

Examiners' Report

Master of Medicine (Anaesthesiology) Part B SAQ Examination

- 26 to 27 April 2023

General Comments

This report summarises the areas examined in the 2023 Master of Medicine Anaesthesiology Part B Short Answer Question (SAQ) Examination conducted on 26 to 27 April 2023. The report is designed to aid residents and faculty in preparing for future examinations.

Candidates should note that all aspects of the syllabus are examinable. The examination syllabus is available from the Division of Graduate Medical Studies (DGMS) [website](#). Candidates are advised to use the document to guide them and cover the breadth of the syllabus to maximise their chance of success at the examination.

The 16 SAQ are divided into Paper One and Two, each 8 questions to be completed over 2 hours, held on 2 different days.

Candidates should note that the weightage of all the questions is equal, and all the questions need to be answered. Some questions have multiple parts with allocated percentages (%). The percentages serve to guide the candidates with time allocation and may not reflect the exact mark allocation. Candidates are advised to plan and manage their time accordingly.

Candidates are reminded to read the questions carefully. The SAQ examination is designed to examine the candidates' ability to apply their knowledge in specific clinical situations. If a specific clinical situation with history or physical findings is provided, the candidates are expected to tailor their answers to that situation. Generic answers that are not specific to the clinical scenario tend to be awarded lower marks leading to poor performance overall.

Marking and Passing Criteria

All the SAQs are reviewed and criteria for passing each question are determined by the examination committee prior to the examinations. The answer for each question is marked by 2 examiners.

| <u>Score</u> | <u>Interpretation of Score</u> |
|---------------------|---|
| 8 | An excellent performance with both examiners |
| 7 | A performance significantly better than a pass |
| 6 | A definite pass |
| 5 | A reasonable performance but not up to a pass |
| 4 | A poor performance but not an absolute failure |
| 3 | An absolute failure which cannot be compensated |

Note that a score of 6 is a pass, while a score of 5 is considered a "borderline fail".

The sum of the scores for all 16 questions is added for each candidate. The candidate passes the examination if the total score is greater than or equal to 90. This score is an approximative equivalent to having a clear pass in 10 out of the 16 questions and a borderline performance in the remaining 6 questions.

Results for the MMed Part B 2023 April SAQ Examination:

Total number of candidates who registered: 26

Number of candidates who withdrew or were absent: 0

Number of candidates who completed the examination: 26

Number of candidates who passed the examination: 13 (50%)

Questions:

Paper One, Question One:

A 2-year-old boy presents for emergency toilet and suture of a forehead laceration. He has a runny nose and cough that started this morning, and you hear a murmur on auscultation of his chest.

A) What features in the history and physical examination would differentiate between an innocent and pathological murmur? (50%)

B) What features in the history and physical examination may suggest increased risks of adverse respiratory events if this child undergoes general anaesthesia? (50%)

Pass Rate: 42.3%

Candidates were required in Part A to describe the features in the history and physical examination that they will be looking out for to differentiate an innocent from a pathological murmur. Expected answers in the history include looking for features of syndromes associated with cardiac lesions (such as VACTERL, Trisomy 21 etc.), significant developmental history such as failure to thrive or abnormal symptoms such as cyanotic spells. Expected answers for physical examination included looking for cyanosis, diastolic murmur, or thrill.

In Part B, the candidates were expected to mention features in the history of the child that may suggest a prior respiratory issue such as significant perinatal events or underlying respiratory conditions such as bronchiolitis, asthma etc. The expected answer for the physical examination includes looking for the severity of the current respiratory symptoms such as fever, tachycardia or being systemically unwell.

Candidates who omitted distinguishing features in the history or physical examination regarding the cardiac murmurs or respiratory symptoms tend to do more poorly in this question.

Paper One, Question Two:

You are called to the Emergency Department to assist in the management of a 55-year-old man who developed acute aortic regurgitation (AR) following a Stanford type A aortic dissection. His heart rate is 100 bpm, blood pressure is 150/100 mmHg and respiratory rate is 36 bpm. His pulse oximetry reading is 97% while breathing 10 L/min of oxygen via a face mask.

A) What are the pathophysiological changes of acute AR? (50%)

B) Outline the initial management of this patient before his inter-hospital transfer for surgery. (50%)

Pass Rate: 26.9%

Candidates were required to use their understanding of cardiac physiology to describe the pathophysiological changes during an acute aortic regurgitation during an aortic dissection when there is no time for compensatory changes of the left ventricle for the first part of the question.

Candidates were expected to outline the initial management to stabilise the patient before transfer for the second part of the questions, and where possible link the management to the pathophysiological changes.

Most of the candidates who did poorly demonstrated a poor understanding of cardiac pathophysiology and an inability to transfer their understanding of cardiac physiology to clinical scenarios in their answers. Writing down a generic template without demonstrating an understanding of how it should be applied to this case generally resulted in a poorer grade.

Paper One, Question Three:

A 30-year-old male motorcyclist is brought to the Emergency Department with head injuries following a motor vehicular collision. On examination, he is unconscious with a Glasgow Coma Score of 5 (E1V1M3) and not moving his right arm and leg. His eye examination reveals a 6 mm left pupil, non-reactive to light, and a 3 mm right pupil, reactive to light.

An urgent CT scan reveals an acute left subdural haematoma with mass effect and midline shift. He is sent to the operating theatre for surgical evacuation of the subdural haematoma and insertion of intracranial pressure monitor.

A) Briefly explain the cause and neurologic basis for the neurological findings on clinical examination. (40%)

B) Outline the role of an intracranial pressure monitor in the postoperative management in the intensive care unit. (60%)

Pass Rate: 11.5%

Candidates were required, for the first part of the question, to identify the significant neurological findings in the scenario provided and explain how these findings (pupillary signs, hemiparesis and low GCS) came about as a result of the acute left SDH.

The second part of the question expects the candidate to list the purpose of the intracranial pressure monitor and specifically how it can guide in the postoperative management of this patient including the target intracranial pressure (ICP) readings or ranges on the monitor, strategies to maintain the ICP and also interventions in the event the ICP exceeds the target ranges.

The candidates who did poorly did not demonstrate sufficient knowledge of neuropathological changes leading to clinical signs. A significant number did not discuss the pathophysiology of uncal herniation which is central to the first part of the question. The second part tends to be poorly organised with inadequate discussion on the role of ICP monitoring and tiered measures for ICP control.

Paper One, Question Four:

An 80-year-old man is admitted for an acute exacerbation of severe low back pain which is associated with pain radiating from his buttock to his calves bilaterally.

Discuss the principles of assessment and management of his pain.

Pass Rate: 92.3%

This is a common clinical scenario, and the candidates generally did well. Candidates were expected to look for “red flags” to exclude significant pathological causes of the pain and to present a systematic pain targeted history and physical examination and investigation. The management is expected to be multimodal and multidisciplinary in nature with some discussion on the step ladder approach to the pharmacotherapy and interventions considering his age and likely associated co-morbidities.

Areas for improvement for candidates include structuring the answer in a practical clinical way, highlighting the urgency of escalated care and the patient's inability to cope with pain as an indication of a more serious pathology, appreciating that opioids are generally avoided for non-cancer pain as much as possible, risks of adjuvants such as TCAs in elderly, to emphasize the role of non-pharmacological interventions such as physiotherapy, acupuncture, heat therapy, stretching or massage as well as topical agents such as patches or liniments.

Paper One, Question Five:

A patient with progressive Parkinson's disease presents for removal of an ulnar shaft plate and screw implant which is causing pain. The patient is cognitively intact, but wheelchair bound. The patient and her family believe that the general anaesthesia she received 5 years ago when she had her ulnar bone fracture following a fall was the cause of her rapid progression of her Parkinson's disease.

A) At the preoperative visit, what are the relevant points you would discuss with the patient regarding the anaesthesia options? (30%)

B) What are the possible regional techniques that can be used? Justify your recommended choice for her. (30%)

C) Describe the anatomy of the brachial plexus and the nerves that will need to be blocked for this surgery to proceed. (You may illustrate your answer with a line diagram) (40%).

Pass Rate: 57.7%

For Part A, candidates were expected to explore the patient's concerns and the reasons for their beliefs before addressing these concerns and discussing the various anaesthetic options including general anaesthesia, and regional anaesthesia with or without sedation.

Part B and Part C require the candidate to list the regional anaesthesia techniques, justify them and describe the anatomy.

Candidates tended to do well in Part B. Many candidates failed to evaluate the patient's previous GA, address the patient's concerns regarding GA and Parkinson's disease, or did not tailor their answers to the clinical scenario. The knowledge of innervation of the upper limb was generally poor, with many candidates unsure of the sensory supply to the forearm. Some candidates also failed to consider tourniquet pain when listing the nerves that were required to be blocked.

Paper One, Question Six:

A 30-year-old woman is seen at the preoperative evaluation clinic 2 weeks prior to her scheduled laparoscopic resection of the right adrenal mass. Her initial presentation was a 6-month history of hypertension and paroxysmal episodes of palpitations, dizziness, blurring of vision and headache.

A) Describe your pre-operative management of this patient's medical condition. (40%)

B) List the main concerns during the intra-operative period and outline your management to address these concerns. (60%)

Pass Rate: 61.5%

For Part A, candidates were expected to identify that this is a possible phaeochromocytoma, which they will confirm by reviewing the relevant blood and urine investigations and looking for associated syndromes. They are expected to describe the assessment of hypertension control and end-organ damage or complications as well as review the medications and effects of the medications.

For Part B, candidates were expected to bring up concerns regarding the various phases of surgery for phaeochromocytoma, the effect of laparoscopic surgery and positioning and address them.

The poorer candidates did not demonstrate an appreciation of the phases of haemodynamic changes, the perioperative concerns other than haemodynamic changes as well as naming the various agents they would use for blood pressure control.

Paper One, Question Seven:

A 65-year-old woman with a BMI of 18 and weighing 42 kg is listed for a laparoscopic excision and biopsy of an ovarian mass.

She is induced with intravenous propofol 80 mg, fentanyl 40 mcg and paralysed with rocuronium 30 mg. She is intubated with a #7.0 endotracheal tube and placed on controlled mechanical ventilation on a volume controlled ventilatory mode with a tidal volume of 320 ml at a set rate of 12 bpm. PEEP is set at 5 cm H₂O.

Immediately after induction, she is moved down the operating table and put in a low lithotomy position with her legs abducted 90° in stirrups.

The operation starts with a pneumoperitoneum created for insertion of the laparoscopic instruments and the patient is placed in a Trendelenburg position.

A) What are the peripheral nerve injuries (excluding airway related nerves) possibly sustained by this patient perioperatively? Describe the mechanism of injury as well as her risk factors. (50%)

B) Describe the respiratory and hemodynamic changes experienced by this patient from the moment before induction of anaesthesia in the supine position until initiation of laparoscopic surgery in the Trendelenburg position. (50%)

Pass Rate: 42.3%

Candidates were required to list the nerve at risk, the mechanism of nerve injury and the risk factors in this patient for the first part of the question. The second part requires them to describe the respiratory and haemodynamic changes associated with induction, abdominal insufflation and the Trendelenburg position.

The candidates that did not perform well in the first part generally failed to identify the nerves, did not specify or gave wrong mechanisms and/or did not mention any contributory factors. The candidates who did not correlate the specific interventions such as pneumoperitoneum and Trendelenburg position with the associated specific respiratory and haemodynamic changes tended to do more poorly.

Paper One, Question Eight:

A 70-year-old man undergoes an elective robotic laparoscopic prostatectomy under general anaesthesia. He has well controlled chronic hypertension and a 40 pack-year history of smoking cigarettes. One hour into the procedure, the airway pressure alarm on the ventilator sounds and shows a reading of 40 cmH₂O.

- A) List the possible causes of this airway pressure alarm and reading. (40%)
- B) Describe your step-by-step management of this situation. (60%)

Pass Rate: 73.1%

This is not an uncommon anaesthetic situation and candidates are expected to have a systematic approach in terms of the causes and how to manage this situation.

A fair number of candidates missed out on machine problems and checking gas flow settings for pneumoperitoneum and their associated complications. Candidates who did poorly tend to have scanty or incomplete answers.

Paper Two, Question One:

An unbooked 32-year-old parturient G1P0 is admitted at 36 weeks of gestation in active labour with her foetus in a breech position. She needs an emergency lower segment caesarean section, and she is keen on regional anaesthesia. However, her latest platelet count is only $79 \times 10^9 /L$.

- A) List the possible causes of her low platelet count. (20%)
- B) How will you manage her preoperatively? (50%)

You have given spinal anaesthesia to the patient and the baby has been delivered uneventfully. Fifteen minutes later, the uterus is still atonic despite the initial dose of oxytocin 5U.

- C) List the pharmacological agents that you would use to treat the atony and explain their mechanism of action. (30%)

Pass Rate: 46.2%

Candidates were expected to know some common and some less benign causes of low platelets and have a plan to approach, differentiate and manage the patient before the surgery. The last part of the question requires the candidates to list some of the uterotonic agents and explain their mechanisms.

The candidates who did poorly did not have a clear plan of how to approach a patient with low platelets and were unfamiliar with the mechanisms of the uterotonic agents.

Paper Two, Question Two:

A 40-year-old previously healthy male motorcyclist was involved in a road traffic accident 1 week ago and suffered multiple injuries, including multiple fractured ribs on the right, with right pneumothorax managed with a chest tube, bilateral lung contusions and a liver laceration for which he had undergone laparotomy.

He is currently still sedated, intubated and ventilated in the intensive care unit as there is a persistent leak from a bronchopleural fistula on the right. The surgeon has scheduled him for right thoracotomy and lung resection. He remains in spinal nursing as the cervical spine integrity has yet to be fully evaluated radiologically.

A) What are the options for lung isolation? (30%)

B) Discuss the factors in this patient that will influence your choice of method for lung isolation. (70%)

Pass Rate: 34.6%

Candidates were expected to list the options for lung isolation in the first part of the question and discuss the factors influencing the choice of the option using the history provided above. The issues pertinent to the case include possible lung contusion and inability to tolerate one-lung ventilation, difficulty with tube exchange due to spinal nursing and difficulty with bronchial blocker placement.

Answers that are brief and generic, with no contextual link to the question are generally awarded lower scores.

Paper Two, Question Three:

A 72-year-old male is admitted to the Surgical Intensive Care Unit after undergoing emergency laparotomy for perforated ischaemic small bowel with gross intraabdominal soilage. Due to significant bowel oedema, vacuum-assisted abdominal closure is performed. On the morning of the second postoperative day, he is observed to intermittently hyperventilate and attempt to pull out the endotracheal tube despite

being restrained. He does not maintain eye contact and does not follow simple bedside commands. You make a diagnosis of ICU delirium.

A) How would you assess the patient for the possible contributing causes of his delirium? (50%)

B) Describe, with reasons, your management of this patient's delirium. (50%)

Pass Rate: 73.1%

Candidates were required to list the possible causes of the neurological state, how to assess the severity and cause of the neurological state and describe their management with reasons.

The first part of the question was generally done well. However, the second part tended to be poorly done with some candidates confusing agitation and delirium. Some over-emphasised the role of antipsychotic while others failed to mention it. Generally, most candidates did mention non-pharmacological treatments which is good.

Paper Two, Question Four:

A 56-year-old man with chronic hepatitis C cirrhosis is scheduled for an emergency upper gastrointestinal endoscopy for haemostasis of variceal bleeding.

He reported an episode of melena and haematemesis at home, but since admission had no further bleeding. He was hypotensive on admission and treated with fluid resuscitation and blood transfusion.

The patient is now lucid with a BP of 125/78 and HR of 90 bpm. Investigations show: Haemoglobin 9.6 g/dL, INR 2.0.

Arterial blood gas on room air shows:

| | |
|-------------------|-------------|
| pH | 7.49 |
| PaCO ₂ | 29 mmHg |
| PaO ₂ | 68 mmHg |
| HCO ₃ | 22.6 mmol/L |
| SBE | -0.4 |

A) How is the severity of the patient's liver disease assessed? (30%)

B) Interpret this arterial blood gas and list possible causes in this patient. (30%)

C) Justify your anaesthetic technique for the gastroscopy for this patient, including the choice of anaesthesia drugs. (40%)

Pass Rate: 7.7%

For the first part, candidates were not expected to list down all the criteria for the Child-Turcotte-Pugh score, but they were expected to mention significant aspects of the criteria like encephalopathy, significant clinical examination findings, liver function and coagulation profile.

The second part includes interpretation of ABG and gives some possible causes which include both oxygenation as well as acid-base abnormalities.

The last part requires the candidate to describe one technique including drugs used with justification of the technique and choice of drugs.

The candidates who did poorly tended to miss out on important investigations like liver function test and platelet counts for Part A, the finding of hypoxaemia on the ABG and causes for hypoxaemia and respiratory alkalosis for Part B, and not justifying the choice of drugs for Part C.

Paper Two, Question Five:

A 30-year-old woman, weighing 100 kg (BMI 38 kg/m²), has severe nausea and vomiting in the post anaesthesia care unit following an uneventful elective laparoscopic cholecystectomy under general anaesthesia.

A) What are the known risk factors for postoperative nausea and vomiting (PONV) in adults? (30%)

B) List the strategies for reducing the baseline risks for PONV. (30%)

C) Briefly outline your perioperative management of this patient with regards to PONV only. (40%)

Pass Rate: 69.2%

Candidates were expected to list the known risk factors and strategies to reduce PONV for the first 2 parts of the question. The candidates were expected to identify risk factors for PONV in this patient and outline their strategies for this patient including their choices of antiemetics as well as treatment postoperatively in event that the patient still has PONV despite their preoperative and intraoperative measures.

While Part A and Part B are generally done well, candidates tended to do more poorly for Part C with few candidates describing the postoperative management of this patient with PONV as well as their choice of antiemetics for PONV treatment either in the presence of intraoperative antiemetic prophylaxis or in absence of prophylaxis.

Paper Two, Question Six:

With respect to the induction of anaesthesia in an adult patient:

- A) What are the situations when inhalational induction may be preferred over intravenous induction? (30%)
- B) What are the disadvantages of inhalational induction compared to intravenous induction? (40%)
- C) How can you minimise the risks associated with inhalational induction? (30%)

Pass Rate: 7.7%

Candidates were expected to list some situations where inhalational induction will be preferred, provide some disadvantages of this technique and how they go about minimising these risks when they use inhalational techniques for some of these situations.

Candidates tended to cover the first 2 parts of this question adequately showing fairly good theoretical knowledge.

However, they tended to do poorer in the last part of the question, being unable to list down practical methods on how they will minimise the risks (e.g., adequate fasting, IV access, anti-sialagogue, skilled assistance, gradual induction with sufficient time to achieve adequate depth etc), possibly from lack of practical knowledge or experience.

Paper Two, Question Seven:

A 65-year-old woman undergoes an elective total thyroidectomy for a large multinodular goitre. The surgery was uneventful. Fifteen minutes after arrival in the PACU, she developed acute respiratory distress.

- A) List the possible airway related causes for her acute respiratory distress and describe how you will distinguish between the causes. (50%)
- B) Outline your immediate management of this patient. (20%) Outline your specific measures for each of the causes. (30%)

Pass Rate: 46.2%

Candidates were expected to give possible airway causes for the respiratory distress, including those specific to thyroid surgery and generic causes for respiratory distress, followed by how they can via history, physical examination or reviewing the anaesthetic chart etc distinguish these causes.

The second part expects the candidate to outline the immediate management to stabilise the patient and specific management for each of the possible causes.

Candidates who did poorer tended to have incomplete answers, lacked factual knowledge or provided diagnoses that were not relevant to the question.

Paper Two, Question Eight:

A 27-year-old primigravida with uncorrected moderate scoliosis (Cobb angle 35°) was admitted to the labour ward for induction of labour at 34 weeks amenorrhoea for severe pre-eclampsia. She subsequently requested labour analgesia.

A) What are the basic principles for informed consent? (25%)

B) What is the essential information that a patient needs to understand to give informed consent? (25%)

C) In the consent-taking process, what is the specific information that you would give **THIS** patient regarding her labour analgesia? (50%)

Pass Rate: 46.2%

Candidates were expected to list the basic principles of informed consent and the essential information for giving consent on a procedure for parts A and B. Most candidates did well for these 2 parts.

Part C requires the candidates to tailor the consent to this patient with the presenting history above and not a generic labour analgesia consent.

Some candidates showed a lack of understanding of the principles of informed consent. Many candidates did not take into account the patient's scoliosis and preeclampsia history and tailor their consent accordingly. Both reasons contributed to a poorer score for some of the candidates.

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Master of Medicine (Anaesthesiology) Examination Committee

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