



Public Report on the Part 2 FRCOphth Examination February/April 2009

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Report on the Part 2 FRCOphth examination

The second sitting of the Part 2 FRCOphth examination was held in February and April 2009.

1. Candidates and examiners

The candidates

15 candidates presented themselves for the examination.

The examiners

12 examiners took part in the structured vivas and OSCE. Training was provided for examiners on Wednesday 4 February 2009.

The written papers

The written papers consisted of a two hour, 90 question single best answer from four MCQ paper and a 45 stem, 90-question EMQ paper lasting three hours. This examination was held on Monday 23 February 2009. Candidates must pass the written papers to be allowed to sit the clinical part of the examination. To pass, candidates must gain a total score from both papers that equals or exceeds the combined marks from the Ebel standard setting process minus 2 SEM (which is the lower 95% confidence interval for the pass mark). This policy is currently under review so that candidates cannot compensate an extremely poor mark in EMQ paper by a good mark in the MCQ paper (or visa versa).

The clinical papers

The clinical part of the examination took place on two half-days. The structured vivas and communication skills OSCE were held in the Westburn Postgraduate Centre of the Aberdeen Royal Infirmary on Monday 27 April 2009. The OSCE was held in the Eye Department on the morning of Tuesday 28 April 2009.

2. The MCQ paper

Reliability (KR20):	0.813
Standard error of measurement:	4.05
1. Pass mark derived from standard setting: (Using agreed minimally competent candidate values)	58/90
2. Adjusted pass mark (-1 SEM)	54/90
3. Adjusted pass mark (-2 SEM)	50/90
4. Pass rate	9/15

Distribution of marks:

Table MCQ 1

Score	Distribution
36-40	1
41-45	1
46-50	1
51-55	111
56-60	111
61-65	11
66-70	111

*The adjusted pass marks provides the lower 66% and 95% confidence interval for the pass standard agreed using the Ebel method (after the results are known and the reliability and hence the standard error measurement can be calculated).

2a) Blueprint

The subjects that were assessed in the MCQ paper are summarised below:

Table MCQ 2

Basic science 17	Anatomy & embryology	3
	Microbiology	4
	Optics	2
	Genetics	2
	Pathology	6
	Physiology	0
Clinical ophthalmology 30	Cataract	3
	Neurology & pupils	3
	Glaucoma	2
	Strabismus	5
	Paediatrics	3
	Vitreo-retinal	4
	Medical retina & uveitis	6
	Oculoplastics and orbit	1
	Cornea	3
Management & therapeutics 12	Pharmacology & therapeutics	12
Investigations 17	Ophthalmic & Neuro-imaging	14
	Orthoptics	3
Miscellaneous 14	Statistics and research	4
	Medicolegal	3
	Health economics	1
	Ethics	0
	General medicine	3
	Guidelines	3
Total		90

Analysis of questions

Table MCQ 3

	Difficult (<30% correct)	Moderate (31-70% correct)	Easy (>70% correct)	Total
Negative discrimination	1	6	1	8
Poor discrimination (0-0.19)	3	10	10	23
Good discrimination (0.2-0.5)	6	15	25	46
Excellent discrimination (>0.5)	0	7	6	13
Total	10	38	42	90
Comparison to Ebel*	14	38	38	

*The examiners were very accurate in the classification of the questions.

2b) Standard setting for MCQ paper

The examiners agreed the pass mark using the Ebel technique.

Table MCQ 4a: Classification of the questions

	Difficult	Moderate	Easy	
Essential	1	12	22	35
Important	8	19	14	41
Supplementary	5	7	2	14
Total	14	38	38	90

Table MCQ 4b: Percentage correct by borderline candidates previously agreed by Part 2 sub-committee

	Difficult	Moderate	Easy
Essential	0.5	0.7	0.85
Important	0.4	0.6	0.7
Supplementary	0.3	0.45	0.65

Table MCQ 4c: Weighted score

	Difficult	Moderate	Easy	
Essential	0.5	8.4	18.7	27.6
Important	3.2	11.4	9.8	24.4
Supplementary	1.5	3.15	1.3	5.95
Total	5.2	22.95	29.8	57.95

MCQ paper pass mark: 58/90 or 64%

Adjusted Final MCQ paper pass mark -1 SEM = 54/90 or 60%

3. The EMQ paper

Reliability (KR20):	0.9
Standard error of measurement:	3.96
1. Pass mark derived from standard setting: (Using agreed minimally competent candidate values)	57/90
2. Adjusted pass mark (-1 SEM)	53/90
3. Adjusted pass mark (-2 SEM)	49/90
4. Pass rate	6/15

Distribution of marks

Table EMQ 1

Score	Distribution
26-30	11
31-35	11
36-40	1
41-45	1
46-50	11
51-55	11
56-60	111
61-65	11

The adjusted pass marks provides the lower 66% and 95% confidence interval for the pass standard agreed using the Ebel method (after the results are known and the reliability and hence the standard error measurement can be calculated).

3a) Blueprint

The subjects that were assessed in the EMQ paper are summarised below:

Table EMQ 2

Clinical ophthalmology 45	Uveitis	4
	Paediatrics	2
	Vitreo-retinal	4
	Medical retina	10
	Strabismus	4
	Oculoplastics and orbit	4
	Cornea/external eye	7
	Trauma	2
	Cataract/lens	4
	Glaucoma	4
Neurology and medicine 17	Neurology	13
	Medicine	4
Basic sciences 8	Pathology/genetics	6
	Optics/refraction	2
Pharmacology and therapeutics 8	Pharmacology	8
Investigations 6	Ophthalmic & Neuro-imaging	6
Miscellaneous 6	Statistics and epidemiology	2
	Research	4
Total		90

Analysis of questions

Table EMQ 3

	Difficult (<30% correct)	Moderate (30-70% correct)	Easy (>70% correct)	Total
Negative discrimination	1	2	1	4
Poor discrimination (0-0.19)	4	5	6	15
Good discrimination (0.2-0.5)	14	19	18	49
Excellent discrimination (>0.5)	3	16	3	22
Total	22	42	28	90
Comparison to Ebel	20	31	39	

The examiners over-estimated how many of the questions that the candidates would find easy, but accurately predicted the number of difficult questions.

3b) Standard setting for EMQ paper

The examiners agreed the pass mark using the Ebel technique.

Table EMQ 4: Classification of the questions

	Difficult	Moderate	Easy	Total
Essential	2	10	23	35
Important	11	16	12	39
Supplementary	7	5	4	16
Total	20	31	39	90

Table EMQ 4b: Percentage correct by borderline candidates previously agreed by Part 2 sub-committee

	Difficult	Moderate	Easy
Essential	0.5	0.65	0.8
Important	0.45	0.6	0.75
Supplementary	0.35	0.5	0.65

Table EMQ 4c: Weighted score

	Difficult	Moderate	Easy	
Essential	1	6.5	18.4	25.9
Important	4.95	9.6	9	23.55
Supplementary	2.45	2.5	2.6	7.55
Total	8.4	18.6	30	57

EMQ paper pass mark: 57/90 or 64%

Adjusted Final EMQ paper pass mark -1SEM = 53/90 or 59%

4. Overall results from the written papers

Distribution of marks:

61-70	1
71-80	11
81-90	1
91-100	11
101-110	11
111-120	1111
121-130	11
131-140	1

4a) Candidates who were invited to attend the clinical examinations

To satisfy the requirements to proceed to the clinical papers, candidates must achieve the following:

- 1 pass both written papers at the Ebel standard – 1 SEM (lower 66% CI) or
- 2 cross-compensation to achieve a total mark greater than the combined pass marks from both papers (combined pass mark of 107)

In total 8 candidates passed the written papers and were invited to attend the clinical papers as follows:

- 4 candidates achieved a pass in both papers
- 4 candidates achieved a pass mark by cross compensation

This represents a pass rate on the written papers of 8/15 or 53%

Candidate feedback:

- Some questions were felt to be ambiguous
- They would prefer more questions based upon clinical images
- They encouraged the use of question setters from overseas
- They were concerned that candidates who pass the written paper but fail the clinical paper are required to resit the whole examination

5. The structured vivas

There were five structured vivas, which were held on the afternoon of 27 April 2009 at the Westburn Centre, Aberdeen Royal Infirmary. The communication skills OSCE was conducted as one of the viva stations, making six stations in all. Each viva lasted 10 minutes. The stations were:

- Station 1** Patient investigations and data interpretation
Corneal topography in keratoconus
- Station 2** Patient management
Child with partially accommodative esotropia and amblyopia
- Station 3** Health promotion and disease prevention.
Prevention of steroid induced osteoporosis in a patient diagnosed with temporal arteritis
- Station 4** Attitudes, ethics and responsibilities.
Consultant colleague with alcohol problems and consultant appraisal / assessment/revalidation
- Station 5** Role: Audit, research and evidence based practice.
Management of subfoveal CRNVM and discussion of clinical trials

The vivas were run in two rooms and the stations were separated by screens. The examination was conducted in two rounds with four candidates in each round.

Each station began with a clinical scenario, and subsequent discussion was based upon, but not limited to, the clinical diagnosis suggested by the scenario.

5a) Results

Maximum mark (5 stations, 10 examiners, 3 criteria scored 0-3):	90
Pass mark (using borderline candidate method):	48.5
Mean score:	55.5
Median score:	54.5
Range:	41-72
Reliability: (Cronbach alpha)	0.8
SEM:	4.3

Pass mark (using borderline candidate method)	48 (53%)
Pass mark (+ 1 SEM)	53 (58.8%)
No candidates were identified with a red flag	
Pass rate	5/8 (62.5%)

The adjusted pass mark (+1 SEM) was chosen as the safer upper 68% confidence interval of the borderline candidate standard (identified from the results based upon the reliability of the examination).

Correlation between examiners at each station

Station 1	Station 2	Station 3	Station 4	Station 5
PI	PM	HPDP	AER	Role
0.478	0.850	0.889	0.990	0.688

The poor correlation between the examiners in Station 1 was a result of the variation in marks awarded despite the close agreement between the examiners in their global judgement.

Correlation between viva stations

	Station 2	Station 3	Station 4	Station 5
Station 1	-0.244	0.357	0.171	0.256
Station 2		0.438	0.403	-0.098
Station 3			0.532	0.415
Station 4				0.505

5b) Standard setting for the structured vivas

	1		2		3		4		5		Total
Number of borderline candidates	1	1	2	4	3	3	3	2	2	4	25
Median borderline candidate mark	5	5	5	5.5	5	4	5	5	4	5	48.5

5c) Observations and feedback

Examiner feedback

- The viva room was noisy and this problem should be addressed at future centres.

Candidate feedback

- The AER and communications stations are based upon topics that are specific for UK practice. As this examination is offered to international candidates this will be an unfair disadvantage.
- The content was, otherwise, considered to be appropriate.

6. The OSCE

There were six OSCE stations in all. Five were held on 28 April 2009. The communication skills OSCE was conducted with the vivas. Four of the OSCE stations lasted 15 minutes. The medicine and neurology station lasted 30 minutes. The communication skills OSCE lasted 10 minutes. There were two examiners at each station. In the communication OSCE, one examiner was a trained lay assessor.

The patients examined in the stations observed by the examination assessor were as follows:

Station 1: Cataract and anterior segment (3 patients)

8 cases used – 3 per candidate

Clinical conditions:

Iris naevus ; Peters/nystagmus; JIA/cataract

Keratoconus; Marfans; HSK uveitis/heterochromia

Station 2: Glaucoma and eyelid (3 patients)

6 cases used – 3 per candidate

Clinical conditions:

Ptosis with aberrant III_n; aniridia with ptosis; phthisis/graft/end-stage glaucoma.

Essential iris atrophy / JIA uveitis / glaucoma; aponeurotic ptosis

Station 3: Posterior segment (3 patients)

9 cases used – 3 per candidate

One case each assessed with direct, indirect and slit lamp 90D ophthalmoscopy

Clinical conditions:

Optic disc pit / capillary haemangioma; retinoschisis; BRVO

Optic disc pit; chorioretinitis; diabetic maculopathy

Station 4: Strabismus and orbit (2 patients)

9 cases used – 2 per candidate

Clinical conditions:

CCF; OC albinism / nystagmus

Orbital lymphangioma; congenital nystagmus

TED, Browns, Duanes, congenital SO palsy, cavernous haemangioma

Station 5: Medicine and neurology (4 patients)

Station 5a:

4 cases used – 4 per candidate

Clinical conditions:

Myotonic dystrophy / pseudophakia/ goitre; NF1 with ON glioma; Parinauds

syndrome; Pituitary adenoma / bilat OA/ L temporal hemianopia

Station 5b:

5 cases used in total – 4 per candidate

Clinical conditions:

Myotonic dystrophy/XT; Adies pupil; R upper quadrantanopia; Marfans

(TED)

Station 6: Communication (1 patient actor) *Subject area:* Patient with stable glaucoma not meeting DVLA driving field requirement

6a) Results

The variation in numbers of patients seen at each station made it necessary to adjust the marks to ensure equal weighting of the stations as follows:

Stations 1-4: 2 patients

Station 5 (a double station): 4 patients

Station 6: 1 patient

Weighted maximum mark:	234
Pass mark (using borderline candidate method-BCM):	132
Reliability	0.819
SEM:	11

The adjusted pass mark (+1 SEM) was chosen as the safer upper 68% confidence interval of the borderline candidate standard (identified from the results based upon the reliability of the examination).

OSCE pass mark (adjusted BCM+1 SEM)	143
Pass rate	3/8 (37.5%)

Correlation between examiner's marks at each station

Station 1	Station 2	Station 3	Station 4	Station 5	Station 6
Cat/AS	Glauc/lid	Posterior	Orbit/strab	Med/neurol	Comm
0.843	0.892	0.836	0.925	0.812	0.775

Correlation between station scores (combined marks 2 examiners)

	Station 2	Station 3	Station 4	Station 5	Station 6
Station 1	-0.107	0.240	0.587	0.522	0.031
Station 2		0.349	0.135	0.355	0.235
Station 3			-0.328	-0.055	0.332
Station 4				0.914	0.218
Station 5					0.253

6b) Standard setting for the OSCE

	total	1		2		3		4		5		6	
No. of borderline candidates	43	2	2	5	2	3	4	4	2	3	5	5	6
Median borderline candidate score	162	15.5	18.5	14	15	12	15	10.5	10	21	20	5	5.5

6c) Observations and feedback

Candidate feedback

- Very happy with patients, “fantastic cases”, “enjoyed medicine station”
- Exam felt to be harder than American and Canadian Board exams by one candidate
- Clinical part felt to be important
- Some unhappy with assessment of direct ophthalmoscope
- Pleased with increase to three patients at some stations

Examiner feedback

- Should be one examiner with sub-specialty interest at each OSCE station
- Double medicine station thought to work well
- Need to ensure adequate fixation targets available for cover test
- Good to see use of children as patients
- Huge number of patients
- Examiners used up to 8-9 patients at some stations therefore possibly less standardized than ideal. However at medicine station where the same patients used all morning there was a suspicion that one later candidate knew about pituitary patient!
- Marking quite hard - difference in standard from Part 3 MRCOphth difficult to set. Candidates still seem to dwell on demonstrating examination and ability to elicit abnormal signs. Need to cut to diagnosis / differential more quickly and discuss management, especially with 3 patients per station. Try to standardise number of questions per patient
- Need to standardise policy on handwashing: some stations gel given to candidates, others left to candidates to clean hands – if not done then what?
- Lay assessor present – may not be appropriate in clinical examinations
- The examiners should be aware of the instructions to candidates for the communications station.
- The communication station is very similar to the Part 3 MRCOphth examination. As the standard expected is much higher for the exit examination the scenario should be more sophisticated or address a more difficult subject.

7 Overall results

Three candidates passed the examination overall. This represents a pass rate for the clinical papers of 38% and 20% for the whole examination. This is a credible result for an exit examination in its infancy. It is anticipated that the pass rate will rise in subsequent years.

Correlation between scores in each part of examination

	EMQ	VIVA	OSCE
MCQ	0.384	0.239	0.324
EMQ		-0.135	-0.140
VIVA			0.778

It is encouraging that all the parts of the examination are appropriately correlated apart from the EMQ. The viva and OSCE have a good correlation but not so high that would make the viva redundant. The validity of the EMQ paper should be kept under review.

8 Comments and recommendations

MCQ paper

The MCQ paper had a high reliability of 0.813 (KR20).

1. The MCQ paper closely matched the recommended blueprint with 17 clinically relevant basic science questions, 30 clinical ophthalmology questions, 12 management and therapeutics, 17 investigations questions and 14 miscellaneous questions.

Recommendation Actioned:

The paper setting for the MCQ paper will continue with the following blueprint:

Clinically relevant basic science (anatomy, physiology, biochemistry, cell biology, microbiology, optics, genetics, pathology and laser physics):	15-20
Clinical ophthalmology (trauma, neurology, pupils, glaucoma, strabismus, paediatrics, retina, uveitis, oncology, cataract, oculoplastic, orbit):	25-30
Management and therapeutics:	10-15
Investigations:	15-20
Miscellaneous:	10-15
Total:	90

2. The paper had 14% negatively discriminating questions (questions more likely to be answered correctly by poor candidates than good candidates). These questions should be reviewed by the Part 2 FRCOphth sub-committee and amended or discarded from the question bank.

Recommendation Actioned:

The Part 2 FRCOphth Sub-Committee has reviewed the MCQ paper questions with a negative 33% discrimination and amended or discarded them from the question bank.

3. The classification of questions using the Ebel method was successful and closely matched the performance of the candidates. The pass mark agreed using the previously agreed minimally competent candidate standard produced a MCQ pass mark of 58/90 or 64%.

Recommendation Actioned:

Future examinations will continue to use the following grid to calculate the pass mark after the Ebel classification (easy, moderate, difficult, essential, important and supplementary):

	Difficult	Moderate	Easy
Essential	0.5	0.7	0.85
Important	0.4	0.6	0.7
Supplementary	0.3	0.45	0.65

EMQ paper

4. The EMQ paper maintained a high reliability of 0.9 (KR20).

Recommendation Actioned:

The paper setting for the EMQ paper will continue with the following blueprint:

Clinical ophthalmology (uveitis, paediatrics, vitreo-retinal, medical retina, strabismus, oculoplastics, orbit, cornea, external eye disease, trauma, cataract, glaucoma):	40-50
Neurology and medicine:	14-24
Clinically relevant basic sciences (pathology, optics):	4-8
Pharmacology and therapeutics:	6-10
Investigations:	6-10
Miscellaneous:	2-4
Total:	90 (45x2)

5. The EMQ paper had a very low proportion of negatively discriminating questions (4%). The Part 2 FRCOphth sub-committee should review these questions and amend or remove them from the question bank.

Recommendation Actioned:

The Part 2 FRCOphth sub-committee has reviewed the EMQ paper questions with a negative 33% discrimination and amended or discarded them from the question bank.

6. The classification of questions using the Ebel method was reasonably close to the performance of the candidates. The pass mark agreed using the previously agreed minimally competent candidate standard produced a pass mark of 58/90 or 64%.

Recommendation Actioned:

Future examinations will continue to use the following grid to calculate the pass mark after the Ebel classification (easy, moderate, difficult, essential, important and supplementary):

	Difficult	Moderate	Easy
Essential	0.5	0.65	0.8
Important	0.45	0.6	0.75
Supplementary	0.35	0.5	0.65

7. Passing the written papers and invitation to attend clinical papers.

The decision to invite candidates to the clinical papers is based upon achieving a mark in both papers that meets or exceeds the combined pass mark from both papers (set at the Ebel standard less 1 SEM calculated after the results are known). Although there was a great improvement in the correlation between the two papers (0.384 vs 0.092 in September 2008) two candidates were able to offset a very poor result in the EMQ paper (less than 2 SEM below the pass mark) with a good MCQ mark. One of these candidates went on to pass the clinical papers.

Recommendation Actioned:

In order to progress to the clinical examination, candidates are required to obtain:

- 1. A combined mark from both written papers \geq Ebel mark -1 SEM AND**
- 2. A mark in BOTH papers that \geq Ebel mark -2 SEM**

Structured vivas

The Structure Vivas had a high reliability 0.8. Five candidates passed at the level of borderline candidate mark +1 SEM. It is acknowledged that with small numbers the borderline candidate method has some difficulties in application. If the pass standard for the Part 3 MRCOphth examination of two clear fails in one station had been applied, four candidates would have passed. Only two candidates passed with both standards applied.

Recommendation Actioned:

Examiners will be reminded to agree the standard expected to pass the station and understand the criteria for awarding marks based upon the acceptable answers provided.

OSCEs

9. The host unit was very successful in recruiting patients but this caused problems for the examiners as there were too many for each station. This has the potential for reducing the reliability of the examination as the degree of difficulty for candidates may vary.

Recommendation Actioned:

The Senior Examiner has reviewed the instructions issued to host units and updated the appropriate number of patients required for the OSCE depending upon the number of candidates and the number of sessions that the OSCE requires.

10. For the OSCE, the correlation coefficient between both examiners and stations can be improved. Ideally correlation should be between 0.4 and 0.8 so that the OSCE has high construct validity without being redundant.

Recommendation Actioned:

Examiners will be reminded to agree the purpose of the station and the standard expected. As the number of candidates increases and correlation coefficients become more reliable, the role of each station will be reviewed and, if necessary, modified.

11. Some examiners commented on hand hygiene. It is important that examiners and patients are reassured that candidates are observing appropriate guidance regarding hand hygiene. If candidates are expected to clean hands between patients, this should be made clear to patients at the start of the OSCE and time given for this in each OSCE (which will be notable in the three patient stations). If candidates do not maintain hand hygiene to an acceptable degree they should be advised that this could adversely affect the result of the examination.

Recommendation Actioned:

Candidates will be advised that they must clean their hands between every patient (not just between stations) and that time will be allowed for this. Examiners will also remind candidates of this during the clinical examination. Candidates will be made aware that failure to maintain an appropriate standard of hand hygiene may adversely affect the result of the examination.

12. The introduction of different numbers of patients in each station has produced a variable natural weighting for each.

Recommendation Actioned:

In order to apportion marks appropriately the station marks for each station will continue to be adjusted as follows:

Station	1	2	3	4	5	6
Patients	3	3	3	2	4	1
Natural relative weighting	0.18	0.18	0.18	0.13	0.25	0.06
Adjusted relative weighting	0.15	0.15	0.15	0.15	0.31	0.07
Equivalent patients	2	2	2	2	4	1

The second Part 2 FRCOphth Examination can be considered as a success, with good feedback from candidates and examiners, a credible pass rate, and components with, on the whole, a high reliability. Lessons have been learned from the first examination and changes have been made.

I am grateful to Dr Carrie MacEwen, Mr Peter Tiffin, Emily Beet and George Hibdige for their assistance and support in the preparation of this report

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