individual Sections | 2022.1 | 2021.2 | 2021.1 | 2020.1 / 2020.2 | 2019.2 |
|---|---|---|---|---|---|
| Successful in the written section | 21/38<br>55% | 46/64<br>72% | 40/54<br>74% | 29/45 37/50<br>64% 74% | 34/57<br>60% |
| Successful in the Hot case section | 21/45<br>47% | 37/70<br>53% | 35/66<br>53% | 45/74<br>61% | 27/40<br>68% |
| Successful in both Hot cases | 14/45<br>31% | 25/70<br>36% | 22/66<br>33% | 26/74<br>35% | 15/40<br>38% |
| Successful in the Viva section | 40/45<br>88% | 56/70<br>80% | 40/66<br>61% | 55/74<br>74% | 33/40<br>83% |

| Sectional Pass Rates | 2022.1 | | 2021.2 | | | 2021.1 | | | 2020.1 / 2020.2 | | | 2019.2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 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 | 51% | 82% | 67% | | 80% | 58% | | 85% | 55% | | 57% | 55% | 88% |
| Hot case 2 | 47% | 85% | 49% | | 90% | 44% | | 85% | 51% | | 65% | 60% | 83% |
| | Week 1 | Week 2 | Day 1 | Day 2 | Day 3 | Day 1 | Day 2 | Day 3 | Day 1 | Day 2 | Day 3 | Day 1 | |
| Viva 1 | 100% / 82% | 74% / 78% | 79% / 90% | 100% / 86% | 74% / 80% | 80% / 89% | 91% / 90% | 78% / 82% | 87% / 95% | 55% / 76% | 73% / 72% | 83% | 92% |
| Viva 2 | 59% / 70% | 78% / 84% | 58% / 66% | 83% / 76% | 65% / 73% | 71% / 73% | 775 / 68% | 48% / 83% | 57% / 88% | 77% / 85% | 82% / 85% | 80% | 80% |
| Viva 3 | 55% / 66% | 74% / 70% | 46% / 72% | 65% / 71% | 57% / 75% | 33% / 73% | 45% / 80% | 30% / 57% | 70% / 78% | 55% / 71% | 95% / 85% | 90% | 85% |
| Viva 4 | 45% / 72% | 26% / 57% | 71% / 77% | 100% / 79% | 74% / 79% | 62% / 71% | 41% / 60% | 61% / 63% | 63% / 79% | 82% / 75% | 73% / 90% | 50% | 85% |
| Viva 5 | 68% / 78% | 87% / 90% | 54% / 66% | 43% / 78% | 22% / 70% | 67% / 64% | 23% / 66% | 13% / 64% | 37% / 85% | 41% / 100% | 91% / 85% | 65% | 90% |
| Procedure Viva | 95% / 95% | 87% / 94% | 67% / 83% | 96% / 96% | 61% / 94% | 62% / 80% | 64% / 78% | 83% / 73% | 53% / 85% | 41% / 93% | 86% / 83% | 45% | 93% |
| Radiology Viva | 55% / 55% | 61% / 71% | 42% / 60% | 17% / 60% | 57% / 69% | 52% / 69% | 32% / 60% | 17% / 56% | 40% / 89% | 59% / 69% | 36% / 61% | 90% | 91% |
| Communication Viva | 59% / 92% | 65% / 90% | 58% / 90% | 48% / 90% | 48% / 85% | 43% / 88% | 68% / 78% | 74% / 95% | 57% / 95% | 50% / 95% | 91% / 88% | 50% | 95% |

| Oral Section Pass Rates | 2022.1 | 2021.2 | 2021.1 | 2020.2 | 2020.1 | 2019.2 |
|---|---|---|---|---|---|---|
| Candidates who passed in written section and passed the overall exam | 12/38<br>**32%** | 27/46<br>**59%** | 24/40<br>**60%** | 14/29<br>**48%** | 28/37<br>**76%** | 24/34<br>**71%** |
| All candidates invited to oral section and passed the overall exam (written + carry + SIMG) | 29/45<br>**64%** | 41/70<br>**59%** | 32/66<br>**48%** | 16/31<br>**52%** | 36/48<br>**75%** | 30/40<br>**75%** |
| Overall Pass Rate | 29/62<br>**47%** | 41/90<br>**45%** | 32/79<br>**40%** | 16/47<br>**34%** | 36/61<br>**59%** | 30/64<br>**47%** |

## EXAMINERS' COMMENTS

**Written Paper**

The pass rate for the written section was 55%. Candidates who failed questions 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 as 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 junior consultant. Candidates often gave generic "proforma" answers that did not deal with the specific issues in the question.

Candidates are advised to read the questions carefully and thoroughly and ensure they answer the question as 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 and may impact the subsequent mark.

As with the previous written paper, some of the marks in this examination sitting were very low, suggesting that candidates did not have the breadth of knowledge and application required to pass the written component of the part 2 exam. **Candidates are encouraged to listen to feedback and advice from their SOTs and educational advisors when considering the correct time for them to attempt the part 2 examination.**

## SECOND PART WRITTEN EXAMINATION

(A) Write your answers in the blue book provided

(B) Start each answer on a **new page** 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) The questions are worth **equal** marks

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

## GLOSSARY OF TERMS

| | |
|---|---|
| **Critically evaluate:** | Evaluate 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, initial and ongoing monitoring, supportive treatment, and definitive treatment. |
| **Discuss:** | Explain the underlying key principles. Where appropriate, this may include controversies and/or pros and cons. |
| **Explain**: | Make plain, interpret, and account for. |

## NOTE

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

*Please note that in this report all images from the SAQs have been removed.*

### Question 1

a) Outline the advantages and disadvantages of the following modes of epicardial pacing post cardiac surgery.

   i. AAI

   ii. VVI

   iii. DDD

(80% marks)

A patient arrives ventilated to the ICU following a CABG and aortic valve replacement. They are on low dose noradrenaline and a native rate of 60 beats/minute in sinus rhythm. They have VVI epicardial pacing wires *in situ* with a pacemaker backup rate of 40 beats/minute.

You are called to the patient when the monitor trace below is demonstrated (see Figure 1.1).

b) State the pacing issue, and list the specific actions you would perform with the pacing box. (20% marks)

*(Image removed from report.)*

Many candidates had a solid and safe knowledge on the topic of pacing, however, there was a failure to mention some of the basic concepts around the advantages and disadvantages. A high number of candidates failed to mention R on T phenomenon as one of the main drawbacks/risks of ventricular pacing modes.

| | |
|---|---|
| Maximum Score | 8.75 |
| Percentage scoring >5/10 | 73.7% |

**Question 2**

Regarding antibiotic stewardship in the ICU:

a) Outline the principles and practical aspects. (20% marks)

b) List the advantages and disadvantages. (80% marks)

Many candidates could have improved their answer structure to reflect the 20/80 allocation of marks, as they wrote very little on the advantages/disadvantages and thus lost potential marks. A generic quality and safety framework plus some general knowledge on antibiotics would have been adequate to score well on question. For example, many forgot to mention audit, education, cost, time/resources, evidence and a MDT based approach.

| | |
|---|---|
| Maximum Score | 7.75 |
| Percentage scoring >5/10 | 60.5% |

**Question 3**

List the <u>one</u> pharmacological intervention for each of the following medications in the context of toxic ingestion leading to haemodynamic collapse. Outline the rationale for use of the pharmacological intervention including the mechanism of action.

a) Digoxin (25% marks)

b) Tricyclic anti-depressants (25% marks)

c) Beta blockers (25% marks)

d) Lignocaine (25% marks)

Well answered by most candidates. Mechanism of action was not explained by many candidates.

| | |
|---|---|
| Maximum Score | 8.00 |
| Percentage scoring >5/10 | 78.9% |

**Question 4**

a) List <u>five</u> patient factors associated with an increased risk of bleeding after a renal biopsy. (20% marks)

b) List three steps that may be taken prior to the procedure to reduce the risk of bleeding after a renal biopsy. (20% marks)

c) Outline three management strategies of major bleeding after a renal biopsy. Include the advantages and disadvantages of each approach. (60% marks)

A very well answered question with almost all candidates scoring good marks. This question tested clinical experience and ability to manage patient deterioration.

| | |
|---|---|
| Maximum Score | 8.25 |
| Percentage scoring >5/10 | 97.4% |

**Question 5**

5.1

A 27-year-old patient presents with the following laboratory results after a prolonged sub-acute illness.

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Sodium | 132 mmol/L* | 135 – 150 |
| Potassium | 2.2 mmol/L* | 3.5 – 5.5 |
| Chloride | 94 mmol/L* | 100 – 110 |
| Bicarbonate | 28 mmol/L* | 22 – 27 |
| Urea | 8.3 mmol/L* | 3.0 – 8.0 |
| Creatinine | 236 µmol/L* | 70 – 120 |
| Total Calcium | 5.04 mmol/L* | 2.15 – 2.60 |
| Ionised Calcium | 2.6 mmol/L* | 1.1 – 1.3 |
| Magnesium | 0.7 mmol/L | 0.7 – 1.1 |
| Phosphate | 1.09 mmol/L | 0.70 – 1.40 |
| Albumin | 37 g/L | 35 – 47 |
| Total Bilirubin | 8 µmol/L | 4 – 20 |
| γ-Glutamyl transferase | 105 U/L* | 0 – 50 |
| Alkaline phosphatase | 263 U/L* | 40 – 110 |
| Alanine transferase | 76 U/L* | < 40 |
| Aspartate transferase | 48 U/L* | < 40 |

a) List the ECG changes associated with the most striking biochemical abnormalities. (10% marks)

b) List three differential diagnoses. (15% marks)

c) List three management strategies. (15% marks)

5.2

A 67-year-old patient is admitted with an altered mental state. There is a history of type 2 diabetes on oral agents.

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| pH | 7.42 | 7.35 – 7.45 |
| $pO_2$ | 60 mmHg (7.9 kPa) | |
| $pCO_2$ | 37 mmHg (4.9 kPa) | 35 – 45 (4.7 – 6.0) |
| Standard bicarbonate | 24 mmol/L | 22 – 29 |

| | | |
|---|---|---|
| Base excess | 0 mmol/L | -3 to +3 |
| Blood haemoglobin | 178 g/L* | 115 – 155 |
| Haematocrit | 0.54* | 0.35 – 0.46 |
| Sodium | 136 mmol/L | 135 – 145 |
| Potassium | 3.7 mmol/L | 3.5 – 5.2 |
| Ionised Calcium | 1.06 mmol/L* | 1.15 – 1.30 |
| Chloride | 95 mmol/L | 95 – 110 |
| Glucose | 47 mmol/L* | 4.0 – 8.0 |
| Lactate | 5.9 mmol/L* | 0.5 – 1.3 |
| Urea | 22 mmol/L* | 3.0 – 8.0 |
| Creatinine | 209 µmol/L* | 45 – 90 |

a) List the important biochemical abnormalities, showing your calculations where appropriate. (10% marks)

b) List the diagnosis most consistent with these abnormalities. (5% marks)

c) List <u>three</u> complications of this condition. (15% marks)

5.3

A 42-year-old patient is found unconscious after being missing for several days.

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| pH | 7.26* | 7.35 – 7.45 |
| $pO_2$ | 90 mmHg (12 kPa) | |
| $pCO_2$ | 45 mmHg (6.0 kPa) | 35 – 45 (4.7 – 6.0) |
| Standard bicarbonate | 18 mmol/L* | 22 – 29 |
| Base excess | -7 mmol/L* | -3 to +3 |
| Sodium | 134 mmol/L | 135 – 145 |
| Potassium | 5.6 mmol/L* | 3.5 – 5.2 |
| Calcium (ionized) | 0.91 mmol/L* | 1.15 – 1.30 |
| Calcium (pH 7.4 adjusted) | 0.84 mmol/L* | 1.15 – 1.30 |
| Chloride | 98 mmol/L | 95 – 110 |
| Glucose | 8.1 mmol/L | 4.0 – 8.0 |
| Lactate | 2.2 mmol/L* | 0.5 – 1.3 |
| Creatinine | 330 µmol/L* | 45 – 90 |
| Urea | 25 mmol/L* | 3 – 8 |
| Serum osmolality (measured) | 321 mOsm/kg | 280 – 300 |

a) List the important biochemical abnormalities, showing your calculations where appropriate. (20% marks)

b) List the most likely diagnosis. (5% marks)

c) List <u>two</u> investigations that could help secure the diagnosis. (5% marks)

Data interpretation questions test knowledge recall along with an ability to demonstrate simple calculations to assist in interpreting the data. Some candidates made errors in their calculations and subsequent interpretations. Improved time management ensuring the accuracy calculations and subsequent interpretations would assist candidates.

| | |
|---|---|
| Maximum Score | 8.60 |
| Percentage scoring >5/10 | 76.3% |

**Question 6**

You have been asked to review a 53-year-old patient with known alcoholic liver disease. The patient has had a progressive fall in consciousness level over the last 24 hours and the medical team are concerned about the development of hepatic encephalopathy (HE).

a) List four alternative diagnosis to HE that you would consider in this circumstance. (20% marks)

b) List six clinical signs that would be suggestive of HE. (30% marks)

c) Discuss the specific management of severe HE in this setting. (50% marks)

Candidates are reminded to answer the question asked. In this question many candidates listed clinical signs of chronic liver disease and not hepatic encephalopathy. The management aspect was answered well.

| | |
|---|---|
| Maximum Score | 8.15 |
| Percentage scoring >5/10 | 71.1% |

**Question 7**

Compare and contrast catastrophic antiphospholipid syndrome (APL), acute disseminated intravascular coagulation (DIC), and the thrombotic microangiopathies (TTP/HUS) under the following headings.

a) Pathophysiology (30% marks)

b) Clinical presentation (30% marks)

c) Diagnostic laboratory features (20% marks)

d) Specific management (20% marks)

Most candidates had good knowledge of the question, however some answers missed details (especially history), depth, and good synthesis of this knowledge in context of the answer. Candidates often write appropriate key words and phrases and would score more marks if these were expanded further.

| | |
|---|---|
| Maximum Score | 8.75 |
| Percentage scoring >5/10 | 86.8% |

**Question 8**

You have agreed to develop and implement a strategy to mitigate fatigue in the medical workforce in your ICU.

Outline the principles of staff fatigue management. Include in your answer how you would implement a fatigue management strategy.

Candidates had a reasonable baseline structure from similar previous questions, however, some candidates provided generic answers which were not related to topic asked. The question asked is for implementing a strategy, not just a initiating survey, and there was a lot of comments around review and monitoring, but no strategy to implement change.

| | |
|---|---|
| Maximum Score | 7.50 |
| Percentage scoring >5/10 | 55.3% |

**Question 9**

9.1

A 75-year-old patient presents with diarrhoea, vomiting and abdominal discomfort. There is a history of previous ingestion of a homemade health tonic.

a) Explain the following results and provide a rationale for the abnormalities. (30% marks)

| Parameter | Patient Value | Adult Normal Range |
|---|---|---|
| $FiO_2$ | 0.21 | |
| pH | 7.00* | 7.35 – 7.45 |
| $pO_2$ | 101 mmHg (13.4 kPa) | |
| $pCO_2$ | 20.0 mmHg (2.6 kPa)* | 35.0 – 45.0 (4.7 – 6.0) |
| $SpO_2$ | 97% | |
| Bicarbonate | 6.0 mmol/L* | 22.0 – 26.0 |
| Base Excess | -22 mmol/L* | -2 to +2 |
| Lactate | 1.0 mmol/L | 0.5 – 1.3 |
| Sodium | 120 mmol/L* | 135 – 145 |
| Potassium | 5.1 mmol/L* | 3.5 – 5.0 |
| Chloride | 90 mmol/L* | 95 – 105 |
| Urea | 41.7 mmol/L* | 3.0 – 8.0 |
| Creatinine | 1284 µmol/L* | 45 – 90 |

9.2

A 21-year-old patient presents with fainting spells and lethargy.

a) Explain the following results and provide a rationale for the abnormalities. (40% marks)

| Parameter | Patient Value | Adult Normal Range |
|---|---|---|
| $FiO_2$ | 0.21 | |
| pH | 7.51* | 7.35 – 7.45 |
| $pO_2$ | 72 mmHg (9.5 kPa) | |
| $pCO_2$ | 69.0 mmHg (9.1 kPa)* | 35.0 – 45.0 (4.7 – 6.0) |
| $SpO_2$ | 97% | |
| Bicarbonate | 55.0 mmol/L* | 22.0 – 26.0 |
| Lactate | 1.0 mmol/L | 0.5 – 1.3 |
| Sodium | 128 mmol/L* | 135 – 145 |
| Potassium | 2.0 mmol/L* | 3.5 – 5.0 |
| Chloride | 71 mmol/L* | 95 – 105 |
| Glucose | 4.4 mmol/L | 3.5 – 6.0 |
| Urea | 15.2 mmol/L* | 3.0 – 8.0 |
| Creatinine | 82 µmol/L | 45 – 90 |

9.3

A 25-year-old patient presents with significant wheeze and shortness of breath after accidental inhalation of vapour whilst cleaning a bathroom. On arrival in the Emergency Department continuous nebulized salbutamol was commenced.

This arterial blood gas was taken 6 hours into the treatment.

| Parameter | Patient Value | Adult Normal Range |
|---|---|---|
| $FiO_2$ | 0.4 | |
| pH | 7.27 | 7.35 – 7.45 |
| $pO_2$ | 70 mmHg (9.2 kPa) | |
| $pCO_2$ | 36.0 mmHg (4.7 kPa) | 35.0 – 45.0 (4.7 – 6.0) |
| $SpO_2$ | 93% | |
| Bicarbonate | 16.0 mmol/L* | 22.0 – 26.0 |
| Lactate | 8.8 mmol/L* | 0.5 – 1.3 |

| | | |
|---|---|---|
| Sodium | 145 mmol/L | 135 – 145 |
| Potassium | 2.9 mmol/L* | 3.5 – 5.0 |
| Chloride | 111 mmol/L* | 95 – 105 |
| Glucose | 9.7 mmol/L* | 3.5 – 6.0 |

a) Explain the results and give reasons for the abnormalities, showing your calculations where appropriate. (30% marks)

This question was generally answered well. Most candidates had appropriate knowledge to interpret the data, however, many candidates failed to contextualise the interpretation to the clinical scenario provided.

| | |
|---|---|
| Maximum Score | 7.75 |
| Percentage scoring >5/10 | 78.9% |

**Question 10**

a) Discuss the use of prone positioning in critically ill patients with respiratory failure. Include in your answer the rationale, advantages and disadvantages of prone positioning in the critically ill in both awake and intubated patients. (80% marks)

b) Outline the important findings, strengths and weaknesses of the PROSEVA trial**.** (20% marks)

This question was answered poorly. The main issue was not organising the answer to include all the aspects required. For example, the advantage of prone positioning was not discussed beyond physiological benefits and little clinically relevant advantages were given, especially in awake patient. Advantages and disadvantages needed to be discussed separately between intubated and non-intubated patients.

| | |
|---|---|
| Maximum Score | 6.00 |
| Percentage scoring >5/10 | 21.1% |

**Question 11**

You have been asked to retrieve a 40-year-old patient, intubated with COVID pneumonia, from a small regional ICU. The clinical condition has deteriorated in the last two days with worsening oxygenation.

a) Discuss the considerations for this patient with regards to preparation and planning, to ensure safe transport. (70% marks)

b) Outline the factors that will dictate the choice of transport including the advantages and disadvantages of each. (30% marks)

For part a), many candidates lost marks by proceeding to describe intubation which was not the question asked. Regarding the preparation and planning, candidates commonly provided general descriptions that were not in line with CICM guidelines and omitted such issues as PPE and infection control issues, consideration of advance therapies e.g. ECMO, specific patient preparations and team communication issues.

For part b), few candidates outlined the pertinent factors when considering choice of transport.

| | |
|---|---|
| Maximum Score | 7.00 |
| Percentage scoring >5/10 | 26.3% |

**Question 12**

In a suspected case of autoimmune encephalitis:

a) List the investigations needed, and explain why they are required. (50% marks)

b) Outline a specific management plan for proven autoimmune encephalitis and its common complications. Do not include resuscitation in your answer. (50% marks)

In part a) many candidates described disease specific investigations and treatments, rather than the investigations needed when a disease was suspected. For part b) many candidates answered the complication of the therapies instead of the complication of the disease with the corresponding management to the complications.

Candidates are reminded to answer the questions specifically asked, as even if candidates have a given a good answer to a different question, from the perspective of fairness to all candidates, marks can only be awarded for answers to the specific questions asked.

| | |
|---|---|
| Maximum Score | 7.00 |
| Percentage scoring >5/10 | 10.5% |

**Question 13**

The ANZICS statement on care and decision making at the end of life for the critically ill outlines the process for shared decision making about treatment options.

a) Outline the ICU physician's responsibilities in this process. (80% marks)

b) Outline the steps you would take if a person or their substitute decision-maker disagrees with the consensus opinion of the treating teams that treatment is futile or non-beneficial. (20% marks)

Many candidates did not attempt this question, and a logical, first principles approach, would have scored well. In part b) there was a need to recognise the requirement for ongoing discussions with family, and an exploration of the conflict source before any further escalation.

| | |
|---|---|
| Maximum Score | 6.75 |
| Percentage scoring >5/10 | 39.5% |

**Question 14**

A 10-year-old child has been found at the bottom of a public swimming pool. On arrival to the Emergency Department, the Glasgow Coma Scale is E1V1M4 and the following vital signs are noted:

| | |
|---|---|
| Oxygen saturation | 89% on 15 L/min of non-rebreathing mask |
| Respiratory rate | 40 breaths/min |
| Blood pressure | 80/40 mmHg |
| Heart rate | 140 beats/min |
| Temperature | 32°C |

You have been asked to help to manage the child.

a) Outline your resuscitative management plan. (80% marks)

b) List four factors that may influence the outcome of the immersion injury. (20% marks)

As this was a mainly a resuscitation question (80% of marks), it required a thorough detailed answer to be at the standard of an ICU trainee entering transition training. Basic descriptions of standard interventions without

giving specific reference to the likely issues outlined by the scenario, resulted in many potential marks being lost by candidates. The glossary at the start of the paper states the difference between a 'list' and an 'outline' question.

| | |
|---|---|
| Maximum Score | 6.00 |
| Percentage scoring >5/10 | 13.2% |

**Question 15**

a) State the reversal agent(s) for the following medications, and their indication(s). (50% marks)

b) List the mechanism of action for each stated reversal agent:

i. Dabigatran (<u>one</u> specific agent)

ii. Alteplase (tPA) (<u>two</u> specific agents)

iii. Warfarin (<u>two</u> specific agents)

(50% marks)

This question is based on some commonly used drugs that have a risk of causing life threatening bleeding. A good understanding of mechanism of action was expected, and was commonly omitted.

| | |
|---|---|
| Maximum Score | 7.50 |
| Percentage scoring >5/10 | 52.6% |

**Question 16**

Outline the advantages and disadvantages of the methods that enable speech in a patient with a tracheostomy tube *in situ.*

A thorough understanding of each method was expected since this is a commonly encountered scenario for long-term ICU patients. Candidates who scored well were able to describe multiple techniques with a nuanced description of advantages and disadvantages

| | |
|---|---|
| Maximum Score | 8.00 |
| Percentage scoring >5/10 | 65.8% |

**Question 17**

Compare and contrast phenytoin, sodium valproate and levetiracetam under the following headings.

a) Mechanism of action (20% marks)

b) Pharmacokinetics (20% marks)

c) Adverse effects (30% marks)

d) Therapeutic monitoring (30% marks)

Most candidates did not have sufficient knowledge of these commonly prescribed medications. The aspects required in the answers to this question are relevant to clinical practice, on which the part 2 CICM exam is based.

| | |
|---|---|
| Maximum Score | 7.75 |
| Percentage scoring >5/10 | 15.8% |

**Question 18**

Discuss the role of extracorporeal cardiopulmonary resuscitation (ECPR) in cardiac arrest.

Include in your answer, the rationale for its use, the advantages, disadvantages, and appropriate patient selection.

This question was answered very well by majority of the candidates, with a good use of the headings provided. Some answers lack specific details around patient selection, and candidates that described this usually scored better.

| | |
|---|---|
| Maximum Score | 8.75 |
| Percentage scoring >5/10 | 71.1% |

**Question 19**

A 73-year-old patient with a history of ankylosing spondylitis and type 2 diabetes presents with severe respiratory failure.

You are asked to review the patient in the Emergency Department as there has been progressive deterioration since presentation. The patient is clearly dyspnoeic with a respiratory rate of 35 breaths/min and oxygen saturation of 86% on supplemental oxygen of 15 L/min through a non-rebreather mask. A decision has been made to progress to urgent intubation.

Discuss potential difficulties or challenges you foresee and your strategies for dealing with them under the following headings.

a) Infection control measures during the airway procedure. (20% marks)

b) Securing the airway. (80% marks)

Infection precaution answer are usually well answered, although candidates often listed a number of options for the intubation plan without indicating which they would choose, or on what criteria they would choose it.

Most candidates briefly deliberated on some of the challenges for this patient - infectious precautions, hypoxia requiring airway management. However, a significant proportion did not relate the complex challenges arising from the co-morbidities of the patient - ankylosing spondylitis (difficult airway, interstitial lung disease, associated cardiovascular disease), T2DM (occult CVS disease), sepsis (CVS instability) to the emergency airway management or the strategies to overcome them.

| | |
|---|---|
| Maximum Score | 7.50 |
| Percentage scoring >5/10 | 73.7% |

**Question 20**

a) Outline the classification system for pressure induced skin and soft tissue injuries. (20% marks)

b) List <u>six</u> risk factors for the development of pressure injuries. (30% marks)

c) List the mechanisms by which negative pressure wound therapy systems (VAC systems) potentially contribute to wound healing. (20% marks)

d) List <u>six</u> complications of negative pressure wound therapy systems. (30% marks)

A low scoring question. Most candidates provided a classification of pressure injuries and were able to list points on how VAC dressings work, but not around how they potentially contribute to wound healing. Many candidates

missed the importance of incontinence, sensory deficiencies (including dementia and peripheral neuropathies) and requirement for high doses of vasopressors as risk factors for pressure injuries.

| | |
|---|---|
| Maximum Score | 6.50 |
| Percentage scoring >5/10 | 36.8% |

**Question 21**

21.1

A blood film taken from a 23-year-old patient 3 months after a motor vehicle accident shows target cells, acanthocytes, Howell-Jolly bodies, basophilic stippling and Pappenheimer bodies.

a) State the diagnosis. (10% marks)

b) State which condition is the patient at risk for. (10% marks)

c) List <u>two</u> prevention strategies. (20% marks)

21.2

A 16-year-old patient presents feeling generally lethargic after a recent episode of diarrhoea. Her blood results are as follows:

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Haemoglobin | 78 g/L* | 130 – 150 |
| White Cell Count | 14.5 x $10^9$/L* | 4.0 – 11.0 |
| Platelet count | 43 x $10^9$/L* | 150 – 300 |
| Urea | 17.1 mmol/L* | 3.0 – 8.0 |
| Creatinine | 200 µmol/L* | 60 – 120 |

a) What is the most likely diagnosis? (10% marks)

b) List <u>two</u> pathogens that can cause this syndrome. (10% marks)

21.3

A 36-year-old patient who has returned from overseas, presents with fever, headache, nausea, general fatigue, and muscle ache. The blood film with Giemsa stain shows a parasitaemia level of 4%.

a) List <u>one</u> other diagnostic test can be used to diagnosis malaria. (10% marks)

b) List the laboratory parameters which correlate with severity of illness. (20% marks)

c) List <u>one</u> specific treatment option. (10% marks)

Candidates scored highly on this question, and this would have been reflected in the Angoff score allocated to this question

| | |
|---|---|
| Maximum Score | 8.62 |
| Percentage scoring >5/10 | 97.4% |

**Question 22**

a) Outline the WHO classification system for the causes of pulmonary hypertension. (30% marks)

b) Discuss measures to optimise right ventricular function in a patient with known pulmonary hypertension who is intubated for pneumonia. (70% marks)

This was a discuss question, which on the exam paper glossary *states 'explain the underlying key principles. where appropriate, this may include controversies and/or pros and cons'*. Our advice to candidates is to follow the glossary advice on how to answer question, as the wording is carefully selected by the examiners to give the candidates the best opportunity to score well. Part b) of the question can appear to be an extensive topic for discussion, however, the candidates who explained the key principles and related it to the content asked scored reasonably. Similarly, to the previous question, the Angoff score would have taken the previous aspects into consideration.

| | |
|---|---|
| Maximum Score | 5.82 |
| Percentage scoring >5/10 | 13.2% |

**Question 23**

A 59-year-old patient was involved in a motor vehicle accident (MVA). Injuries included chest trauma, multiple long bone fractures and a decreased level of consciousness.

On arrival to the Emergency Department observations were:

| | |
|---|---|
| Blood Pressure | 75/60 mmHg |
| Heart Rate | 120 beats/min |
| Respiratory Rate | 30 breaths/min |
| Temperature | 35.1°C |

Initial investigations reveal:

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Haemoglobin | 95 g/L* | 120 – 160 |
| Mean Cell Volume | 82 fl | 80 – 94 |
| White Cell Count | 15 x $10^9$/L* | 4.0 – 11.0 |
| Platelet count | 188 x $10^9$/L | 150 – 350 |

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Prothrombin Time | 20.0 secs | 12.0 – 16.5 |
| International Normalised Ratio | 1.7 | 0.9 – 1.3 |
| Activated Partial Thromboplastin Time | 52.0 secs | 27.0 – 38.5 |
| Fibrinogen | 0.8 g/L | 2.0 – 4.0 |

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| $FiO_2$ | 0.5 | |
| pH | 7.30* | 7.35 – 7.45 |
| $pO_2$ | 150 mmHg (20 kPa) | |
| $pCO_2$ | 33.0 mmHg (4.4 kPa)* | 35.0 – 45.0 (4.7 – 6.0) |
| $SpO_2$ | 99% | |
| Bicarbonate | 14.0 mmol/L* | 22.0 – 26.0 |
| Base Excess | -6.0 mmol/L* | -2.0 to +2.0 |

| | | |
|---|---|---|
| Lactate | 5.0 mmol/L* | 0.5 – 1.3 |
| Sodium | 139 mmol/L | 135 – 145 |
| Potassium | 3.8 mmol/L | 3.5 – 5.0 |
| Chloride | 105 mmol/L | 95 – 105 |
| Glucose | 5.8 mmol/L | 3.5 – 6.0 |
| Ionised Calcium | 0.7 mmol/L* | 1.0 – 1.1 |

a) Explain the abnormalities in the above investigations. (30% marks)

b) Outline your fluid and haemostatic resuscitation for this patient. Include your rationale in your answer. (70% marks)

Most marks in this question were for part b), and most candidates answered his well, however, some focused on generic resuscitation of a shocked patient, rather than the specific context asked. Context is an essential part of ICM practice, and this is also seen in the vivas and hot cases, as something that distinguishes between candidates' performances,

| | |
|---|---|
| Maximum Score | 9.00 |
| Percentage scoring >5/10 | 86.8% |

**Question 24**

24.1

A 27-year-old patient was found unresponsive with no signs of life Two rounds of CPR were performed prior to ROSC. A laryngeal mask (LMA) was placed en route to hospital.

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| $FiO_2$ | 1.0 | |
| pH | 6.60* | 7.35 – 7.45 |
| $pO_2$ | 400 mmHg (53 kPa) | |
| $pCO_2$ | 192.0 mmHg (25.0 kPa)* | 35.0 – 45.0 (4.7 – 6.0) |
| $SpO_2$ | 99% | |
| Bicarbonate | 11.0 mmol/L* | 22.0 – 26.0 |
| Lactate | 18.0 mmol/L* | 0.5 – 1.3 |
| Sodium | 147 mmol/L* | 135 – 145 |
| Potassium | 6.4 mmol/L* | 3.5 – 5.0 |
| Chloride | 109 mmol/L* | 95 – 105 |
| Glucose | 1.3 mmol/L* | 3.5 – 6.0 |
| Creatinine | 207 µmol/L* | 45 – 90 |

a) List the abnormalities and show any relevant calculations. (20% marks)

b) List <u>three</u> differential diagnoses for the arterial blood gas findings. (15% marks)

24.2
The same patient has another cardiac arrest in the Emergency Department with 2 minutes CPR and adrenaline administered. The patient is now intubated, ventilated and arrives to ICU on an adrenaline infusion. Subsequent results are available.

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Albumin | 32 g/L* | 35 – 50 |

| | | |
|---|---|---|
| Protein | 50 g/L* | 60 – 80 |
| Total bilirubin | 11 µmol/L | < 26 |
| Alanine transferase | 10200 U/L* | < 35 |
| Aspartate transferase | 9200 U/L* | < 35 |
| Alkaline phosphatase | 164 U/L* | 30 – 110 |
| γ-Glutamyl transferase | 251 U/L* | < 40 |
| Ammonia | 555 µmol/L* | 11 – 32 |

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Prothrombin time | 18.0 secs* | 12.0 – 16.5 |
| International Normalised Ratio | 2.0* | 0.9 – 1.3 |
| Activated Partial Thromboplastin Time | 66.2 secs* | 27.0 – 38.5 |
| Fibrinogen | 1.6 g/L* | 2.0 – 4.0 |

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Haemoglobin | 100 g/L* | 120 – 160 |
| White Cell Count | 18.5 x $10^9$/L* | 4.0 – 11.0 |
| Platelet count | 36 x $10^9$/L* | 150 – 350 |

a) Explain the abnormalities and the likely causes. (25% marks)

24.3

The following blood gas was taken from a 35-year-old patient who presented with weakness and lethargy.

| **Parameter** | **Patient Value** | **Adult Normal range** |
|---|---|---|
| pH | 7.49* | 7.35 – 7.45 |
| $pO_2$ | 85 mmHg (11.3 kPa) | |
| $pCO_2$ | 35 mmHg (4.7 kPa) | 35 – 45 (4.7 – 6.0) |
| Standard bicarbonate | 28 mmol/L | 22 – 29 |
| Base excess | 4 mmol/L* | -3 to +3 |
| Sodium | 148 mmol/L* | 135 – 145 |
| Potassium | 1.8 mmol/L* | 3.5 – 5.2 |
| Ionised Calcium | 1.09 mmol/L* | 1.15 – 1.30 |
| Chloride | 111 mmol/L* | 95 – 110 |
| Glucose | 9.1 mmol/L | 4.0 – 11.0 |
| Lactate | 1.2 mmol/L | 0.5 – 1.3 |
| Creatinine | 63 µmol/L | 45 – 90 |

a) List the important biochemical abnormalities and show calculations where appropriate. (25% marks)

b) List <u>three</u> clinical scenarios, which may produce this pattern of abnormalities. (15% marks)

Well answered by the majority of candidates. For those that did not score well, marks were usually lost due to poor synthesis of the data.

| | |
|---|---|
| Maximum Score | 8.75 |
| Percentage scoring >5/10 | 92.1% |

**Question 25**

Discuss the key differences in cardiac arrest management in a patient within 4 hours of cardiac surgery compared to management of cardiac arrest in a general ICU patient.

Whilst most candidates knew there was a difference between ALS and CALS, only a few candidates answered the question sufficient detail and rationale. Context was a vital component of this question and the reason that it was asked.

| | |
|---|---|
| Maximum Score | 6.50 |
| Percentage scoring >5/10 | 28.9% |

**Question 26**

a) In patients with hepatic cirrhosis and ascites, list three risk factors for developing spontaneous bacterial peritonitis. (30% marks)

b) In a patient with suspected spontaneous bacterial peritonitis, explain your approach to antimicrobial therapy. (40% marks)

c) List three further management priorities for the management of spontaneous bacterial peritonitis. (30% marks)

This question has a list, explain, and another list component. The glossary at the start of the paper is to guide candidates, therefore a 'list' part-question can be answered with a list, whereas explain requires much more depth and context. Most candidates provided lists for all three parts of the question, and therefore scored poorly in part b)

| | |
|---|---|
| Maximum Score | 5.50 |
| Percentage scoring >5/10 | 7.90% |

**Question 27**

a) Discuss the use of platform trials as a research tool. Include in your answer, trial design, advantages and disadvantages. (90% marks)

b) List two examples of platform trials. (10% marks)

Platform trials are commonly known throughout the ICM community, especially with the presence of REMAP-CAP, and these would be discussed at journal clubs and research meetings throughout the year. Candidates that scored well demonstrated a clear knowledge around the topic, and their answers often echoed discussions which would be had in departmental ICM meetings. EBM is an essential part of medical and not just ICM practice, and as research evolves, so will the expected knowledge associated with it.

| | |
|---|---|
| Maximum Score | 6.50 |
| Percentage scoring >5/10 | 26.3% |

**Question 28**

28.1

A 15-year-old previously well patient is admitted to the Emergency Department with headache and photophobia. The CSF result shows as follows.

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| White Cell Count | 100 x $10^6$/L* | < 5 |

| | | |
|---|---|---|
| Differentiation | 90% neutrophils | |
| Protein | 2.0 g/L* | 0.5 – 0.5 |
| Glucose | 1.0 mmol/L* | > 2.5 |
| Gram stain | Gram positive cocci in chains | |

a) State the diagnosis. (10% marks)

b) Outline the antimicrobial treatment you would prescribe. (10% marks)

28.2

A 48-year-old patient with a history of mechanical aortic valve replacement presents with fever, fatigue, arthralgia and a tender abdomen. Trans-oesophageal echocardiography (TOE) is positive for prosthetic valve endocarditis. Blood cultures eventually grew *Kingella kingae*.

a) Outline the antimicrobial treatment you would prescribe. (5% marks)

b) List the other fastidious gram negative organisms which can be associated with culture negative endocarditis. (15% marks)

28.3

A 62-year-old renal transplant recipient presents with abdominal pain and bloody diarrhoea. Cytomegalovirus (CMV) serology is positive, but plasma viral load is negative.

a) Explain this result in this context. (10% marks)

b) How is the diagnosis of CMV colitis confirmed? (10% marks)

28.4

A 27-year-old patient with a prolonged ICU stay following a subarachnoid haemorrhage has developed fever with an altered consciousness level.

The CSF specimen result below was taken from the external ventricular drain.

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Red Blood Cells | 1946 x $10^6$/L* | 0 – 5 |
| Neutrophils | 198 x $10^6$/L* | 0 – 5 |
| Mononuclear cells | 74 x $10^6$/L | |

a) List your treatment decisions to be made based on the CSF. (10% marks)

b) Explain your rationale for the above. (10% marks)

28.5

A 76-year-old patient living in a shelter presents with weight loss and lethargy. On clinical examination, there is moderate ascites. A diagnostic ascites tap was performed with the result below.

| **Parameter** | **Patient Value** | **Adult Normal Range** |
|---|---|---|
| Red Blood Cell | 120 x $10^6$/L* | < 5 |

| | | |
|---|---|---|
| White Cell Count | 350 x $10^6$/L* | < 300 |
| Neutrophils | 50 x $10^6$/L | |
| Lymphocytes | 300 x $10^6$/L | |
| Albumin | 24 g/L* | 35 – 50 |
| Serum albumin | 31 g/L | 35 – 50 |
| Slight milky coloured appearance | | |

a) Outline the abnormalities in the ascitic fluid and outline your rationale for the most likely diagnosis. (20% marks)

As with most data interpretation questions, these were answered well. There were some candidates who gave answers which appeared to not link microbiological descriptions e.g. GPC, to an appropriate organisms, and therefore did not give appropriate antibiotics.

| | |
|---|---|
| Maximum Score | 8.12 |
| Percentage scoring >5/10 | 73.7% |

**Question 29**

A 22-year-old patient is admitted with an acute traumatic brain injury with raised intracranial pressure. They also have a severe acute kidney injury requiring renal replacement therapy (RRT). Outline the potential issues of providing RRT, including your management of the issues.

Generally answered well, however many candidates could have scored more marks if they had discussed other forms of RRT e.g. IHD and not just CRRT. Many candidates thought that RRT should be delayed in TBI / High ICP, however there is sound rationale for commencing early.

| | |
|---|---|
| Maximum Score | 7.00 |
| Percentage scoring >5/10 | 81.6% |

**Question 30**

A 52-year-old patient is admitted to your ICU with a World Federation of Neurosurgeons (WFNS) Grade IV subarachnoid hemorrhage following a cerebral aneurysmal bleed. On day four of admission, you note the patient has become hyponatraemic ($Na^+$ 126 mmol/L).

a) List <u>six</u> differential diagnoses of the acute hyponatraemia. Indicate the most likely diagnosis. (30% marks)

b) Outline your principles of management for this level of hyponatraemia, and your specific management based on the most likely diagnoses. (70% marks)

Although answered well, several candidates did not list the most likely diagnosis along with the differentials. Candidates who provided thorough details for managing SIADH in the context of SAH, scored better.

| | |
|---|---|
| Maximum Score | 7.25 |
| Percentage scoring >5/10 | 68.4% |

## SECOND PART ORAL EXAMINATION

### EXAMINERS' COMMENTS

### Clinicals "Hot cases" Section

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 also 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 (Junior Consultant).

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

- Missing or misinterpreting key clinical signs on examination.
- Failure to perform a focussed examination relevant to the case in question.
- Incomplete or poor technique for examination of a system.
- 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 grasp 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 he/she could safely take charge of the unit.

It is apparent that some candidates are very nervous, and this affects 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 sit 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 are not at this level 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.

**Vivas**

The overall pass rate for the vivas was 88%, compared with 55% for the written paper and 47% for the hot cases, with the procedure viva in particular, being answered poorly. Candidates who failed a viva mostly did so because of knowledge gaps, poorly structured answers, and 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.

**CLINICALS "HOT CASES" SUMMARIES**

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

- *This patient was admitted to the ICU following an out-of-hospital cardiac arrest due to attempted hanging MET call for respiratory distress and required intubation soon after admission. Can you please assess him for the ongoing clinical issues and formulate a management plan for the next 24 hours.*

- *This patient was admitted to the ICU following respiratory failure after an elective knee replacement. Please outline the key current ongoing issues and describe a management plan.*

- *This patient presented to the ICU 21 days go after a fall, where she sustained a severe TBI requiring a craniectomy. Please examine them and provide a plan for weaning from mechanical ventilation.*

- *This patient is day 5 in the ICU after a WFNS grade 5, Fischer scale 4 SAH. Please examine them patient and determine your current management priorities and issues you anticipate.*

- *This patient was admitted to the ICU with a severe intentional overdose of Insulin.Please examine this him and evaluate his suitability for extubation.*

The clinical ‘hot cases’ were assessed at the following venues:

Hong Kong
- Prince of Wales Hospital

NSW, Australia
- Liverpool Hospital
- Nepean Hospital
- Prince of Wales Hospital

VIC, Australia
- Austin Hospital
- Royal Melbourne Hospital
- The Alfred Hospital

**VIVAS STEMS**

**WEEK 1 (MELBOURNE WEEK)**

**Viva 1**

A 20-year-old male has been brought to the Emergency Department of your hospital with a 3-day history of fever, sore throat, and an altered level of consciousness.

Examination findings:

GCS of 11 (E2 V4 M5)
Respiratory rate: 28 breaths/min
Heart rate: 130/min, sinus rhythm
Blood Pressure: 90/60 mmHg
Temperature: 39°C
Peripheries are cold to touch with a prolonged capillary refill
Non-specific rash on the lower extremities, extending to his abdomen

Please outline your main differential diagnoses with your reasoning.

| | |
|---|---|
| Maximum Score | 8.20 |
| Percentage Passed | 100% |

This viva dealt with the assessment and ongoing management of septic shock due to meningococcal septicaemia, including a discussion regarding evidence for the meningitis aspect

**Viva 2**

A 65-yr-old female patient is transferred to your tertiary ICU from a regional hospital. She presented with sudden onset right hemiplegia and a decreased level of consciousness.

Past medical history: CABG 4 years ago; hypercholesterolaemia

Medications: aspirin and atorvastatin.

Examination findings on arrival to the regional hospital:

GCS: 9 ($E_3M_5V_1$)
Blood Pressure: 220/140 mmHg

Pulse: 90 beats/min
Pupils: 3mm and reactive bilaterally

Imaging: non-contrast CT brain scan shows left sided intracerebral haemorrhage with extension into the 3rd ventricle.

Initial neurosurgical opinion based on the CT scan is for non-operative management, and they will assess the patient further in the ICU.

She was intubated for transfer.

Outline your specific management at the time of ICU admission.

| | |
|---|---|
| Maximum Score | 7.00 |
| Percentage Passed | 59% |

This viva dealt with the assessment and ongoing management of ICH, including a discussion regarding evidence of blood pressure management and surgery

**Viva 3**

You are the on-call intensivist for a regional hospital where you have not previously worked. You receive a call from your registrar at 2:00am with a referral from the Emergency Department (ED). A 57-year-old male with known history of alcoholic liver disease has presented with two episodes of “coffee ground” vomiting, associated with dizziness.

On presentation to the ED the patient had a pulse rate of 115 beats/min, blood pressure 95/58 mmHg and was alert and oriented.

The initial Hb was 89 g/L. ED staff administered 500mL 0.9% Saline and 1 unit of packed red blood cells, and now the vital signs are heart rate 85 beats/min, blood pressure 105/65 mmHg; respiratory rate 20 breaths/min and $SaO_2$ 98% on room air.

Discuss with reasoning, what further information you would seek, in deciding your management priorities.

| | |
|---|---|
| Maximum Score | 6.60 |
| Percentage Passed | 55% |

This viva dealt with the assessment and ongoing management of hepatic failure, secondary to an UGI bleed in a patient with CLD

**Viva 4**

You are part of the trauma team in your Emergency Department, managing a 45-year-old male who has had a high-speed motorbike accident (MBA). The patient was wearing a helmet.

At the scene of the MBA, the patient had an $SpO_2$ of 80% with a GCS of 13 (E4M6V3), was intubated, and bilateral needle decompression of the chest was performed.

Currently, the patient has a heart rate of 128 beats/min, systolic blood pressure of 75 mmHg and a $SpO_2$ of 93%.

What are the most likely causes for hypotension in this patient?

| | |
|---|---|
| Maximum Score | 7.20 |
| Percentage Passed | 45% |

This viva dealt with the differentials for shock post MVA with chest, abdominal, and pelvic trauma, leading to diagnosis and ongoing assessment and management of major pelvic trauma.

**Viva 5**

You are asked to urgently assist in the management of a 52-year-old male, who has presented to the Emergency Department with an out-of-hospital cardiac arrest.

Bystander CPR was performed before the arrival of the paramedic team. The initial rhythm was ventricular fibrillation, and he was defibrillated twice.

Return of spontaneous circulation was achieved after 15 minutes of resuscitation. He was intubated at the scene.

His saturations are 98% on an $FiO_2$ of 0.4. He is currently in a sinus rhythm at 95 beats/min. His blood pressure is 110/70 mmHg.

What is your initial approach to the assessment of this patient in the Emergency Department?

| | |
|---|---|
| Maximum Score | 7.80 |
| Percentage Passed | 68% |

This viva dealt with the early assessment and management of a patient post cardiac arrest, with specific consideration of cardiovascular support and the evidence interventional angiography, and a subsequent discussion around the assessment and management of new severe mitral regurgitation.

**Viva 6 – Radiology Station**

| | |
|---|---|
| Maximum Score | 5.50 |
| Percentage Passed | 55% |

The radiology station consisted of 4 plain X-rays and 3 CT scans.

**Viva 7 – Procedure Station**

A 65-year-old male has had elective coronary artery bypass surgery (LIMA to LAD and SVG to RCA) with an aortic valve replacement. His surgeon and anaesthetist reported no intra-operative issues, with a 90-minute clamp time and satisfactory TOE post bypass with ejection fraction (EF) 60%.

He has drained a total of 230 mls in the underwater seal drain over a period of 4 hours. He has developed an escalating inotrope requirement in the past 60 minutes. His postoperative chest X-ray was unremarkable.

He has suddenly deteriorated, and you are called urgently to the bedside after the cardiac arrest alarm has been activated.

What are your immediate priorities as you enter his bedspace?

| | |
|---|---|
| Maximum Score | 9.50 |
| Percentage Passed | 95% |

This viva dealt with management of a cardiac arrest, in a patient who has undergone cardiac surgery in the past 6 hours

**Viva 8 – Communication Station**

James is a 22-year-old previously independent male who was involved in a motor vehicle accident 3 days ago, where he sustained an isolated traumatic brain injury. His GCS at the scene was 4, and he went to theatre for insertion of an EVD prior to being admitted to your ICU.

CT brain scan shows a small left sided SDH, with multi-compartmental haemorrhage, significant oedema, and slight midline shift to the right.

James remains haemodynamically stable on SIMV ventilation, coughing when suctioned. He is sedated with fentanyl and midazolam with an ICP of 21 mmHg, and on neurological examination he has no motor response to central pain.

You are meeting his parent, Sam, for the first time. You're going to update them about his condition before they visit him.

*N.B.: Reminder for candidates to <u>not</u> to shake hands with the actors.*

| | |
|---|---|
| Maximum Score | 9.20 |
| Percentage Passed | 59% |

This viva consisted of a discussion with the family of a patient who had uncertainty regarding his current clinical status and required further information regarding his future clinical management

**WEEK 2 (SYDNEY WEEK)**

**Viva 1**

A 33-year-old female with Type I diabetes mellitus, presents to hospital ten days after caesarean section, with fever, diarrhoea, generalised body ache, and a pre-syncopal episode.

On examination, her vital signs are:

Temperature: 390C
Heart Rate: 130 beats/min
Blood Pressure: 70/40 mmHg
Respiratory Rate: 30 breaths/min
SpO2: 98% breathing room air

Initial investigations reveal an elevation of: white cell count, CRP, liver enzymes, and creatinine. There is also a severe metabolic acidosis.

She has a widespread rash as shown in the picture below, which is more intense around the caesarean section wound, and extending to the palms and soles, with associated conjunctival suffusion.

Describe the skin rash, and give <u>four</u> diagnoses that should be considered for this clinical presentation.

| | |
|---|---|
| Maximum Score | 7.80 |
| Percentage Passed | 74% |

This viva dealt with the assessment and ongoing management of septic shock due to Staphylococcal skin infection, including a discussion regarding evidence of the treatment of toxic shock syndrome

**Viva 2**

A 28-year-old male is brought to the Emergency Department (ED) after a high-speed motor vehicle accident.

His GCS is 5 (E1 M3 V1) and pupils are equal and reactive to light. He was intubated and had a right sided ICC inserted, at the scene.

The ED team have performed a trauma CT series. CT brain scan showed a small right subdural haemorrhage, parenchymal contusions, and subarachnoid blood.

Chest CT scan showed right sided pulmonary contusions, and a right sided haemopneumothorax, with an ICC in situ. No injuries were noted to the C-spine, abdomen and pelvis. The patient has been transferred to the ICU.

What are your priorities and specific assessment and management of the traumatic brain injury in the first 24 hours?

| | |
|---|---|
| Maximum Score | 8.40 |
| Percentage Passed | 78% |

This viva dealt with the assessment and ongoing management of TBI with raised ICP, including a discussion regarding evidence for surgery and osmotherapy

**Viva 3**

A Medical Emergency Team is called to a ward for a 58-year-old previously fit and well male, who has developed severe abdominal pain, nausea, vomiting, tachycardia, and hypotension. He underwent an ERCP procedure 2 days ago for a common bile duct stone. He is receiving 2 litres/min oxygen via nasal cannulae, and has an oxygen saturation of 98%. He had received 1 litre of crystalloid solution prior to the MET call.

Outline your initial assessment and resuscitation for this patient.

What are the main differential diagnoses you would consider?

| | |
|---|---|
| Maximum Score | 7.00 |
| Percentage Passed | 74% |

This viva dealt with the assessment and ongoing management of pancreatitis post biliary stones, including discussion of antibiotics and surgery.

**Viva 4**

A 59-year-old male was admitted to your ICU 7 days ago with severe COVID pneumonitis. He is currently intubated and ventilated.

His background history includes Type II diabetes mellitus, hypertension, hypercholesterolaemia, and rheumatoid arthritis.

He had been progressing well, but over the past 24 hours has had increasing oxygen requirement, with his $FiO_2$ increasing from 0.4 to 0.7. His latest ABG on $FiO_2$ 0.7 is:

pH 7.36
$pCO_2$ 45 mmHg
$pO_2$ 61 mmHg
$HCO_3^-$ 23 mmol/L

What are the likely reasons for his worsening hypoxemia?

| | |
|---|---|
| Maximum Score | 5.70 |
| Percentage Passed | 26% |

This viva dealt with the differentials for worsening hypoxia, in a stable ventilated patient COVID pneumonitis, with a background history of immunocompromise and immunosuppression, including a discussion around the evidence for ventilation strategies in ARDS.

**Viva 5**

A previously well 47-year-old male is admitted from a medical ward after a rapid response/MET call, which was activated for severe respiratory distress.

He was confirmed positive for influenza one week ago, and now presents with a temperature of 39.5°C, with bilateral patchy infiltrates on the chest X-ray.

What are the most likely causes for his deterioration, and outline your clinical reasoning?

| | |
|---|---|
| Maximum Score | 9.00 |
| Percentage Passed | 87% |

This viva dealt with the differentials for sudden respiratory distress and a new fever at a MET call, leading to discussions around management of refractory hypoxaemia, and subsequent management of an ongoing air-leak from the ICC.

**Viva 6 – Radiology Station**

| | |
|---|---|
| Maximum Score | 7.10 |
| Percentage Passed | 61% |

The radiology station consisted of 4 plain X-rays and 3 CT scans

**Viva 7 – Procedure Station**

A 36-year-old male is admitted to the ICU with septic shock, due to Streptococcal pneumonia, requiring dual vasoactive medication. He is not intubated.

48 hours after admission, he remains anuric with rising renal indices, and it is decided to initiate dialysis with CVVHDF. His past medical history includes anxiety and panic attacks.

What is your preferred site for vascular dialysis catheter placement, and justify your answer.

| | |
|---|---|
| Maximum Score | 9.40 |
| Percentage Passed | 87% |

This viva dealt with the decision making and practical considerations, around the commencement and ongoing use of CRRT in a critically ill patient

**Viva 8 – Communication Station**

Corey Smith is a 20-year-old student who initially presented to hospital with trismus secondary to a dental abscess. He required urgent fibreoptic intubation to facilitate surgical drainage but ongoing concerns about residual airway oedema prevented safe extubation at the conclusion of surgery. He was admitted to ICU for ongoing ventilation whilst this oedema settled.

His ICU progress had been uneventful with slow improvement in airway oedema over the last 48 hours, and you anticipated that he would be safe to extubate in the next day or so. Unfortunately, he had a major desaturation event overnight, which was erroneously ascribed to a right-sided tension pneumothorax. Urgent needle thoracostomy and chest drain insertion failed to resolve the situation and subsequent chest x-ray findings were more consistent with a proximal sputum plug. These radiological changes largely resolved after bronchoscopy but an ongoing air leak with significant surgical emphysema still remain. The situation remains stable with the respiratory and cardiothoracic teams planning to treat the air leak conservatively.

You have requested a meeting with Corey's parent (Alex) to discuss the events overnight.

*N.B.: For covid safety you are requested not to shake Alex's hand.*

| | |
|---|---|
| Maximum Score | 9.00 |
| Percentage Passed | 65% |

This viva consisted of a discussion with the family of a patient around the principles and practice of open disclosure, of a complication that has happened to their family member whilst in the ICU.