Royal College of Anaesthetists

Review of RCoA Final Exam 2015-2016

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Final Fellowship of the Royal College of Anaesthetists (FRCA)
Examination Chairman's Report

Academic year (Sept 2015 – Aug 2016)

Outline

The aim of this document is to provide a summary of the Final Fellowship of the Royal College of Anaesthetists examinations undertaken during the Academic year September 2015 – July 2016. Different parts of this report may be relevant to different parties but by producing a single report rather than multiple separate ones we aim to provide a balanced overview. It is hoped that the report will be of interest to the general public, examinations and other departments within the College, the General Medical Council (as our regulator), examiners and candidates.

The Final examination is in two parts:

1. The written examination.
2. The structured oral examination.

Each will be considered separately as they are stand-alone examinations.

Three areas will be described for each examination type:

1. Outcome statistics.
2. An assessment of the utility of the examination.
3. A brief overview of areas of poor candidate performance to drive learning.

The Final examination is a national test of knowledge as laid out in the intermediate level training curriculum agreed with the General Medical Council. The examination is embedded within the curriculum and anaesthetists in training may not progress to specialist training year 5 without possession of this qualification (or equivalent).

1. The Final written examination

The Final written examination consists of two parts:

a) 90 question multiple choice paper (MCQ) consisting of 60 five-part true / false questions and 30 single best answer questions.

b) Short answer question paper (SAQ) consisting of 12 individual questions, all of which must be attempted.

It was held twice in the 2015-16 academic year (September 2015 and March 2016) in a number of venues across the United Kingdom. Both elements of the examination are tests of knowledge (knows and knows how– under Miller's Pyramid of competence). The format of the examination has not changed significantly in the last five years. The composition of the SAQ paper has been mapped against the curriculum since 2012 to ensure that the full range of the curriculum is sampled in a question paper. The examination is passed or failed as a whole entity with marks attained from both parts of the examination being added together.

a) Outcome Statistics:

Academic Year	2012-13		2013-14		2014-15		**2015-2016**	
Examination date	Sept 2012	March 2013	Sept 2013	March 2014	Sept 2014	March 2015	**Sept 2015**	**March 2016**
Number applicants	360	492	348	461	287	471	**359**	**534**
Withdrawals / non attendees	17	11	13	20	8	9	**12**	**20**
Attendees	343	481	335	441	279	462	**347**	**514**
Pass Rate: Number (%)	177 (52%)	285 (59%)	227 (68%)	305 (69%)	114 (41%)	193 (42%)	**123 (35%)**	**271 (53%)**
MCQ Internal consistency KR-20	0.72	0.79	0.80	0.82	0.79	0.80	**0.80**	**0.77**
SAQ Internal consistency Cronbach alpha	0.75	0.74	0.68	0.74	0.79	0.78	**0.79**	**0.77**

The pass rate for the September 2015 sitting of the written examination is the lowest recorded since the exam moved to its current format in September 2009. The pass rate for the March 2016 sitting of 53% was a good improvement on the pass rates of the previous three sittings. It is hoped that this improvement will be maintained although it is as yet too early to be sure.

The lower pass rates experienced between September 2014 and September 2015 may have been due to:

1. A change in characteristics of the cohort of candidates.
2. A change in difficulty of the examination.
3. A combination of the two.

These possible causes have been considered in detail and are discussed in the next section of this report.

b) Examination Utility:

The utility of any formal assessment such as an examination can be assessed in terms of its reliability, validity, cost, acceptability and educational impact.

Reliability:
The Final Written Examination is a high stakes examination requiring good reliability and validity.

The MCQ is a long examination (3 hours) with a large number of separate questions of varying type. The aim of this format is to provide good examination reliability. The pass mark for the MCQ examination is criterion referenced. The pass mark is set by a core group of examiners (the Angoff group) who use the Angoff technique to assign marks to each question based on what the average candidate would know. Questions are reviewed where there is marked variation in the Angoff scores assigned. One standard error of measurement (SEM) is then subtracted from the total to arrive at the pass mark. In addition, attempts are made to establish aspects of the reliability of the MCQ paper. The Kuder Richardson formula (KR-20) is calculated for each set of

MCQ paper results. This is a measure of internal consistency (an aspect of reliability) for dichotomous data. KR-20 results in this academic year for the MCQ papers were 0.80 (September 2015 MCQ) and 0.77 (March 2016 MCQ). These values are satisfactory and in line with values of internal reliability of most recent MCQ papers.

Each question in the SAQ paper is marked out of a total of 20 marks by a single examiner marking against a model answer. Examiners are divided into six groups and each group is given 2 of the 12 questions to mark for all the candidates. The papers are divided up amongst the group such that each candidate has 6 examiners in total assessing separate parts of their paper. In order to provide a standardized approach all examiners marking a single pair of questions meet together to agree a model answer well in advance of the planned paper. Once candidates have sat the exam the examiners meet again and mark four specimen answer papers to ensure a standardized interpretation of the model answer. The pass mark for each individual question is set by the SAQ group but then refined by the marking group. The pass marks for the 12 questions are summed to give a total mark for the paper and this mark is then reduced by 1 x SEM to give the pass mark. The test of internal consistency used for this paper is the Cronbach alpha calculation (as the data is continuous not dichotomous). Results in the most recent examinations are shown in the table above. The values of Cronbach alpha are 0.79 (September 2015) and 0.77 (March 2016) which are in line with or improved on recent values.

Has the examination changed in difficulty?

There have been no changes in this academic year in the way the examination papers are constructed, no change in the sampling of questions across the curriculum, no change in the way the pass marks are calculated, and no significant change in the make-up of the Angoff reference group setting the pass mark. Also the statistical measures of internal consistency remain acceptable.

Have the candidates changed?

The make-up of the cohort of candidates taking the examinations was looked at in detail. We know there is an increased statistical chance of passing the examination if the candidate's primary medical qualification is from a UK medical school and also if the candidate is taking the examination for the first time. Analysis of the cohort of examinees from September 2014 to September 2015 showed no changes in the make-up of the groups in respect of percentages for these two characteristics. The three cohorts of examinees in the exams affected by low pass rates do not look different from the norm in respect of registered characteristics.

We have no other method of assessing if the ability of the candidates or the effectiveness of training has changed for this cohort of candidates. Since the majority of successful candidates go on to sit the subsequent oral examination a variation in the pass rate of the following Structured Oral Examinations may be informative.

Cost, accessibility, feasibility and educational impact:

It is extremely important to ensure this examination is accessible to all. Anaesthesia is the largest hospital specialty so each year there are many candidates needing to take this examination for career progression. Suitable capacity already exists and has allowed all eligible candidates applying to take the written examination in 2015-16 to do so. In addition the multiple examination halls hired (including across all four health jurisdictions) supports ease of access to the examination. The fees levied to take the examination are a reflection of the costs incurred and do not provide a source of income over expenditure to the College. The numbers sitting the examination have varied from 350 to 530 per sitting over the last decade. 893 candidates sat the written examination in 2015 – 2016, which is a record. This increase in candidate numbers may

partly be explained by the low pass rates seen in the written examination between September 2014 and September 2015.

c) Areas of poor candidate performance

To date the results of the MCQ examination with multiple discrete assessments have not been analysed to identify areas of candidate weakness. This will occur in the next academic year when the structure of the MCQ examination is changed to be formally mapped against the intermediate level training curriculum. The change will allow this advice to be offered in the future.

The leads of the SAQ group produce a detailed report, freely available on the College website, describing performance at each SAQ paper sitting. Details of the pass rate for each individual question are included and considerable detail is provided on the answers required. Candidates who failed the examination tended to produce poor answers in multiple different questions, and were not failing the examination because of a poor result in a single question area. Some were let down by not reading the question correctly, not paying attention to the distribution of marks and by illegible handwriting. All of these are recurring problems and probably represent poor time management. It is very important to practise SAQs under exam conditions, which brings in the element of timing as well as knowledge. In previous academic years concern has been expressed about poor candidate performance in questions on mandatory units of training. In the September 2015 exam it was reassuring that four of the six questions on mandatory units had amongst the highest pass rate. Of concern was the fact that the obstetric question in this paper had the lowest pass rate – this is worrying as pre fellowship trainees are often working with distant supervision when on call for obstetrics. The overall pass rate for the SAQ in March 2016 was much improved (62.65%) compared to the previous three sittings. Again, it was encouraging that 3 of the 6 questions on mandatory units of training had amongst the highest pass rates although knowledge of the pathophysiology of aortic stenosis, a commonly encountered condition, was poorly explained by many candidates.

2. The structured oral examination

Candidates may only take the Final structured oral examination (SOE) once they have been successful at the Final written examination. The oral examination consists of two parts:

a) SOE 1 (clinical) consisting of a 40 minutes review of one long clinical case and three short clinical cases.

b) SOE 2 (applied science) consisting of a 30 minute review including sciences as applied to patient care (anatomy, physiology, pharmacology, physics and clinical measurement).

Although all questions are structured, the face to face nature of the examination allows exploration not only of knowledge but also of the understanding (application) of that knowledge. The examination is held twice per year approximately two months after the written examination to allow smooth progression through both parts of the Final examination.

a) Outcome Statistics:

Academic Year	2012-13		2013-14		2014-15		**2015-2016**	
Examination Date	Dec 2012	June 2013	Dec 2013	June 2014	Dec 2014	June 2015	**Dec 2015**	**June 2016**
Candidates attending	297	360	351	384	243	267	**214**	**319**
Pass rate Number (%)	187 (63%)	234 (65%)	235 (67%)	261 (68%)	157 (65%)	170 (64%)	**142 (66%)**	**225 (71%)**

A total of 533 candidates sat the Final SOE in 2015-2016. This is a similar number of candidates to the 2014 -2015 academic year but substantially lower than the 2012-13 and 2013-14 years. Although December saw the lowest number of candidates applying for the exam since the current exam format came into place in December 2009 there was a sharp rise in the number of candidates in June, which is reflective of the written examination pass rates in September 2015 and March 2016 respectively. The average pass rate for the 2015 – 2016 academic year was 68.45%, which is in line with other annual means since the new exam format was put in place. The pass rate of 71% in June 2016 is, by a small margin, the highest pass rate since December 2009 which is gratifying.

b) Examination Utility:

It is important to ensure that the SOEs are a reliable and valid test of knowledge and understanding of the intermediate level training curriculum. The questions are constructed and reviewed by the SOE group and answer guidance is given. Marks given on the day are a matter of independent professional judgement by the 2 examiners conducting the SOE. However, during the academic year more than 60 individuals observed the SOEs, the majority being consultants in active clinical practice from across the UK. All were asked to provide written feedback on the content and conduct of the examinations they observed. During this year there was a uniformity of view that the clinical cases used were highly reflective of UK practice and were pitched at the correct level to effectively assess trainee anaesthetists at the appropriate level of training. Overall independent observers regarded the assessment as being valid and relevant.

All questions used in the SOEs are held in a computerized bank. Most have been used on a number of occasions with any individual candidate being exposed to at most one new question, without statistics relating to reliability and consistency from previous examinations. The SOE examination matrix is put together to provide a paper of approximately equal difficulty across the different days in an examination week, and also across different sittings of the examination.

Twelve new examiners joined the Board of Final examiners at the start of the academic year, replacing a number of colleagues relinquishing their examining role at the end of their term of office. All had at least 2 years-experience of examining for the Primary FRCA exam. The pairing of new examiners with experienced colleagues in their first year of SOEs allows rapid assimilation to the professional standard expected. Rigorous audit of examiner performance identified no episodes of concern regarding examiner performance during the academic year. It is our view that we therefore have evidence to suggest examiners function appropriately in their role.

Trends in pass rates for the SOE by registered characteristics are the same as for the written examinations with higher pass rates for females, UK medical graduates, those employed in training posts, Primary FRCA holders and non BME candidates.

Cost, accessibility and educational impact:
Again the administration of the Final SOE examination does not represent a source of income generation for the College. All candidates wishing to take this examination were accommodated during the two examination weeks. There are sufficient examiners to accommodate up to 400 candidates per SOE examination sitting.

c) Areas of poor candidate performance

Some examiners and visitors have expressed a modicum of concern on the apparent clinical inexperience of some of the weaker candidates taking the Final FRCA examination. Many of the questions which form core elements of the intermediate level training curriculum are met by answers showing theoretical (book) knowledge but no practical knowledge of having seen the clinical situations in either a supervised or unsupervised capacity. This is clearly unsatisfactory. The maintenance of a consistent pass rate in the SOEs suggests that the overall ability of candidates getting through to the SOE is unchanged from previous years.

Summary:
In the 2015 – 2016 academic year, whilst the written pass rate in September 2015 followed the downward trend seen in 2014-2015, pass rates in both parts of the examination improved in the latter half of the year, with an increase of nearly 18% in the written exam and 5% in the SOEs from those seen in the first half of the year. It is hoped that the trend towards higher pass rates will be maintained in the forthcoming academic year. It is unclear why there was such a reduction in pass rates in the three written examinations from September 14 to September 15.

It is important to remember that one of the prime roles of postgraduate examinations is to maintain standards in healthcare. Possession of the FRCA diploma permits trainees to work with reduced levels of clinical supervision. It is vital therefore that, in order to protect those requiring the services of an anaesthetist in the UK and further afield, the standard of knowledge required to pass the FRCA examination is not reduced.

Finally, we wish to acknowledge the hard work of the staff in the examinations department of the College without whom the Final FRCA examination would not be the smooth and efficient process that it is. It is equally important to recognize the efforts of our fellow examiners many of whom are finding it increasingly difficult to get time away from work to perform their examination duties.

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