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Editorial

A Proposal to Improve Ophthalmic Education in Medical Schools

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Ophthalmic education in North American medical schools has eroded significantly over the past 4 decades.[1–6] The article by Shah et al[7] in this issue (see page 1160) provides a useful but sobering update. Rather than continuing merely to observe this decline, it is time to address the problem assertively and affirmatively. Effective action is both necessary and possible, and we propose steps to infuse relevant ophthalmic content into medical school education.

The primary method of addressing this decline in the past 2 to 3 decades has been to request more time for teaching ophthalmology through lectures, small group teaching, and experience in the eye clinic. These attempts largely have been unsuccessful. We believe that a better approach follows from recognizing that outcomes-based education is the driving force in the evolution and transformation of medical schools. In medicine, standards of competence have become the accepted norm in evaluating the effectiveness of physician training. Consequently, we believe that ophthalmic leaders should press for standardized and meaningful competency requirements while also developing robust assessment tools to evaluate medical students in the fundamentals of ophthalmology. This would best ensure that ophthalmology teaching is restored to its appropriate place in the medical curriculum and conforms with the public's perspective on what is needed for medical education.[8]

It is essential to establish competency-based standards that can be tested, measured, and used to generate scientific data indicative of the students' level of knowledge and the adequacy of their training.

The Necessary Core of Knowledge

Is there a well-defined core of knowledge that the non-ophthalmologist requires to recognize the signs and symptoms of preventable vision loss? The answer is yes. In 2009, a committee of medical educators representing the Association of University Professors in Ophthalmology presented a core curriculum, endorsed by the American Academy of Ophthalmology, to the Liaison Committee on Medical Education (LCME).[9] The LCME is a key group in shaping medical student education and is sponsored by the Association of American Medical Colleges and the American Medical Association. This curriculum ensures a working knowledge of clinical entities such as the red eye, ocular complications of diabetes and vascular disease, papilledema, basic visual field defects, uveitis, Graves' disease, neoplasms, amblyopia, and dyslexia. Regrettably, as Shah et al[7] point out, no guidelines for ophthalmic education currently are included in LCME guidelines.

Causes for the Decline of Ophthalmic Education in Medical School

There are several reasons why the teaching of ophthalmology to medical students has been curtailed:

1. The exponential increase in scientific information: expansion of the core areas of the medical curriculum has crowded out time previously allotted to ophthalmology (and other specialties).
2. Uncertainty of medical schools' leadership about whether their basic product is a family practice generalist, a researcher, or a specialist. The attempt by many schools to produce all 3 makes it difficult to create a unified education system.
3. The failure of ophthalmologists to convince curriculum committees and medical school leaders to retain ophthalmology teaching time, which also reflects ophthalmology's frequent isolation from other departments and its underrepresentation on key committees and in positions of administrative influence at many institutions.
4. The largely unfulfilled hope that necessary ophthalmic skills will be learned during subsequent primary care residency training.

A Different Approach

Where do we go from here? Simply proclaiming that ophthalmology education is important will not facilitate change. It is essential to establish competency-based standards that can be tested, measured, and used to generate scientific data indicative of the students' level of knowledge and the adequacy of their training. If we were to find that only 20% of a graduating class can find the optic nerve with a direct ophthalmoscope, it should transform attitudes about ophthalmic education. The LCME must be convinced to set national standards of competence, and ophthalmologists must be involved in these discussions and must participate in the decision making. However, ophthalmology cannot do this in isolation; success will require working with all other

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disciplines. Fortunately, the door is already open because medical leaders believe that questionable clinical skill levels in medical student graduates lead to mismanagement of problems, unnecessary costs, and poor functioning of the healthcare system.[10,11]

National standards of competence, when established, can be tested readily in the clinical skills examination that all medical students must pass before graduation. For example, as part of the Year End Professional Skills Assessment at the University of Wisconsin, students are examined on a primary care-based case of headache. This requires the performance of an eye examination, including detecting a visual field defect, using the direct ophthalmoscope, and matching the patient's optic nerve to one of a series of fundus photographs. Students are prepared for this in a short course taught at a level appropriate for a primary care provider. Similar courses and tests are given at other medical schools, including Mayo Medical School, so the framework is largely in place for implementation of a standardized competency examination. An additional source of useful information could be obtained from a survey of recently trained generalists directed at learning how well their medical school ophthalmology training prepared them for caring for patients with eye-related problems. Such surveys and related opinion pieces are available regarding many skills other than ophthalmology.[12–15]

Such information, we believe, should lead to augmented ophthalmology training—but where will it fit into the already packed medical school schedule? Experience in the so-called curriculum wars has taught ophthalmic educators that arguing about the time assigned exclusively to ophthalmology is rarely fruitful. The fight over the assignments of curriculum time usually is more about control than teaching clinical skills. If the goal is raising the level of competence by working with family medicine, internal medicine, pediatrics, and other specialties, ways can be found to integrate ophthalmic education under the supervision of ophthalmologists into their clerkships rather than demanding standalone rotations.[16] This requires effective teachers who are given the time and support to do this job well. Such teaching preferably would occur through case-based, face-to-face, hands-on encounters, but also could be delivered through simulation laboratories at institutions that have such facilities, web-based instructional courses, or both.

A detailed online review of the listed required qualifications for candidates for primary care residencies and the postgraduate curriculum offered during these residencies clearly indicates that remedial education in ophthalmology during generalist residencies, although possible, is unattractive to these specialties. The preference is for adequate skill levels in ophthalmology in the medical graduates they accept into their programs.

The Consequences of Allowing the Decline to Continue

After decades of waiting for others to solve the problem, we are left with 2 options: continue to observe the trend of decreasing ophthalmology education or take the initiative with effective action. Although we lack direct statistical data regarding the effects of inadequately prepared medical school graduates, some consequences are being observed already. For example, recognition of ocular signs and symptoms in diabetes is sometimes considered a surrogate for the ability of primary care physicians to perform an adequate eye examination, and there is indirect evidence that this diagnosis is being missed.[17] Other measures of a primary care physician's ophthalmic knowledge are his or her ability to recognize and appropriately treat a red eye, acute visual loss, or ocular trauma and, with ophthalmoscopy, to find the optic disc and rule in or rule out papilledema or cupping suspicious for glaucoma.

Increasing specialization throughout medicine lowers the threshold to refer patients, and the inadequately trained medical generalist has a still lower threshold to send patients to specialists. Health care managers and hospital administrators increasingly depend on optometrists as midlevel providers to compensate for the general decrease in the eye care abilities of primary care doctors.[18]

Newly trained generalists are likely to struggle with ophthalmology-related questions in the demonstration of examination skills on standardized board and state medical licensing examinations. As Shah et al[7] point out, at the same time ophthalmology is being extracted from medical school training, its inclusion on licensing tests underscores its importance. Additionally, ophthalmologists recognize that exposure to inspiring ophthalmology teachers often is the first step in attracting top students to ophthalmology as a career.

Conclusions

Ophthalmology has shown time and again that it is capable of dealing with challenges in both the clinical and research arenas. The crisis in ophthalmic medical education similarly must be overcome. To succeed, our specialty's various constituents—notably the American Academy of Ophthalmology, the American Board of Ophthalmology, the National Eye Institute, the Association for Research in Vision and Ophthalmology, the Association of University Professors of Ophthalmology, the American Ophthalmological Society, and perhaps subspecialty societies such as the American Association for Pediatric Ophthalmology and Strabismus, as well—must designate the restoration of ophthalmic education in medical schools as a high priority. Further, these organizations must enlist the support and collaboration of the leadership in the relevant primary care associations and societies. High-quality, outcome-based medical education requires adequate and appropriate contributions from multiple disciplines, so the more broadly based the effort, the more likely that the outcomes will be successful. That is what is best for our patients, and for ophthalmology as a profession.

References

1. Kalina RE, Van Dyk HJ, Weinstein GW. Ophthalmology teaching in medical schools. J Med Ed 1981;56:143–5.
2. Clarkson JG. Training in ophthalmology is critical for all physicians. Arch Ophthalmol 2003;121:1327.

3. Quillen DA, Harper RA, Haik BG. Medical student education in ophthalmology: crisis and opportunity. Ophthalmology 2005;112:1867–8.
4. Lippa LM. Medical student education [letter]. Ophthalmology 2006;113:890–1.
5. Mottow-Lippa L. Ophthalmology in the medical school curriculum: reestablishing our value and effecting change. Ophthalmology 2009;116:1235–6.
6. Higginbotham EJ, Lippa L. Assessing the status of ophthalmic education 100 years after the Flexner report. Arch Ophthalmol 2010;128:1600–1.
7. Shah M, Knoch D, Waxman E. The State of Ophthalmology Medical School Education in the United States and Canada, 2012−2013. Ophthalmology 2014;121:1160–3.
8. Cooke M, Irby DM, O'Brien BC, Shulman LS. Educating Physicians: A Call for Reform of Medical School and Residency. San Francisco, CA: Jossey-Bass; 2010.
9. AUPO Medical Education Task Force. Core Knowledge Skills White Paper. AUPO Medical Student Educators; 2014. Available at: http://www.aupomse.org/node/71. Accessed February 6, 2014.
10. Verghese A, Horwitz RI. In praise of the physical examination. BMJ 2009;339:b5448.
11. Elder A, Chi J, Ozdalga E, et al. The road back to the bedside. JAMA 2013;310:799–800.
12. American Academy of Family Physicians. Recommended Curriculum Guidelines for Family Medicine Residents. Updated January 2008. Available at: http://www.aafp.org/medical-school-residency/program-directors/curriculum.html. Accessed February 19, 2014.
13. Murdoch W, Porcerelli J, Markova T. Incoming resident experience and comfort with procedures designated as "basic." Fam Med 2012;44:47–50.
14. Dickson GM, Chesser AK, Keene Woods N. Family medicine residency program director expectations of procedural skills of medical school graduates. Fam Med 2013;45:392–9.
15. Nothnagle M, Sicilia JM, Forman S. Required procedural training in family medicine residency: a consensus statement. Fam Med 2008;40:248–52.
16. Pershing S, Fuchs JR. Restructuring medical education to meet current and future health care needs. Acad Med 2013;88:1798–801.
17. Bressler N, Varma R, Doan Q. Underuse of the healthcare system by persons with diabetes mellitus and diabetic macular edema in the United States. JAMA Ophthalmol 2014;132:168–73.
18. Lazaridis EN, Qui C, Kraft SK, Marrero DG. Same eyes, different doctors: differences in primary care physician referrals for diabetic retinopathy screening. Diabetes Care 1997;20:1073–7.