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AMERICAN ACADEMY OF OPHTHALMOLOGY®

Editorial

The State of Ophthalmology Medical Student Education in the United States: An Update

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Eye disease and vision loss impact quality of life, independence, mental health, social function, and mortality.[1–3] Visual impairment affects 7.5% of the United States population and requires frontline providers to diagnose and manage eye conditions.[4,5] However, the time dedicated to teaching medical students about these conditions has been on the decline for half a century.[6–8] After the 1910 Flexner report, ophthalmology preserved a small but regular role in United States medical school curricula.[9] Unfortunately, as undergraduate medical curricula expanded, ophthalmology saw a decline in curricular time, which may be related to the fact that the Liaison Committee on Medical Education does not provide specific guidelines on ophthalmology training.[8,10]

Medical student exposure to ophthalmology during medical school is the first step to integrating potentially interested students into this subspecialty.

Several prior surveys have assessed the state of ophthalmology in medical education. In 1981, Kalina et al[6] reported a decrease in ophthalmology content throughout United States medical schools, noting that didactic instruction had decreased from 25 hours in 1974 to 20 hours in 1979. In more recent surveys, clinical rotations went from being a requirement at 60% of schools in 2000 to 30% by 2004, and to 18% of Association of University Professors of Ophthalmology (AUPO)-affiliated medical schools by 2014 (Haik B, et al. Unpublished survey of US ophthalmology departments. Paper presented at: Association of University Professors of Ophthalmology Annual Meeting; January 2005; Indian Wells, CA).[7,8]

Given the marginalization of ophthalmology content within medical school and the potential negative downstream effects of this change for the field, many ophthalmology departments have created a dedicated director of medical student education (DMSE) position. This individual acts as a leader for ophthalmology within the medical school and advocates for medical students' learning of ophthalmology. In 2018, the AUPO's Medical Student Educators' Council sought to take an updated snapshot of the state of ophthalmology education, with attention to whether schools have a DMSE and how that position impacts curricula.

One hundred seventeen AUPO institutions with an active department or division of ophthalmology associated with an allopathic medical school were surveyed using an updated version of the 2014 survey tool by Shah et al[8] assessing curricular and extracurricular exposure to ophthalmology in medical school (Table S1, available at www.aaojournal.org). Individuals responsible for medical student education, as indicated in the AUPO directory, were contacted via e-mail and telephone. Ninety-five responses were collected on Google Forms (81% response rate).

Our results revealed 4 main themes. First, the decline of ophthalmology's role in medical student curricula has slowed, if not plateaued. Second, ophthalmology teaching has shifted to the preclinical years. Third, ophthalmology has compensated for its decline in the traditional curriculum by teaching knowledge and skills outside the regular curriculum. Finally, programs with DMSEs have higher rates of both required and extracurricular exposure and higher rates of faculty engagement with medical students. Each of these findings raises further points of discussion regarding how to shape the ophthalmology curriculum within models of medical education that are constantly changing.

The first trend observed in the new data demonstrates how the decreasing curricular time for ophthalmology has slowed, if not plateaued, particularly since the last survey in 2014. We found that required exposure to ophthalmology during medical school in 2018 was very similar to where it was 4 to 5 years earlier, despite the rapid decline of the required clinical ophthalmology clerkship noted in the decades before the 2014 study.[8] In 2018, required clerkships existed at 16% of responding institutions, whereas

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required preclinical coursework existed at 93% of institutions compared with 18% and 95%, respectively, in 2014. These statistics indicate a much slower decrease compared with the previous decade.

Of note, this plateau has occurred after the competence of graduating medical students already had been compromised. By the time medical students graduate, an estimated 70% are not able to use an ophthalmoscope properly. Furthermore, primary care residency program directors report that most of their residents do not meet AUPO standards for ophthalmic skills.[9,11] Although 80% of schools did have some required ophthalmology training, medical students in 20% of medical schools have no required exposure to ophthalmology training in skills or clinical ophthalmology exposure, unless it is sought by individual students. The question that remains is whether the current number of ophthalmology hours and teaching methods during medical school are sufficient to produce competence in graduating medical students.

The second theme we identified is that ophthalmology teaching has shifted to the preclinical years. The vast majority of institutions (94.7%) included some form of required exposure to ophthalmology during medical school. Most institutions (78.9%) required preclinical coursework only, 13.7% required both preclinical and clinical exposure, and 7.4% offered clinical exposure only. Preclinical coursework was 12.5 hours on average (median, 7 hours; n = 84), but varied from 1.5 to 50 hours, with 1 outlier at 120 hours. Lecturing was the most common way to teach ophthalmology, followed by skills training and problem-based learning. In terms of clinical exposure, only 16% of schools required clinical rotations, half of which were embedded within another course. However, clinical electives, typically 4 weeks in length, were ubiquitous, and 58% of institutions also offered ophthalmology as an option during the surgery rotation (Table S2, available at www.aaojournal.org).

The third theme relates to nontraditional teaching, which has allowed schools to maintain exposure to ophthalmology.[10] As an increasing number of institutions transition to shorter preclinical time, ophthalmology will have to continue to reinvent itself creatively in new curricula alongside all other specialties condensed into the same period. We have already seen this occur, as ophthalmology has compensated for loss in the traditional curriculum by teaching knowledge and skills in other ways. Many institutions report activities outside of the curriculum for medical students, such as interest groups (89%), medical student advisors (80%), career fairs (77%), and outreach or community service experiences (75%). More recently, our experience with the current coronavirus pandemic shows that virtual electives can be developed to teach content to medical students. Efforts to create shared resources, such as those on the American Academy of Ophthalmology medical student portal, are essential, especially when circumstances demand remote learning.

A final trend observed in the data highlights a novel discussion related to designated medical student educators. Programs with DMSEs have higher rates of both required and extracurricular exposure and higher rates of faculty engagement. Most AUPO institutions had a DMSE (83%), less than half (43%) of whom had funding for such a position. Institutions with a DMSE offered more preclinical coursework (11.9 hours vs. 10.8 hours), reported more students opting into electives (28 students vs. 21 students), and saw higher rates of faculty engagement and extracurricular exposure. A significantly higher likelihood was found that institutions with a DMSE actively engaged medical students outside of the curriculum ($P = 0.01$), had an ophthalmology interest group ($P = 0.01$), or had a formal student advisor in the department ($P = 0.003$; Table S3, available at www.aaojournal.org). The DMSE designation may be a marker for preserved ophthalmology education efforts.

The pipeline of students entering ophthalmology also is germane to this discussion. Research has uncovered that racial and ethnic disparities in eye care exist.[12] Underrepresented minorities and women continue to make up a minority of the ophthalmology workforce, despite an increasingly diverse pool of medical students.[13] Medical student exposure to ophthalmology during medical school is the first step to integrating potentially interested students into this subspecialty.[14]

The survey results showing that ophthalmology is still required at a large percentage of schools are encouraging. Medical student exposure to inspiring ophthalmologists is the best way to teach the vital ophthalmology skills required of most physicians. Medical education is changing rapidly, and ophthalmology must be an active participant in this change.

In summary, although preclinical and clinical year education are comparable with 2014 values and may be nearing a plateau, rates of extracurricular exposure have increased in the past 5 years.[15] In the ever-changing educational climate, increasing limitations are placed on formal curriculum time for subspecialties. As further changes in medical school curricula continue to occur, all ophthalmology departments need to remain vigilant for potential further marginalization of required ophthalmology curriculum. It will be up to all of us together, as ophthalmologists, to help spark a beginning foundation in ophthalmic knowledge. As DMSEs and academic ophthalmology departments continue to lead innovative solutions within medical schools, our specialty as a whole can continue to foster initial and longitudinal learning through valuable shadowing and mentorship. Our continued evaluation of the system is crucial to ensure the competence of graduating students and to ensure the future of our profession.

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