

Canadian Ophthalmology Curriculum Topics & Objectives

This document is the finalized list of curriculum topics and objectives for Canadian undergraduate medical education in ophthalmology. The development of this list was based off three resources: The [2018 objective list](#) developed by the Association of University Professors in Ophthalmology (AUPO) with endorsement from the American Academy of Ophthalmology (AAO)¹, the [AUPO's 2009 Ophthalmology Core Knowledge and Skills competencies](#)², and the [Medical Council of Canada's \(MCC\) objectives](#) pertaining to ophthalmology³.

After a preliminary list of objectives was made based off the previously mentioned resources, a survey was sent to the members of AUPO asking for expert opinion on each curriculum objective and if they warrant inclusion. Based on this survey, talking points were created and later discussed in a virtual meeting where the list was finalized.

*Urgent and red flag conditions have been denoted with a red Asterix. These warrant urgent referral to an ophthalmologist.

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Topic #1: Describe the anatomy of the eye and the visual system

1(a): List the important structures of the eye

- External eye and adnexa
- Conjunctiva
- Sclera
- Cornea

- Anterior chamber
- Ciliary body and aqueous drainage system
- Iris
- Lens
- Optic nerve
- Retina
- Extraocular muscles

1(b): Describe the location and function of these structures

1(c): Describe the anatomy of the entire visual pathway

Topic #2: Perform a basic eye exam

2(a): Measure and record visual acuity

2(b): Note whether visual acuity was measured at near or far

2(c): Note whether visual acuity was measured with or without correction

2(d): Understand refractive error

2(e): Remeasure visual acuity using pinhole when vision subnormal

2(f): Describe techniques of age-appropriate visual acuity measurement

2(g): Examine pupillary responses

- Assess for an afferent pupillary defect
- Assess for pupil shape, size, and symmetry

2(h): Examine ocular motility

- Demonstrate an examination for ductions, versions, and comitance in the nine cardinal positions of gaze
- Demonstrate the use of corneal light reflex (Hirschberg) or the cover-uncover technique to assess for ocular misalignment

2(i): Assess visual fields by confrontation testing

2(j): Understand the role of intraocular pressure in the physical exam

- Recognize an abnormal intraocular pressure reading

2(k): Examine the important structures of the anterior segment of the eye with a penlight in a systematic way

- Lids
- Conjunctiva/sclera
- Cornea
- Iris
- Lens
- Anterior chamber depth estimation

- Assessment of clarity of media

2(l): Examine the fundus with either direct ophthalmoscope or fundus photography and identify the most important structures

- Disc (cup, color, contour, margins, vessels)
- Retina in adults/cooperative children
- Red reflex in infants/children

2(m): Instillation of drops

2(n): Ocular maneuvers

- Lid eversion
- Ocular Irrigation

Topic #3: Evaluate a patient with acute vision loss

3(a): Obtain a focused history and recognize urgency regarding the timing, severity, monocular or binocular nature, pain or redness associated with the vision loss

3(b): Obtain a focused past ocular history relevant to acute vision loss

3(c): Obtain a focused systemic medical history relevant to acute vision loss

3(d): Perform a focused clinical exam as outlined in [Topic #2](#)

3(e): List and describe the pathophysiology and presentations of the important causes of acute vision loss including:

- Retinal detachment *
- Retinal arterial occlusion*
- Retinal vein occlusion*
- Diabetic vitreous hemorrhage*
- Amaurosis fugax*

3(f): Optic nerve insults such as

- Giant cell arteritis and non-arteritic ischemic optic neuropathy*
- Compressive optic neuropathy*
- Optic neuritis

3(g): List and interpret critical investigations related to important causes of acute vision loss (e.g., imaging, blood work)

3(h): Describe the presenting signs and symptoms of these diagnoses and generate a differential diagnosis based on the elicited history and exam

3(i): Describe the initial management and urgency of referral for these diagnoses

Topic #4: Evaluate a patient with chronic vision loss

4(a): Take a focused history with regards to the timing, severity, monocular or binocular nature, pain or redness associated with the vision loss

- 4(b): Take a focused past ocular history relevant to chronic vision loss
- 4(c): Take a focused systemic medical history relevant to chronic vision loss
- 4(d): Perform a focused clinical exam as outlined in [Topic #2](#)
- 4(e): List and describe the pathophysiology of the common causes of chronic vision loss including:
- Refractive error - myopia, hyperopia, astigmatism, presbyopia
 - Cataract
 - Glaucoma
 - Macular degeneration
 - Diabetic retinopathy
 - Hypertensive retinopathy
- 4(f): List and describe the chronic manifestations of systemic diseases such as:
- Sickle Cell disease or trait
 - Human Immunodeficiency Virus/ Immunocompromised patients
 - Autoimmune conditions such as systemic lupus erythematosus, sarcoidosis, and rheumatoid arthritis
- 4(g): Describe the presenting signs and symptoms of these diagnoses and generate a differential diagnosis based on the elicited history and exam, understanding that some of these may present in an acute manner

Topic #5: Evaluate a patient with a red or painful eye

- 5(a): Take a focused history with regards to the timing, severity, monocular or binocular nature or vision loss associated with the painful or red eye
- 5(b): Take a focused past ocular history relevant to painful or red eye
- 5(c): Take a focused systemic medical history relevant to painful or red eye
- 5(d): Perform a focused exam as outlined in [Topic #2](#) and describe the pattern of redness
- 5(e): List and describe the pathophysiology of common causes of a painful or red eye including:
- Blepharitis and dry eye
 - Conjunctivitis (allergic, viral, and bacterial)
 - Subconjunctival hemorrhage
 - Scleritis
 - Corneal abrasion
 - Uveitis
- 5(f): List and describe the pathophysiology of urgent causes of a painful or red eye including:
- Angle-closure glaucoma*
 - Preseptal and orbital cellulitis*
 - Corneal ulcer (infectious, herpetic, bacterial, or contact lens related) *

- Intraocular infection/endophthalmitis*

5(g): Describe the presenting signs and symptoms of these diagnoses and generate a differential diagnosis based on the elicited history and exam

5(h): Describe the initial management and urgency of referral for these diagnoses

Topic #6: Evaluate a patient with eye trauma

6(a): Take a focused history with regards to the mechanism of injury and associated pain or vision loss

6(b): Take a focused past ocular history relevant to eye trauma

6(c): Perform a focused exam as outlined in [Topic #2](#)

6(d): List and describe the common manifestations of eye trauma including

- Eyelid laceration*
- Canalicular injury*
- Corneal abrasion
- Corneal foreign body*
- Corneal laceration (open globe)*
- Chemical injury*
- Hyphema*
- Ruptured globe*
- Vitreous hemorrhage*
- Traumatic retinal detachment*

6(f): Describe the presenting signs and symptoms of these diagnoses and generate a differential diagnosis based on the elicited history and exam

6(g): Describe the initial management and urgency of referral for these diagnoses

6(h): Describe the importance of ruling out globe rupture before manipulating the eye

Topic #7: Evaluate a patient with an eye movement abnormality, diplopia, or pupillary disorders

7(a): Take a focused history with regards to the timing, associated pain, redness, or vision loss

7(b): List distinguishing characteristics and identify monocular and binocular diplopia

7(c): Understand and identify cranial nerve III, IV, and VI paresis/palsy

7(d): Understand and identify the presentation of ptosis

7(e): List and describe common manifestations of pupillary disorders including

- Anisocoria
- Light-near dissociation

7(f): Take a focused past ocular history relevant to diplopia and ocular misalignment

7(g): Perform a focused exam as outlined in [Topic #2](#)

7(h): Have a basic understanding of the common manifestations of eye movement abnormalities due to:

- Ischemia, vascular insufficiency, diabetes associated
- Multiple sclerosis
- Intracranial mass (e.g., aneurysm)
- Myasthenia gravis
- Graves' orbitopathy
- Orbital inflammation, infection, or tumor
- Fracture of orbital floor or "blow-out"*
- Decompensation of childhood phoria

7(i): Describe the ocular manifestations of neurologic conditions such as

- Cerebral vascular event*
- Increased intracranial pressure

7(j): Describe the presenting signs and symptoms of these diagnoses and generate a differential diagnosis based on the elicited history and exam

7(k): Describe the initial management and urgency of referral for these diagnoses

Topic #8: Evaluate pediatric ophthalmic presentations

8(a): Take a focused history with regards to timing and presenting symptoms

8(b): Identify the risk factors for the development of strabismus or amblyopia in a child (e.g., prematurity, family history)

8(c): Perform a focused ocular exam as outlined in [Topic #2](#), including visual acuity if appropriate

8(d): List and interpret key components of the history and physical exam including red reflex testing

8(e): Understand age-appropriate visual responses as per Rourke Baby Record

8(f): List and identify the most important ophthalmic problems in children including:

- Refractive error
- Amblyopia
 - Strabismic
 - Refractive
 - Deprivation
- Strabismus
 - Manifest or Intermittent Tropia
 - Phoria
- Pseudoesotropia
- Nasolacrimal duct obstruction

- Anisocoria
- Ptosis
- Congenital cataract or other causes of leukocoria*
- Congenital glaucoma*
- Retinoblastoma*
- Retinopathy of prematurity

8(g): Construct an effective initial management plan, including determining if the patient requires further investigation or a referral based on the risk factors or the clinical findings

8(h): Counsel parents about the need for timely referral to manage ocular issues

Topic #9: Ocular Pharmacology

9(a): List the most important ocular side effects of systemic drugs including:

- Corticosteroids (oral, topical, injected, inhaled)
- Hydroxychloroquine
- Sympathomimetic & anticholinergic medications
- Topiramate
- Amiodarone
- Aminoquinolines

9(b): List the common ocular medications that can have systemic side effects and contraindications to their use:

- Fluorescein
- Topical anesthetic
- Dilation drops (contraindicated in angle closure glaucoma)
- Topical beta blockers
- Topical alpha-2 adrenergic agonists
- Topical anticholinergics

Topic #10: Evaluate a patient with ocular manifestations of systemic disease

10(a): Take a focused history with regards to the systemic disease and ocular manifestations

10(b): Take a focused past ocular history relevant to systemic disease

10(c): Perform a focused exam as outlined in [Topic #2](#)

10(d): List and describe the ocular manifestations of systemic diseases including:

- Human Immunodeficiency Virus/ Immunocompromised patients
- Graves' disease (thyroid eye disease)
- Giant cell arteritis
- Multiple sclerosis

- Autoimmune conditions
 - Systemic lupus erythematosus
 - Sarcoidosis
 - Rheumatoid arthritis
 - Juvenile idiopathic arthritis

10(e): Describe the presenting signs and symptoms of these diagnoses and generate a differential diagnosis based on the elicited history and exam

10(f): Describe the initial management and urgency of referral for these diagnoses

References

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3. Medical Council of Canada Objectives: <https://mcc.ca/objectives/>