Section 1 General Advice for the FRCS (Tr&Orth) Oral Examination

Chapter 1

Candidate Guidance for the Section 1 Written SBA Paper

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The FRCS (Tr&Orth) examination comprises two parts (termed Sections), and transition to the Section 2 clinical and viva voce examination is dependent upon candidates passing the Section 1 written component.

The Exam Format

Section 1 is the written component of the Intercollegiate Examination in Trauma and Orthopaedic Surgery.

Section 1 examinations are currently held at Pearson VUE Test Centres at multiple locations throughout the United Kingdom and Ireland. Candidates can choose their preferred centre during registration. These test centres often host unrelated tests (e.g. driving theory, USMLE) that take place alongside the Section 1 examination. Computer stations are separated by dividers to help minimise visual distraction. Be prepared to focus so as not to be distracted by the movements of others. Some candidates may choose to travel further to utilise quieter test centres.

Candidates should bring photographic identification on the day of the exam. This is checked at registration and again before entry into the examination room. Exam conditions are strict. Bags and all but essential items will be stored in the lockers provided at most centres. Unsurprisingly, no mobile devices are permitted in the examination room. Video surveillance of candidates is common. Depending on the location, it is recommended to bring lunch, as some centres do not have local facilities to purchase food. Paper and a pencil are provided for making notes.

The computer-based questions include multimedia images such as radiographs and clinical photographs. Candidates are not permitted to read ahead but will be able to flag difficult or ambiguous questions for later review.

Overview

At the time of publication, the Section 1 examination consists of two papers as follows:

Paper 1 Single best answer (SBA) – 120 questions (2 hours 15 minutes)

Paper 2 Single best answer (SBA) – 120 questions (2 hours 15 minutes)

Total 4 hours 30 minutes – 240 questions

Candidates will have a 7-year period to complete the examination process for Section 1 (written SBAs) and Section 2 (clinicals). Please check the JCIE website for up to date candidate information and guidance (www.jcie.org.uk).

Candidates will have a maximum of 4 attempts in total at each Section across both the Intercollegiate Specialty Examinations and the Joint Surgical Colleges Fellowship Examinations (i.e., the total of 4 attempts applies to the Intercollegiate Specialty Examinations and the Joint Surgical Colleges Fellowship Examinations alone or any combination of the two).

Candidates with proven dyslexia may be eligible for the Section 1 and Section 2 examination times to be extended and this should be highlighted in advance of the exam.

There is no negative marking; therefore, all questions should be attempted. Sample questions can be viewed on the JCIE website. Experienced examiners perform a formal process of standard setting to decide the final pass mark for each paper. The SBA questions are subject to quality assurance procedures, including feedback from both examiners and candidates. Difficulty level, content, discrimination index and internal consistency are analysed. Ambiguous questions or those deemed insufficient to differentiate between candidates are removed through this process.

The SBA questions consist of an introductory theme, a question stem and five possible responses (listed A–E), of which one is the most appropriate answer. SBA questions are exactly what the name suggests: candidates choose the best from five possible answers. It is important to note that this is not a 'single

correct answer' but a 'single best answer'. Moreover, all five possible answers could be considered correct, but candidates are asked which is best, or most appropriate, given the information provided. As questions are designed to test higher order thinking, this could mean that limited or irrelevant information is provided. Questions require a judgement based on interpretation of the available evidence. Questions that candidates later complain about, for example, 'there was more than one correct answer' or that a question was 'too ambiguous', can often prove the best performing questions. Although the standard is widely publicised to be set at the level of a day one consultant working in the generality of trauma and orthopaedics, candidates should appreciate that some questions will appear more niche and stretch them more than others.

At the time of publication, consideration is being made to reduce the total number of SBAs in Section 1 (perhaps reducing from 240 to 180 questions). We await to see future developments and candidates should review the JCIE website for any future changes.

Advantages of SBA questions:

- They can assess higher order learning and discriminate between candidates of differing ability.
- They can assess a broad sample of the curriculum within a relatively short period of time, which helps to improve reliability and validity.
- With all trainees assessed using the same highly standardised questions, they make for a fair assessment.
- Automated marking helps to remove examiner subjectivity and reduce costs.
- The pitfalls of other question formats (e.g. extended matching, true/false) make SBA questions a popular choice for high-stakes examinations such as the FRCS.

Disadvantages of SBA questions:

- A candidate's reasoning for selecting a particular answer cannot be assessed.
- Despite permitting a broad assessment of the curriculum, there is little opportunity to focus in-depth on a particular subject.
- They rarely reflect the real-life practices of surgical diagnosis and management, which are varied and nuanced.

The five example SBA questions provided on the JCIE website are shown opposite.

1. A 35-year-old man has a combined ACL rupture and posterolateral instability. There is a bony varus knee deformity with lateral thrust in the stance phase of gait.
   What is the most appropriate treatment for this patient?
   A. ACL reconstruction alone
   B. Distal femoral osteotomy
   C. Reconstruction of the posterolateral corner alone
   D. Simultaneous reconstruction of the ACL and the posterolateral corner
   E. Valgus osteotomy and ligament reconstruction simultaneously

2. A 4-year-old girl has had a swollen, painless left knee joint for eight weeks. In the last ten days her left ankle has become swollen. It is uncomfortable after she has been sitting for twenty minutes. Examination of her eyes shows an irregular pupil on the right side.
   What is the most appropriate first step in the management of this patient?
   A. A painful heel due to enthesiopathy is a common associated condition.
   B. Her pupillary abnormality is likely to be due to a dislocated lens
   C. Synovectomy leads to improved joint function over the short and medium term
   D. The HLA B27 gene is a strong marker for this condition
   E. This child is likely to be rheumatoid factor negative

3. A 25-year-old man had an acute dislocation of his shoulder, which was reduced. During the follow-up visit he was found to have wasting of the deltoid and the infraspinatus muscles.
   Injury to which one of the following neural structure accounts for this finding?
   A. Axillary nerve
   B. Lateral cord of the brachial plexus
   C. Posterior cord of the brachial plexus
   D. Suprascapular nerve
   E. Upper trunk of the brachial plexus

4. A 20-year-old woman has had low back pain for the last six months. She has no fever or constitutional symptoms. Radiographs of her thoracic

spine show coarse striations of the vertical trabeculae of the 12th thoracic vertebra. Her ESR is normal.

What is the most likely diagnosis?

A. Bone cyst
B. Fibrous dysplasia
C. Haemangioma
D. Non-ossifying fibroma
E. Osteoblastoma

5. **Considering Hawkins type 3 talar neck fractures, which of the following statements is correct?**
   A. Medial malleolar osteotomy should be avoided because of danger to the blood supply
   B. Talar osteoporosis after three months indicates satisfactory fracture healing
   C. The rate of talar avascular necrosis is related to the rapidity of reduction
   D. The risk of avascular necrosis is 90%
   E. The sub-talar joint is not involved

What is the Relevance of the FRCS (Tr&Orth) Examination?

The FRCS (Tr&Orth) examination helps to reassure patients, the GMC and employers that a candidate has reached the necessary standard required for independent practice as a consultant surgeon. The reference level is that of a day one consultant working in a district general hospital in the generality of trauma and orthopaedic surgery. It is important for the public to have confidence in the process. The exam assesses knowledge and judgement, clinical acumen, management and treatment planning, in addition to communication skills.

Bloom's Level 1, 2 and 3 Questions

The Section 1 examination is designed to test knowledge from across the Trauma and Orthopaedics (T&O) curriculum by using questions that require higher order thinking. Bloom's Taxonomy defines six cognitive categories: knowledge, comprehension, application, analysis, synthesis and evaluation. The taxonomy presents a cumulative hierarchy, with categories ordered from simple to complex and concrete to abstract. The five categories that follow knowledge cover skills and abilities, with mastery of simpler levels considered a prerequisite for mastery of the next more complex level. Rather than assessing factual recall (level 1 questions), the FRCS (Tr&Orth) examination aims to assess each candidate's ability to apply their knowledge to solve a clinical scenario or problem (level 2 and 3 questions). Higher order questions make up most of the question bank, and the aim is to increase the proportion further.

The difference between level 1 and level 2 questions is best illustrated with an example. For a tibial shaft fracture:

> Level 1: How do you classify (knowledge), how are you going to manage the fracture and what is your operative technique?
>
> Level 2: What will be your treatment plan for the patient?

Higher order thinking is being replaced with the term 'higher order judgement'. The difference is best illustrated with an example. For a tibial plateau fracture, higher order thinking may test why the fracture is classified as a Schatzker type III rather than type II. With higher order judgement the patient is presented as a 46-year-old man with a tibial plateau fracture that has 4 mm of articular depression. This fracture would normally require operative fixation with grafting and elevation of the articular surface. However, the scenario is expanded to include the patient's medical history, which includes diabetes, peripheral vascular disease and chronic alcohol abuse. Candidates are expected to make a judgement based on clinical experience. How one manages this patient in reality may differ significantly from what is outlined in the textbooks! The examination is designed to assess real-life decision-making.

Multilogical thinking is a new and evolving concept in exam theory that pertains to questions requiring knowledge of more than one fact to logically and systematically apply concepts to solve a problem or clinical scenario. Such questions present multiple viable answers and are highly valued for their capacity to differentiate between candidates.

Shifting Challenges of the Section 1 and Section 2 Examination

During the Covid pandemic, patients were removed from the Section 2 examination and replaced with clinical photographs and images. This unsettling period required new clinical VIVA questions to be written for the new exam format. Candidate

unfamiliarity with the new format created anxiety, and patients returned to the Section 2 intermediate cases in November 2022. At the time of publication, the short cases continue without patient involvement and the long-term plan for patient involvement remains unconfirmed. Many of the short case clinical pictures are to be replaced with short video clips.

For the International FRCS (Tr&Orth) examination it is likely that patients will not be reintroduced and that the Covid format will continue indefinitely.

Due to reduced patient involvement in Section 2, it is felt that candidates will need to be more robustly tested on clinical examination scenarios in the Section 1 examination. Traditionally, Section 1 had high pass rates and was considered as passable for most candidates to progress to the more difficult Section 2 examination. Following the Covid-era format changes, there has been a move to ensure Section 1 provides a more rigorous assessment of candidate knowledge and clinical understanding. This has proven a shock to many candidates expecting to sail through their Section 1 examination with minimum of effort. In addition, SBAs are now more clinically focused, with each requiring higher order thinking to work out the 'most correct' answer rather than the learning of facts from traditional orthopaedic revision textbooks that had proven sufficient when preparing for previous Section 1 examinations.

General Advice

The Section 1 examination seeks to test background knowledge and judgement that will have developed during daily clinical work, rather than abstract facts from a book. The exam, and the preceding revision period, will be stressful and exhausting. Plan upcoming clinical rotations to ensure that they will permit the necessary time for revision and cover gaps in clinical knowledge and experience. Such placements should also allow for the clustering of annual and study leave for revision and courses in the weeks leading up to both parts of the examination. It is generally recommended to start revising at least 6 months before the Section 1 examination. Candidates who report preparing for just a few months are either superbly talented, incredibly lucky or inappropriately misleading. Avoid accepting unrelated projects, such as research or audits, in the months ahead of your revision.

Candidates should ensure that they are physically and mentally prepared. Eating a well-balanced diet, keeping hydrated, minimising alcohol intake and taking regular revision breaks are all advised. Engaging with regular physical activity and hobbies will also help to improve concentration and well-being. It will prove helpful to allocate an evening or afternoon per week to spend with family and friends. Concentrate on sleep hygiene in the weeks and months preceding the examination. Remember that caffeine has a half-life of 4–6 hours, meaning that it will take up to 24 hours for it to be cleared. Additionally, maintain a clear distinction between revision and relaxation by avoiding bedroom-based revision if possible.

After completing a bank of questions, it is important to allocate sufficient time to review the answers, which can take far longer than expected. With this in mind, consider supplementing evening revision with early morning revision. Every candidate will have different home circumstances and revision preferences, so it is important to create a personal schedule that suits. Identify areas of knowledge that are lacking early in your revision journey and tackle these subjects head-on (i.e. do not delay congenital hand, stress-strain theory or brachial plexus revision until the weeks before Section 1!). Avoid wasting time by reading around answers for questions that were answered correctly and with relative certainty. There is insufficient time for this feel-good approach given the breadth of the T&O curriculum. It is a valuable revision strategy to review correctly answered questions that were based on a lucky or best guess. Reviewing these questions will help consolidate your knowledge. Many candidates soon realise that practising questions must be prioritised over reading or making detailed notes.

The following advice may be useful:

- Troublesome questions are made more difficult if candidates are underprepared. Understand the breadth of the T&O curriculum and practice the SBA question format to develop the required exam technique.
- Confront difficult areas of the curriculum early and avoid burying topics for the few weeks preceding the examination, as this consolidation stage is associated with its own stresses.
- One mark can make the difference between a pass and a fail. Practice questions at the correct knowledge level and under timed conditions. Some websites permit the setting of a time limit for each question. At the start of your revision,

consider allocating 70–80 seconds per question and reduce this to 50–60 seconds as your knowledge and familiarity improve.

- Efficient time management during the Section 1 examination is important. Go fast. Candidates have only one minute to read and interpret each question, consider the options and indicate an answer. Some questions will present cases with a longer stem.
- Each question carries a 1 in 5 chance of being correct, so be sure to provide an answer for every question. There is no negative marking.
- If an answer is not immediately clear, flag the question, mark a best guess (preferred to leaving it unanswered) and move on promptly with the foresight that returning later may not be possible. Flagging a question electronically will help expedite later review. Marking a best guess will avoid the common error of running out of time and throwing away marks.
- Read questions carefully and understand fully what the question stem is asking. All of the options presented may not be ideal, but one must be selected from the options available. Additionally, the answer to questions requesting the 'most appropriate management' may differ from those asking the 'next most appropriate step in management'.
- Candidate feedback suggests that around 20% of questions are straightforward. These test standard textbook knowledge, with answers easily narrowed down to perhaps two options (level 1). The remaining questions are less obvious, with detailed or ambiguous stems and similar answers requiring a more considered judgement (levels 2 and 3).
- Do not assume that ambiguous questions will be removed during the final quality assurance process, as very few questions are actually removed.
- In recent examinations there has been a greater emphasis on higher order anatomy questions. Consider reading an anatomy textbook and practice anatomy questions.

The Build-Up to the Examination

Much of the knowledge and judgement required for the FRCS (Tr&Orth) examination will have been acquired during training; however, the T&O syllabus is extensive, and the examination requires a lot of preparation. Applications are made through the JCIE website, where guidance notes, eligibility criteria and future dates for Sections 1 and 2 can be reviewed. Candidates should plan their preferred date or 'diet' for Section 1 after considering their likely personal and professional circumstances. For UK trainees with a National Training Number (NTN), the date of their ST6 ARCP review is an important waypoint. NTN trainees must achieve an Outcome 1 at their ST6 ARCP before they are eligible to apply. Those not in training are required to demonstrate a level of competence and knowledge equivalent to that achieved by NTN trainees at the end of ST6.

Be sure to read the JCIE 'Guidance Notes for Applicants' document far in advance of making an application.

The Section 1 examination is usually timed a few months ahead of the next Section 2 (clinical and viva voce) examination. The preferred exam dates for both parts are requested at the time of initial application; however, the date for Section 2 will only be confirmed after Section 1 is passed. First-time applicants must submit their application with full payment for both Sections ahead of the published deadlines, which are set approximately 10–12 weeks ahead of each Section 1 examination. The number of candidates permitted to complete Section 2 at each diet is capped and it is widely understood that candidates who apply far in advance of the application deadline are more likely to secure their preferred Section 2 date if successful at Section 1.

The following must be satisfied when completing the online application:

- Payment in full (covering Sections 1 and 2)
- Three completed Structured Reference forms
- Curriculum vitae
- Summary of operative experience
- Photographic identification

NTN trainees should submit three Structured Reference forms, including one completed by their Training Programme Director (TPD) and two by other consultants. Applicants not in training should provide structured references from the head of department (clinical lead) and two other consultants. To avoid unnecessary delays, candidates should contact potential referees far in advance of their planned application date.

Fee penalties apply to candidates who withdraw from the exam after the closing date, so choose the

preferred date carefully after considering all the aforementioned circumstances. It should be noted that candidates who withdraw during an examination will be deemed to have failed and will forfeit one of their four attempts.

Preparation and Revision Resources

Approaching the examination as a single assessment consisting of two parts (as opposed to two separate entities) is the preferred revision strategy. The common denominator for Sections 1 and 2 is for candidates to develop knowledge that is of sufficient breadth and depth. Those who begin by revising topics using textbooks and online resources before proceeding to SBA question practice often succeed in passing both parts in successive diets (e.g. February Section 1 followed by April Section 2). In contrast, those who approach Section 1 by concentrating heavily on questions may require a longer interval to convert the SBA 'best of 5' skill to that of being able to coherently elaborate and expand on topics during the Section 2 viva voce examination. A combination of both strategies is perhaps the best compromise. Whatever strategy is adopted, be sure to dedicate sufficient time to practice the SBA question format, aiming to complete a few thousand questions as a minimum. Questions will not only reinforce and test knowledge, but also help to gauge the time constraints of the actual exam.

Although fundamental to preparing for the Section 2 examination (clinical and viva voce), some candidates find an informal study group helpful during Section 1. Peer-to-peer teaching and discussion is a powerful learning tool. Although group learning can take various forms, verbalising knowledge according to a structured revision timetable can prove useful, especially ahead of the Section 2 examination. Revision groups should be limited to a small number of individuals who share similar knowledge levels, plan to sit the exam on the same date and are fully committed to the process. Moreover, it is important to recognise when revision methods are proving ineffectual as evidenced by poor progression or revision group distraction or fatigue. Candidates should be honest with their study partners if this becomes the reality and refocus or redesign their revision strategy at the earliest opportunity. Finally, consistency and continuity are imperative, and candidates should avoid prolonged gaps in their revision.

The following revision resources are commonly used by candidates for the Section 1 examination:

- **Postgraduate Orthopaedics – The Candidate's Guide (3rd edition)**
  This comprehensive textbook helps to prepare candidates for the clinical and viva voce aspects of the Section 2 examination. It utilises concise prose, graphics, illustrations and case-based examples to consolidate knowledge gained during preparation for Section 1. Cases are designed to reflect those in the examination. Insights from recent candidates help to demonstrate good and bad practice during the viva voce examination. Although this textbook is oriented towards Section 2, the core topic sections will provide a useful revision aid for the questions found in Section 1.
- **Postgraduate Paediatric Orthopaedics**
  Although oriented towards the Section 2 examination, this textbook is packed with diagnostic and surgical tips that will aid success in both parts. The dysplasias section offers a structured methodology when approaching any skeletal dysplasia, and the cerebral palsy section touches on gait analysis with clear graphs of the types that could be asked in both parts of the exam.
- **Miller's Review of Orthopaedics (7th edition)**
  This comprehensive textbook presents the breadth of T&O surgical practice in one volume, including anatomy and the basic sciences. The book is aligned with the American Board of Orthopaedic Surgery examination but remains very popular for FRCS (Tr&Orth) revision, especially when preparing for Section 1. Recent editions are easier to read and include colour illustrations, clinical photographs and tables. Candidates may choose to focus on specific sections or chapters, read it in its entirety or use it as a reference alongside other resources.
- **Basic Orthopaedic Sciences (2nd edition)**
  This popular textbook for both parts of the exam aims to cover the basic sciences that underpin T&O surgical practice. Topics include biomechanics, biomaterials, immunology, pharmacology, imaging techniques and statistics. Some chapters read more clearly and accurately than others.
- **Orthopaedic Basic Science for the Postgraduate Examination: Practice MCQs and EMQs**[1]
  Included here are more than 500 multiple choice and extended matching questions related to

orthopaedic basic science. Detailed and insightful explanations are included for each question. The level of knowledge required is perhaps above that expected for the FRCS (Tr&Orth) examination but it is good to assess areas of the curriculum that are often neglected in everyday practice.

- **Postgraduate Orthopaedics: MCQs and EMQs for the FRCS (1st edition)**
  The predecessor to this SBA textbook was published in 2012. It contains an additional bank of quality SBA and EMQ questions that remain relevant to the FRCS (Tr&Orth) examination. Answer explanations are short but adequate for rapid revision. Candidates may consider using this older textbook later in their revision when they are better able to identify information that may be outdated.
- **AAOS Comprehensive Orthopaedic Review (2nd edition)**[2]
  This comprehensive and well-presented three-volume text is designed for the American Board examination. The final volume is dedicated to multiple choice question practice. An excellent but expensive resource.
- **Succeeding in the FRCS T&O Part 1 Exam**[3]
  This book has received mixed reviews, with the majority proving highly critical. Questions concentrate on factual recall and explanations can be confusing, unfocused and contradictory. It is perhaps a book to consider borrowing rather than buying and should not form a significant part of one's Section 1 preparation.
- **Practice Questions in Trauma and Orthopaedics for the FRCS**[4]
  The questions in this outdated book more closely reflect the standard of the MRCS examination and are far removed from that of the FRCS (Tr&Orth) Section 1 examination. Poor online reviews reflect the low level of knowledge examined.
- **First Aid for the Orthopaedic Boards (2nd Edition)**[5]
  This book is written for the in-service examinations (Orthopaedic In-Training Exam [OITE]) of the American Board. It receives mixed reviews, with the question style and depth differing from that observed in the FRCS (Tr&Orth) Section 1 examination. Although it is easy to read and may help you score a few extra points, it is expensive for what it provides.
- **Review Questions in Orthopaedics**[6]
  Originally written for orthopaedic residents preparing for the in-training (OITE) examinations of the American Board, this book (often termed the 'black book' by UK candidates) has remained a favourite supplementary question bank for the FRCS (Tr&Orth) Section 1 examination. Despite having been published in 2001, the comprehensive SBA questions and accompanying high-quality explanations have helped maintain its popularity. However, it may be time to re-evaluate, with recent candidates suggesting that the questions are outdated, difficult and esoteric when compared with the Section 1 examination.
- **1000 EMQs in Trauma and Orthopaedic Surgery**[7]
  This book does not reliably recreate the questions found in today's Section 1 examination and is of limited use. Some trainees have found the questions confusing and overly complicated. Perhaps doubly obsolete when considering that the EMQ format has been phased out.
- **FRCS (Tr&Orth): MCQ and Clinical Cases**[8]
  This book includes around 60 SBA questions and a similar number of worked viva voce cases taken from the *Bone & Joint Journal* (*BJJ*). Although most SBAs rely on factual recall (level 1), the book's primary merit lies with the good-quality explanations. Online reviews are mixed, with many preferring to use the book when preparing for the Section 2 examination.

Other Sources

- **Orthobullets**
  This website is an essential tool for the Section 1 examination. The generous question bank provides detailed explanations that link to the subject areas or chapters on the website. Candidates can revise topics and then construct sets of questions relevant to the area of focus (i.e. paediatric orthopaedics or arthroplasty). The website resembles a virtual textbook with topics generally covered in sufficient detail to guide revision. Topics appear to be loosely based on *Miller's Review of Orthopaedics*; however, bullet points largely replace the textbook prose, with a focus on American practice and the Board examination.

  The primary advantage of Orthobullets is the functionality that permits candidates to create bespoke SBA test papers. Candidates can set the

number and focus of the questions tested (i.e. random or subject-specific) and the time allocated per question. The site also maintains a record of performance, with scores presented according to test date and subject area. The primary disadvantage is that the free questions (more than 2,000) rely heavily on factual recall (level 1) and are generally of a standard below that required for the FRCS (Tr&Orth) examination. The paid-for premium content provides a higher standard but they still more closely resemble the style of the American Board examination.

- **UKITE**
  The United Kingdom In-Training Examination (UKITE) was established by the British Orthopaedic Association (BOA) in 2007 as a curriculum-based self-assessment tool for the FRCS (Tr&Orth) examination. It has evolved to emulate the Section 1 examination more closely. Although the breadth of the T&O curriculum is sampled, the UKITE assessment relies more heavily on questions testing factual recall. Completing the annual UKITE assessment during orthopaedic training is a useful formative assessment tool for monitoring progression and understanding the breadth of the T&O curriculum.
- **Postgraduate Orthopaedics**
  The newly revamped website includes SBA questions and case-based discussions that complement core revision material to help reinforce difficult key concepts and develop higher order thinking skills.

The Week of the Examination

As the Section 1 examination approaches, consider reducing exam day anxiety by travelling to the test centre in advance. Candidates should consider familiarising themselves with the venue, its surroundings and the available services (i.e. transport, parking, refreshments). For Section 2, consider arriving a day or more in advance of the exam for the reasons outlined above. Get into 'exam mode' by minimising distractions and arranging to meet other candidates for face-to-face practice.

Finally, good luck when revising for both parts of the FRCS (Tr&Orth) examination. It is a fair exam that represents the pinnacle of T&O surgical assessment and practice worldwide.

Notes

1 Dawson-Bowling SJ et al. *Orthopaedic Basic Science for the Postgraduate Examination: Practice MCQs and EMQs*. Gloucester: Orthopaedic Research UK Publishing; 2012.

2 Lieberman JR, ed. *AAOS Comprehensive Orthopaedic Review*. Rosemont, IL: American Academy of Orthopaedic Surgeons; 2009.

3 Gulam Attar F, Ibrahim T. *Succeeding in the FRCS T&O. Part 1: Exam*. London: BPP Learning Media; 2011.

4 Sharma P. *Practice Questions in Trauma and Orthopaedics for the FRCS (Master Pass Series)*. Milton Keynes: Radcliffe Publishing Ltd; 2007.

5 Mallinzak RA, Albritton MJ, Pickering TR. *First Aid for the Orthopaedic Boards*. 2nd ed. Bronson, TX: McGraw-Hill Medical; 2009.

6 Wright JM, Millett PJ, Crockett HC, Craig EV. *Review Questions in Orthopaedics*. Rosemont, IL: American Academy of Orthopaedic Surgeons; 2001.

7 Sharma H. *1000 EMQs in Trauma and Orthopaedic Surgery*. Glasgow: FRCS Orth Exam Education; 2008.

8 Khanduja V. *FRCS (Tr&Orth): MCQs and Clinical Cases*. London: JP Medical Ltd; 2014.

Chapter 2

SBA Writing Process

Paul Banaszkiewicz

Introduction

The National Board of Medical Examiners (NBME) item-writing manual is an excellent starting point for a more detailed analysis of the MCQ writing process.[1] It is widely referenced in this chapter, being a mainstay of guidance for question writers aiming to produce high-quality questions. The original 'red book' was updated to a 4th edition in 2016,[2] continuing to be the gold standard guidance book for improving the quality of multiple choice items.

The main question is: Do candidates really need to know the finer details of how to write good-quality SBAs and the processes involved in constructing the Section 1 paper? The answer is definitely yes, if you experience any major difficulties with this type of summative high-stakes exam. Some candidates do poorly with MCQ type questions, so any guidance is better than nothing.

For most candidates, some general information for the written paper is always useful, especially if it neatly summarises information from a variety of different sources that may be difficult or time-consuming to find otherwise.

Aims

By the end of this chapter, candidates should have a greater appreciation of the complexity of constructing SBAs to ensure a fair, valid and reliable Section 1 exam.

Going through the process of how SBAs are constructed will provide general guidance to a candidate in their overall preparation for Section 1.[3]

Investing extra time working through this chapter may score a candidate the extra couple of marks that may pull them over the line as a borderline pass.[4]

This chapter will make clear why there are so many poor-quality orthopaedic MCQ books out on the market. It is very difficult to construct a good-quality, new and relevant SBA and much easier to plagiarise existing questions already out there or spend an evening producing some poor-quality questions without understanding the sophisticated nuances of SBA construction.

Constructing good-quality SBAs needs considerable examiner training and question writers need to initially attend workshops for training and advice in their construction before being allowed to start contributing to the question bank.

Looking ahead, this chapter may prove useful reading if you end up writing MCQ type questions for exams in the future.

For aspiring TPDs or future examiners, it is important to know the intricacies of how to write SBAs and the processes involved in constructing the Section 1 paper. This will allow you to give more specific and useful advice to candidates who may be repeated failures on this section of the exam.

In any detailed lecture on Section 1 of the FRCS (Tr&Orth) exam reliability, content validity and educational theory (Miller's pyramid, Bloom's Taxonomy) are all discussed. Therefore, it is worth going over these terms since if unfamiliar these concepts can be difficult to grasp.

Last, those candidates with an educational slant will find the whole process of constructing the Section 1 exam fascinating.

Educational Theory

Miller in 1990 introduced an important framework that can be presented as four tiers/levels of a pyramid to categorise the different levels at which trainees needed to be assessed. Although SBAs can be used to test application of knowledge and higher order thinking, their construction is difficult and in general they assess the bottom two levels of 'knows' and 'knows how' in Miller's pyramid (Figure 2.1).[5]

Knows – Knowledge or information that the candidate has learned.

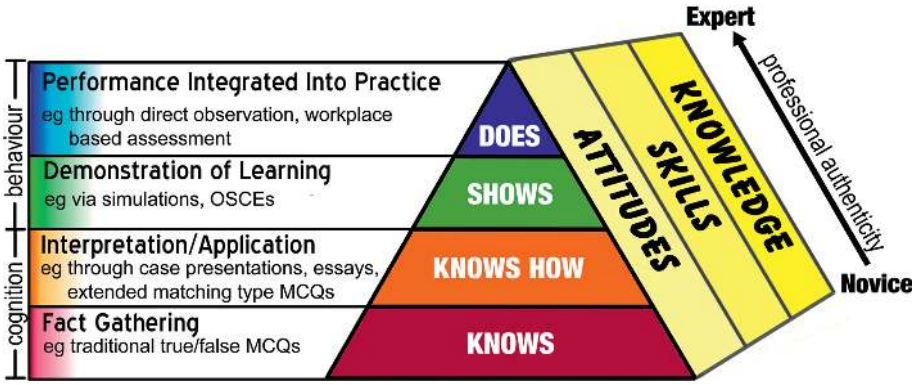

Figure 2.1 Miller's pyramid. The different layers represent the different components of clinical competency and how they can be assessed. WBAs attempt to assess how an individual performs in the workplace, i.e. what they actually do.

Knows how – Application of knowledge to medically relevant situations.

Shows how – Simulated demonstration of skills in an examination situation.

Does – Behaviour in real-life situations

Workplace-based assessments (WBAs) were introduced into the postgraduate curriculum because there were concerns that high-stakes examinations that used tests such as single best answers or EMI encouraged rote learning. It is also known that performance in a controlled assessment correlates poorly with actual performance in professional practice.

In 1956, Bloom et al.[6] described six levels in the cognitive domain: (1) knowledge recall; (2) comprehension; (3) application; (4) analysis; (5) evaluation; and (6) synthesis. Over the years Bloom's Taxonomy has been revised and alternative taxonomies created. A substantial revision occurred in 2001 to a more dynamic classification that uses action verbs to describe the cognitive processes and a rearrangement of the sequence within the taxonomy (Figure 2.2; Table 2.1).

More recently, the shape of Bloom's Taxonomy has been represented not as a pyramid – where there is a large base composed of facts and a tiny peak of creativity (which someone might interpret to mean that we should spend the majority of our time focusing purely on knowledge) to a broad wedge that better highlights the value of creating, evaluating and analysing (Figure 2.3).

Remembering: the candidate can remember previously learned material from long-term memory by recalling facts, terms, basic concepts and answers, e.g.
List the causes of . . .
What are the steps in . . . ?

Understanding: the candidate can explain ideas or concepts by organising, translating, interpreting, giving descriptions and stating main ideas, e.g.
Discuss the causes of . . .
Explain the pathophysiology.

Applying: the candidate can solve problems by applying acquired knowledge, facts, techniques and rules in a different way, e.g.
Provide a differential diagnosis.

Analysing: the candidate can distinguish between the different parts, how they relate to each other and to the overall structure and purpose. This involves examining and breaking information into parts by identifying motives or causes, making comparisons and finding evidence to support generalisations, e.g.
How will your differential diagnosis be altered in the light of investigation findings?

Evaluating: the candidate makes judgements and justifies decisions about information, presenting and defining opinions by making judgements about information, validity of ideas or quality of work based on a set of criteria e.g.
Justify your management of this patient.

Creating: the candidate puts elements together to form a functional whole, create a new product or point of view, e.g.
What will be your plan of management?

Bloom's Taxonomy is a hierarchical classification, with the lowest cognitive level being 'remembering' and the highest being 'creating'. The lower three levels