

Resident surgical experience with lens and corneal refractive surgery: Survey of the ASCRS Young Physicians and Residents Membership

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A 43-question survey was e-mailed to all resident members of the American Society of Cataract and Refractive Surgery (ASCRS), ASCRS members in practice for 5 or fewer years, and residency program directors of 118 U.S. Accreditation Council for Graduate Medical Education–accredited ophthalmology programs (for distribution to their residents) in June 2010. Two hundred eighty-five of 2279 surveys sent were completed and returned, for a response rate of 12.5%. Most respondents (88.7%) had served as primary surgeon in more than 100 cataract surgeries. Fifty-two percent of respondents had not performed corneal relaxing incisions; 60% had no experience implanting a toric IOL. Twenty-two percent had experience implanting a presbyopia-correcting IOL. Over 75% had not performed any corneal refractive surgical procedures. Although basic cataract case numbers appear adequate, there are significant perceived deficiencies in current resident training models for surgical astigmatism management, implanting presbyopia-correcting IOLs, and corneal refractive surgery.

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Cataract and corneal refractive surgery are the most common ophthalmic surgical procedures performed in the United States and worldwide. These fields are rapidly evolving in terms of techniques, available technology, and patient expectations. Over the past 10 years, a multitude of new intraocular lens (IOL) styles with unique optical properties have become available, including toric, multifocal, and pseudoaccommodating IOLs.¹ Corneal refractive surgical techniques continue to evolve as well, including the advent of femtosecond

laser technology for laser in situ keratomileusis (LASIK) flap creation.^{2,3} The addition of these refractive surgical technologies has changed the landscape of ophthalmic practice, with increasing numbers of patients desiring the lifestyle benefits these technologies can provide.

The ophthalmology Residency Review Commission (RRC) and the Accreditation Council for Graduate Medical Education (ACGME) have established minimum requirements for operative experience for residents.^A The current requirements include residents serving as primary surgeon for 86 cataract surgeries and as primary or assistant surgeon for 6 corneal refractive surgeries. These requirements, however, do not specify refractive surgical technique or specific exposure to new-technology IOLs.

Several studies^{4–15} have evaluated the objective surgical practice patterns and outcomes of residents for cataract and refractive surgeries in the U.S, showing adequate competency for basic surgical techniques. The adaptation of core competencies,¹⁶ structured surgical curriculums,¹⁷ microsurgical laboratories,^{18,19} and surgical simulation devices^{20–22} are currently used to varying degrees to help solidify basic surgical

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techniques.¹⁶ However, previous surveys^{23,24} have also identified advanced cataract techniques and corneal refractive surgery as areas of perceived underexposure in residency. Furthermore, Kwon et al.²⁵ recently found that at least 45% of U.S. residencies do not offer resident-performed LASIK experience. It therefore seems plausible that residents may need and could effectively gain additional exposure to more advanced refractive corneal and cataract surgical techniques during residency without compromising primary training competency.

To better understand the current resident refractive surgical experience, the American Society of Cataract and Refractive Surgery (ASCRS) Young Physicians and Residents Committee created a survey of current residents, fellows, and physicians in practice 5 years or less. To our knowledge, this is the first direct survey of residents to evaluate both the objective quantity and the perceived quality of resident surgical experiences with the management of new-technology IOL implantation and corneal refractive surgery.

MATERIALS AND METHODS

A comprehensive 43-question survey created by the ASCRS Young Physicians and Residents Committee was e-mailed to all resident members of ASCRS (postgraduate years 2 to 4), ASCRS members identified as being in practice for 5 years or less, and residency program directors of 118 ACGME-accredited ophthalmology programs throughout the U.S. (to be distributed to their residents) in June 2010, which corresponded to the last month of an academic year. The surveys were sent and collected electronically using Survey Monkey, a commercially available Internet-based survey web service. The data were collected between June 10, 2010, and July 6, 2010. To increase the response rate, the survey was resent via a follow-up reminder e-mail; those who had previously responded were removed from the reminder e-mails to avoid duplicate entries. In addition, the survey responses were incentivized with a drawing for an Apple iPad (Apple, Inc.). Only 1 survey submission per Young Physicians and Residents section member was allowed.

Survey questions were designed to determine the objective quantity of surgical procedures performed in residency as well as the perceived adequacy of training (inadequate, adequate, or excessive) for particular surgical skills. The survey questions are shown in Appendix A (available at <http://jcrsjournal.org>).

Statistical Analysis

Responses to the survey were coded in a Microsoft Excel spreadsheet (Microsoft Office 2007, Microsoft Corp.) for analysis. Frequency data were tabulated and used for descriptive statistics. Analyses were performed for the whole group and for subgroups stratified by respondent training level.

RESULTS

Of the 2279 e-mail survey, 285 surveys (12.5%) were completed. Two hundred seventy-six surveys (96.8%

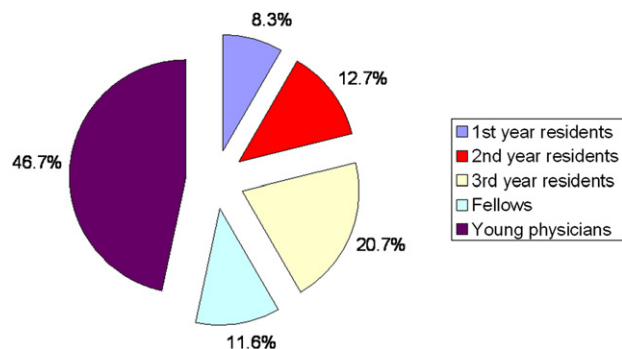


Figure 1. Percentage of respondents at each training level.

of completed surveys) were included for data analysis; 9 surveys were excluded for being duplicates (7) or because they contained no information (2). Of the respondents, there was a relatively even distribution between members in the second or third year of residency and those in the first 5 years of practice (Figure 1).

First Exposure to Phacoemulsification as Primary Surgeon

Eighteen percent of respondents (49/275) started phacoemulsification surgery during their first year of residency, 61.1% (168/275) began performing or planned to start phacoemulsification during their second year of residency, and 21.1% (58/275) began performing or planned to start phacoemulsification in their third year.

Number of Phacoemulsification Cases Performed During Residency and Quality of Exposure

Most respondents performed more than 100 surgeries as the primary surgeon; 89.4% of respondents (245/274) said they felt their exposure was adequate or excessive (Figure 2).

Management of Astigmatism During Cataract Surgery and Quality of Exposure

Of the 272 respondents, 51.8% (141/272) had not performed any corneal relaxing incisions, and 37.1% (101/272) were graduating residency without having experience with these (Figure 3). Sixty-nine percent of respondents (189/272) said that their training with corneal relaxing incisions was inadequate.

Sixty percent of respondents (162/272) had no experience implanting a toric IOL (Figure 3), and 66.1% (180/272) said they believed that the exposure to toric IOL technology was inadequate. Accordingly, 86.7% (235/271) said they believed that training for toric IOL implantation should begin in residency.

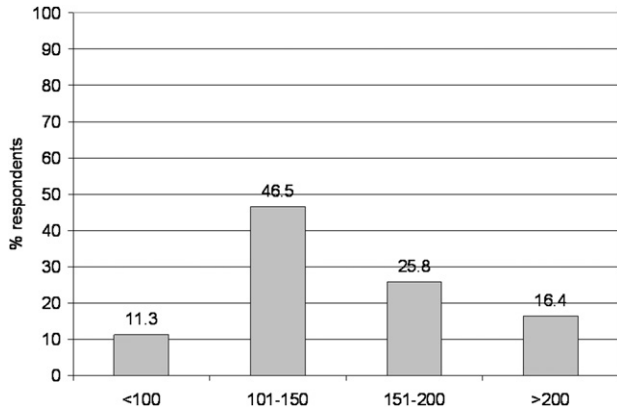


Figure 2. Number of phacoemulsification cases performed during residency.

Experience with Presbyopia-Correcting Intraocular Lenses

Seventy-eight percent of respondents (211/272) had not implanted a presbyopia-correcting IOL (Figure 4), and 77% (207/269) said they felt their exposure to this technology was inadequate. When asked about the appropriate timing for such training, 61% (166/272) stated “during residency” (Figure 5).

Experience with Laser Corneal Refractive Surgery

Figure 6 shows the residents' exposure to formal refractive surgical training, including certification training with the microkeratome and femtosecond and excimer lasers. Seventy-six percent (208/274) of those surveyed stated they had not performed any LASIK procedures, and 77% (207/269) had no experience with surface ablation procedures (Figure 7). Similarly, 75.0% of respondents (204/272) said they felt their exposure to excimer laser surgery was inadequate, and 80.9% (220/272) said this training should occur during residency.

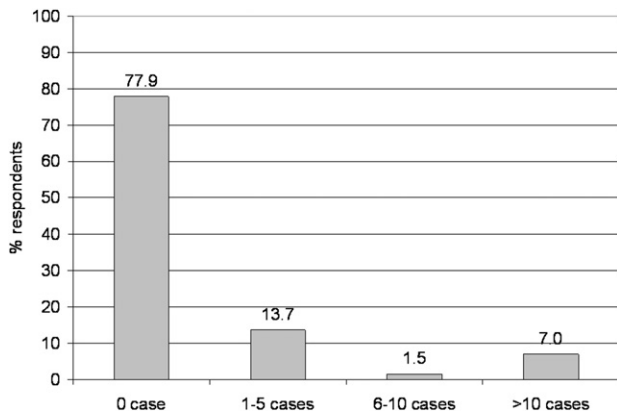


Figure 4. Number of presbyopia-correcting IOL implantations performed during cataract surgery.

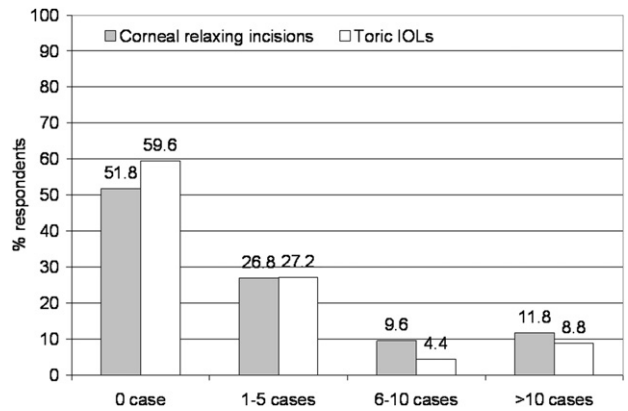


Figure 3. Number of astigmatism management cases performed during cataract surgery (IOLs = intraocular lenses).

DISCUSSION

The results in this survey suggest that although total cataract case numbers appear subjectively and objectively adequate,⁶ there are significant perceived deficiencies in current resident training models in preparing future surgeons for many of the more advanced procedures and techniques they are likely to use immediately after completing residency. Encouragingly, 89% of respondents had performed more than 100 cataract extractions, which is well above the minimum RRC and ACGME requirement. Furthermore, the above-average cataract volume suggests that most residents are exposed to a sufficient number of “average” cases so the later stages of their residency training could have increased focus on more advanced techniques without compromising core training. This is substantiated by a recent study by Roensch et al.,²⁶ who found that resident surgical outcomes using toric and multifocal IOLs in county hospital training facilities can be excellent with appropriate supervision.

There are multiple potential reasons for limited resident experience with premium IOLs. The current

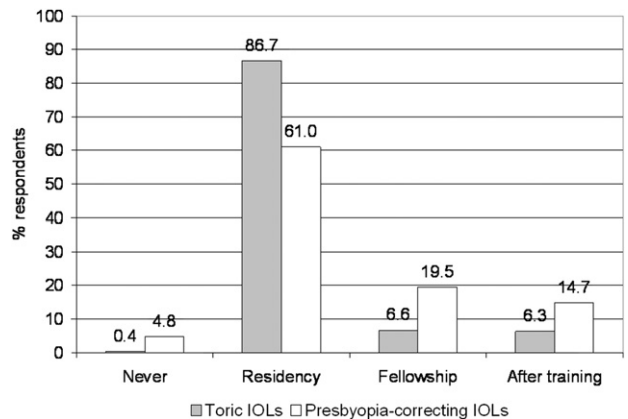


Figure 5. Appropriate timing to start training of toric IOLs and presbyopia-correcting IOLs (IOLs = intraocular lenses).

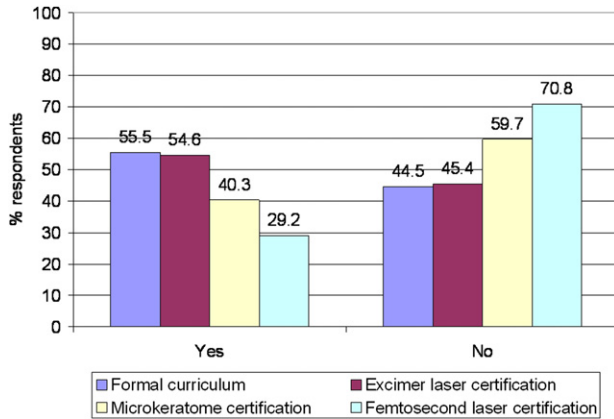


Figure 6. Formal refractive surgery curriculum, excimer laser, microkeratome, and femtosecond laser certification opportunities.

RRC and ACGME cataract surgery requirement of a finite number of cases without regard to technique does not address the nuances of modern cataract surgery, which is increasingly becoming refractive in nature. Most respondents complete their training without real or perceived exposure to presbyopia- or astigmatism-correction strategies, and most surgeons, regardless of stage of training, said that this exposure should occur during residency. Furthermore, there may be a real or perceived limited availability of these IOLs in some resident education settings. In academic centers, it is likely that patients opting for premium IOL options are less likely to allow resident involvement in their surgery,²⁷ although to our knowledge this has not been directly evaluated. Finally, faculty at academic centers may have less experience themselves performing premium IOL cataract surgery, although to our knowledge this also has not been evaluated.

The responses to the questions regarding refractive surgery training also show a large deficit in overall resident training in this field. Despite the increasing role of refractive surgical education in the curriculum, with an American Academy of Ophthalmology (AAO) Basic and Clinical Sciences book²⁸ devoted specifically to the subject and the inclusion of minimum requirements for surgical practice or observation, only one half of the residents reported having a formal refractive surgery component in their surgical curriculum and only one quarter had actual surgical experience with LASIK or surface ablation procedures. Accordingly, 75% of respondents said they felt their exposure to excimer laser surgery training was inadequate, and almost 81% said they felt this training should occur during residency.

The deficits in exposure to corneal laser refractive surgery may exist because this is still a relatively “newer” area covered under ACGME requirements and by the AAO Basic and Clinical Sciences series.

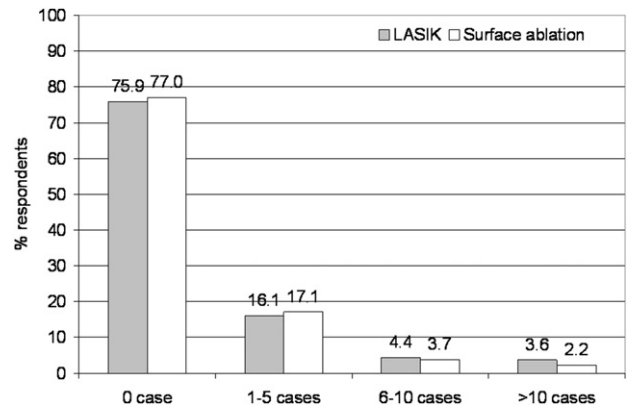


Figure 7. Number of refractive surgery procedures performed during residency (LASIK = laser in situ keratomileusis).

Since current ACGME requirements for corneal laser refractive surgery are minimal, there may be a similar lack of emphasis placed on such exposure.

Given the data in this survey, what options should be explored to implement a more expansive surgical education that would more adequately prepare residents in lens and corneal refractive surgery? The surgical management of astigmatism, premium IOL implantation, and basic corneal refractive surgery should be considered a vital component of the ophthalmology resident surgical training process. We recommend including increased requirements in the curriculum, with the incorporation of formal didactics and wet-laboratory exposure as the first step. In addition, we propose that basic lens and corneal refractive surgical operative skill requirements be expanded by the RRC and ACGME to better prepare residents in these deficiencies. Skills courses and computer-simulation training could further enhance the training to help increase confidence in these techniques.²⁰⁻²²

The responsibility to expand surgical education should be shared by individual residency programs and supplemented by national organizations such as ASCRS, AAO, and the International Society of Refractive Surgery.

There are some inherent limitations to this study that may affect its accuracy. First, although there were 275 responses to this survey, there is a weakness in sampling methodology because this represents a small percentage of the total number of residents and young physicians. Second, the survey relied on self-reported data and was subject to recall bias. Finally, all surveys were completed online through Survey Monkey, and we have no information on which program directors forwarded the information to the residents and which did not. Although the surveys were sent to 118 residency programs, respondents were not asked to identify their residency program.

Hence, it is unclear how many programs were actually represented in the survey.

To our knowledge, this direct survey is the first reported publication to evaluate the quality of cataract surgery, IOL technology, and refractive surgery education of young ophthalmologists during residency. The results show that the minimum number of cataract surgeries set by the RRC and ACGME coincides well with overall resident satisfaction with exposure to phacoemulsification cataract extraction. The very low requirements for excimer laser surgery exposure also correlate with the overall dissatisfaction about the lack of such training in residency. The data presented in this study highlight a need for improved residency training in surgical astigmatism management, new-technology IOL implantation, and basic corneal refractive surgery skills. With such improvements, graduates will likely feel more prepared for entering current anterior segment practice with its increasing emphasis on refractive and patient lifestyle outcomes.

WHAT WAS KNOWN

- Several studies have shown that U.S. ophthalmology residents are graduating with adequate competency for basic surgical techniques. However, previous surveys also identified advanced cataract techniques and corneal refractive surgery as areas of perceived underexposure in residency.

WHAT THIS PAPER ADDS

- To our knowledge, this is the first direct survey of residents to evaluate both the objective quantity and perceived quality of resident surgical experiences with the management of new-technology IOL implantation and corneal refractive surgery.
- Although total cataract case numbers appear adequate, there are significant perceived deficiencies in current resident training models in preparing future surgeons for procedures and techniques they are likely to use after residency.

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