November | 15

Review of RCOA Final Exam 2014-2015

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

Academic year (Sept 2014 – July 2015)

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 2014 –July 2015. It is hoped to be relevant to the general public, Examinations and other departments within the College, The General Medical Council (as our regulator), examiners and candidates. Different parts of this report may be relevant to different parties but a single report aims to provide a balanced overview rather than multiple separate reports. A single report is provided for the academic year to avoid repetition of common themes.

The Final examination is in two parts:

1. a written examination
2. a structured oral examination.

Each will be considered separately as they represent stand alone examinations.

Three areas will be described for each examination type:

1. Outcome statistics for each examination
2. An assessment of 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 2014-15 academic year (September 2014 and March 2015) in a number of venues across the United Kingdom. Both elements of the examination are essentially tests of knowledge (knows – 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	2011-12		2012-13		2013-14		**2014-15**	
Examination date	Sept 2011	March 2012	Sept 2012	March 2013	Sept 2013	March 2014	**Sept 2014**	**March 2015**
Number applicants	378	439	360	492	348	461	**287**	**471**
Withdrawals / non attendees	13	21	17	11	13	20	**8**	**9**
Attendees	365	418	343	481	335	441	**279**	**462**
Pass Rate: Number (%)	249 (68%)	273 (65%)	177 (52%)	285 (59%)	227 (68%)	305 (69%)	**114 (41%)**	**193 (42%)**
MCQ Internal consistency KR-20	0.80	0.72	0.72	0.79	0.80	0.82	**0.79**	**0.80**
SAQ Internal consistency Cronbach alpha	0.81	0.76	0.75	0.74	0.68	0.74	**0.79**	**0.78**

The pass rates for the two sittings in this academic year are the lowest and second lowest recorded in the last ten years. The pass rates are at least 10% less than expected values, and results were disappointing in both the MCQ and SAQ components in the March 2015 examination, and the SAQ component in the September 2014 examination. These results may be due to:

1. a change in candidates,
2. a change in difficulty of the examination,
3. a combination of the two.

The possible causes for the results were considered in detail and are discussed in the next section of this report.

b) Examination Utility:

The utility of any formal assessment (examination) may be regarded as a compilation of the reliability, validity, cost, acceptability and education 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. The use of a long examination time with multiple different questions aims to provide good examination reliability. The pass mark for this part of the examination is criterion referenced. Three years ago, a small subgroup was established (Angoff Group), who define 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 0.79 (September 2014 MCQ) and 0.80 (March 2015). 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 against a model answer. An individual examiner marks two of the twelve questions with a single candidate having 6 examiners in total assessing separate parts of their response. 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, and then mark together 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 each marking group. 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 2014) and 0.78 (March 2015) 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. An abnormal result in one sitting in an academic year may be due to chance. Two abnormal results in the same academic year are of concern. It is difficult to see any evidence that this is due to a change in the difficulty of the examination itself.

Have the candidates changed?

Firstly 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 candidates' primary medical qualification is from the UK and also if you are taking the examination for the first time. Analysis of the cohort of examinees in September 2014 and March 2015 showed no changes in the make up of the groups in respect of percentages for these two characteristics. The two cohorts of examinees in this academic year 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 with many candidates needing to take this examination each year for career progression. Suitable capacity already exists and has allowed all eligible candidates applying to take the written examination in 2014-15 to do so. In addition the multiple examination halls hired (including across all four health jurisdictions) supports access to the examination. The fees levied to take the examination are a reflection of the costs incurred and do not provide a significant source of income over expenditure to the College. The numbers siting the examination have varied from 350 to 500 per year over the last decade with relatively static numbers over the last few years.

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 lead of the SAQ group produces 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 on answers required. In the last academic year it was clear that candidates who failed the examination produced poor answers in multiple different questions, and were not failing the examination because of a poor result in a single question area. In addition, four out of the six questions examining mandatory units of training had high levels of poor fail rates. The four units were paediatric anaesthesia, cardiac anaesthesia, neuroanaesthesia and pain medicine. This is not the whole story with areas in general duties also performing poorly.
This is interpreted to mean that candidates are taking the examination too early before they have clinical experience of large areas of the curriculum. Knowledge was superficial even in areas that are common practice in every hospital across the UK. Two examples from the last year are:

1. Minimal understanding of ultrasound in anaesthetic practice.
2. Aspects of anaesthesia for revision hip replacement surgery.

These poor results, the areas of particular weakness and a perception that candidates are taking the examination too early in their training have been published widely and College Tutors informed at regular meetings.

2. <u>The structured oral examination.</u>

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 the understanding (application) of that knowledge. This represents "knows how" in Miller's pyramid.
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	2011-12		2012-13		2013-14		**2014-15**	
Examination Date	Dec 2011	June 2012	Dec 2012	June 2013	Dec 2013	June 2014	**Dec 2014**	**June 2015**
Candidates attending	373	363	297	360	351	384	**243**	**267**
Pass rate Number (%)	254 (68%)	237 (68%)	187 (63%)	234 (65%)	235 (67%)	261 (68%)	**157 (65%)**	**170 (64%)**

A total of 510 candidates sat the Final SOE in 2014-2015. The numbers are substantially lower than recent years reflecting the poor pass rates in the written examinations. The most common pattern is for those successful in the September written examination to take the December SOE examination, and those successful in the March written examination to take the SOEs in June. The pass rate for the academic year in the oral examinations was 64%. This pass rate is similar to previous years with pass rates of between 60 and 70% for almost all sittings of the examination in the last 6 years.

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. As a test of clinical knowledge this remains a professional judgement. 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 had 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 an appropriate level to effectively assess anaesthetists at the appropriate level of training. Overall independent observers regard 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 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..

Both examiners and visitors have increasingly commented on the clinical inexperience of 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 an unchanged pass rate in the SOEs suggests that the overall ability of candidates getting through to the SOE this academic year is unchanged on previous years. If the written examinations had been more difficult than usual, with a small number of very good candidates coming through to the oral examinations we would have expected to see a rise in the SOE pass rate.

Ten 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. The pairing of new examiners with experienced colleagues in their first Final year allows rapid assimilation to the professional standard expected. There were no episodes of concern regarding examiner performance identified within the academic year 2014-15. It is my view that we therefore have some 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. The data has been extensively reviewed by Lumb and Brennan and published in the Bulletin of the Royal College of Anaesthetists, page 29/Bulletin 92/July 2015.

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. We have enough examiners to accommodate up to 400 candidates per examination sitting, and the low number of candidates coming through to the SOEs this academic year is disappointing.

Summary:
In summary the academic year 2014-15 saw a substantial fall in the number of candidates achieving a pass in the Final FRCA examinations. It is my view that this is a reflection of candidates taking the examination too early before they have adequate clinical exposure. It may reflect a reducing level of clinical training within base hospitals. There is no evidence to support the view that the examination has changed in difficulty. Whilst disappointing it is important to remember that one of the prime roles of post graduate examinations is protection of the general public. Possession of the Final FRCA allows career progression and a reducing level of direct clinical supervision. For patient safety it is important that standards do not change.

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