Single Best Answer MCQs

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The FRCA examinations are undergoing a major review. In the Final Examination, negative marking was removed from the MCQ in 2008, and the written and oral components were uncoupled, with pass/fail examinations being introduced from the autumn of 2009. In September 2010, single best answer (SBA) questions will be introduced into the Final FRCA MCQ paper.

Why introduce SBAs to the Final Examination?

In 2007, the Postgraduate Medical Education and Training Board (PMETB) challenged the Royal College of Anaesthetists to ‘reconsider the format and marking of its examinations, taking into account contemporary literature and models of best (examining) practice’. With respect to the MCQ examinations, the College has always relied exclusively on the traditional multiple true-false (MTF) type question with which we are all familiar. However, times change and it is clear that all of the other major UK post-graduate medical examinations are using alternative genres of MCQ question, namely SBAs, and/or extended matching questions (EMQs).

SBAs are used widely in UK undergraduate medicine, and are also used by the GMC in the assessment of poorly performing doctors. The RCoA has recently collaborated with the GMC in producing speciality specific questions for this purpose. SBAs also have a key role in overseas anaesthesia examinations (for instance, in the Final FANZCA in Australasia, and the American Boards examination in the USA.).

What are the advantages of SBAs as an assessment tool?

Traditional MTF questions are useful where it is important to assess factual recall of essential knowledge, for example, in management protocols for emergency situations. However, this style of question does not allow facts to be placed in context, or lend itself to testing the application of knowledge and problem solving that is so essential in clinical practice. This is where SBAs can be invaluable; they allow the candidate to demonstrate that they ‘know how’ rather than simply ‘know’, and this is a fundamental principle of the assessment of clinical skill.

What are the plans for introduction of SBAs?

The current Final FRCA MCQ paper consists of 90 MTF questions to be answered within three hours. From September 2010, the MCQ paper will comprise 60 MTF questions together with 30 SBAs, also within three hours. The construct of the existing and revised papers are shown below. The Primary FRCA Examining Board is also considering the use of SBAs, but no decision about their introduction to the Primary Examination has been taken at the time of writing.

SBAs will be confined to the assessment of areas of clinical anaesthesia, intensive care and pain medicine. It is important to emphasise that MTF questions will remain as an important part of the MCQ examination for the foreseeable future, in order to assess essential factual knowledge elements of the final curriculum to which they are best suited.
Experience from pilot examinations has confirmed that the timings will remain appropriate following the introduction of the new style of questions. The mark allocation for MTFs will remain at five marks per question. For SBAs, the mark allocation is four marks for each correctly answered question. This is based on the principle being to discount four responses to arrive at the fifth Single Best Answer.

**What is the construct of an SBA question?**

Questions are written by individual examiners, and then refined by an MCQ sub-group who agree the single best answer using evidence from the published literature, standard texts or expert opinion, and consensus from the members of the examining board.

SBAs consist of a stem, lead-in question and five options. The stem is a clinical vignette in clinical anaesthesia, intensive care or pain medicine (acute or chronic). The stem has a maximum of 60 words focusing on a single problem. The lead-in is short and precise and poses a single question. The five options should all be possible solutions or responses to the question arising from the stem. However, one of the options will be the best response, and the remaining four will be inferior.

A useful approach for candidates is to read the stem and lead-in question while covering up the five options so that they cannot be seen. The answer that occurs to a well-prepared candidate at this stage, and then appears in the list of options, is likely to be the correct best response. Candidates make a single mark on their answer sheet next to their choice for each question. Marks will only be awarded for a single correct answer. If candidates make more than one response to a question then no marks will be awarded for that question.

Three examples of SBAs taken from the three clinical areas outlined above now follow.

**A. Clinical Anaesthesia**

A previously fit 78 year-old man has a transurethral resection of the prostate (TURP) performed under general anaesthesia taking 90 minutes to complete. Half an hour after arrival in the recovery room he has not regained consciousness. Respiratory effort is adequate and vital signs are stable.

Which of the following deranged investigations is most likely to account for his current clinical condition?

A. Haemoglobin 7.1 g/dl
B. Serum sodium 114 mmol/L
C. Serum glucose 2.8 mmol/L
D. PaO\textsubscript{2} 8.9 kPa (FiO\textsubscript{2} = 0.35)
E. PaCO\textsubscript{2} 7.4 kPa

**ANSWER = B**
B. Intensive Care Medicine

A 75 year-old man is admitted to HDU following an episode of severe chest pain and collapse with transient loss of consciousness. On admission he is conscious and complaining of chest pain radiating into his back. Blood pressure measured in the right arm is 210/110. The left radial pulse is absent and there are signs of a left hemiparesis.

Which one of the following is the most likely diagnosis?

A. Acute pulmonary embolism  
B. Acute myocardial infarction with systemic embolisation.  
C. Dissecting aneurysm of the thoracic aorta  
D. Acute rupture of the aortic valve  
E. Rupture of a mycotic aneurysm of the aortic arch  

ANSWER = C

C. Pain Management

A previously fit 5-year-old girl is distressed and in severe pain in the recovery room following emergency appendicectomy. She is awake and cardiovascularly stable. Intraoperatively, she received fentanyl 2 mcg kg\(^{-1}\) iv, paracetamol 15 mg kg\(^{-1}\) iv & diclofenac 1mg kg\(^{-1}\) PR.

What would be the most appropriate analgesia option for her now?

A. Administer Entonox until the child calms down  
B. Codeine phosphate 1 mg kg\(^{-1}\) orally  
C. Codeine phosphate 1 mg kg\(^{-1}\) intramuscularly  
D. An intravenous morphine infusion at 10 mcg kg\(^{-1}\) hour\(^{-1}\)  
E. Morphine 0.1 mg kg\(^{-1}\) intravenous bolus  

ANSWER = E

References

1. McCourbie P. Improving the fairness of MCQs. Medical Teacher 2004; 26: 709-12
2. Tomlinson A. Changes to the FRCA examinations. RCOA Bulletin 2008; 52: 2690-92
Current MCQ format

90 T/F MCQ in three hours:
• 20 questions in medicine and surgery
• 40 questions in anaesthesia and pain management including applied basic sciences (mainly pharmacology and physiology ~ 10 Qs)
• 10 questions in clinical measurement
• 20 questions in intensive therapy

Revised MCQ format from September 2010

60 T/F MCQs + 30 SBAs in three hours:
• 20 T/F questions in medicine and surgery
• 20 T/F questions in applied basic science (including clinical measurement)
• 15 T/F questions in intensive care medicine
• 5 T/F questions in pain management
• 20 SBA questions in clinical anaesthesia
• 5 SBA questions in intensive care medicine
• 5 SBA questions in pain management