# Evaluation of Canadian undergraduate ophthalmology medical education at Western University

Bo Li, MD, Dustin Curts, MD, Yiannis Iordanous, MD, FRCSC, Alain Proulx, MD, FRCSC, Sapna Sharan, FRCSC

## ABSTRACT • RÉSUMÉ

To assess and evaluate the current level of ophthalmology knowledge and teaching curriculum in undergraduate year 3 (MS-3) at Western University. The Undergraduate Medical Education Curriculum at Western University has instituted additional ophthalmology lecture series to all MS-3 students. A test on basic ophthalmic knowledge was administered to MS-3 students immediately before and after lecture series to evaluate the level of knowledge at baseline and after ophthalmology didactic teaching. An evaluation survey was also given to MS-3 students to assess students' self-perceived level of competency, exposure, and interests in ophthalmology. A total of 134 students attended the ophthalmology lecture series in the study, and 88.1% of students completed the pretest, post-test, and Ophthalmology Education Survey. The average pretest and post-test scores were 40.7% and 75.6% ($p < 0.01$), respectively. The average rating from MS-3 students for ophthalmology exposure during medical school education was 2.11 (1 = "very minimal" and 5 = "more than adequate"). The average rating for desire for additional didactic ophthalmology lectures was 4.02 (1 = "strongly disagree" and 5 = "strongly agree"). The average rating for interest in ophthalmology was 2.74 (1 = "very little interest" and 5 = "very strong interest"). The additional ophthalmology lecture series had a positive impact on the level of ophthalmic knowledge among MS-3 students, and a strong desire for more ophthalmology teaching during medical school education was identified, as evidenced by the survey undertaken by students after the lectures.

Évaluer les connaissances en ophtalmologie et le programme d'enseignement de l'ophtalmologie en troisième année (MS-3) du programme d'études médicales de premier cycle à l'Université Western. Le programme d'études médicales de premier cycle de l'Université Western a instauré des cours théoriques additionnels en ophtalmologie pour tous les étudiants MS-3. On a fait passer un test aux étudiants MS-3 immédiatement avant et immédiatement après ces cours théoriques, afin d'évaluer leurs connaissances ophtalmiques de base au départ et après un enseignement théorique en ophtalmologie. Les étudiants ont aussi répondu à un sondage visant à évaluer leur perception de leur niveau de compétence, leur exposition au domaine et leur intérêt pour l'ophtalmologie. En tout, 134 étudiants ont suivi les cours théoriques en ophtalmologie dans le cadre de l'étude. De plus, 88,1 % ont effectué les tests précédant et suivant les cours et ont répondu au sondage sur l'enseignement de l'ophtalmologie. Les résultats moyens étaient de 40,7 % au test précédant les cours et de 75,6 % au test suivant le cours ($P < 0,01$). Au sondage, le score moyen des étudiants MS-3 quant à leur exposition à l'ophtalmologie pendant leurs études en médecine était de 2,11 (1 = très limitée, 5 = amplement suffisante). Le score moyen quant à l'intérêt pour des cours théoriques additionnels en ophtalmologie était de 4,02 (1 = fortement en désaccord, 5 = fortement d'accord). Le score moyen quant à l'intérêt pour l'ophtalmologie était de 2,74 (1 = très peu d'intérêt, 5 = intérêt très élevé). Les cours théoriques additionnels en ophtalmologie ont eu un effet positif sur le niveau de connaissances ophtalmiques des étudiants MS-3, et il y a un grand intérêt pour un nombre accru de cours d'ophtalmologie pendant les études en médecine, comme en témoigne le sondage auquel les étudiants ont répondu après les cours.

Competency in ophthalmic clinical skills and a solid knowledge base in the field of ophthalmology is crucial for primary care physicians and emergency physicians given that ocular complaints make up a significant proportion of ambulatory care patient visits.[1–4] As a result, ophthalmology education at the level of undergraduate medical training is vital in preparing graduating medical students for common ocular conditions encountered during residency and clinical practice. Despite the importance of ophthalmology knowledge, changes to medical education have led to a gradual, yet significant, decline in the amount of formal ophthalmology teaching in medical school curriculums over the last 4 decades.[5–7] Surveys conducted by the Association of University Professors of Ophthalmology and American Academy of Ophthalmology have demonstrated both a reduction in the amount of didactic ophthalmology teaching and the number of medical schools requiring mandatory ophthalmology clinical rotations for clerkship students.[5,8,9]

Recently, the decline in ophthalmology teaching for medical students in their first and second years (MS-1 and MS-2) and the absence of ophthalmology teaching for medical students entering their clerkship years (MS-3 and MS-4) were identified by the Departments of Ophthalmology and Surgery at the Schulich School of Medicine, Western University (London, Ont.). As a result, a newly created ophthalmology lecture series has been designed and initiated since September 2013. This is based on published guidelines from the International Council of Ophthalmology (ICO) to help clerkship students in achieving core competency in ophthalmology before graduating from medical school.[10]


http://dx.doi.org/10.1016/j.jcjo.2016.04.024
ISSN 0008-4182/16

Canadian Ophthalmological Society | Société canadienne d'ophtalmologie
EYE PHYSICIANS AND SURGEONS OF CANADA | MÉDECINS ET CHIRURGIENS OPHTALMOLOGISTES DU CANADA

**Table 1—The design of new undergraduate ophthalmology lecture series for MS-3 students**

| Lecture Title (Lecture Time) | Specific ICO Guideline Topics Covered |
|---|---|
| Ocular anatomy (30 min) | • Anatomy of anterior segment, orbit, lacrimal system, lid structure |
| Approach to red eye (45 min) | • Cornea and external diseases<br>• Glaucoma<br>• Diseases of the eyelid, lacrimal system, and orbit<br>• Ocular manifestations of systemic diseases<br>• Refraction and contact lens |
| Approach to diplopia (45 min) | • Cornea and external diseases<br>• Lens and cataract<br>• Neuro-ophthalmology<br>• Pediatric ophthalmology and strabismus |
| Approach to ocular trauma (45 min) | • Cornea and external diseases<br>• Diseases of the eyelid, lacrimal system, and orbit<br>• Neuro-ophthalmology<br>• Pediatric ophthalmology and strabismus |
| Approach to acute vision loss (45 min) | • Cornea and external diseases<br>• Neuro-ophthalmology<br>• Vitreoretinal disease<br>• Glaucoma<br>• Ocular manifestations of systemic diseases |

The purpose of the present study was to assess the baseline ophthalmology knowledge of clinical clerks (MS-3), to determine the effectiveness of the newly designed ophthalmology lecture series, and to assess self-perceived needs and competency among third-year medical students at Western University.

## Methods

### Medical Student Involvement

All MS-3 medical students at London campus of Western University entering their surgery clerkship in 2013 were asked to participate in the study. The students were asked to complete a pretest immediately before attending the newly designed ophthalmology lecture series. Immediately after the lecture series, the students were asked to complete a post-test and ophthalmology education survey.

### Newly Designed Ophthalmology Lecture Series

The new undergraduate ophthalmology lecture series was designed for clinical clerks (MS-3) at Western University. The lecture series was based on ICO guidelines and covers areas of core competencies in ophthalmology that medical students should achieve before entering subsequent residency training.[10] The lecture series comprises five 45-minute lectures covering areas of ocular anatomy, red eyes, diplopia, ocular trauma, and acute vision loss. Specific topics recommended under the ICO guidelines were also included (Table 1).

### Pre- and Post-Teaching Test

A 10-question multiple-choice pre- and post-test was designed to evaluate the baseline ophthalmology knowledge and knowledge gained during the lecture series across all areas of ophthalmology core competencies. The pre- and post-tests comprised the same 10 multiple-choice questions (in the same order) and were completed anonymously immediately before and after the lecture series (Table 2).

### Medical Student Ophthalmology Education Survey

An 18-question Ophthalmology Education Survey was designed for medical students to evaluate and rate their self-perceived competency in ophthalmology knowledge base and ophthalmic clinical skills, interests, and exposure to ophthalmology during medical school; usefulness of ophthalmology lecture series; and desire/need for more didactic teaching in ophthalmology (Supplementary Document, available online). The survey was completed after the completion of the post-tests.

## Results

The class enrolment for MS-3 students at Western University was 134 in 2013 in the London campus. Only London campus students took part in the study, even

**Table 2—Pre- and post-test for MS-3 students before and after lecture series**

| Question Number | Question |
|---|---|
| 1 | Which of the following is FALSE regarding the orbital septum: |
| 2 | A true dendrite is commonly seen in which condition: |
| 3 | A monocular visual field defect that did not respect the horizontal or vertical midline and began with photopsia would likely suggest: |
| 4 | A positive Seidel sign is described by which of the following: |
| 5 | Which of these is NOT a main clinical feature of an orbital blowout fracture? |
| 6 | Mild pain, photosensitivity, and an irregularly shaped pupil after blunt trauma to the eye suggest which diagnosis? |
| 7 | A complete third cranial nerve palsy associated with an ipsilateral dilated pupil is usually the result of which etiology? |
| 8 | A patient presents with binocular diplopia and ptosis that varies in severity throughout the day, but is usually worse later in the day. Ptosis can be elicited in office by asking the patient to maintain up-gaze for 1 minute. The most likely diagnosis is? |
| 9 | Sudden visual loss associated with diffuse intraretinal hemorrhages (also known as "blood and thunder") on ophthalmoscopy is most likely caused by? |
| 10 | A differential diagnosis of acute vision decline associated with unilateral facial/eye pain would include all the following except: |