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

### The Exam Format

Part 1 is the written component of the Intercollegiate Examination in Trauma and Orthopaedic Surgery. In 2018 the Joint Committee on Intercollegiate Examinations (JCIE) agreed to phase out extended matching item (EMI) questions. When compared to single best answer (SBA), EMI questions were less able to differentiate candidates and were difficult to construct. Subject to General Medical Council (GMC) approval, EMI questions will not feature in the FRCS (Tr & Orth) examinations from January 2021 onwards.

Part 1 exams 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 Part 1 exam. 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 Part 1 exam consists of two papers as follows:

- **Paper 1** (2 hours)
  - Single best answer (SBA) – 110 questions

- **Paper 2** (2 hours 30 minutes)
  - Extended matching item (EMI) – 135 questions
    - 45 themes with option lists
    - 3 questions using each of these option lists

**Total**
- 4 hours 30 minutes – 245 questions

From January 2021 onwards (subject to GMC approval), the Part 1 exam will consist of two papers as follows:

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

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

**Total**
- 4 hours 30 minutes – 240 questions

Candidates will have a 2-year period from their first attempt to pass the Part 1 exam, with a maximum of four attempts with no re-entry. Details are available on the JCIE website (www.jcie.org.uk). Candidates with proven dyslexia may be eligible for the Part 1 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.

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. EMIs, true/false) make SBA questions a popular choice for high-stakes examinations like 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 below.

1. A 4-year-old girl has had a swollen, painless left knee joint for 8 weeks. In the last ten days her left ankle has become swollen. It is uncomfortable after she has been sitting for 20 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 enthesopathy 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

2. A 19-year-old motorcyclist is brought to the Emergency Department following an RTA. He is complaining of difficulty moving his left arm. Clinical examination suggests the latissimus dorsi, subscapularis, pectoralis major and pectoralis minor are functioning, but infraspinatus is not functioning.

   **Which part of the brachial plexus is most likely to have been injured?**
   A. The lateral cord
   B. The medial cord
   C. The middle trunk
   D. The posterior cord
   E. The upper trunk
3. 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

4. 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 infraspinatus muscles.

Injury to which one of the following neural structures 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

5. A 20-year-old woman has had low back pain for the past 6 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

What is the Relevance of the FRCS (Tr & Orth) Exam?
The FRCS (Tr & Orth) exam helps to reassure patients, the GMC and employers that a candidate has reached the necessary standard required for independent practice as a consultant. 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, as well as communication skills.

Bloom’s Level 1, 2 and 3 Questions
The Part 1 exam 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) exam 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 the majority of the question bank, and there is a drive to increase the proportion further.

The differences between level 1 and level 2 questions are best illustrated with an example.

For a tibial shaft fracture:
Level 1: How do you classify (knowledge), your management of the fracture and operative technique?
Level 2: What will be your treatment plan for the featured 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 4mm of articular depression. This fracture would normally require operative fixation with grafting and elevation of the articular surface. However, the scenario is expanded further 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 exam 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.

**General Advice**

The Part 1 exam 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. Candidates should ensure that they are physically and mentally prepared. Eating a well-balanced diet, keeping hydrated, minimising alcohol intake and taking regular breaks during revision are all advised. Engaging with regular physical activity 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 patterns in the weeks and months leading up to the exam. 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.

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 you. Identify areas of knowledge that are lacking and tackle these subjects head-on. Avoid wasting time by reading around answers to 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 practicing questions has to 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 practise 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 exam, 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 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 exam 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 long 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 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 exams 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 Exam

Much of the knowledge and judgement required for the FRCS (Tr & Orth) exam will have been acquired during training; however, the T&O syllabus is extensive, and the exam requires lots of preparation. Applications are made through the JCIE website where guidance notes, eligibility criteria and future dates for Parts 1 and 2 (termed Sections 1 and 2) can be reviewed. Candidates should plan their preferred date or ‘diet’ for Part 1 after considering their likely personal and professional circumstances and, for UK trainees with a National Training Number (NTN), the date of their ST6 ARCP. 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 Part 1 exam is usually timed a few months ahead of the next Part 2 (clinical and viva voce) exam. The preferred exam dates for both parts are requested at the time of initial application; however, the date for Part 2 will only be confirmed after Part 1 is passed. First-time applicants must submit their application with full payment for both Parts 1 and 2 ahead of the published deadlines, which are set approximately 10–12 weeks ahead of each Part 1 exam. The number of candidates permitted to complete Part 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 date for Part 2. The requirement for social distancing in response to the coronavirus pandemic may have implications for those sitting both Parts 1 and 2. Keep an eye on the JCIE website for further guidance.

The following must be satisfied when completing the online application:
- Payment in full (covering Parts 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 Program 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.

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 exam. It is generally recommended to start revising at least 6 months before the Part 1 exam. Candidates who report preparing for just a few months are either superbly talented, incredibly lucky or inappropriately misleading. Avoid accepting work-related projects, such as research, in the months ahead of your revision.

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 exam will be deemed to have failed and will forfeit one of their four attempts.

Preparation and Revision Resources

Approaching the exam as a single assessment consisting of two parts (as opposed to two separate entities) is the preferred revision strategy. The common denominator for Parts 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 Part 1 followed by April Part 2). In contrast, those who approach Part 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 Part 2 viva voce exam. 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 Part 2 exam (clinical and viva voce), some candidates find an informal study group helpful during Part 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 Part 2 exam. 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 Part 1 exam:

  This comprehensive textbook helps to prepare candidates for the clinical and viva voce aspects of the Part 2 exam. It utilises concise prose, graphics, illustrations and case-based examples to consolidate knowledge gained during preparation for Part 1. Cases are designed to reflect those in the exam. Insights from recent candidates helps to demonstrate good and bad practice during the viva voce exam. Although this textbook is oriented towards Part 2, the core topic sections will provide a useful revision aid for the questions found in Part 1.

- **Postgraduate Paediatric Orthopaedics**
  Although oriented towards the Part 2 exam, 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 exam but remains very popular for FRCS (Tr & Orth) revision, especially when preparing for Part 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**
  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) exam but good to test knowledge on 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 edition was published in 2012. It contains an additional bank of quality SBA and EMQ questions that remain relevant to the FRCS (Tr & Orth) exam. Answer explanations are short but adequate for rapid revision. Candidates may consider using this older textbook as a minimum. Questions will not only reinforce and test knowledge, but also help to gauge the time constraints of the actual exam.

More Information

Excerpt

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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 laid out three-volume text is designed for the American Board exam. The final volume is dedicated to multiple choice question practice. An excellent but expensive resource.

- Succeeding in the FRCS T&O Part 1 Exam³
  This book has received mixed online reviews, with the majority proving highly negative. 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 Part 1 preparation.

- Practice Questions in Trauma and Orthopaedics for the FRCS⁴
  The questions in this outdated book more closely reflect the standard of the MRCS exam and are far removed from that of the FRCS (Tr & Orth) Part 1 exam. 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 exams (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 Part 1 exam. 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 Orthopaedics⁶
  Originally written for orthopaedic residents preparing for the in-training (OITE) exams 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) Part 1 exam. 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 too dissimilar (outdated, difficult and esoteric) when compared to the Part 1 exam.

- 1000 EMQs in Trauma and Orthopaedic Surgery⁷
  This book does not reliably recreate the questions found in the Part 1 exam and is of limited use. Some trainees have found the questions confusing and overly complicated. Perhaps doubly obsolete when considering that the EMI questions are being phased out.

- FRCS (Tr & Orth): MCQ and Clinical Cases⁸
  This book includes around 60 SBA questions and 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 Part 2 exam.

Other Sources

- Orthobullets
  This website is an essential tool for the Part 1 exam. 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). 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, prose is largely replaced by bullet points, with a focus on American practice and the Board exam.

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⁷ Sharma H. 1000 EMQs in Trauma and Orthopaedic Surgery. Glasgow: FRCS Orth Exam Education; 2008.
Orthobullet’s primary advantage is the functionality for 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) exam. The paid-for premium content provides a higher standard but they still more closely resemble the style of the American Board exam.

- **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) exam. It has evolved to emulate the Part 1 exam 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 Exam**

As the Part 1 exam 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 Part 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) exam. It is a fair exam that represents the pinnacle of T&O surgical assessment and practice worldwide.