

# Prevalence of biometry assessment experiences among trainee ophthalmologists in the United Kingdom

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## Abstract

**Purpose** To determine the biometry assessment experiences of senior house officers (SHOs) during basic surgical training (BST).

**Methods** This is a postal survey of SHOs in recognized UK surgical training posts from April 2005 to November 2005. Data collected included SHO proficiency in various types of biometry, practical biometry experience and opinions as to whether performing biometry is still a required skill.

**Results** Of 460 SHOs who were sent questionnaires 279 (60.1%) responded. Only 13% of respondents received formal training in biometry while 43% received informal training in biometry from either senior colleagues or nurses. SHOs maintained they were proficient in different types of biometry including contact biometry (49%), non contact biometry (45%), immersion biometry (2.5%) and keratometry (81%). If their current unit, 84% of SHOs did not perform any biometry. Although the majority of SHOs reported familiarity with IOL power prediction formulae, there was no consistency among the SHOs working in the same unit. Despite the lack of exposure to biometry, most (88%) felt that biometry was still a required skill.

**Conclusion** This study highlights the lack of training and low prevalence of performing biometry among trainee ophthalmologists. As proficiency in biometry is part of BST and the majority of the trainees wished to learn the skill, it is hoped that this issue will be addressed in the new Ophthalmic Specialist Training curriculum.

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**Keywords:** biometry; senior house officer; training

## Introduction

The refractive outcome of cataract surgery is affected by ocular biometry and intraocular lens (IOL) power prediction formulae. Recent advances in ocular biometry include the use of noncontact partial coherence interferometry biometry machine such as IOL Master. More sophisticated IOL calculation formulae such as the Holladay, Hoffer Q, and Haigis have also been introduced.

As outlined in the Royal College of Ophthalmologists' (RCOphth) curriculum of basic surgical training (BST)<sup>1</sup>, trainee ophthalmologists need to be proficient in the method of applanation ultrasonography and noncontact optic biometry (IOL Master), and to subsequently calculate the desired IOL power. However, the trend in most ophthalmic units is for the preoperative biometry to be carried out by experienced technicians or nurses. Trainees may, therefore, not be involved in any part of the assessment.

This situation allowed us to undertake a survey to determine the biometry experience and proficiency of senior house officers (SHOs) during BST. The level of training received by SHOs was also determined. In addition, the views of SHOs as to whether performing biometry is still a skill required by trainees were sought.

## Methods

### Questionnaire

A self-completion questionnaire was developed to describe SHOs' biometry experience based on

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the recommendations set out by the RCOphth in their Guide for Basic Specialist Training.<sup>1</sup> Demographic data including age, gender, type of hospital they were working, length of time as SHO, and qualifications were collected. They were asked if biometry was part of their weekly job plan, and if they received any formal training in the technique including attendance of a formal biometry course. In addition, they were asked to judge their level of proficiency in the use of contact and noncontact biometry and immersion biometry. The percentage of biometry, which was performed by SHOs in the unit was also ascertained. Senior house officers were also asked if they were familiar with IOL power prediction formulae, and were asked to indicate whether the IOL calculation formulae was currently in use in their department.

Their opinion as to whether biometry is still a skill required by SHO were sought. Respondents, who did not think biometry is a skill required, were asked to provide a reason. Those who believed biometry is still a skill required, were asked to indicate a suggested frequency to perform biometry. Senior house officers were also asked if their unit audit biometry outcomes and its frequency. Spaces were also on the questionnaire for further comments.

### Respondents

Using the RCOphth Directory of Training Posts in Ophthalmology (2005) and telephone conversations with each unit, 464 Ophthalmology SHOs in training programmes were identified. Those who were within general practice vocational training schemes or nontraining posts were excluded. Individuals who did not respond within 3 months were sent a follow-up questionnaire.

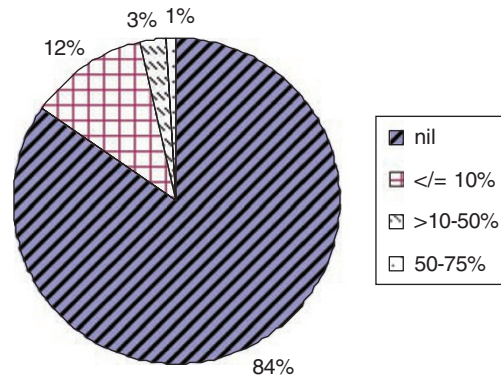
### Qualitative analysis

Free text comments made by respondents were documented and analysed thematically.<sup>2,3</sup>

### Results

#### Demography

Of 464 questionnaires sent to SHOs, 279 (60.1%) responded. 188 were men and 91 were women. The median age was 29 years (range: 22–42 years). Eighty-nine (31.9%) respondents were trained to postgraduate level overseas. Of those who replied, the median length of time in post was 18 months (range: 3–48 months) for the UK graduates and 36 months (range 3–144 months) for overseas graduates. Of the SHOs who responded, 102



**Figure 1** Percentage of biometry workload performed by SHOs.

(36.6%) had passed the MRCOphth part 1 examination, 110 (39.4%) part 2, and 51 (18.3%) had passed the part 3 MRCOphth. Twenty-one respondents had a Fellowship of the Royal College of Surgeons (FRCS) and 10 had a diploma in Ophthalmology.

### Performance of biometry

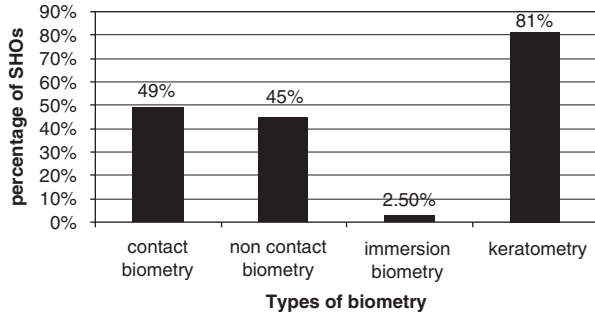
Only 19 respondents (6.8%) stated biometry was part of their weekly duties. Thirteen (4.7%) performed biometry on 1–5 patients/week; five (1.8%) performed biometry on 5–10 patients/week; one (0.36%) performed biometry on 10–15 patients/week while 233 (83.5%) did not perform any biometry within their department. Where biometry was not performed by an SHO, nurses were responsible in 78.1% of cases, optometrists 12.5%, orthoptist 3.2%, and a combination of all these in 12.3%. The proportion of biometry workload performed by SHOs is shown in Figure 1.

### Training

Questions regarding the training revealed that only 36 (13%) received formal training in biometry while 43% received informal training from consultants, registrars, senior colleagues, nurse practitioners, and optometrists. Only 12 (4.3%) had attended a biometry course.

### Proficiency

Nearly half of respondents (48.7%) said that they were proficient in performing contact biometry while 126 (45.2%) reported proficiency with noncontact biometry. Only seven (2.5%) were proficient with immersion biometry. In contrast, 226 (81%) said that they were proficient with keratometry (Figure 2).



**Figure 2** Percentage of SHOs proficient in various types of biometry.

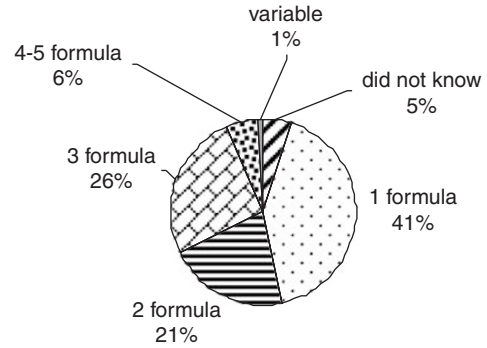
**IOL calculation formulae**

Almost all respondents (95.3%) reported familiarity with the stated IOL formulae. When asked about the standard practice of their own unit, it was found that different SHOs working in the same department had given different answers. The median level of agreement for the various formulae in use within the same unit was 66% (range: 60–95%). It was, therefore, decided that rather than using individual answers as a basis on which IOL power prediction formulae each department were using, we would use the results as an estimate of SHOs' familiarity with the formulae use in their department. Amongst the respondents, 13 (4.7%) did not know which formulae their department used while 116 (41.6%) reported the use of one formula. Of the latter, 95 used SRKT, 17 used SRK II, two Holladay, one Haigis and one Hoffer Q. Sixty-one SHOs used two formulae of which majority were SRKT and Hoffer Q and 72 SHOs reported use of three formulae of which the majority were Hoffer Q, SRKT, and Holladay. Sixteen SHOs said their department used up to four or five formulae (Figure 3).

**Biometry**

The majority of SHOs (87.8%) believed biometry is a necessary skill for BST training. Of the 32 SHOs who did not believe so, four gave the reason that other trained technicians were available; seven thought that an understanding of the method was sufficient; three thought that unless the biometry is performed regularly the results are unsafe, while two thought it as a simple technique that was easily mastered and should therefore be performed by designated technicians. One SHO thought that his/her time could be used more profitably with clinical activities and one summarized his/her thoughts in relation to 'falling doctors hours, extended roles for nurses, and little training value'.

For those who believed that biometry is a skill required by SHOs, 107 (38.4%) thought 1 session/week was



**Figure 3** Number of formulae SHO believed their departments used.

**Table 1** The suggested frequency of biometry to be performed by SHOs

Frequency of biometry suggested by SHOs	Percentage (%)
Once a week	39
Once a fortnight	14.5
Once a month	18.3
Enough to be proficient and does not need to be a routine part of job	8.6
Beginning part of job	2.2
Practiced as required	1
As frequent as possible	1
Included in the exam	1
No opinion	1
6 monthly	0.3
yearly	0.3

SHOs, senior house officers.

sufficient, 50 (17.9%) favoured 1 or 2/week and 50 (17.9%) preferred 1 session/month, while 22 (7.9%) thought it was enough to be proficient without featuring in their weekly job plan. Seven (2.5%) respondents said that it was necessary only in the early period of training and 11 (4%) thought it should be practiced as required. Other comments included six monthly, yearly, no opinion, and two suggested that it was included in a MRCOphth examination (Table 1).

A large number of respondents (70.6%) reported departmental audit of biometry outcome while 44 (15.8%) reported no activity and 35 (12.5%) did not know of any. Of those reporting a departmental audit, 96 (34.4%) reported annual audit, 43 (15.4%) at six monthly-intervals, three at 2–3 monthly intervals and six every 2–5 years. Only two said that individual consultants performed personal audit. Fifty-two respondents gave no answer.

The free comments section could be summarised in three main themes.

1. That the educational and practical opportunities for biometry are taken over by other health professionals:

'This is one of many skills now being delegated to nurses. This undermines SHO training, as trusts are more interested in long-term service commitment.'

2. Many SHOs expressed a desire to learn biometry skills:

'Biometry should be done by the SHOs. It is essential that postop refraction status at four weeks should be reviewed by the SHO to judge its accuracy that includes a report sent by the optician.'

3. A group considered biometry is best performed by permanent staff rather than rotating SHOs.

## Discussion

The Royal College of Ophthalmologists had stipulated in its BST guidelines that all SHOs should be proficient in performing biometry.<sup>1</sup> Previously, biometry was almost exclusively performed by doctors.<sup>4</sup> Recent trends show that nursing staff, orthoptists, and optometrists carry out 92–97% of the work while trainee ophthalmologists are responsible for 9% of the service.<sup>5</sup> This correlates with our results. This change reflects the increase in high-volume cataract surgery and reduced junior doctors' working hours. However, it raises the issue of biometry competency by ophthalmic trainees.

In our study, only 6.8% of trainees identified biometry within their job plan and performed it on 1–5 patients/week. The majority (83%) of SHOs did not perform any biometry. While 4.3% had attended a biometry course and 13% had received any formal training in the procedure, the lack of involvement of basic surgical trainees in biometry measurement explains why less than half (48.7%) were proficient in contact biometry and 45.2% in noncontact biometry. Only 2.5% said that they were proficient in performing immersion biometry. The reason for this is likely to be that immersion biometry is not widely used in the United Kingdom.<sup>5</sup>

Although a vast majority of SHOs (95.3%) stated that they were familiar with IOL power prediction formulae, the fact that different SHOs within the same department quoted different answers with regard to the formula used in their department has highlighted a worrying lack of awareness of some SHOs with the types of formula used in their departments. Again this is likely related to the fact that the majority of the SHOs did not perform biometry measurements.

Another worrying statistics is an apparent lack of biometry audit conducted by the departments of those who responded. It appears that up to 30% of units do not conduct biometry audit.

Although the majority of current respondents lacked the exposure to the practical aspects of performing biometry,

87.8% believed performing biometry is a skill required by SHOs. However, we acknowledge that a postal questionnaire is not completely accurate. It is possible that only those dissatisfied with their biometry training responded as a way of 'complaining'. Those who did not respond may have been very content with their skill.

Nevertheless, it is strongly suggestive from this survey that there is a need for enhanced biometry training among trainees. Therefore, it is important that the need to learn both the principles and practice of biometry should be acknowledged and supported by the RCOphth and the relevant training authorities.

We report a deficiency in biometry training, amongst basic surgical trainees with only 13% reporting formal training and 4.3% had attended a formal biometry course. As most biometry within our study is currently conducted by the trained pre-assessment teams without trainee involvement, we suggest that SHOs should have a formal training by the trained staff. The SHOs should be taught the principles of different machines and have regular sessions with the experienced biometry staff who can check the accuracy of measurements made.

We found that a majority of SHOs were able to perform keratometry. This is likely because keratometry is tested in the practical session of the Part II MRCOphth. The authors suggest that biometry skills should also be tested in the up and coming Ophthalmic Specialist training (OST) curriculum and knowledge of biometry should be listed as a core competency.

Having emphasized the importance of achieving training and competence in performing biometry among SHOs, it is also important that SHOs should not be asked to perform biometry routinely in a way that provides the bulk of the of biometry service. As clearly stated in the RCOphth cataract surgery guidelines,<sup>6</sup> 'ophthalmologists in training should learn, perform and be familiar with biometry, but it is not appropriate for them to provide a routine biometry service.'

## Conclusion

A significant number of SHOs do not acquire competency in biometry measurement due to lack of training opportunities to learn this important skill. We also report a worrying lack of involvement by SHOs in audit of biometry outcomes. Trainees indicated a desire to learn biometry and a frustration from lack of training opportunities. We suggest that biometry is a core competency to be included in the future OST curriculum.

## Acknowledgements

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