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FROM THE EXAMINATIONS DEPARTMENT

## Public Report on the Part 2 FRCOphth Examination February/April 2010

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## **Report on the Part 2 FRCOphth examination**

The written papers of the fourth sitting of the Part 2 FRCOphth examination were held in London on Monday 22 February 2010.

### **1. Candidates**

#### ***The candidates***

21 candidates presented themselves for the examination.

#### ***The written papers***

The written papers consisted of a 2 hour, 90 question single best answer from 4 MCQ paper and a 45 stem, 90-question EMQ paper lasting 3 hours. Candidates must pass the written papers to be allowed to sit the practical component 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 1 SEM. They must also gain at least the pass mark minus 2 SEM in each paper.

## 2. The MCQ paper

Reliability (KR20): 0.834  
 Standard error of measurement: 3.92

Notes: (see standard setting for further details)

1. Pass mark derived from standard setting: 59/90
2. **Adjusted pass mark (- 1 SEM) 55/90**
3. Adjusted pass mark (- 2 SEM) 51/90

**Table MCQ 1: Distribution of marks:**

Score	Distribution	
36-40		1
41-45		3
46-50		5
51-55		1
56-60		3
61-65		4
66-70		3
71-75		1
		21

### 2a) Blueprint

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

**Table MCQ 2**

Basic science 18	Anatomy & embryology	2
	Microbiology	4
	Optics	2
	Genetics	1
	Pathology	6
	Physiology	3
Clinical ophthalmology 28	Cataract	3
	Neurology & pupils	4
	Glaucoma	2
	Strabismus	2
	Paediatrics	3
	Vitreo-retinal	3
	Medical retina & uveitis	6
	Oculoplastics and orbit	2
	Cornea	3
Management & therapeutics 8	Pharmacology & therapeutics	8
Investigations 20	Investigations	20
Miscellaneous 16	Statistics and research	5
	Medicolegal	4
	Health economics	1
	Ethics	2
	General medicine	2
	Guidelines	2
Total 90		90

## 2b) Analysis of questions

**Table MCQ 3**

	Difficult (<30% correct)	Moderate (31-70% correct)	Easy (>70% correct)	Total
Negative discrimination	3	4	1	8
Poor discrimination (0-0.19)	2	8	16	26
Good discrimination (0.2-0.49)	7	21	14	42
Excellent discrimination (>0.49)	2	10	2	14
Total	14	43	33	90
Comparison to Ebel*	10	31	49	

\*The examiners underestimated the difficulty of the questions

## 2c) Standard setting for MCQ paper

The examiners agreed the pass mark using the Ebel technique.

**Table MCQ 4: Classification of the questions:**

	Difficult	Moderate	Easy	
Essential	0	9	22	31
Important	5	14	19	38
Supplementary	5	8	8	21
Total	10	31	49	90

**Table MCQ 5: Percentage correct by borderline candidates**

	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 6: Weighted score**

	Difficult	Moderate	Easy	
Essential	0	6.3	18.7	25
Important	2	8.4	13.3	23.7
Supplementary	1.5	3.6	5.2	10.3
Total	3.5	18.3	37.2	59

**Unadjusted MCQ pass mark: 59/90 or 66%**

### 3. The EMQ paper

Reliability (KR20):	0.86
Standard error of measurement:	4
Notes: (see standard setting for further details)	
1. Pass mark derived from standard setting:	59/90
2. <b>Adjusted pass mark (- 1 SEM)</b>	<b>55/90</b>
3. Adjusted pass mark (- 2 SEM)	51/90

#### Distribution of marks:

**Table EMQ 1**

Score	Distribution	Number
31-35	/	1
36-40	/	1
41-45	////	4
46-50	///	3
51-55	////	4
56-60	//	2
61-65	///	3
66-70	//	2
71-75	/	1

#### 3a) Blueprint

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

**Table EMQ 2**

Clinical ophthalmology 46	Uveitis	2
	Paediatrics	6
	Vitreo-retinal	0
	Medical retina	12
	Strabismus	4
	Oculoplastics and orbit	2
	Cornea/external eye	6
	Trauma	4
	Cataract/lens	4
	Glaucoma	4
	Oncology	2
Neurology and medicine 14	Neurology	12
	Medicine	2
Basic sciences 6	Pathology/genetics	4
	Optics/refraction	2
Pharmacology and therapeutics 12	Therapeutics	12
Investigations 6	Ophthalmic & Neuro-imaging	6
Miscellaneous 6	Statistics and epidemiology	4
	Research	2
Total		90

### 3b) Analysis of questions

**Table EMQ 3**

	Difficult (<30% correct)	Moderate (30-70% correct)	Easy (>70% correct)	Total
Negative discrimination	2	2	2	6
Poor discrimination (0-0.19)	6	14	14	34
Good discrimination (0.2-0.5)	2	18	12	32
Excellent discrimination (>0.5)	0	15	3	18
Total	10	49	31	90
Comparison to Ebel*	15	29	46	

### 3c) 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	1	9	29	39
Important	9	12	10	31
Supplementary	5	8	7	20
Total	15	29	46	90

**Table EMQ 5: Percentage correct by borderline candidates**

	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 6: Weighted score**

	Difficult	Moderate	Easy	
Essential	0.5	5.85	23.2	29.55
Important	4.05	7.2	7.5	18.75
Supplementary	1.75	4	4.55	10.3
Total	6.3	17.05	35.25	58.6

**Unadjusted EMQ paper pass mark: 59/90 or 65%**

#### 4. Overall results from the written papers

##### Distribution of marks:

71-80	/	1
81-90	////	4
91-100	////	4
101-110	//	2
111-120	////	4
121-130	//	2
131-140	////	4

##### 4b) Combined blueprint from both papers

Theme	Topic	N=	%
Clinical ophthalmology 70 (39%)	Retina and uveitis	20	11
	Paediatrics and strabismus	15	8
	Vitreo-retinal	3	2
	Oculoplastics and orbit	4	2
	Cornea/external eye	9	5
	Trauma	4	2
	Cataract/lens	7	4
	Glaucoma	6	3
	Oncology	2	1
	Neurology & medicine 20 (11%)	Neurology	16
Medicine		4	2
Basic sciences 24 (13%)	Pathology/genetics	15	8
	Optics/refraction	4	2
	Anatomy/physiology	5	3
Therapeutics 20 (11%)	Therapeutics	20	11
Investigations 28 (16%)	Ophthalmic & Neuro-imaging	28	16
Miscellaneous 20 (11%)	Statistics, research, epidemiology	9	5
	Economics, ethics, law, guides	9	5
		180	100
Total			

#### 4c) Breakdown of Written Results

##### Breakdown of written results by training

	Failed	Passed	Total
In OST	3 (43%)	4 (57%)	7 (33%)
Not in OST	8 (57%)	6 (43%)	14 (66%)
Total	11 (52%)	10 (48%)	21

These differences are not statistically significant ( $p = 0.537$ )

##### Breakdown of written results by gender

	Failed	Passed	Total
1Female	3 (75%)	1 (25%)	4 (19%)
Male	8 (47%)	9 (53%)	17 (81%)
Total	11 (52%)	10 (48%)	21

These differences are not statistically significant ( $p = 0.314$ )

##### Breakdown of written results by country of qualification

	Failed	Passed	Total
UK	1 (25%)	3 (75%)	4 (19%)
Outside UK (inc Republic of Ireland)	10 (59%)	7 (41%)	17 (81%)
Total	11 (52%)	10 (48%)	21

These differences are not statistically significant ( $p = 0.223$ )

##### Breakdown of written results by number of previous attempts

Attempts	Failed	Passed	Total
1 (First)	5 (42%)	7 (58%)	12 (57%)
2	5 (71%)	2 (29%)	7
3	1 (100%)	0 (0%)	1
4	0 (0%)	1 (100%)	1
Any resit	6 (67%)	3 (33%)	9 (43%)



**4d) Candidates who were invited to attend the clinical examination.**

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

1. Obtain a combined mark from both papers, which equals or exceeds the combined pass mark from both papers after each has been lowered by 1 SEM and
2. Obtain a mark in each paper that equals or exceeds the pass mark in that paper after it has been reduced by 2 SEM

In total, ten candidates passed the written papers and were invited to attend the clinical papers.

**This represents a pass rate for the written papers of 10/21 or 48%.**

## Oral examinations (Structured Viva and OSCE)

The oral examinations took place in April 2010 at Ninewells Hospital in Dundee.

### 5. The Structured Vivas

There were five structured vivas, which were held the afternoon of 27 April 2010 in the Integrated Teaching Area of Ninewells Hospital. The communication skills OSCE station 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  
Retinal imaging: Myopic CRNVM

**Station 2.** Patient management 1  
Orbital cellulitis

**Station 3.** Patient management 2  
Tobacco amblyopia

**Station 4.** Attitudes, ethics and responsibilities.  
Visual standards for driving

**Station 5.** Audit, research and evidence based practice.  
Clinical governance (5 minutes)  
Health promotion and disease prevention  
Screening (5 minutes)

The vivas were held in one, well-sized room, which is part of the Medical School and frequently used for this type of assessment. The examination was conducted in two rounds of five candidates. The examiners were very happy with the facilities.

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, 12 marks per station): 120

Pass mark (using borderline candidate method):	63 (53%)
Mean score:	78 (65%)
Median score:	83.5 (70%)
Range:	49-107 (41%-89%)
Reliability: (Cronbach alpha)	0.9
SEM:	5
Adjusted pass mark (+ 1 SEM)	68 (57%)

Modifying the pass mark up by 1 SEM did not alter the pass rate for the structured viva examination. No candidate received a red flag.

**Correlation between examiner's marks at each station:**

Station 1	Station 2	Station 3	Station 4	Station 5
PI	PM	HPDP	AER	Role
0.58	0.73	0.92	0.77	0.92

**Correlation between examiner's global judgements at each station:**

Station 1	Station 2	Station 3	Station 4	Station 5
PI	PM	HPDP	AER	Role
0.77	0.41	1	0.36	0.81

**Correlation between viva stations:**

		Station 2	Station 3	Station 4	Station 5
		PM	PM	AER	Role HPDP
Station 1	PI	0.788	0.533	0.701	0.692
Station 2	PM		0.368	0.584	0.676
Station 3	PM			0.556	0.697
Station 4	AER				0.443

**5b) Standard setting for the structured vivas:**

	1		2		3		4		5		Total
Number of borderline candidates	4	5	4	1	1	1	3	4	2	1	26
Median borderline candidate mark	7	7	6	6	9	6	6	6	5	5	63

The pass mark for the structured viva was increased by 1 SEM from 63 (53%) to 68 (57%).

**5c) Feedback**

**Candidate Feedback – Structured Viva**

- Examiners made candidates comfortable and relaxed
- Background noise made it difficult for examiner to hear answers
- Well run examination
- Some found it difficult to find the venue once in the hospital

**Examiner Feedback – Structured Viva**

- Examiners in the Patient Management 1 station felt it a struggle to get through all the questions but it was generally agreed that the slower candidates should receive fewer marks as the bright candidates got through the questions
- Make the EBM viva more clinically relevant

## 6. The OSCE

There were seven OSCE stations in all. The six clinical stations were held on the morning of 28 April 2010 in Clinic 6A, the Eye Outpatients Department, at Ninewells Hospital. The communication OSCE was conducted with the vivas. Four of the OSCE stations lasted 15 minutes. The medicine and neurology stations ran as a double station and lasted 30 minutes. The communication OSCE lasted 10 minutes. There were two examiners at each station. In the communication OSCE, one examiner was a trained lay assessor. Patients with the following clinical problems were made available by the host department for the examiners:

### OSCE Stations

#### **Station 1: Cataract and anterior segment (3 patients)**

ICE syndrome / glaucoma / trabs  
HSK / PK / Pseudophakia  
Bilat pseudophakia  
High myope / corneal oedema / pseudophakia / iris naevus  
Pseudopterygium / pemphigoid / blepharitis  
HZO / PK

#### **Station 2: Glaucoma and eyelid (3 patients)**

III n palsy / Ptosis  
Glaucoma / Deep sclerostomy  
Glaucoma / cystic bleb  
Glaucoma / bilat trabs / cataract

#### **Station 3: Posterior segment (3 patients)**

Retinal tear with free operculum and laser – BIO  
PDR with PRP – 90D  
Mild dry ARMD / tilted disc - direct

#### **Station 4: Strabismus and orbit (2 patients)**

Congenital nystagmus / Peters  
Browns syndrome  
Orbital tumour  
Heavy eye syndrome / hypotropia  
CCF  
Thyroid eye disease  
Consecutive XT / Latent nystagmus

#### **Stations 5 and 6: Medicine and neurology (4 patients)**

Ptosis / Myaesthesia  
Atrial fibrillation / on warfarin  
Craniopharyngioma / optic atrophy / field defect  
CRAO  
Longstanding VI n palsy  
Adies pupil  
Homonymous hemianopia / subarach  
Diabetic retinopathy

#### **Station 7: Communication (1 patient actor)**

Breaking bad news to a parent whose child has a retinoblastoma

## 6a) Results

Candidates examine three patients in stations 1-3, two patients in stations 4, four patients in station 5 and one patient in station 6. Each patient is worth a maximum of 12 marks (2 examiners x 3 marks x 2 criteria). To balance the contribution to a candidate's mark from each station, the mark from each of stations 1-3 and 7 is weighted by 0.666. The relative contribution from each station in the OSCE is thus 2,2,2,2,4,1.

Maximum mark after weighting: 156

Stations 1-3: 2 criteria scored 0-3 for 3 patients by 2 examiners x 0.666 = 24

Station 4: 3 criteria scored 0-3 for 2 patients by 2 examiners = 24

Station 5: 3 criteria scored 0-3 for 4 patients by 2 examiners = 48

Station 6: 3 criteria scored 0-3 for 1 patient/actor by 2 examiners x 0.666 = 12

Pass mark (using borderline candidate method):	87 (56%)
Mean score:	100 (64%)
Median score:	95 (61%)
Range:	56-143 (36%-92%)
Reliability (Cronbach alpha):	0.8
SEM:	8
Adjusted pass mark (+1 SEM)	95 (61%)

Candidates found the strabismus and communication skill stations the most difficult. Unsurprisingly they performed well in the cataract/anterior segment, glaucoma/lid and posterior segment examination stations.

### 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/neural	Comm.
0.75	0.81	0.93	0.80	0.90	0.74

### Correlation between examiner's global judgements at each station

Station 1	Station 2	Station 3	Station 4	Station 5/6	Station 7
Cat/AS	Glauc/lid	Posterior	Orbit/Strab	Med/neural	Comm.
0.64	0.67	0.86	0.81	0.94	0.63

### Correlation between station scores (combined marks 2 examiners)

		Station 2	Station 3	Station 4	Station 5	Station 6
		Glauc/lid	Posterior	Orbit/Strab	Med/neuro	Comm.
Station 1	Cat/AS	0.33	0.53	0.43	0.10	-0.30
Station 2	Glauc/lid		0.57	0.17	0.43	0.08
Station 3	Posterior			0.30	0.35	-0.06
Station 4	Orbit/Strab				0.38	-0.13
Station 5	Med/neuro					0.57

## 6b) Standard setting for the OSCE

Station	1		2		3		4		5		6	
No. of borderline candidates	2	4	4	1	2	1	2	3	3	2	3	3
Median borderline candidate score	5.7	9.7	8	11.3	9	10	3.5	5	13	15	2.7	4

The pass mark for the OSCE was increased by 1 SEM from 87 (56%) to 95 (61%).

## 6c) Feedback

### Candidate Feedback

- No concerns over conduct of examiners
- All felt the range and quality of patients was very good
- General concern over:  
Shortage of time to carry out thorough examination  
Uncertainty about the exam requirements to score positively
- Directed to Ward 25, not clinic 6A
- Could have more explanation of which station was which beforehand
- Candidates felt afraid to speak loudly in Communication Skills station to be clearly heard because of 'sensitive' scenario
- Difficult communication case for 10 minutes
- No tissues available in communication case where upsetting news being delivered

### Examiner Feedback

- Was agreed that the right number of patients were being seen for the different OSCE stations
- 4 patients in the Medicine & Neurology stations was felt to strike the right balance

## 7a) Final results

### Correlation between scores in each part of examination:

	EMQ	VIVA	OSCE
MCQ	0.51	0.66	0.67
EMQ		0.78	0.59
VIVA			0.84

Correlation between written and oral examinations 0.80

Five candidates passed the examination overall. This represents a pass rate of 5/21 or 24%

## 7b) Breakdown of Clinical Examination

### Breakdown of clinical examination results by training

	Failed	Passed	Total
In OST	1 (25%)	3 (75%)	4 (40%)
Not in OST	4 (67%)	2 (33%)	6 (60%)
Total	5 (50%)	5 (50%)	10

These differences are not statistically significant ( $p = 0.197$ )

### Breakdown of clinical examination results by gender

	Failed	Passed	Total
Female	1 (100%)	0 (0%)	1 (10%)
Male	4 (44%)	5 (56%)	9 (90%)
Total	5 (50%)	5 (50%)	10

These differences are not statistically significant ( $p = 0.292$ )

### Breakdown of clinical examination results by country of qualification

	Failed	Passed	Total
UK	0 (0%)	3 (100%)	3 (30%)
Outside UK (inc Republic of Ireland)	5 (71%)	2 (29%)	7 (70%)
Total	5 (50%)	5 (50%)	10

These differences are statistically significant ( $p = 0.038$ )

### Breakdown of clinical examination results by number of previous attempts

Attempts	Failed	Passed	Total
1 (First)	3 (43%)	4 (57%)	7 (70%)
2	2 (100%)	0 (0%)	2
3	0 (0%)	0 (0%)	0
4	0 (0%)	1 (100%)	1
Any resit	2 (67%)	1 (33%)	3 (30%)

## 7c) Comparison to previous examinations

Date	Oct 08	April 09	Sept 09	April 10
Candidates	7	15	16	21
MCQ pass mark	61%	64%	64%	66%
Reliability	0.55	0.81	0.77	0.83
EMQ pass mark	64%	64%	66%	65%
Reliability	0.82	0.90	0.83	0.86
Viva pass mark	59%	59%	64%	57%
Reliability	0.88	0.80	0.84	0.90
OSCE pass mark	65%	60%	63%	61%
Reliability	0.85	0.82	0.94	0.80
Written pass rate	86%	53%	38%	48%
Oral pass rate	50%	50%	33%	50%
Overall pass rate	29%	27%	13%	24%

## 8) Summary

The Part 2 FRCOphth examination is a comprehensive assessment of the knowledge and skills required for independent practice in the UK. Since it was first introduced in 2008 the reliability of each component has risen and now almost meets the standards set by PMETB/GMC. The pass rate remains low at around 25% and half of the candidates who pass the written paper eventually pass the examination overall. The examination has not yet been taken by sufficient numbers of trainees to assess its validity.

The correlation between the viva and OSCE supports the continued use of both types of oral assessment. The communication, strabismus and medicine/neurology stations remain the most challenging. This suggests that candidates do not yet have a clear idea of the standard that is expected of them and fail to prepare well.

Candidate's performance in neither the written, nor the oral examinations appeared to be influenced by training in OST (OST or non-OST) or gender. Candidates whose country of qualification was outside the UK appear to be less likely to pass the oral examination than those who qualified in the UK. There are many possible reasons for this but the College should be concerned that if a candidate's first language is not English, they may be at a disadvantage. As the examination is primarily designed to assess a candidate's competence to practise in the UK, the College may consider that this is legitimate. The examination is, however, open to doctors from overseas and this difference based upon country of qualification may make the examination unpopular as an international postgraduate qualification in ophthalmology.

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