NUS | Division of Graduate Medical Studies
National University of Singapore | Yong Loo Lin School of Medicine

Examiners' Report
Master of Medicine (Anaesthesiology) Part B SAQ Examination
- 16 & 17 April 2025

General Comments
This report summarises the areas examined in the 2025 Master of Medicine (Anaesthesiology) [MMed(Anaes)] Part B Short Answer Question (SAQ) Examination conducted on 16 & 17 April 2025. 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.

Candidates should also note that unless it would assist them answering the questions, there is no need to waste time restating the question in their answers, as it would not yield them any additional credit.

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.

Score	Interpretation of Score
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 2025 April MMed (Anaes) Part B SAQ Examination:

Total number of candidates who registered: 44
Number of candidates who withdrew or were absent: 2
Number of candidates who completed the examination: 42
Number of candidates who passed the examination: 18 (43%)

Paper One, Question One:

A 65-year-old man with hypertension and chronic obstructive pulmonary disease is placed in a steep Trendelenburg position during robot-assisted laparoscopic prostatectomy.

A: Describe the physiological effects of initiating a pneumoperitoneum while in a steep Trendelenburg position. (60%)

Shortly after, his blood pressure and $ETCO_2$ suddenly decrease from 130/80 mmHg to 80/60 mmHg and from 45 mmHg to 25 mmHg respectively.

B: What are the three most likely causes for this sudden change in his clinical status? Give the reasons for your choices. (40%)

Pass Rate: 69%

The first part of this question expects the candidate to describe the physiological effects associated with the patient in a steep Trendelenburg position, a commonly encountered situation in the operating theatre. Candidates are expected to provide fairly detailed description of the physiological changes involving the cardiovascular and respiratory system as well as some description of changes involving either the central nervous system or the endocrine system to pass this question.

The second part of this question is a crisis situation associated with the application of pneumoperitoneum a patient with the stated clinical history. Candidates are expected to conclude that there is significant drop in cardiac output causing the hypotension and hypoperfusion of the lungs resulting in the stated changes in physiological parameters and provide 3 most likely causes relevant to this scenario (e.g., CO_2 embolism due to CO_2 insufflation, tension pneumothorax due to CO_2 insufflation in the clinical history of COPD etc) and explain how that might be probable in this situation such that they are the most likely choices.

This question is done reasonably well with most candidates being able to provide reasonable answers for first part of the questions. Most of the candidates who failed this question did poorly for second part.

Paper One, Question Two:

A 65-year-old woman presents for elective resection of a large right parietal lobe meningioma. She has a history of hypertension and hyperlipidaemia, well controlled on regular amlodipine and lovastatin.

A: List the measures in your anaesthesia management to mitigate increases in intracranial pressure during this surgery. (60%)

B: Explain the reasons for increased risk of venous air embolism during neurosurgery and how it can be detected intraoperatively. (40%)

Pass Rate: 79%

The first part of this question requires the candidate to list the measures (such as positioning, ventilation, haemodynamics, anaesthetic depth, medications etc) in anaesthetic management that help reduce intracranial pressures in the stated neurosurgery. The second part of the question expects the candidates to give reasons why the venous air embolism is more common in neurosurgery especially the named surgery (how venous air embolism arise and why it is more common here) and provide a list of methods and relevant findings (physical findings, clinical measurement equipment, changes in parameters etc) to detect its presence intraoperatively.

The question is generally well done. Candidates were able to give clear and detailed descriptions of the anaesthetic process suggesting a good understanding of the whole procedure with good organisation of their points were awarded better scores for this question. Candidates who failed either did not cover enough points or give multiple erroneous points in their answers. Candidates are reminded to be mindful of what they type (e.g., wrong targets for etCO2 etc) as it may be interpreted as having wrong concepts regarding management.

Paper One, Question Three:

A 60-year-old man with a history of poorly controlled diabetes mellitus presents at the pain clinic with complaints of burning pain in both hands and feet for 4 months.

Discuss the assessment and management of his pain.

Pass Rate: 67%

This question requires the candidate to discuss the assessment and management of a common pain presentation. Candidates are expected to describe a focused assessment process to determine the likely diagnoses including discussing how exclude critical ones such as limb ischaemia. This should be followed by discussing a multimodal, multidisciplinary analgesic plan for the probable diagnosis (painful diabetic neuropathy)

Most candidates demonstrated a good understanding of the need for a multimodal and multidisciplinary approach to pain management. Candidates generally performed well in outlining proper assessment, including history, physical examination, investigation, and consideration of differential diagnoses. Many candidates recognised the neuropathic nature of the pain and the importance of ruling out red flags. However, some responses lacked a targeted management approach, instead listing generic chronic pain

strategies or interventions that may not be appropriate. A few candidates mentioned strong opioids without proper context or caveats, which was identified as an area for improvement. Higher scores were awarded to those who provided a focused, logical, and context-specific management plan.

Paper One, Question Four:

An 81-year-old woman presents for emergency right hip surgery for a fracture sustained during a fall at home. She has a history of atrial fibrillation and ischaemic heart disease and is on rivaroxaban. Prior to the fall, she was homebound and ambulates with a walking frame. She denies any chest pain or breathlessness at rest. Her blood investigations reveal a sodium level of 124 mmol/L. All other investigations were unremarkable.

Describe your anaesthetic considerations of this surgery.

Pass Rate: 60%

This is commonly encountered clinical scenario with our aging population. There are multiple considerations in this patient presenting for hip surgery and candidates are expected to describe at least 6 of these considerations with elaborations on why it is of concern.

The better candidates successfully listed at least six key considerations and discussed their impact on clinical outcomes and management. In contrast, weaker candidates provided in-depth discussion on only a limited number of considerations, often presenting generic and unfocused answers that omitted important points relevant to the specific considerations being addressed.

Paper One, Question Five:

A 55-year-old woman is scheduled for device closure of her atrial septal defect (ASD). The ASD was diagnosed 6 months ago when she presented with acute right hemiparesis. She has since made a full functional recovery.

A: What are the anaesthetic considerations for this planned procedure in this patient? (60%)

During the procedure, right heart catheterisation with measurements of pressures and oxygen saturation is done prior to device deployment.

B: What are the reasons for doing this? (20%)

C: How can the presence of left-to-right shunt be determined by these measurements? (20%)

Pass Rate: 40%

To achieve a pass for this question, candidates must demonstrate an understanding of the anaesthetic considerations for a patient with a recent stroke and an atrial septal defect (ASD) undergoing device closure.

In Part A, some of the expected major points includes the effects and complications of a left-to-right shunt (such as right atrial and ventricular dilatation, atrial fibrillation, tricuspid regurgitation, and pulmonary hypertension), the need to maintain a balance between pulmonary and systemic vascular resistance during anaesthetic management to avoid shunt reversal. Candidates should also cover other considerations such as choice of anaesthetic technique and ventilation challenges, thromboembolic risk (meticulous fluid and air management), risks of stroke, monitoring requirements, remote location challenges, airway security during transoesophageal echocardiography (TEE), radiation protection, and perioperative medication considerations (including anticoagulants).

For Parts B and C, candidates must explain some rationale for right heart catheterisation prior to device deployment, such as to assess right heart function, pulmonary hypertension, evaluating shunt extent, and confirming procedural suitability.

In Part C, they should describe how a left-to-right shunt is identified by a step-up in oxygen saturation at the right atrium, using samples from various cardiac chambers and comparing values.

This question was answered poorly overall, revealing significant gaps in candidates' knowledge. Few candidates discussed the pathophysiology of atrial septal defect (ASD) and its complications for the heart and valves. Most did not consider how ventilation strategies could be used to optimise patient management. Several candidates confused ASD closure with transcatheter aortic valve implantation (TAVI), indicating a lack of understanding of the procedures. Additionally, most candidates did not understand the purpose or method of right heart studies, demonstrating a need for better preparation in this area.

Paper One, Question Six:

A 55-year-old woman is scheduled for a laparoscopic anterior resection for a cancerous ulcer in her colon. She reported having severe nausea and vomiting following general anaesthesia for her right knee arthroscopy 10 years ago. You decide to administer total intravenous anaesthesia using a target control infusion (TCI) pump to reduce her risks of nausea and vomiting.

A: Explain how the TCI pump achieves and maintains the target effect site concentration of propofol. (30%)

B: List the limitations of using the TCI pump. (20%)

C: 30 minutes into the surgery, the BIS reading increases and remains above 60. List the likely causes and outline how you would manage the situation. (50%)

Pass Rate: 0%

The first part of this question requires the candidate to briefly explain how the TCI pump achieves the desired effect-site concentration of propofol. Relevant points include the use of pharmacokinetic models developed from studies in healthy volunteers to predict and calculate the required infusion rates to reach and maintain a target plasma or effect-site concentration. This involves using a loading dose based on the predicted volume of distribution at induction followed by an infusion at rate according to the predicted rates of drug distribution and elimination. To achieve the desired effect-site concentration, the pump may set the initial plasma concentration higher to compensate for the delay between plasma and effect-site levels.

The second part of this question expects candidates to provide some practical limitations of using these TCI pumps including the inaccuracies of the models in certain patient groups, lack of feedback hence delayed response to rapid physiological changes, potential for over or underdosing etc.

The last part of this question requires the candidates to list the possible causes for high BIS and give a brief outline of how to manage the situation.

Generally, candidates did better at the last part of this question. Many candidates are unable to explain the pharmacokinetic principles underlying how the TCI pump works and describe limitations of using targeted IV infusions for sedation or general anaesthesia.

Paper One, Question Seven:

A 57-year-old man (BMI 40 kg/m^2) man has wet gangrene on his right first and second toes that requires debridement and amputation. He has medical history of obstructive sleep apnoea (OSA), diabetes mellitus, ischemic heart disease, and pulmonary hypertension. He is on dual antiplatelet therapy following insertion of a coronary stent two months ago. You plan to perform the anaesthesia for the planned surgery under a peripheral nerve block without sedation.

A: Outline the possible factors and mechanisms that may lead to failure of a peripheral nerve block in this patient. Outline how these factors could be mitigated. (50%)

B: The patient becomes distressed and reports having pain during surgery. How would you assess and manage the situation? (50%)

Pass Rate: 48%

The first part of the question requires candidates to outline patient- and procedure-specific factors that may cause block failure, briefly describe the mechanisms involved, and suggest ways to address these issues. Examples of these factors include morbid obesity, possible oedema, anatomical variation, required (steep) needle trajectory, local anaesthetic sensitivity, patient anxiety, surgical approach, and use of a tourniquet.

The second part asks candidates to describe a practical approach to managing block failure. This should include stopping the surgery if necessary, identifying possible causes of failure, and proposing management strategies tailored to these causes.

Most of the candidates answered the second part of the question better than the first part. Many candidates identified diabetes mellitus as a factor for peripheral nerve block failure but did not specify that neuropathy is the underlying mechanism. No candidate noted the potential need for a higher current when using a nerve stimulator in such situations. Some candidates performed poorly by omitting parts of the question, such as mitigation strategies or patient-specific challenges, emphasising the need to read questions carefully and address all components. Brief answers, possibly due to poor time management, were also observed. Most candidates described practical points from experience but often did not explain the rationale or mechanisms due to time constraints. Marks were not awarded for discussing generic block failures unrelated to the scenario, such as medication errors.

Paper One, Question Eight:

A 56-year-old man with diabetes mellitus complicated by peripheral vascular disease requires right lower limb angioplasty and amputation of a gangrenous first toe. His other co-morbidities include hypertension, ischaemic heart disease with New York Heart Association Class 3 for dyspnoea, and chronic kidney disease.

The duration of the procedure is estimated to be 4 hours.

Outline your anaesthetic considerations and management of this patient.

Pass Rate: 40%

Candidates are expected to outline considerations for this patient undergoing a prolonged (4-hour) vascular procedure and suggest one or more management strategies for each of these considerations. A reasonable performance should address at least seven considerations, covering the patient's medical issues or comorbidities, the specifics of the procedure, and the proposed anaesthetic approach, followed by their management strategies. Candidates who outlined more consideration and/or covered more management strategies for each consideration were awarded better score.

Candidates who did poorly for either provided answers on one part (considerations or management) of the question or did not cover sufficient points overall. Candidates are reminded to use the information stated in the question stem (such as estimated duration of surgery, list of medical issues, type of procedure etc) to their advantage when answering the question.

Paper Two, Question One:

You are asked to review a 70-year-old man in the high dependency ward. He has a history of ischemic heart disease (IHD) and hypertension and is taking aspirin, clopidogrel and losartan.

He presented today with acute onset of severe abdominal pain. His parameters are GCS 14, BP 90/40 mmHg, HR 120 bpm, RR 25 bpm, and O2 saturation 92% on 2L/min of oxygen via nasal prongs. Investigations reveal raised inflammatory markers, acute kidney injury, and hyperlactataemia (5.0 mmol/L). His surgeon has scheduled an exploratory laparotomy in the emergency OT, pending an urgent CT scan.

A: List the measures that may reduce the risks of organ damage or mortality in this patient. (50%)

B: Describe how you would prioritize the implementation of these measures. (50%)

Pass Rate: 38%

This question requires candidates to recognise that the patient is elderly and presenting with decompensated shock from intra-abdominal sepsis and possible evolving multiorgan dysfunction. Candidates are expected to list immediate resuscitation and management in line with the Surviving Sepsis guidelines, and other management steps aiming to prevent further organ damage. The answers are expected to describe how to prioritise these interventions when managing this patient.

Candidates scored higher when they explained how specific measures contribute to organ protection, such as using depth of anaesthesia monitoring to prevent burst suppression and reduce postoperative delirium. Well-organised answers, structured by general perfusion and organ systems, and responses tailored to the scenario rather than general anaesthesia considerations, also received higher marks.

For prioritisation, candidates who explained their rationale, performed better. Incomplete answers, lack of justification for prioritisation, or repetition between parts of the answer led to lower scores. Strong candidates categorised their responses into preoperative, intraoperative, and postoperative phases, linked interventions to organ protection, and considered multiple issues including sepsis, cardiac, renal, and geriatric factors. They also rationalised the sequence of interventions beyond simply following ABC principles.

Some areas for improvement include stating fluid bolus volumes recommended by the guidelines accurately and providing relevant indications for intubation (respiratory or haemodynamic indications instead of GCS) in septic shock. Many candidates gave generic answers rather than addressing preoperative organ protection and mortality reduction, and some incorrectly emphasised multidisciplinary input in an emergency context where rapid action is required.

Paper Two, Question Two:

A 68-year-old man with a compression fracture at L1 causing right radiculopathy, undergoes lumbar decompression and posterior instrumentation surgery. General anaesthesia is induced and maintained with propofol and remifentanil infusions.

During insertion of the pedicle screws, the neurophysiologist reports a decrease in the amplitude with associated increase in latency of the MEP signal in the left L1-3 nerve roots.

A: List the possible causes for this observation. (30%)

B: Describe your management. (70%)

Pass Rate: 33%

Candidates are expected to identify at least six possible causes for the observation, including both surgical and physiological causes. These should cover common issues such as anaesthetic factors (e.g., changes in anaesthetic depth, exposure to drugs affecting monitoring), systemic physiological changes (e.g., hypotension, hypovolaemia, hypoxaemia, hypocapnia, hypothermia, anaemia), and surgical causes (e.g., haemorrhage, vascular injury, excessive distraction, spinal cord or nerve injury). Less common causes, such as technical errors or neurogenic shock, may also be mentioned but are not required for a pass.

For management, candidates should describe important steps, such as communicating with the surgeon, checking and correcting vital signs, improving oxygen delivery, ensuring adequate ventilation, checking and replacing blood loss, and maintaining adequate blood pressure and perfusion.

Candidates who scored highly provided detailed, well-organised, and succinct answers that demonstrated clear understanding and logical thought processes, rather than simply listing facts. Better answers addressed both iatrogenic/technical and physiological causes and included identification and management of key abnormalities such as anaemia, hypoxia, hypotension, and hypothermia. Candidates who missed the main focus of the question or failed to address these major issues tended to perform poorly.

Many candidates incorrectly attributed MEP signal loss to hypercapnia, rather than recognising the role of hypocapnia and cerebral vasoconstriction, and often failed to mention practical steps such as checking for blood loss. While some candidates demonstrated comprehensive differential diagnoses and holistic management, including collaboration with the surgical and neurophysiology teams, most lacked sufficient detail in their management plans and showed gaps in knowledge of differential diagnoses.

Paper Two, Question Three:

A 40-year-old woman with history of asthma is scheduled for total thyroidectomy for papillary thyroid cancer. Her goitre is small, and she has no symptoms of airway obstruction. After an uneventful induction and intubation, she is maintained on general anaesthesia with propofol total intravenous anaesthesia (TIVA).

Upon positioning for surgery, she starts to gag, cough, and become tachycardic. The ventilator high pressure (>40 cmH$_2$O) and low tidal volume (<100 mLs) alarms sound and the capnography tracing flattens to 0 mmHg while the SpO$_2$ still reads 100%.

A: List the possible causes for her deterioration and describe your immediate management. (50%)

B: By the time you ascertain that the patient is in severe bronchospasm, her oxygen saturation has decreased to 86%. Describe your management of this further development. (50%)

Pass Rate: 17%

This question examines the candidate's ability to recognise and describe the management of a crisis involving the airway and breathing.

In Part A, they are expected to identify key differential diagnoses such as inadvertent endotracheal tube (ETT) dislodgement with oesophageal placement, obstruction of the circuit or ETT, severe bronchospasm, etc. Immediate management actions must include steps to determine the cause as soon as possible such as performing a direct or video-laryngoscopy to confirm ETT position and auscultating the lungs, in addition to ensuring oxygenation and re-establishing ventilation.

In Part B, once severe bronchospasm is confirmed, candidates must detail further management by listing both pharmacological interventions (including salbutamol with correct dosage) and ventilator management strategies (such as increasing FiO$_2$ to 100%, reducing PEEP, and increasing expiratory time). Subsequent management such as monitoring for signs of improvement and disposition are awarded credit but not essential for a pass.

Examiners noted several recurring issues in candidate responses. Candidates generally demonstrated good knowledge of pharmacological management for bronchospasm, correctly identifying suitable drugs. However, drug dosages were often imprecise or incorrect.

Many candidates frequently mentioned endobronchial migration of the endotracheal tube (ETT) but often failed to adequately consider or rule out the more likely scenario of ETT dislodgement and oesophageal migration, especially during thyroid surgery with neck movement and extension during positioning. Few candidates verified ETT position using laryngoscopy, mistakenly relying on ETT markings at the lip, which does not confirm correct placement.

Most candidates lacked the knowledge or ability to describe safe and effective ventilation strategies for severe bronchospasm, with some suggesting potentially harmful interventions. Many candidates incorrectly suggested increasing PEEP, applying CPAP, or increasing tidal volumes and ventilation rate, which can worsen air trapping. Additionally, while calling for senior help is appropriate, candidates should specify how the additional help will be used, rather than simply requesting assistance.

Furthermore, a significant number of candidates hesitated to administer neuromuscular blockade when indicated, prioritising neuromuscular monitoring over airway, breathing, and circulation (ABC) management during a crisis, which is of concern.

Paper Two, Question Four:

A 27-year-old woman with moderate to severe mitral stenosis is at 36th week of gestation. She is scheduled for an elective caesarean section.

A: How do the cardiovascular changes at this stage of pregnancy exacerbate the pathophysiology of mitral stenosis? (40%)

B: Discuss factors that would influence your choice of central neuraxial block or general anaesthesia for this patient. (60%)

Pass Rate: 33%

To achieve a pass for this question, candidates must demonstrate a clear understanding of how cardiovascular changes in pregnancy worsen the pathophysiology of mitral stenosis and discuss the key factors influencing the choice between central neuraxial block and general anaesthesia.

In Part A, some of the expected answers includes how increased blood volume and cardiac output, higher heart rate, and decreased systemic vascular resistance in pregnancy place additional strain on the heart with mitral stenosis, leading to complications such as atrial fibrillation, pulmonary oedema, and heart failure. Candidates should also mention the risks during labour, such as pain-induced tachycardia, which can precipitate acute decompensation.

For Part B, the discussion on the modality of anaesthesia should include points such as maintenance of haemodynamic stability, risks associated with positive pressure ventilation and sympathetic stimulation under general anaesthesia, and the safety profile of central neuraxial techniques for both mother and foetus. The answer should also address patient-specific considerations, such as contraindications to neuraxial block, the need for airway control, and the context of elective versus emergency surgery.

Most candidates successfully identified the cardiovascular changes that occur during pregnancy and recognised that using a central neuraxial block with a catheter allows for gradual onset and more stable haemodynamics. Additionally, candidates generally understood that general anaesthesia is preferable in cases of severe mitral stenosis with decompensation.

However, many candidates did not specify the extent of cardiovascular changes in pregnancy. Some focused on the management goals of mitral stenosis rather than explaining its physiological consequences as requested by the question. Few candidates mentioned the risk of atrial fibrillation. There was also a lack of clarity in differentiating between single-shot spinal and combined spinal-epidural or plain epidural techniques. Furthermore, some candidates described how they would conduct anaesthesia instead of discussing the factors influencing the choice of technique, and some only addressed one technique without comparing both options.

Paper Two, Question Five:

A 3-year-old boy (15kg) is found to have a systolic murmur when he presents for bilateral laparoscopic hernia repair as a day case. He appears otherwise well.

Discuss your perioperative anaesthetic considerations, including how they may affect your decision to proceed with the anaesthetic.

Pass Rate: 10%

To pass, candidates are expected to demonstrate a structured approach to the perioperative management of a paediatric patient with a murmur undergoing laparoscopic hernia repair.

This includes specifically address the assessment of the murmur, distinguishing between physiological and pathological features, and explain how the decision to proceed with surgery depends on both the nature of the murmur and the presence or absence of hernia obstruction.
In addition, there should be discussion of other key perioperative considerations, such as paediatric-specific considerations: appropriate equipment, fasting, induction strategies and possible need for premedication, laparoscopy-specific risks (including pneumoperitoneum effects. positioning), airway management, analgesia plan, temperature monitoring, extubation plans etc.

Many candidates failed to address the need to assess surgical urgency, such as the risk of obstruction or strangulation, before deciding to postpone surgery, even if the murmur appeared sinister. Most candidates focused only on the murmur and did not discuss other perioperative considerations, such as the specific needs of a paediatric patient, implications for anaesthesia, or the requirements for laparoscopic surgery. Few candidates recognised the necessity for further evaluation, even if the murmur seemed benign and the operation proceeded. Some misread the question as open hernia repair, which led to the omission of laparoscopic considerations and incorrect analgesic choices. Others failed to commit to a clear decision on whether to proceed with surgery, despite identifying features of a pathological murmur.

Many answers were incomplete, with candidates often basing their decisions solely on the murmur's features and neglecting other important aspects, such as premedication, avoidance of prolonged fasting, parental presence, inhalational induction, choice of analgesia, physiologic implications of laparoscopy, patient positioning, securing intravenous access, hydration, extubation strategy, antiemesis, and antibiotic prophylaxis. Some included irrelevant points, such as the complexities of hernia surgery with significant blood loss and the need for group and crossmatch (GXM), which suggested clinical inexperience. A few incorrectly focused on obesity-related concerns, such as difficult airway and intravenous access, which were not relevant to the scenario and did not earn marks.

Most candidates could differentiate between innocent and pathological murmurs, which was done well. However, improvement is needed in providing specific, scenario-based answers rather than generic paediatric considerations. Few candidates demonstrated an understanding of the anaesthetic considerations for simple, uncomplicated laparoscopic surgery in children, and many failed to mention the physiologic implications of pneumoperitoneum and patient positioning. There was also a knowledge gap regarding the appropriate analgesic options for laparoscopic hernia repair, with many suggesting caudal anaesthesia or bilateral ilioinguinal nerve blocks, which are not suitable for this procedure.

Paper Two, Question Six:

A 35-year-old man is admitted for drug-induced sleep endoscopy (DISE).

A: How is the severity of obstructive sleep apnoea (OSA) graded based on the polysomnography findings? (20%)

B: Justify your anaesthesia management for DISE. (50%)

C: The patient has severe OSA and is scheduled for uvulo-palatopharyngoplasty. List your anaesthetic considerations. (30%)

Pass Rate: 43%

To achieve a pass for this question, candidates should accurately describe the grading of obstructive sleep apnoea (OSA) severity using polysomnography findings, specifically how severe OSA is defined. For drug-induced sleep endoscopy (DISE), candidates should explain that the procedure requires procedural sedation in a location with monitoring and resuscitation facility (commonly operating theatre), with gradual titration of sedation (using a sensible agent such as propofol) guided by clinical signs (e.g., snoring) and monitoring (e.g., BIS or Sedline) to replicate natural sleep and allow dynamic airway assessment. The answer should also mention the need for full monitoring, careful secretion management, and readiness for airway intervention if required.

In addition, candidates should list key anaesthetic considerations for uvulopalatopharyngoplasty (UPPPT) in patients with OSA. These include screening for OSA-related complications (such as arrhythmias and pulmonary hypertension), preparing for a potentially difficult airway, selecting an appropriate endotracheal tube, using a multimodal and opioid-sparing analgesic approach, reducing airway oedema with steroids, ensuring awake extubation, and arranging for postoperative high-dependency or intensive care monitoring etc.

Most candidates demonstrated awareness of the anaesthetic considerations for obstructive sleep apnoea (OSA), drug-induced sleep endoscopy (DISE), and uvulopalatopharyngoplasty (UPPPT), although not all were able to express these points clearly.

However, there were notable gaps in knowledge. Many candidates did not know the correct criteria for grading mild, moderate, and severe OSA based on the apnoea-hypopnoea index (AHI), with several incorrectly believing that severe OSA is defined as an AHI greater than 15. No candidate mentioned the respiratory disturbance index (RDI) as an alternative grading measure. Additionally, a few candidates confused DISE with UPPPT, indicating either they have misread the question or a lack of understanding of the differences between these procedures.

Paper Two, Question Seven:

A 76-year-old woman undergoes an elective laparoscopic hysterectomy. Following induction of general anaesthesia, a supraglottic airway device (SAD) is placed and positive pressure ventilation started.

A: List the predisposing factors for regurgitation and aspiration during general anaesthesia with a SAD. (40%)

Shortly after commencement of the surgery, the airway pressure increases, and noisy ventilation is heard. Yellowish fluid is seen oozing from the patient's mouth, and into the SAD and breathing circuit. The patient desaturates to 90%.

B: Describe your management of this situation. (60%)

Pass Rate: 67%

For the first part of this question, candidates are expected to list a range of predisposing factors for regurgitation and aspiration, including those that are patient-related (e.g. full stomach, obesity), surgical factors (e.g. pneumoperitoneum, Trendelenburg position, prolonged surgery), anaesthesia-related (e.g. inadequate depth, positive pressure ventilation, use of nitrous oxide), and device-related (e.g. poor cuff seal, device displacement).

For the second part of this question, the expected answer on management should outline the key initial steps in response to aspiration, including calling for help, alerting the surgical team, adopting an ABC approach, maintaining head-down tilt, removing the SAD, oropharyngeal suction, administering 100% oxygen, and securing the airway by intubation. The answer should also include a description on subsequent supportive management, such as positive pressure ventilation, bronchodilator therapy if needed, early bronchoscopy for particulate aspiration, and decisions regarding continuation of surgery and postoperative care.

Candidates generally performed well in recognising the urgency of the situation and treating it as an emergency. Most appropriately called for help, ensured proper documentation and incident reporting.

However, several areas required improvement. Many candidates failed to identify prolonged procedures or anaesthesia as risk factors for aspiration. Few mentioned the significance of supraglottic airway device seal and positioning as contributing factors. The urgency of removing the laryngeal mask airway (LMA) was often overlooked, as was the need for immediate suctioning both before and after intubation and instituting intermittent positive pressure ventilation (IPPV) and positive end-expiratory pressure (PEEP) following intubation.

Paper Two, Question Eight:

A 70-year-old man with a 50-pack year smoking history is scheduled for minimally invasive three-field oesophagectomy for carcinoma of his upper oesophagus.

A: Discuss the airway management options for this surgery. (40%)

After initiation of one-lung-ventilation for the thoracoscopic phase of the surgery, the patient develops a progressive rise in the measured end-tidal CO_2.

B: List the differential diagnoses and describe your management. (60%)

Pass Rate: 50%

The first part of the question requires a discussion of airway management options for minimally invasive three-field McKeown oesophagectomy. This includes explaining the need for lung isolation during the thoracic phase, comparing the use of a single-lumen endotracheal tube with a bronchial blocker versus a left-sided double-lumen tube, and discussing their respective advantages and disadvantages. Candidates should also mention the importance of assessing the patient's airway, considering the risk of gastro-oesophageal reflux, and consulting with the surgical team regarding airway preferences.

For the management of a progressive rise in end-tidal CO_2 after initiating one-lung ventilation, a passing answer should include at least four to five differential diagnoses, with at least two each from respiratory and equipment-related causes. Candidates must then outline appropriate initial steps, such as checking oxygen saturation, airway pressures, tube or blocker position, and ventilator settings, as well as further management tailored to the underlying cause (e.g. treating bronchospasm, managing pulmonary oedema, addressing malignant hyperthermia, or correcting equipment faults).

Many candidates successfully outlined the advantages and disadvantages of using a double-lumen tube (DLT) versus a single-lumen endotracheal tube (ETT) with a bronchial blocker. This demonstrated a good understanding of the technical aspects of airway management for oesophagectomy.

However, time management was a significant issue, particularly as this was the last question in Paper 2. Several candidates failed to complete their answers, which affected their performance. It was clear from the responses which candidates had direct experience with three-stage oesophagectomy and one-lung ventilation. Prospective candidates are advised to review their clinical experience and case logs to ensure they are adequately prepared for the exam.

Prepared by:
Adj A/Prof Tay Kwang Hui, Chief Examiner
Master of Medicine (Anaesthesiology) Examination Committee
17 July 2025