

Review of Primary FRCA Examination 2021- 2022

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Introduction

This document reports on the Primary FRCA for the academic year 2021-2022. The annual report was not produced in 2020 and 2021 due to the Covid-19 pandemic. A brief summary of those years will be included in this report. It is intended that the document will be of interest and value to examiners, staff and officers of the Royal College of Anaesthetists, the General Medical Council, trainees, trainers and members of the public.

The Primary FRCA consists of two separate components – a written component (undertaken 3 times a year) and an oral component (also undertaken 3 times a year). In this year, 2021-2022, the overall pass rate was 58.9% in the written examination and 56.2% in the oral examination.

The November 21 and January 22 diets of the oral exam were conducted online, moving back to a face-to-face setting in the College from May 2022. All written diets are delivered online with remote invigilation and there is no plan to change this delivery method.

The number of candidates in the oral and written components continues to vary from diet to diet. Candidate demand has been less predictable due to the effects of the pandemic and the associated derogation of exam regulations required. More recently the change of curriculum gives candidates an extra year on the deadline required to pass primary. The nature of the oral examination, comprising two components, OSCE and SOE, means that large numbers of applications for an exam diet creates significant pressure on the examining body. However, there is some mitigation from increased examiner recruitment over the last few years, as well as improvements in the examination process to ensure more efficient use of examiner time. Despite this, it has been necessary to run an additional OSCE day (usually on the Saturday of exam week) on each diet this academic year. Due to the pandemic, Core Group working parties that support the development of the exam, moved online but returned to a face-to-face setting in May and were scheduled where possible during the examining week to minimise the need to attend the college outside that time.

The effects of the pandemic (Academic years 19/20, 20/21)

The Covid-19 pandemic had a major impact on all examination processes for every Medical College. As a result of the lockdowns and mandatory social distancing, the May 2020 oral examination was cancelled. To allow the exams process to continue, work was undertaken to move the oral part of the exam onto an online platform. From the products available on the market, the written exams (MTF/SBA) were moved to TestReach, a platform which allows candidates to sit the exam remotely with external proctoring provided by TestReach. The oral examinations were moved onto Fry IT's platform "Practique". Practique is designed primarily for an OSCE circuit but was adapted for use in the SOE setting. An extensive amount of work was required to transfer exam material, including artefacts and marking schemes, onto the TestReach and Practique systems. Examining recommenced in online formats from September 2020 and for the oral component, continued until January 2022.

More time is required to conduct oral exams in an online environment. Initially the exam was delivered over two weeks, with examiners volunteering extra time. As the teams got more familiar with the systems, it was possible to run an exam, with the required capacity, over six days. To ensure maximum capacity, the SOE and OSCE exams were run on alternate separate days, which enabled the use of considerably more SOE tables and up to three virtual OSCE floors running simultaneously. This is not possible in the physical environment of face-to-face exams at the College. A number of retired examiners returned to support the additional exam requirements of examining online.

The pass-rates of the online examinations will be included in the tables below. These remained within the normal ranges that were seen prior to the pandemic when the exam was run solely at the College and at other venues around the UK for the written exams.

The Examination

The Primary exam consists of two parts:

- A written paper
- An oral day consisting of the Structured Oral Examination (SOE) & the Objective Structured Clinical Examination (OSCE)

The Primary exam tests the knowledge, understanding and application of basic sciences to anaesthetic practice along with an introduction to the clinical aspects of the profession. The science topics covered fall into the realms of physiology, pharmacology and physics.

The Primary MCQ Examination:

The Primary written exam comprises two sections:

- a) 45 Multiple True False (MTF) questions blueprinted to the Primary FRCA Examination and mapped against professionalism of Medical Practice based primarily upon physiology, pharmacology and physics/clinical measurement. This is a test of knowledge. Each MTF question comprises 5 "leaves". 1 mark is awarded for each correct MTF leaf with a total of 5 marks per question. Care is taken to ensure that the aggregate, historical, mean candidate score in each of the 45 questions lies between 0.75-0.81 (or 0.48-0.52 for questions that ran prior to September 2009 with negative marking), and that no more than 10% of the questions have run within 2 years of the exam under construction.
- b) 45 Single Best Answer (SBA) questions. These are designed to examine application of knowledge and are tested over the same curriculum as that examined in the MTF questions. Each SBA comprises 5 options and 4 marks are awarded for a correct answer. Candidates have expressed concern that the SBA questions may be detrimental to their chance of passing but since its inception, the pass rate on the SBA questions has been no lower than that in the MTF section and in the last few years has been significantly higher, improving the overall pass rate.

The MCQ Core Group convenes shortly after each written paper to review the performance of the questions. Candidate feedback on specific questions is discussed carefully and taken into consideration where the group determines it is appropriate. The latest three sittings have continued the historical trend of MTF questions appearing robust, performing well and demonstrating consistent psychometric statistics for reliability. The SBA questions continue to include a number of new questions that have been through a rigorous quality assurance process by the MCQ Core Group. The SBAs consistently perform well, with the best answer almost always chosen by the highest performing candidates so showing good discrimination.

A maximum total score of 225 is possible for the 45 MTF questions and a further 180 marks for the 45 SBA questions. There is no negative marking. Historically, the pass marks of the MTF and SBA sections of the paper are always derived separately using the independent Angoff scores of an extended group of current and previous MCQ Core Group members. Their remit is to score the likelihood that the 'minimally competent' candidate will arrive at the correct answer to each question set. It is noteworthy that the averaged Angoff scores used within the MCQ Examination have remained remarkably consistent over the years.

The Angoff derived mark for the MTF and SBA sections are summated and a reduction applied to allow for one standard error of measurement (SEM). The SEM is formed using a method which uses data from every candidate response to every question and derives a statistic which reports the reliability of the test, the KR-20. In the MCQ Exam, the applied SEM consistently reduces the pass mark in the candidates' favour by a further 9-10 marks. Furthermore, where statistical analysis derives marks that are not whole numbers, these are rounded down to again favour the candidates.

The KR-20 is a measure of internal reliability of the Examination and is influenced by the quality

and the number of test items, the candidate performance on every test item and the variance thereof. The combined KR-20 of the last three papers has been between 0.91-0.93 reflecting a reassuringly high reliability of testing. At the last three sittings, the KR-20 for the MTF section was between 0.89-0.90 and the SBA section between 0.78-0.79, the former reflecting the higher number of questions in the MTF section (each MTF comprises 5 sub questions (leaves)).

Candidate numbers across the current examination year at 1,175 is slightly down on the previous two years. The overall mean pass rate of 58.9% for the three sittings was similar to the mean pass rate of the previous 4 years at 58.62%.

The nominal pass rates in the SBA section continue to be significantly higher (mean 73.80%) than the MTF section (Mean 43.95%) and appear to be improving when looking at the mean nominal pass rates of the two sections over the previous four years (73.94% and 44.18% respectively). The higher performance of candidates in the SBA section offsets what would otherwise be a lower overall pass rate. This has been a consistent observation over the last five years.

The decision to move the written exam to a proctored online platform was accelerated by the pandemic and the exam will remain online as this had been a long-term strategy. The format of the exam will change to 30 MTF and 60 SBA for the academic year 2022-2023. There is an intention to remove all MTF format questions from September 2023, with the exam comprising 90 SBA questions from there onwards.

Percentage pass rates for MCQ over last 5 years (15 sittings)

Candidate attendance, outcome overall and for MTF and SBA components for last 5 years of primary examination along with Angoff score and reliability (KR-20)

Examination Year Sitting	Attendees Per Exam	Overall Pass Rate	MTF Nominal Pass Rate	SBA Nominal Pass Rate	Angoff Mean Score	Total possible Score	Exam KR-20 Reliability	Yearly No. of candidates
2017-2018								
Sep-17	427	57.40%	56.40%	57.90%	298	420	0.90	1177
Nov-17	355	58.30%	36.60%	82.00%	298	418	0.90	
Feb-18	395	51.90%	25.10%	83.30%	300	419	0.90	
2018-2019								
Sep-18	447	75.80%	64.20%	88.60%	298	416	0.91	1184
Nov-18	328	55.80%	36.00%	76.50%	297	417	0.90	
Mar-19	409	60.60%	49.50%	71.20%	291	408	0.93	
2019-2020								
Sep-19	472	72.25%	58.69%	82.84%	294	409	0.92	1182
Nov-19	292	48.63%	30.14%	76.37%	300	414	0.90	
Mar-20	418	56.22%	56.22%	66.03%	291	407	0.92	
2020-2021								
Sep-20	422	69.67%	43.84%	84.36%	269	401	0.89	1263
Nov-20	426	45.31%	29.34%	58.69%	264	390	0.92	
Feb-21	415	51.57%	44.10%	59.52%	265	394	0.91	
2021-2022								
Sep-21	389	59.13%	41.65%	73.26%	268	394	0.93	1175
Nov-21	380	63.68%	41.84%	78.68%	264	395	0.92	
Feb-22	406	56.65%	45.57%	67.73%	267	401	0.91	
Overall	Mean	58.86%	43.95%	73.80%				
	Median	57.40%	43.84%	76.37%				
	SD	8.26%	11.11%	9.65%				

Oral examination (SOE/OSCE)

The oral examination consists of two components sat at the Royal College of Anaesthetists on the same day. The Structured Oral Examination (SOE) comprises two 30-minute oral components and the Objective Structured Clinical Examination (OSCE) is one 107 minute examination as described in more detail below.

On a first attempt, candidates must sit the SOE and OSCE at the same sitting. If a candidate is unsuccessful in one part, they only retake the failed component in a subsequent diet i.e. to take the SOE alone they must have previously passed the OSCE and vice versa.

The oral exam is held 3 times per year and is scheduled to enable candidates to enter after passing the preceding MCQ examination should they wish to do so.

Structured Oral Examination (SOE)

The SOE section of the oral examination enables examiners to explore a candidate's understanding as well as their knowledge of clinical and basic science concepts. To be eligible to sit the SOE, a candidate must have passed the MCQ exam.

The SOE section consists of 2 parts.

- SOE 1: 2 sections, testing pharmacology (15 minutes) and physiology (15 minutes).
- SOE 2: 2 sections, testing clinical (15 minutes) and physics, equipment, safety & measurement (15 minutes)

Each examination lasts a total of 30 minutes. In each section candidates are examined on 3 questions of 5 minutes each, and their answers are evaluated independently by 2 examiners. Thus, a total of 4 examiners are involved in independent scoring for each candidate.

Each of the 4 sections of the SOE exam have their own working party. These are chaired by a senior examiner.

- Pharmacology – Roger Cordery
- Physiology – Jamie MacDonald
- Clinical – Simon Vaughan
- Physics, safety & measurement – Rose McRobert

The working parties (WPs) are tasked with reviewing questions and topics, introducing new questions and setting exams. With increasing examiner numbers in the pool, we are now able to hold many of these WPs during exam week, which provides a more consistent attendance at meetings. This is beneficial when examiners are finding it increasingly difficult to get time away from their Trust.

There are a number of [videos on the College website](#) specifically on the SOE format, questions and overall process of the exam. These are designed to assist those new to the College to familiarise themselves with the order of the day and the facilities, and reduce the stress associated with attending the oral exam.

When the SOE moved back to face-to-face examining at the College in May 2022, the Practique system was retained as the platform for the exam question banks, as well as the tool for marking and statistical analysis.

Objective Structured Clinical Examination (OSCE)

The OSCE consists of 17 - 18 consecutive stations (16 live plus 1 -2 rest stations) of 5 minutes duration each, with 1-minute between to read the instructions for the next station.

A candidate may score a maximum of 20 marks on each station, with the sum of the mark at every station providing the final, total score. The cut score (pass mark) is calculated by the sum of the Angoff score of each of the individual stations.

Videos to help prepare candidates for the OSCE are available on the [College website](#). These include an overview of the exam, with specific focus on individual stations.

Prior to the pandemic, the exam was paper based using Optical Mark Reading technology. Like the SOE, when the OSCE moved back to face-to-face examining at the College in May 2022, Practique was retained for the question bank, marking and analysis. In the pre-pandemic years, a couple of initiatives were being piloted in the OSCE and the intention is for these to continue in the next academic year, 2022-23:

- a) "Follow-on" questions: These were piloted to examine clinical reasoning and communication from the scenario of a previous station. For example, a further discussion of investigations and results from a previous simulated scenario or discussion of an anaesthetic management plan from the history taken in a previous History and Communication station.
- b) Computer based interactive stations: these stations have been replaced and the material examined transferred to clinical data/interpretation stations.

SOE/OSCE Results 2021-2022

954 candidates attended the oral examination in 2021-2022, compared with 1182 in 2020-2021. 537 passed the exam, passing either both components or a single component.

		PASS	Partial pass (SOE)	Partial pass (OSCE)	FAIL	n
NOV 2021	Sat both - First Attempt	54.24%	14.69%	6.78%	24.29%	177
	Sat both - resitting	29.17%	20.83%	8.33%	41.67%	24
	Sat SOE only	81.40%			18.60%	43
	Sat OSCE only	56.41%			43.59%	39
JAN 2022	Sat both - First Attempt	58.85%	14.58%	8.33%	18.23%	192
	Sat both - resitting	18.75%	25.00%	18.75%	37.50%	32
	Sat SOE only	75.00%			25.00%	32
	Sat OSCE only	82.98%			17.02%	47
MAY 2022	Sat both - First Attempt	54.07%	23%	4.44%	18.89%	270
	Sat both - resitting	22.58%	29.03%	3.23%	45.16%	31
	Sat SOE only	51.72%			48.28%	29
	Sat OSCE only	71.05%			28.95%	38

Table 2: Percentage pass, partial pass and fail for each of the 3 sittings of the oral examination with total number of candidates attending (excludes candidates who withdrew or failed to attend)

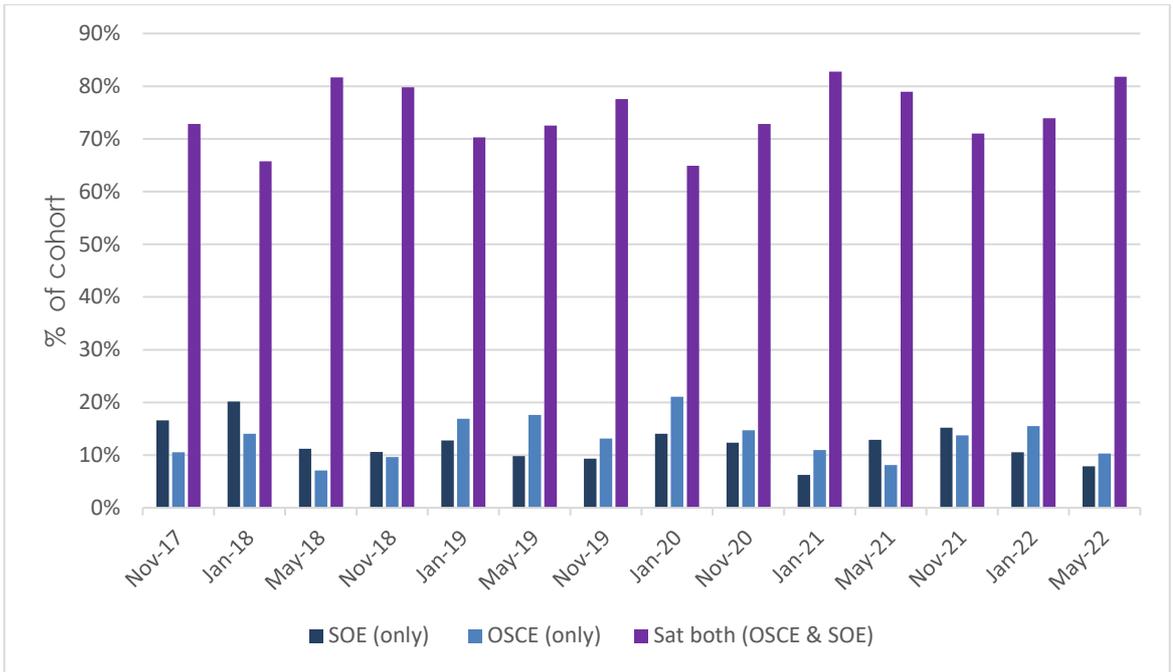


Figure 1: Attendance at SOE & OSCE over last 5 years

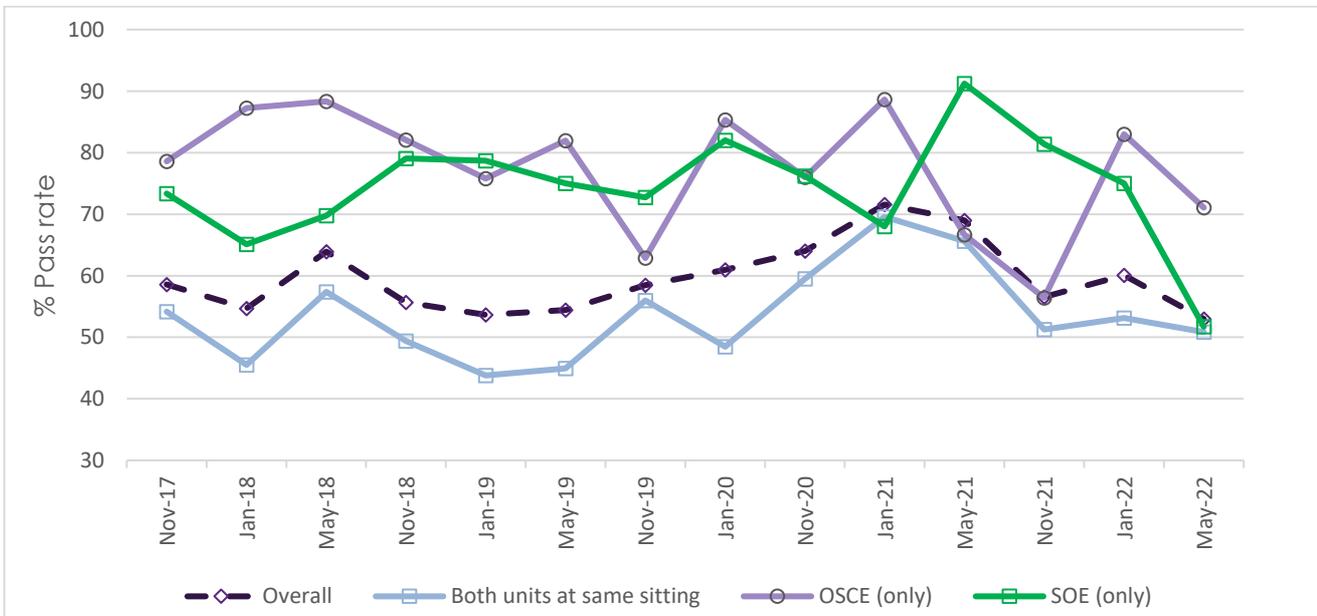


Figure 2: Pass rate for both components, SOE only & OSCE only and overall pass rate for examination over the last 5 years.

Quality Assurance

It is vital that the examination process is of high quality and remains fit for purpose. We are keen to ensure that the principal variable affecting the outcome for a candidate is their performance alone rather than inconsistency in examiner, process or environment. We therefore have robust assurance processes for new examiners and conduct continuous monitoring of examiners via appraisals and audits. In addition, we also collect feedback from candidates and visitors to the exam and use the debrief sessions at the end of each examining day as a daily assurance of the process using the examining body.

Examination process

To ensure the exam process is consistent, fair and up to date we conduct regular working party meetings where groups of examiners in the MCQ, OSCE and SOE review and update the question banks. A senior examiner chairs each of these working parties.

We continue to welcome and value the contribution of visitors, who, being closely involved with trainees at this level, are a valuable source of feedback on the standard of the exam. Whilst providing them with an insight into the exam process, it also helps them to align practice sessions in their trust to the structure and standard of the exam. Reassuringly, visitors generally assess the standard as appropriate and the quality of examiners as fair and consistent. We have recently changed to an online process for visitor feedback, which we hope will ensure more time and consideration is given to the feedback and will increase the independence of this appraisal. Candidates can also feedback on the exam via the post exam survey or my email to exams@rcoa.ac.uk

We have regular visits from the Patient Liaison Group, who as well as being interested in the overall exam process, have been actively involved in the development of the communication stations in the OSCE.

At the end of each exam day, the body of examiners meets at an evening debrief to discuss the exam for that day. This allows discussion of any process issues and any new questions. The meeting also allows examiners to receive updates on contemporary examination practices.

Borderline marks are reviewed in both the OSCE and SOE before publication. All marks of '36' in the SOE and 'fail by one' marks in the OSCE are checked for accuracy and cross checked to examiner feedback on candidate performance.

Exam results are released approximately two to three weeks after the last day of the exam week. A moderation board comprising senior examiners from each section meet prior to the release of results to review the results data, discuss any feedback and process issues, and confirm prize winners. This is a vital part of the process to ensure that problems, improvements and developments are appropriately discussed and approved by the senior exam body.

Examiners

The primary examination continues to be responsible for the induction and initial training of all examiners who join the Primary pool of examiners.

New examiners fill in a standard application form detailing their teaching, training, examination and administration experience. Application windows open in early summer and close in September. Applications are accepted from consultant anaesthetists and SAS doctors, eligibility criteria apply, with full and Less Than Full Time contracts available. More information on becoming an FRCA examiner is available on the [College website](#).

Applications are blind marked by members of the Examinations Committee and the top cohort of applicants is duly appointed to the exam board according to recruitment need.

All new examiners must attend a training day prior to commencing their first exam, as well as completing exam-specific equality and diversity training. The training day is regularly updated, and online e-learning modules are under consideration for future use. During the probationary year, new examiners are mentored by experienced examiners to ensure they are familiar with the process. These measures are designed to ensure new examiners are well prepared for their first year of examining.

Videos are taken during the examining weeks and experienced examiners audit their performance. This data, along with the videos, is discussed at an appraisal at the end of the first year to give new examiners an opportunity to reflect on their progress, formally discuss any issues they may have and discuss future contribution to the exam.

In 2021, 12 new examiners joined the board of examiners all of whom successfully completed their probationary year:

Hassan Ahmad
Manish Chhablani
Sunil Grover
Allan Howatson
Jim Hoyle
Ritoo Kapoor
Luis Lee
Valasubramaniam Mahadevan
Christopher Medd
William Rea
Bhaskar Saha

At the end of the exam year, two examiners moved to the Final examination.

Simon Chau
Mark Edsel

Following the completion of 10+ year tenure, the following examiners retired from examining:

Jamie McDonald
Andrey Varvinsky

Traditionally the examiner tenure has been ten years which could be extended by a further two years. During the pandemic, a number of retired examiners returned to support the exam. Their contribution was significant and allowed the College to continue delivering the exam through this period with good candidate capacity. It was recognised that some senior examiners might wish to contribute to the exam beyond the previous maximum of 12 years, and a "Retire and Return" policy was established to allow extension to examiner tenure beyond the maximum number of years. The policy defines the minimum contribution and sets out the conditions of retire and return, which include regular appraisal and maintenance of up-to-date CPD. In parallel to this it was also recognised that some examiners expressed a preference for flexible and Less Than Full Time (LTFT) working so these policies were updated to give clearer guidance. Information on [Examiner contracts](#) is available on the College website.

Following the completion of 10+ year tenure, the following examiners moved to the new Retire and Return contract:

John Donnelly
Patrick Hopton
Roger Sharpe

Continuing Professional Development

A combined Primary/Final examiners CPD day was held on Friday 24th September 2021. This was the first time examiners had been able to meet on a face-to-face basis since the beginning of the pandemic. A program of lectures, discussions and working parties allowed examiners to discuss a number of educational topics related to the exam. Subjects covered included:

- Exam techniques for SOE
- Writing high quality SBAs
- Equality, Diversity and Inclusion and the attainment gap
- The examination review
- Principles of assessment: reliability, validity and test design
- Improving examiner training programmes
- Optimal test delivery in OSCE

Professionalism of the exam

New policies were developed and implemented to define the level of professionalism required of examiners. These included a general code of conduct, a social media policy and an examiner misconduct policy.

Exam Reviews

The examination is reviewed every 3-5 years. Two reviews were completed in the 21-22 academic year. The first was an internal review with the scope to look at all aspects of the FRCA examination against current best practice in postgraduate medical assessment. For example, the purpose and role of the examination within the assessment strategy for the training programme leading to CCT in Anaesthesia, validity of the current components of this exam, fairness, statistical reporting, lay involvement, use of technology and candidate communication and feedback. This review was started in January 2020, postponed due to the pandemic and restarted in 2021. The second was an external review commissioned by the College as a consequence of errors in the delivery of the Royal College of Anaesthetists (RCoA) assessment processes in 2021. Both reviews produced a number of recommendations which are currently under discussion. These will be prioritized and an action plan and implementation timetable will be published in January 2023.

