

The importance of ophthalmology teaching

A discussion of the barriers to teaching ophthalmology in medical school and its value to future physicians.

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Each year, as incoming first-year UBC medical students excitedly open an email with information that will prepare them for medical school, they are greeted with an orientation manual prepared by the class ahead of them, affectionately known as the *Purple Book*. In the chapter about medical equipment, a direct ophthalmoscope is included at the bottom of the list of instruments they will need (it is listed as an optional purchase).

This is completely reasonable. Direct ophthalmoscopes are expensive, and for the most part unnecessary for a medical student to purchase. They are often available in clinics for medical students to borrow on the off chance they are asked to perform a fundoscopic exam. However, the scarcity of students who own a direct ophthalmoscope reflects the difficulty faced when teaching medical students about ophthalmology and visual health. The specific nature of ophthalmology as a niche specialty makes learning about visual health daunting, and comes with some perceived barriers.

From the student's perspective, a large investment of time (or money, in the case of purchasing a direct ophthalmoscope) may not

yield much return in knowledge that is examinable or brought up by clinical preceptors as expected. From the educator's perspective, visual health is difficult to integrate into other topics in medicine and may appear technically challenging to teach. Learning about the heart, lungs, or kidney does not usually result in much discussion about the eyes, and medical school educators may find it intimidating to teach funduscopy, given the limited opportunities for students to practise the skill. Over time, students may neglect the visual system, forgo learning the fundoscopic examination, and cast the topic aside. These barriers, however, should be examined more carefully.

Barrier 1: Ophthalmology is “low yield” in medical school

To medical students, ophthalmology is under-represented as examinable material, but perhaps inappropriately so. Medical education should strive to reflect the evolving needs of the population that physicians are meant to serve. The reality is that 5.5 million Canadians are currently living with a vision-threatening eye condition, and with Canada's aging population, this number is expected to increase by 29% over the next decade.¹ In fact, more Canadians have age-related macular degeneration than breast cancer, prostate cancer, Alzheimer disease, and Parkinson disease combined.¹ It would, therefore, be prudent to train physicians who are entering primary care to be equipped not just to evaluate, manage, and appropriately refer eye conditions, but to develop a basic appreciation of their importance and prevalence, and the tools to educate patients on ways to maintain visual health. Although 59% of Canadians

experience symptoms of potential eye disease, only half (54%) of these people reach out to a health care professional about their symptoms.² Encouraging more family physicians to develop the skills needed to discuss eye health and integrate it into a routine visit could reduce this impending burden of eye disease among Canadians and provide necessary and accessible eye care.

A common thought among family physicians is that other health care professionals, such as optometrists, are better suited to be on the front line to detect and prevent eye disease. Although optometrists play a vital role in eye health care, optometry visits are not consistently covered by Canadian health insurance plans, which may pose an accessibility issue. In BC, annual eye exams are covered by MSP only for children 0 to 18 years and seniors 65 years or older.³ As family physicians are among the most accessible gatekeepers to the overall health care system, their vital role in visual health should not be overlooked. Studies have shown that family physicians can detect diabetic retinopathy and other ocular pathology fairly well.^{4,5} Moreover, training family physicians to be comfortable with eye health can prove valuable in rural or remote settings, where access to optometrists and ophthalmologists is limited. This is especially relevant in BC, where roughly 40% of UBC Medicine's 2020 graduating class pursued family medicine, and many of the graduates are in rural programs around the province.⁶

Barrier 2: Ophthalmology is difficult to teach in medical school

Another concern is that the ophthalmological exam is a rather specific skill that is difficult

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to teach (particularly direct funduscopy). “Do you see the optic disc?” is a nerve-wracking question for medical students, many of whom sheepishly answer “yes” when they really aren’t sure. Given the few opportunities to practise direct funduscopy, it can be difficult to ever truly learn what a normal, healthy fundus looks like, and medical educators may start to lose patience attempting to teach medical students basic ophthalmological concepts.

However, teaching ophthalmological skills can be modified to be more learner friendly. Studies about medical students’ preferences have demonstrated fundus photography to be a more effective teaching tool for medical students, and it may be more relevant with the increasing availability of nonmydriatic ocular fundus photographs.⁷ A study at Queen’s University in Kingston, Ontario, demonstrated that the use of an online peer fundus photograph matching exercise increased medical students’ skill level and confidence with direct ophthalmoscopy.⁸ Therefore, although the ophthalmological exam may appear technically more difficult, use of fundus photos and increased exposure to these images can be implemented to better engage medical students and improve fundoscopic examination skills.

This is not a new idea—as technology advances, so too should medical education teaching methods. With the increasing digitization of learning, sharing photos has never been more commonplace. Additionally, with aids such as virtual and augmented reality beginning to assist in teaching gross anatomy, the same can and should be applied to ophthalmology, where it is especially relevant. The visual nature and clinical diagnoses of eye conditions is vital to ophthalmology. Ultimately, there is a multitude of ways for students to obtain a better understanding of eye conditions using the mediums that exist today.

Ophthalmoscope usage in family practice

Family physicians should be alerted to a few key conditions that can be diagnosed with direct ophthalmoscopy in their practice. Firstly, cataracts are detectable with a handheld ophthalmoscope. On examination, in a patient with cataracts, the red reflex will appear dull, extinct,



or shady.⁹ If patients present with these findings and report glare sensitivity or difficulty with nighttime vision with an otherwise unremarkable fundoscopic exam, a diagnosis of cataracts should be considered.⁹ If a family physician is comfortable with their fundoscopic skills, they may also screen for age-related macular degeneration (AMD) on direct ophthalmoscopy. This would involve examining the fundus to note the presence of yellowish-colored subretinal deposits, called “drusen,” in the macula.¹⁰ AMD is especially relevant for family physicians given that its development is associated with lifestyle choices or conditions that they would be apt at monitoring: obesity, cigarette smoking, a diet high in saturated fats, heart disease, high cholesterol levels, and hypertension.¹¹ Family physicians can also employ Amsler grid testing in their offices, as this simply requires the use of a printable (or digital) grid.¹⁰ If patients report any Amsler gridlines missing or distorted, this could support a diagnosis of AMD. Finally, it has been demonstrated that family physicians are able to diagnose and monitor diabetic retinopathy fairly well.⁴ To help with this, a panoptic ophthalmoscope can be used, which allows a view of the retina that is 3 to 5 times the area of a standard direct ophthalmoscope, without the need to dilate the patient’s eyes. The findings of hard exudates, hemorrhages, microaneurysms, or neovascularization

in a diabetic patient supports the diagnosis of diabetic retinopathy.⁹

Although referral to an ophthalmologist may be required in the final diagnostic evaluation and treatment of these conditions, family physicians should become familiar with the use of the tools at their disposal to evaluate these conditions and refer appropriately. These skills would prove especially useful in rural communities where access to an eye care professional is limited.

Looking forward

Exposure to ophthalmology in medical school has been minimal. Many Canadian medical schools do not have formal ophthalmology teaching in their clerkship years, and less than 20% of medical schools in the United States require ophthalmology in clerkship.¹² At UBC, there was a concerted effort by the MD Undergraduate Program’s (MDUP) leadership team to include more ophthalmology content after the MDUP’s spiral curriculum was developed a few years ago. This led to the inclusion of vision science as a theme that was meant to spiral through the curriculum. As a result, UBC medical students are now fortunate to be provided didactic ophthalmology teaching in various relevant points in their curriculum—in the context of head trauma, multiple sclerosis, systemic associations with rheumatological diseases, etc.

PREMISE

In addition, all medical students must complete a dedicated ophthalmology clinical skills session. However, unlike dermatology, urology, orthopedic surgery, or other niche specialties, there is no dedicated preclerkship week for ophthalmology in their spiral curriculum, which means there is no case-based learning topic on ophthalmology. Additionally, while students in some parts of the province have a 1-week mandatory ophthalmology clerkship, some sites in the province have opted for as little as 2 days.⁶

Ultimately, there needs to be a change in awareness. As a niche specialty, ophthalmology may suffer from a lack of representation at the table, or simply a lack of advocacy. Even if every first-year UBC medical student received a direct ophthalmoscope for free, the perceived barriers listed above and a relative lack of appreciation for visual health remain. However, medical education planning is not an exact science, and ophthalmology is likely not alone in its underrepresentation in the medical school curriculum. When deciding what to teach medical students, there are no easy answers; as one

topic is added, another must be removed. In an era when medicine is constantly changing to meet the population's health care needs, it may be difficult to determine which medical specialties deserve greater attention. The lack of exposure to ophthalmology represents a need for greater vigilance about all topics in medical education that may be overlooked. In 2021 and beyond, continuing to identify overlooked topics in medical education will require more than 20/20 vision. ■

Competing interests

None declared.

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