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Core competencies in ophthalmology

A systematic review of best practices in teaching ophthalmology to medical students



Tony Succar, MScMed(OphthalSc), PhD^{a,b,c},
 John Grigg, MBBS, MD, FRANZCO^a, Hilary A. Beaver, MD^{d,e,f},
 Andrew G. Lee, MD^{d,e,f,g,h,i,j,k,*}

^a Department of Ophthalmology, Save Sight Institute, Discipline of Ophthalmology, Sydney Medical School, The University of Sydney, Sydney NSW, Australia

^b Envision Research Institute, Envision, Wichita, Kansas, USA

^c The Smith-Kettlewell Eye Research Institute, San Francisco, California, USA

^d Department of Ophthalmology, Blanton Eye Institute, Houston Methodist Hospital, Houston, Texas, USA

^e Department of Ophthalmology, The University of Texas Medical Branch, Galveston, Texas, USA

^f Department of Ophthalmology, Weill Cornell Medical College, New York, New York, USA

^g Department of Neurology, Weill Cornell Medical College, New York, New York, USA

^h Department of Neurological Surgery, Weill Cornell Medical College, New York, New York, USA

ⁱ Department of Ophthalmology, Baylor College of Medicine, Houston, Texas, USA

^j Department of Head and Neck Surgery, The University of Texas MD Anderson Cancer Center, Houston, Texas, USA

^k Department of Ophthalmology, University of Iowa Hospitals and Clinics

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ABSTRACT

Ophthalmic medical student education is a cornerstone to improving eye health care globally. We review the current state of the literature, listing barriers to potential best practices for undergraduate ophthalmology teaching and learning within medical curricula. We describe recent advances and pedagogical approaches in ophthalmic education and propose specific recommendations for further improvements and research. Future research should concentrate on developing teaching and learning innovations that may result in a more time- and resource-effective models for interactive and integrated learning. As well as demonstrating that a competency-based approach results not just in better eye health, but also improvements in patient care, education, and medical care in general. By optimizing teaching available through improved evidence-based education, the ultimate goal is to increase medical students' knowledge and produce graduates who are highly trained in eye examination skills, resulting in improved patient eye care through timely diagnosis, referrals, and treatment.

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* Corresponding author: Andrew G. Lee, MD, Department of Ophthalmology, Houston Methodist Hospital, 6560 Fannin Street, Scurlock 450, Houston, Texas 77030, USA.

E-mail address: Aglee@houstonmethodist.org (A.G. Lee).

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1. Introduction

Ophthalmic evaluation is a core clinical skill. An understanding of the visual system, its interaction with other bodily systems, and the consequences of dysfunction are relevant for all medical practitioners, but it is particularly important that primary care practitioners be trained in ophthalmology as they are the first line in ophthalmic care. They need to deliver high quality, safe, and effective primary ophthalmic care and to recognize, triage, and refer appropriately to specialty eye care providers.²³ There is also a growing need for trained eye care providers for our burgeoning elderly population worldwide, as the most common ophthalmic disorders are diseases of the elderly. Concurrent to this growing need, ophthalmology education in medical school is being marginalized worldwide as a consequence of reduced curriculum time for ophthalmic clinical skills training^{20,51} and is frequently eliminated altogether.^{20,64,84} This trend is worsening,^{54,66,95} as constraints in time, funding, teachers, and resources increase. Essential basic skills, such as direct ophthalmoscopy (DOP), that are critical for primary care referral of potentially serious conditions (e.g., papilledema) now receive diminished attention and instruction in undergraduate medical education.⁴² The decrease in ophthalmology exposure may allow nonophthalmologists to misdiagnose, mismanage, or not refer patients with potentially vision or life-threatening eye disorders.^{20,52,95,97}

It is clear to the ophthalmology community that we should enhance medical student ophthalmology education.^{20,51} Academic ophthalmologists need to be encouraged to form educational partnerships with primary care academics at their medical schools to reinforce ophthalmology's relevance to medicine.⁶⁵ Research in ophthalmic medical education is necessary to reinforce this need and to reverse the adverse trends noted previously.⁶⁶ To date, there are limited studies published on ophthalmology in medical education. To our knowledge, this is the most complete systematic evaluation of medical school ophthalmology instruction.⁹⁵ We review the current state of the literature, listing barriers to potential best practices for undergraduate ophthalmology teaching and learning within medical curricula. We describe recent advances and pedagogical approaches in ophthalmic education and propose specific recommendations for further improvements and research.

2. Importance of ophthalmic education

Ophthalmic medical student education is a cornerstone to improving eye care globally, as the demand for ophthalmic providers exceeds the available and future projected supply of trained specialists.⁵⁹ O'Day described 4 major reasons supporting ophthalmology education in the undergraduate medical curricula⁸¹:

- 1) "To enable general practitioners to diagnose, treat, and refer common ophthalmic problems in primary care.
- 2) Examination of the eye gives insight into systemic disease processes which affect microvasculature circulation such as diabetes.

- 3) Effective training will increase the enthusiasm of medical students to enter the specialty of ophthalmology.
- 4) Teaching students improves the level of expertise of teachers."

In addition, general medical doctors need to understand the key relationships between the visual system and disorders that affect common primary care disorders, such as diabetes and hypertension. Visual dysfunction is a comorbidity that adds to other disability, including increased risk of falls and hip fractures in the elderly,⁶⁷ and higher mortality rates.³⁸ Improved diagnosis of ophthalmic disease and timely referral improves clinical satisfaction and practice efficiency, as well as improving patient outcomes.⁸⁵

The prevalence of eye disorders in primary care clinics is high, with 5 to 19% of all patients in primary health care presenting with eye-related conditions.⁹³ The worldwide increase in life span and the strong relationship between age and the major causes of vision loss (e.g., cataract, glaucoma, diabetic retinopathy, age-related macular degeneration) will further increase the need for ophthalmic expertise among all physicians.

3. Consequences of limited ophthalmic medical student education

Prior studies from around the world have shown that primary care doctors already view their undergraduate ophthalmic medical education to be inadequate. This is reflected in self-reported lower confidence levels and poorer understanding of common ophthalmic disorders.^{20,87} The diminished time for teaching allotted to ophthalmic education in medical schools threatens to reduce the clinical skills (e.g., differential diagnosis, initial management, and timely referral) of graduating primary care doctors and adversely affect the delivery of this first line of eye care.⁵² Conversely, the lack of basic ophthalmic knowledge and skills can also lead to overreferral of simple or benign eye disorders.²⁴ Limited exposure, lack of ophthalmic electives, and lack of one-on-one influence of mentors and teachers may also lead to students not pursuing ophthalmology as a career.⁸⁴

4. Causes and barriers for the decline in ophthalmology teaching time in the medical curriculum

A growing number of medical schools have reduced or eliminated ophthalmology altogether from their curricula.^{20,84} Liesegang and colleagues listed 3 reasons for the decline⁶⁴:

- 1) "The tremendous crowding of medical specialties' desired teaching time.
- 2) The lack of commitment by teachers to ophthalmology in the medical curriculum.
- 3) The availability of ophthalmologists and optometrists in the communities, so that substantial knowledge of the eye and its diseases by primary care physicians was viewed unnecessary."

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