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Saudi Commission for Health Specialties

# OPHTHALMOLOGY



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# SAUDI BOARD OPHTHALMOLOGY CURRICULUM

2014

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## Introduction and Overview

Diseases affecting the eye and adnexa continue to be important causes of ocular morbidity, visual impairment, blindness, and visual loss. Prevention, diagnosis, and management are crucial in alleviating the signs and symptoms, and in the restoration of sight.

The current, structured residency program was initiated on October 1, 1984. A nationwide survey on blindness was conducted by a team from the Research Department at King Khaled Eye Specialist Hospital. The survey included a random sample of the Saudi population and was selected by a multi-stage, cluster, stratified method reflecting the causes, prevalence, and magnitude of eye diseases and visual loss in the Kingdom of Saudi Arabia.

This survey underscored two facts: first, the serious magnitude of ocular diseases and visual loss; second, the paucity and lack of Saudi labor in ophthalmology. The survey encouraged immediate action. A joint, structured four-year residency program in ophthalmology was established, selection criteria drafted, and a curriculum completed and implemented. Several additional studies have been conducted to assess the causes of blindness in Saudi Arabia.<sup>1-7</sup>

The venues for the residency program were two hospitals in Riyadh, namely the King Khaled Eye Specialist Hospital (KKESH) and King Abdulaziz University Hospital (KAUH). An affiliation agreement was signed by the Minister of Higher Education and the Minister of Health.

The residency program was launched on October 1, 1984, and 14 residents were admitted to the first-year residency. On September 30, 1988, 12 of the 14 residents graduated, including the following doctors: Dr. Abdul Razaq Saif, Dr. Ali Al Rajhi, Dr. Ali Al Kaff, Dr. Amal Faqueeh, Dr. Amal Al Hemidan, Dr. Fatma Al Mutlaq, Dr. Khaled Al Jobair, Dr. Othman Al Omar, Dr. Saad Al Hadab, Dr. Saleh Al Amro, Dr. Salaheldin Hassanain, and Dr. Samir Al Mansouri.

There are several reasons for adopting the CanMEDS frameworks. The residency program in ophthalmology is currently 30 years old. The adoption of the CanMEDS frameworks would certainly help the training of individuals who possess certain features in their personal and professional lives. Graduates of the program would attain proficiency as medical experts with skills as communicators, collaborators, health advocates, and scholars.

The curriculum in ophthalmology was modified to include core knowledge in universal topics. Priority will be given to topics relevant to ophthalmology that are of high value, integrated, and interdisciplinary. The format will be didactic and undertaken by the Saudi Commission. Completion of the universal topics would be required during his/her residency program.

The Saudi Commission for Health Specialties (SCFHS) have recognized and accredited a number of centers for residency training in ophthalmology in the Kingdom.

## Minimum Training Requirements for Ophthalmology Residency

The curriculum for the ophthalmology residency training is for four years, and it includes a basic science course in the first two months during the first year, followed by a subspecialty lecture series, fluorescein angiography conferences, journal club, weekly grand rounds, and case presentations; residents are expected to prepare and present cases undertaken during their training. The curriculum is designed to progress their clinical and surgical skills as well as contribute to their widening knowledge in the field of ophthalmology.

Residents are expected to participate in research throughout the residency without compromising their clinical responsibilities. They are also asked (encouraged/required) to develop and conduct a research project in conjunction with a faculty member of their choice. The research project can be prospective or retrospective research. Clinical research may lead to important contributions to the field of ophthalmology, and residents are expected to complete the thesis during the fourth year of training.

### First-Year Resident Rotation

|                                        |          |
|----------------------------------------|----------|
| Basic Science Course                   | 2 months |
| Emergency Room Rotation                | 2 months |
| Oculoplastics/Neuro-ophthalmology      | 2 months |
| General/Comprehensive Ophthalmology    | 3 months |
| Pediatric Ophthalmology and Strabismus | 2 months |
| Vacation                               | 1 month  |

### Second-Year Resident Rotation

|                                                     |          |
|-----------------------------------------------------|----------|
| Emergency Room Rotation                             | 2 months |
| Glaucoma                                            | 2 months |
| Retina/Uveitis                                      | 2 months |
| Anterior Segment (Cataract/Cornea/External Disease) | 3 months |
| Pediatric Ophthalmology and Strabismus              | 2 months |
| Vacation                                            | 1 month  |

### Third-Year Resident Rotation

|                                                     |          |
|-----------------------------------------------------|----------|
| Emergency Room                                      | 2 months |
| Glaucoma                                            | 1 month  |
| General/Comprehensive Ophthalmology                 | 2 months |
| Anterior Segment (Cataract/Cornea/External Disease) | 2 months |
| Retina/Uveitis                                      | 2 months |
| Oculoplastics/Neuro-ophthalmology                   | 2 months |
| Vacation                                            | 1 month  |

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## Fourth-Year Resident Rotation

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|                                                     |          |
|-----------------------------------------------------|----------|
| Emergency Room                                      | 1 month  |
| Glaucoma                                            | 2 months |
| Retina/Uveitis                                      | 2 months |
| Anterior Segment (Cataract/Cornea/External Disease) | 3 months |
| Pediatric Ophthalmology and Strabismus              | 1 month  |
| Elective /Research                                  | 2 months |
| Vacation                                            | 1 month  |

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### Top Ophthalmic Conditions and Procedures in Saudi Arabia

Below are lists of the top conditions/diseases presenting to ophthalmologists in the Kingdom of Saudi Arabia. The lists consist of the most common conditions, procedures, and diseases performed. This list is not exhaustive, nor does it imply that trainees should only master these topics; rather, this is a brief guide to provide trainees with a clear focus during training to help them identify the diseases, conditions, and procedures that must be given priority and mastered. Thus, the Saudi Board Ophthalmology Curriculum concentrates on:

- A. Causes of blindness in KSA.
- B. Emergency conditions.
- C. Examination techniques.
- D. Surgical procedures.
- E. Top laser procedures.
- F. Procedures: Diagnostics and therapeutics.

#### A. Top 10 Causes of Blindness in the Kingdom of Saudi Arabia

1. Cataract.
2. Diabetic retinopathy.
3. Glaucoma: Primary and secondary.
4. Corneal scar.
5. Age-related macular degeneration.
6. Retinal degenerations.
7. Trauma.
8. Uveitis.
9. Amblyopia and strabismus.
10. Refractive errors.

#### B. Emergency Conditions

1. Acute angle closure glaucoma.
2. Corneal ulcer: Bacterial, fungal, parasitic, and viral.
3. Contact lens-related keratitis/conjunctivitis.
4. Conjunctivitis: Bacterial and viral.
5. Ocular surface injuries: Corneal abrasion, chemical, and physical.
6. Blunt trauma to globe.
7. Perforating injury.
8. Penetrating injury.

9. Phacomorphic glaucoma.
10. Orbital cellulitis/dacryocystitis.
11. Endophthalmitis.
12. Acute uveitis.

**C. Examination Techniques**

1. Biomicroscopy.
2. Examination of an infant.
3. Electrophysiology.
4. Retinoscopy.
5. Contact lens fitting and contact lens.
6. Ophthalmic photography.
7. Specular microscopy and micrography.
8. Refraction.
9. Indirect and direct ophthalmoscopy.
10. Hertel exophthalmometry.
11. Orthoptic.

**D. Top Surgical Procedures**

1. Excision of lid lesions.
2. Excision of conjunctival lesions.
3. Strabismus.
4. Dacryocystorhinostomy (DCR).
5. Phacoemulsification with posterior chamber IOL implantation.
6. Extracapsular cataract extraction (ECCE).
7. Penetrating keratoplasty (PKP).
8. Deep lamellar keratoplasty (DLK).
9. Descemet's stripping endothelial keratoplasty (DSEK).
10. Anterior vitrectomy.
11. Intravitreal injections.
12. Cryotherapy.
13. Trabeculectomy with mitomycin C (TMMC) and setons.
14. Keratoplasty:
  - Penetrating keratoplasty (PKP).
  - Lamellar keratoplasty (LKP).
  - Descemet's stripping endothelial keratoplasty (DSEK).
  - Deep lamellar keratoplasty (DLK).
15. Pars plana vitrectomy (PPV).

**E. Top Laser Procedures**

1. Argon laser (pan-retinal photocoagulation).
2. YAG laser capsulotomy.
3. YAG laser iridotomy.
4. Excimer laser phototherapeutic keratectomy (PTK).
5. Excimer laser photorefractive keratectomy (PRK).
6. Argon laser (Focal).
7. Cyclophotocoagulation (CPC).

**F. Diagnostic Procedures**

1. Perimetry (visual fields, static, and kinetic).
2. Irrigation of nasolacrimal duct (NLD).
3. Color vision testing and stereoptics.
4. Orthoptics.
5. Tear function tests: fluorescein, rose bengal, and Schirmer.
6. Tonometry different techniques.
7. Visual acuity testing in children and adults.
8. Fundus fluorescein angiography (indocyanine green angiography).
9. Optical coherence tomography (OCT) of fundus.
10. Anterior Segment OCT.
11. Diagnostic ultrasonography IOL calculation (A scan, B scan, and intraocular lens [IOL] calculation).
12. Corneal topography.

# Teaching and Learning

Teaching and learning are designed for delivery through various methods by mixing formal didactic lectures and self-learning processes through a structured and programmatic core education program (CEP):

## I. Formal Teaching and Learning Activities:

1. Core specialty topics will be delivered as:
  - 1.1. A basic science course (BSC) (2 months)
  - 1.2. Specialty topics
2. Universal topics

## II. Practice-Based Learning (PBL), such as:

1. Morning report case presentations (optional)
2. Morbidity and mortality review
3. Journal club
4. Case presentation
5. Grand round/guest speakers on core specialty topics

## III. Work-Based Learning (WBL), such as:

1. Daily round-based learning
2. On-call-based learning
3. Clinic-based learning
4. Workshops and courses
5. Tutorials

## I. Formal Learning and Teaching Activities

### 1. Specialty Topics

#### 1.1 Basic Science Course in Ophthalmology (BSC)

The basic science course is a comprehensive and intensive course in ophthalmology held for eight weeks at the beginning of the residency program. It represents a series of didactic lectures in ophthalmic subspecialties. Attendance is compulsory for residents in all residency programs in the Kingdom.

#### List of the Lectures in the BSC:

1. The Bony Orbit and The Demonstration of the Orbital Contents
2. Orbit Eyelid Anatomy and Conjunctiva
3. Anatomy and Physiology of Lacrimal Drainage System, and Main and Accessory Lacrimal Glands
4. Thyroid Eye Disease
5. Anatomy of The Globe: Cornea and Sclera
6. Anatomy of The Globe: Lens, Iris, and Uveal Tract
7. Ocular Bacteriology 1, 2
8. Ocular Embryology 1, 2
9. Ocular Immunology 1, 2
10. Mediators of Immune System
11. Biochemistry of the Eye and the Lens
12. Ocular Virology
13. Virology (practical)
14. Ocular Mycology
15. Mycology (practical)
16. Ocular Parasitology 1, 2

17. Anatomy of Retina/Vitreous and Choroid 1, 2
18. Physiology of Retina/Vitreous and Choroid 1, 2
19. Physiology of Cornea
20. Physiology of Lens and Accommodation
21. Topical Medication for Ocular Inflammation and Allergy 1, 2
22. Physical Signs of Retinal Disorders 1, 2
23. Examination of Anterior Segment with Slit Lamp
24. Clinic Approach of Ophthalmic Disorders
25. Ocular Toxicology 1, 2
26. Doctor—Patient Relationship 1, 2
27. Optic Nerve Evaluation
28. Medications of Glaucoma
29. Ophthalmic Ultrasound
30. Ophthalmic Ultrasound (practical)
31. Basic Physics 1, 2
32. Glaucoma Overview 1, 2
33. Immunosuppressive Therapy 1, 2
34. Ocular Trauma
35. Principle of Primary Repair for Anterior Segment
36. Ophthalmic Laser 1, 2
37. Anatomy and Physiology of Pupil
38. Pupil Disorders
39. Corneal Infection and Inflammation 1, 2

40. Topography of the Orbit
41. Work up of Orbital Disorder
42. Methods of Visual Assessment
43. Lens Disorder
44. Ocular Trauma 1, 2
45. Wound Healing & Sutures in Ophthalmology 1, 2
46. Endophthalmitis 1, 2
47. Retinopathy of Prematurity
48. Community Service in Ophthalmology
49. Fluorescein Angiography—Basic and Interpretation
50. Complications of Intraocular Surgery 1, 2
51. Basic Orbital Infection and Inflammation
52. Clinical Presentation of Glaucoma
53. Principles and Types of Glaucoma Surgeries
54. Eyelid and Orbital Trauma
55. Lacrimal System Trauma
56. Postnatal Structural Development of Normal Eye
57. Visual Development of Normal Eye
58. Basic Orthoptics 1, 2
59. Leukocoria
60. Optics Refraction Week
  - Refraction of light
  - Prisms
  - Vergence

- Object-image movement
- Retinoscopy
- Mirrors
- Correction of ametropia
- Accommodation
- Astigmatism
- Important lens abrasions
- Subjective refraction
- Intraocular lenses
- Magnification
- Accommodation through corrective lenses
- Ophthalmic instruments-optical principles
- Physical optics
- Pinhole pearls

61. Pathology week

- Introduction to Eye Pathology/Specimen Grossing and Tissue Processing
- Introduction to Eye Pathology/Special Stains and Immunohistochemistry
- Ocular Histology I
- Developmental Anomalies
- Phakomatoses
- Inflammation
- Ocular Trauma
- A UCSD Nano-engineered Artificial Retinal Prostheses to End-Stage Retinal Diseases
- Conjunctiva
- Cornea I
- Iris
- Pathology of the Glaucoma
- Pathology of the Lens

- Retina I
- Vitreous
- Retinoblastoma
- Update on Diabetic Retinopathy
- Uveal Melanoma
- Other Intraocular Tumors in Adults
- Pathology of Eyelids I
- Pathology of the Orbit I
- Pathology of Orbit II & Optic Nerve
- Clinicopathological Correlations
- Histopathology Review I

62. Amblyopia
63. Antimicrobial Agents 1, 2
64. Physiology of Ocular Motility
65. Strabismus Overview
66. Esotropia
67. Exotropia
68. Vertical Strabismus
69. Retinal Detachment 1, 2
70. Intraocular Tumors
71. Corneal Dystrophy
72. Corneal Degeneration
73. Principles of Strabismus Management
74. Anterior Segment Imaging 1, 2
75. Corneal Ectasia
76. Principle of Surgical Microscope

77. Corneal Topography 1, 2
78. Ophthalmic Genetics 1, 2
79. Uveitis Basics 1, 2
80. Common Uveitic Conditions in the ER 1, 2
81. Anatomy & Histology of Limbus and Angle
82. OCT in Glaucoma
83. Anatomy of Cranial Nerves 3, 4, 6 (Part 1, 2)
84. Visual Field 1, 2
85. Intraocular Lens Biometry
86. Cataract
87. Third, Fourth, and Sixth Cranial Nerve Palsies 1, 2
88. Age-Related Macular Degeneration
89. Retinal Vascular Disorders
90. Visual Field for Neuro-ophthalmology
91. Optic Neuritis and Multiple Sclerosis
92. Facial Nerve and Trigeminal Nerve
93. Anatomy and Physiology of Chiasmal and Retrochiasmal Visual System
94. Principles of Corneal Surgery 1, 2
95. Papilledema & Pseudo-papilledema 1, 2
96. Nystagmus 1, 2
97. Diabetic Retinopathy 1, 2
98. Myopia 1, 2

99. Basic Light Physics
100. Basic Laser Physics
101. Information Database & Internet Resources Available to Ophthalmologist 1, 2
102. Doctor-Patient Relationship 1, 2
103. Principles of Conducting Scientific Research
104. Ethical Principles & Guidelines for Research Involving Human Participants

### 1.2-Specialty Topics

Formal specialty lectures would be given during the residency program for 1–2 hours per week. This ensures that residents are well taught the important ophthalmic clinical problems.

| GLAUCOMA                                                                                                                              | OBJECTIVE                                                                                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Classification of Glaucoma & Clinical Evaluation.                                                                                  | <ul style="list-style-type: none"> <li>Discuss the importance of detailed and complete history to help in glaucoma diagnosis.</li> <li>Explain the risk factors leading to glaucoma.</li> <li>Discuss the different types of glaucoma in relation to age and pathology.</li> <li>Apply the proper clinical approach for glaucoma classification.</li> </ul>                                                           |
| 2. Primary Angle-closure Glaucoma and Secondary Angle-closure Glaucoma.                                                               | <ul style="list-style-type: none"> <li>Describe the pathology and clinical manifestations of types of closed angle glaucoma.</li> <li>Describe and interpret glaucoma investigations, including gonioscopy, OCT of optic nerve and nerve fiber layer, and visual field.</li> <li>Discuss emergency cases and management protocol.</li> <li>Describe the indicated medical, laser, and surgical management.</li> </ul> |
| 3. Primary Open-Angle Glaucoma, Ocular Hypertension, Normal Tension Glaucoma, and Glaucoma Suspect and Secondary Open-Angle Glaucoma. | <ul style="list-style-type: none"> <li>Definition of different types of open-angle glaucoma, causes, and risk factors.</li> <li>Describe the pathological aspects of each type.</li> <li>Discuss the proper management, medical and surgical, for each type.</li> </ul>                                                                                                                                               |

|                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4. Lens-induced Glaucoma                                                        | <ul style="list-style-type: none"> <li>• Differentiate between different types of lens-induced glaucoma.</li> <li>• Describe the underlying pathology.</li> <li>• Discuss clinical approach, and clinical and surgical management.</li> </ul>                                                                                                                                  |
| 5. Medical Management of Glaucoma                                               | <ul style="list-style-type: none"> <li>• Describe the different types of glaucoma medication and the pharmacological action.</li> <li>• Discuss the indication, topical, and systemic side effects of each medication.</li> </ul>                                                                                                                                              |
| 6. Childhood Glaucoma                                                           | <ul style="list-style-type: none"> <li>• Discuss the associated ocular and systemic anomalies.</li> <li>• Perform the proper evaluation and management (medical and different types) of surgical procedures and their indications.</li> <li>• Maintain visual rehabilitation after surgical management.</li> </ul>                                                             |
| 7. Glaucoma Management Surgical and Laser Therapy Filtering Surgical Management | <ul style="list-style-type: none"> <li>• List types of glaucoma surgical procedures and laser therapy.</li> <li>• Describe the clinical indications of each procedure.</li> <li>• Discuss the preoperative patient evaluation and preparation.</li> <li>• Describe surgical procedure techniques.</li> <li>• Recognize post-operative and complications management.</li> </ul> |

| PEDIATRIC OPHTHALMOLOGY               | OBJECTIVE                                                                                                                                                                                                                                                                                      |
|---------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Amblyopia—Diagnosis and Management | <ul style="list-style-type: none"> <li>• Recognize different causes of amblyopia.</li> <li>• Assess visual acuity in different age groups.</li> <li>• Perform refraction for children.</li> <li>• Manage amblyopia according to the cause.</li> </ul>                                          |
| 2. Esotropia                          | <ul style="list-style-type: none"> <li>• Perform orthoptic work-up and interpret this.</li> <li>• Describe all types of esotropia, and causes and management of each type (nonsurgical and surgical).</li> <li>• List the special types of esotropia and describe their management.</li> </ul> |
| 3. Exotropia                          | <ul style="list-style-type: none"> <li>• Perform orthoptic work-up and interpret this.</li> </ul>                                                                                                                                                                                              |

|                                                                        |                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                        | <ul style="list-style-type: none"> <li>List all types of exotropia and causes, and nonsurgical and surgical management.</li> <li>List the special types of exotropia and describe their management.</li> </ul>                                                                                                                                                    |
| 4. Incomitant Strabismus, Third, Fourth, and Sixth Cranial Nerve Palsy | <ul style="list-style-type: none"> <li>List the different causes of incomitant strabismus.</li> <li>Describe the differential diagnosis for each cause.</li> <li>Describe the investigations.</li> <li>Recognize the urgency of management.</li> <li>Describe the appropriate optical and surgical management for each type.</li> </ul>                           |
| 5. Strabismus Syndromes                                                | <ul style="list-style-type: none"> <li>List the strabismus syndromes and clinical manifestations of each.</li> <li>Describe nonsurgical and surgical management.</li> </ul>                                                                                                                                                                                       |
| 6. Congenital Cataract and Leukocoria                                  | <ul style="list-style-type: none"> <li>List the differential diagnosis of leukocoria.</li> <li>Describe the types of cataract and associated systemic diseases.</li> <li>List the laboratory and ocular investigations.</li> <li>Describe nonsurgical and surgical management.</li> <li>Recognize the urgency of management and visual rehabilitation.</li> </ul> |

| NEURO-OPHTHALMOLOGY                         | OBJECTIVES                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Disc Edema and Pseudotumor Cerebri (PTC) | <ul style="list-style-type: none"> <li>Perform evaluation for patients with disc edema.</li> <li>Identify the standard investigation for disc edema and PTC.</li> <li>List all differential diagnoses.</li> <li>Describe the standard management.</li> <li>Recognize the serious causes that require urgent management.</li> <li>Refer the patient to appropriate subspecialty according to the cause.</li> </ul> |
| 2. Diplopia                                 | <ul style="list-style-type: none"> <li>Describe anatomy and function of the III, IV, VI, and VI cranial nerves.</li> <li>List all differential diagnoses of uniocular and binocular diplopia.</li> <li>Describe the evaluation of patients with myasthenia gravis.</li> </ul>                                                                                                                                     |

|                                                                                       |                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                       | <ul style="list-style-type: none"> <li>• Describe the standard investigations of diplopia.</li> <li>• Describe the standard management of diplopia.</li> <li>• Recognize the serious causes of diplopia.</li> </ul>                                                                                                                 |
| <b>3. Optic Neuritis and Optic Neuropathy</b>                                         | <ul style="list-style-type: none"> <li>• Describe the clinical presentation and differential diagnosis.</li> <li>• Propose the standard investigation.</li> <li>• List all differential diagnoses.</li> <li>• Describe the standard management.</li> <li>• Recognize the serious causes.</li> </ul>                                 |
| <b>4. Supranuclear Disorders of Ocular Motility</b>                                   | <ul style="list-style-type: none"> <li>• Describe anatomy and pathophysiology.</li> <li>• Describe the clinical assessment.</li> <li>• Propose the standard investigation.</li> <li>• List all differential diagnoses.</li> <li>• Describe the standard management.</li> <li>• Recognize the serious causes.</li> </ul>             |
| <b>5. Patient with Transient Visual Loss</b>                                          | <ul style="list-style-type: none"> <li>• Discuss the differential diagnosis and associated systemic diseases.</li> <li>• Propose the standard investigation.</li> <li>• Describe the standard management.</li> </ul>                                                                                                                |
| <b>6. Orbital pathology causing Neuro-ophthalmic Manifestation</b>                    | <ul style="list-style-type: none"> <li>• Diagnose and evaluate patients with orbital disease causing neurological disorders.</li> <li>• Propose the standard investigation orbital disease.</li> <li>• List all differential diagnoses for orbital disease.</li> <li>• Describe the standard management orbital disease.</li> </ul> |
| <b>7. Systemic disorders commonly associated with Neuro-ophthalmic Manifestations</b> | <ul style="list-style-type: none"> <li>• Perform ophthalmic and systemic evaluation.</li> <li>• List all differential diagnoses.</li> <li>• Propose the standard investigation.</li> <li>• Describe the standard management.</li> </ul>                                                                                             |

| ANTERIOR SEGMENT AND UVEITIS      | OBJECTIVE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Conjunctiva Diseases           | <ul style="list-style-type: none"> <li>List causes of conjunctivitis (chronic and acute).</li> <li>Describe characteristic conjunctival degeneration and tumors.</li> <li>Describe/propose standard investigations.</li> <li>Describe clinical and surgical management.</li> </ul>                                                                                                                                                                                                                                                                                              |
| 2. Corneal Opacity and Ectasia    | <ul style="list-style-type: none"> <li>Describe the basics of corneal physiology and anatomy.</li> <li>Recognize the common corneal dystrophies and degenerations.</li> <li>Describe the clinical manifestations of each diagnosis.</li> <li>Describe the examination methods and work-up using the different imaging devices and how to interpret the results.</li> <li>Describe the differential diagnosis and treatment.</li> </ul>                                                                                                                                          |
| 3. Lens Opacity (Adult) Cataract  | <ul style="list-style-type: none"> <li>Describe the basics of lens anatomy, physiology, and types of lens opacities.</li> <li>Enumerate the etiological factors and risk factors.</li> <li>Describe the indications and techniques of cataract surgery.</li> <li>Describe the standard work-up and preparation, surgery, and follow-up.</li> <li>Describe the complications of pre, intra, and postoperative complications and how to manage these.</li> <li>Describe the evaluation and management of common and uncommon causes of post-operative endophthalmitis.</li> </ul> |
| 4. Microbial Keratitis (2 hours)  | <ul style="list-style-type: none"> <li>Describe all etiological factors.</li> <li>Discuss possible causative organisms and to perform all work-up procedures to identify the causative organisms.</li> <li>Describe the initial empirical treatment and shift according to the culture.</li> <li>Describe the complications and how to manage each.</li> </ul>                                                                                                                                                                                                                  |
| 5. Toxic and Traumatic Eye Injury | <ul style="list-style-type: none"> <li>Describe detailed medical history to identify type of injury.</li> <li>Describe/propose standard investigations.</li> <li>Recognize how to do immediate management according to the type of</li> </ul>                                                                                                                                                                                                                                                                                                                                   |

|                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                      | injury.                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>6. Basic of Refractive Surgery</b>                                | <ul style="list-style-type: none"> <li>Describe optical basis of refractive surgery.</li> <li>Describe work-up procedures for refractive surgery.</li> <li>Describe different procedures of refractive surgery.</li> <li>Recognize the complications of refractive surgery.</li> <li>Observe the procedures performed by senior staff.</li> </ul>                                                                                                    |
| <b>7. Clinical Approaches to Diagnose Uveitis</b>                    | <ul style="list-style-type: none"> <li>Describe the basics of ocular inflammation.</li> <li>Describe classification of uveitis: anatomical, pathophysiology, and clinical definition of uveitis.</li> <li>Describe the clinical approaches, investigations, and related systemic diseases seen in uveitis.</li> <li>List all causes of uveitis and differential diagnosis.</li> </ul>                                                                |
| <b>8. Anterior Uveitis</b>                                           | <ul style="list-style-type: none"> <li>Describe types of anterior uveitis.</li> <li>List all the causes of anterior uveitis and correlated systemic diseases.</li> <li>Describe the clinical manifestations, complications, and management.</li> </ul>                                                                                                                                                                                               |
| <b>9. Intermediate Uveitis and Posterior Uveitis Parts 1 &amp; 2</b> | <ul style="list-style-type: none"> <li>Discuss the etiologies and associated systemic diseases.</li> <li>Recognize the standard manifestations for each grade of uveitis.</li> <li>Describe the differential diagnosis and clinical manifestations of each cause.</li> <li>Describe the standard investigations.</li> <li>Describe the management of uveitis, preferred treatment options, and complications and the management of these.</li> </ul> |

| RETINA                                                   | OBJECTIVES                                                                                                                                                                                                                                             |
|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Diabetic Retinopathy and Cystoid Macular Edema</b> | <ul style="list-style-type: none"> <li>Describe the classification of diabetic retinopathy and risk factors.</li> <li>Discuss standard investigations.</li> <li>Recognize the urgency of treatment.</li> <li>Apply the diabetic retinopathy</li> </ul> |

|                                                                                             | screening.                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2. Arterial and Venous Occlusive Diseases of the Retina and Retinopathy of Blood Dyscrasias | <ul style="list-style-type: none"> <li>Describe the clinical manifestation of each disease and associated systemic diseases.</li> <li>List the standard investigations and interpret these.</li> <li>Describe the standard and immediate management.</li> <li>Perform laser and other treatment modalities.</li> </ul> |
| 3. Age-related Macular Degeneration and Choroidal Neovascularization (CNV)                  | <ul style="list-style-type: none"> <li>Describe the pathogenesis of CNV development and early clinical manifestation of the disease.</li> <li>Discuss the clinical features, standard investigation, and interpret these.</li> <li>Describe the different treatment modalities and visual rehabilitation.</li> </ul>   |
| 4. Macular Diseases                                                                         | <ul style="list-style-type: none"> <li>Describe diseases that affect macula.</li> <li>Describe the standard investigations and interpret these.</li> <li>Describe the treatment modalities.</li> </ul>                                                                                                                 |
| 5. Hereditary Retinal and Choroidal Diseases                                                | <ul style="list-style-type: none"> <li>Discuss medical history, including family history.</li> <li>Describe the clinical manifestations of retinal diseases and associated systemic disease.</li> <li>Describe the standard investigations.</li> <li>Describe the management and visual rehabilitation.</li> </ul>     |
| 6. Retinopathy of Prematurity (ROP)                                                         | <ul style="list-style-type: none"> <li>List stages of ROP and clinical manifestations of each stage.</li> <li>Describe ROP screening process.</li> <li>Describe the management of each stage and recognize urgency of management.</li> </ul>                                                                           |
| 7. Phakomatoses and Congenital Retinal Disease                                              | <ul style="list-style-type: none"> <li>Describe all phakomatoses and ocular manifestations of each.</li> <li>Describe congenital retinal diseases with clinical manifestations.</li> <li>Describe standard investigations and management.</li> </ul>                                                                   |
| OCULOPLASTICS                                                                               | OBJECTIVE                                                                                                                                                                                                                                                                                                              |
| 1. Ptosis in Children and Adult                                                             | <ul style="list-style-type: none"> <li>Describe causes of ptosis in children and adult unilateral and bilateral.</li> <li>Describe the clinical manifestation for each diagnosis.</li> </ul>                                                                                                                           |

|                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                     | <ul style="list-style-type: none"> <li>Describe standard investigations (non-surgical and surgical management).</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>2. Disorders of Eye Lid Lacrimal Drainage System in Children</b> | <ul style="list-style-type: none"> <li>List and describe eyelid disorders in children's system (congenital and acquired), and medical and surgical management.</li> <li>Describe lacrimal drainage system disorders, their clinical manifestations, clinical examinations, and procedures for diagnosis.</li> <li>List uncommon eyelid disorders.</li> <li>Describe standard investigations and management.</li> </ul>                                                                                     |
| <b>3. Disorders of Eye Lid and Lacrimal System in Adult</b>         | <ul style="list-style-type: none"> <li>List all disorders and tumors of the eye lid in adults.</li> <li>List all disorders affecting lacrimal system.</li> <li>Describe the clinical manifestations and standard investigations.</li> <li>Describe management (non-surgical and surgical).</li> </ul>                                                                                                                                                                                                      |
| <b>4. Orbital Diseases in Children</b>                              | <ul style="list-style-type: none"> <li>Enumerate orbital disorders affecting children into categories (e.g., orbital inflammation, hamartoma, choriostoma, benign, and malignant tumors).</li> <li>Describe the clinical manifestation and full assessment of different categories.</li> <li>Describe differential diagnosis of acute and chronic proptosis in children.</li> <li>Recognize serious causes and urgent management.</li> <li>Describe the standard investigations and management.</li> </ul> |
| <b>5- Orbital Diseases in Adult</b>                                 | <ul style="list-style-type: none"> <li>Describe orbital diseases according to pathology and associated systemic diseases.</li> <li>Discuss the clinical manifestations of different orbital diseases and differential diagnosis.</li> <li>Recognize serious causes.</li> <li>Describe standard investigations and management.</li> </ul>                                                                                                                                                                   |

## 2. Universal Topics

These are high-value, interdisciplinary topics of utmost importance to the trainee, which are developed and delivered centrally to ensure that every trainee receives high-quality teaching and develops their essential core knowledge. These topics are common to all specialties and have a suggested duration of 1.5 hrs.

The topics will be delivered in a modular fashion. At the end of each Learning Unit there will be online formative assessment. After completion of all topics, there will be a combined summative assessment in the form of a context-rich MCQ. All trainees must attain minimum competency in the summative assessment. Alternatively, these topics can be assessed in a summative manner along with a specialty examination.

| YEARS OF TRAINING    | UNIVERSAL TOPIC                                                                                                                                                                                                                          |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 <sup>st</sup> year | <ol style="list-style-type: none"><li>1. Safe drug prescription.</li><li>2. Hospital-acquired infection.</li><li>3. Blood transfusion.</li></ol>                                                                                         |
| 2 <sup>nd</sup> year | <ol style="list-style-type: none"><li>1. Principles of cancer management.</li><li>2. Side effects of chemotherapy and radiation therapy.</li></ol>                                                                                       |
| 3 <sup>rd</sup> year | <ol style="list-style-type: none"><li>1. Management of acute chest pain.</li><li>2. Management of acute breathlessness.</li><li>3. Pre-operative assessment.</li><li>4. Post-operative care.</li><li>5. Acute pain management.</li></ol> |

## II. Practice-Based Learning:

| PRACTICE-BASED LEARNING                         | OBJECTIVE                                                                                                                                                                                                                                                                                                                                                                            | CanMEDS Competencies                                                                                                         |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| 1. Morning Report Case Presentations (Optional) | <ul style="list-style-type: none"> <li>Educate residents through case-based teaching.</li> <li>Improve problem-solving skills and generate leadership and confidence.</li> <li>Improve patient care by generating appropriate management plan.</li> <li>Evaluate the available patient care services.</li> </ul>                                                                     | <ul style="list-style-type: none"> <li>Manager.</li> <li>Medical expert.</li> <li>Professional.</li> <li>Scholar.</li> </ul> |
| 2. Morbidity and Mortality Review               | <ul style="list-style-type: none"> <li>Increase residents' awareness of health care system, patient care, and communication skills.</li> <li>Enhance the educational value by exploring the contributed factors that led to medical errors and adverse outcomes in patient management.</li> <li>Participation of residents in quality improvement system of medical care.</li> </ul> | <ul style="list-style-type: none"> <li>Professional.</li> <li>Manager.</li> <li>Medical expert.</li> </ul>                   |
| 3. Journal Club                                 | <ul style="list-style-type: none"> <li>Teaching residents how to read critically and review the literature to improve patient care.</li> <li>Teaching residents to develop critical appraisal skills.</li> </ul>                                                                                                                                                                     | <ul style="list-style-type: none"> <li>Medical expert.</li> <li>Scholar.</li> <li>Health advocate.</li> </ul>                |
| 4. Case Presentation                            | <ul style="list-style-type: none"> <li>Improve the residents' knowledge of the study design and statistical methods.</li> <li>Increase the knowledge of the advances in clinical and biomedical areas.</li> </ul>                                                                                                                                                                    | <ul style="list-style-type: none"> <li>Medical expert.</li> <li>Scholar.</li> </ul>                                          |

## 5. Grand Round/Guest Speakers Lectures

- Formulate differential diagnosis based on finding from history examination.
- Appropriate and cost-effective selection of diagnostic tests.
- Application of practice guidelines to guide diagnostic test ordering and management of patients.
- Keep residents up-to-date with advances in ophthalmology.
- Provides professional opportunities in teaching development.
- Disseminate emerging best practice in evidence-based education.

- Medical Expert
- Scholar

### III. Work-Based Learning (WBL)

| WORK-BASED LEARNING           | OBJECTIVE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | CanMEDS Competencies                                                                                                                              |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Daily Round-Based Learning | <ul style="list-style-type: none"> <li>• Focus on immediate care for the patients.</li> <li>• Learning through hands-on supervised clinical experience and bedside teaching.</li> <li>• Demonstrate the appropriate skill in history taking, diagnosis, clinical judgment, and management.</li> <li>• Receive instructions, and feedback to improve interpersonal and communication skills with colleagues and patients.</li> </ul>                                                                                                | <ul style="list-style-type: none"> <li>• Medical expert.</li> <li>• Communicator.</li> <li>• Health advocate.</li> <li>• Professional.</li> </ul> |
| 2. On-call-based Learning     | <ul style="list-style-type: none"> <li>• Provide a structured approach to initial assessment with differential diagnosis of short-term management of common on-call eye problem.</li> </ul> <p><u>Junior Level</u></p> <ul style="list-style-type: none"> <li>• Provide intensive training in emergency eye disease management.</li> <li>• Assume appropriately increased level of responsibility while being supervised by seniors.</li> <li>• To recognize and treat ocular emergency by performing comprehensive eye</li> </ul> | <ul style="list-style-type: none"> <li>• Medical expert.</li> <li>• Scholar.</li> <li>• Health advocate.</li> <li>• Professional.</li> </ul>      |

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                          |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
|                          | <p>examination.</p> <ul style="list-style-type: none"> <li>• Develop communication skills with senior residents and nursing staff.</li> </ul> <p><b>Senior Level:</b></p> <ul style="list-style-type: none"> <li>• Assess the performance of the junior residents' history taking, eye examination, differential diagnosis, and management.</li> <li>• Guide junior residents to the diagnosis.</li> <li>• Learn to be responsible and confident.</li> <li>• Develop communication skills with senior staff and nursing staff.</li> </ul> |                                                                                                                          |
| 3. Clinic-based Learning | <p><b>Junior Level:</b></p> <ul style="list-style-type: none"> <li>• Elicit detailed history and ocular examination according to the subspecialty under the supervision of the consultant/senior resident.</li> <li>• Present the clinical finding, and discuss the differential diagnosis and management plan to the attending consultant/senior resident.</li> <li>• Document the ocular examination and management plan in the patient file.</li> <li>• Develop communication skills from the attending consultant /senior</li> </ul>  | <ul style="list-style-type: none"> <li>• Medical expert.</li> <li>• Communicator.</li> <li>• Health advocate.</li> </ul> |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  | <p>resident.</p> <p><b>Senior Level:</b></p> <ul style="list-style-type: none"> <li>• Supervise and guide the junior resident in taking medical history, residents' performance in undertaking ocular examinations and outpatient ocular surgical procedures, requesting ocular and systemic investigations, and provisional treatment planning.</li> <li>• Interpret and discuss the requested ocular and systemic investigation results with junior residents.</li> <li>• Discuss the management plan, including investigations, treatment, and referral to other disciplines with the consultant.</li> <li>• Discuss with consultant the surgical options and book patients for surgery.</li> </ul> |  |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|

#### 4. Courses and Workshop

| COURSES AND WORKSHOP             | OBJECTIVE                                                                                                                            | DESCRIPTION                                                                                                            |
|----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| 1. Hands-on Microsurgical Skills | <ul style="list-style-type: none"> <li>• Use of microscope.</li> <li>• Practice operating on animal eyes with microscope.</li> </ul> | <ul style="list-style-type: none"> <li>• 1-day course.</li> <li>• Multiple microscopes and disposable kits.</li> </ul> |
| 2. Phacoemulsification Course    | <ul style="list-style-type: none"> <li>• Teach residents, via the supervising consultant, suturing techniques and basic</li> </ul>   | <ul style="list-style-type: none"> <li>• Hands on (animal eye).</li> <li>• 1 day.</li> <li>• Needs multiple</li> </ul> |

|                                      |                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                   |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | intraocular steps using animal eyes. <ul style="list-style-type: none"> <li>To be familiar with using microscope.</li> </ul>                                                                                                                                                                                                        | microscopes and disposable kits.                                                                                                                                                  |
| <b>3. Cataract Simulation Course</b> | <ul style="list-style-type: none"> <li>Teach residents, via the supervising consultant, suturing techniques and basic intraocular steps using computer-based system.</li> <li>To master using microscope.</li> <li>Learn the intra-operative complications and how to manage these.</li> <li>To maintain patient safety.</li> </ul> | <ul style="list-style-type: none"> <li>Half day as an introduction, then practiced by residents according to their schedule.</li> <li>Computerized surgical simulator.</li> </ul> |
| <b>4. Retinal Laser Course</b>       | <ul style="list-style-type: none"> <li>Training residents to be operate laser machine and multi-wave laser to do pan-retinal photocoagulation settings and steps under supervision of consultants using photo papers.</li> <li>To maintain patient safety.</li> </ul>                                                               | <ul style="list-style-type: none"> <li>Half day.</li> <li>Observe the senior practicing laser therapy.</li> <li>Operate the machine under supervision of the seniors.</li> </ul>  |

## 5. Tutorials

| TUTORIALS                    | OBJECTIVES                                                                                                                                          | DESCRIPTION                                                                                                                                          |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1. Corneal Topography</b> | <ul style="list-style-type: none"> <li>Enable resident to diagnose different corneal diseases.</li> <li>Guide appropriate management.</li> </ul>    | <ul style="list-style-type: none"> <li>Half day.</li> <li>Learn to operate the machines and interpret the results.</li> </ul>                        |
| <b>2. Visual Field</b>       | <ul style="list-style-type: none"> <li>Enable resident to diagnose different neurological and glaucoma visual field defects and localize</li> </ul> | <ul style="list-style-type: none"> <li>Reading different types of visual field in relation to different neurological pathology, glaucoma,</li> </ul> |

|                                                  |                                                                                                                                                                                                                                                                                               |                                                                                                                                           |
|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|
|                                                  | <ul style="list-style-type: none"> <li>the lesion.</li> <li>Guide appropriate management.</li> </ul>                                                                                                                                                                                          | and ocular diseases.                                                                                                                      |
| <b>3. Laser Management of Glaucoma</b>           | <ul style="list-style-type: none"> <li>Define the different type of lasers used in glaucoma treatment.</li> <li>Define the clinical application of each procedure.</li> <li>Understand pre and post laser patient preparation.</li> <li>Describe the complications and management.</li> </ul> | <ul style="list-style-type: none"> <li>To be familiar with the principles and techniques of lasers used in glaucoma treatment.</li> </ul> |
| <b>4. Electrophysiology Tests Interpretation</b> | <ul style="list-style-type: none"> <li>Enable resident to diagnose insult to optic pathway.</li> <li>Enable resident to diagnose retina disease and localize the lesion.</li> <li>Guide for appropriate management.</li> </ul>                                                                | <ul style="list-style-type: none"> <li>Half day.</li> <li>To interpret all electrophysiology tests.</li> </ul>                            |
| <b>5. Neuroimaging in Neuro-Ophthalmology</b>    | <ul style="list-style-type: none"> <li>Learn basic radiological studies and interpretation.</li> <li>Select the most appropriate imaging study according to clinical presentations.</li> </ul>                                                                                                | <ul style="list-style-type: none"> <li>Be familiar with all neurological imaging in ophthalmology.</li> </ul>                             |
| <b>6. Ultrasound in Ophthalmology</b>            | <ul style="list-style-type: none"> <li>Learn basic ultrasound in ophthalmology, including interpretation.</li> <li>Guide diagnosis and management.</li> </ul>                                                                                                                                 | <ul style="list-style-type: none"> <li>Half day.</li> <li>Learn how to operate the machine and interpret the results.</li> </ul>          |

## Clinical Training Rotations/Competencies

### a. Intent of Objectives

The objectives outline the minimum requirements of a graduate in ophthalmology after four years of training. Individual differences in talent and capacity should be recognized and, when possible, be met fully by the Department. The objectives provide guidance for resident evaluations and, if expectations are not fulfilled, such failure may be cause for remediation or dismissal. The Department will provide opportunities for learning through didactic means as well as observation and hands-on experience. Ultimately, it will be residents' responsibility to take advantage of these experiences.

### b. General Goals of Residency Training

To produce a high-quality, multi-faceted ophthalmologist.

#### MEDICAL EXPERT

As medical experts, physicians integrate all of the CanMEDS roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centered care. The medical expert is the central physician role in the CanMEDS framework.

Physicians possess a defined body of knowledge, clinical skills, procedural skills, and professional attitudes, which are directed toward effective patient-centered care.

They apply these competencies to collect and interpret information, make appropriate clinical decisions, and undertake diagnostic and therapeutic interventions.

They do so within the boundaries of their discipline, personal expertise, healthcare setting, patients' preferences, and context.

Their care is characterized by up-to-date, ethical, and resource-efficient clinical practice as well as with effective communication in partnership with patients, other health care providers, and the community.

The role of the medical expert is central to the function of physicians and draws on the competencies included in the roles of communicator, collaborator, manager, health advocate, scholar, and professional.

#### COMMUNICATOR

As communicators, physicians effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.

Physicians enable patient-centered therapeutic communication through shared decision-making and effective dynamic interactions with patients, families, caregivers, other professionals, and other important individuals.

The competencies of this role are essential for establishing rapport and trust, formulating a diagnosis, delivering information, striving for mutual understanding, and facilitating a shared plan of care.

Poor communication can lead to undesired outcomes, and effective communication is critical for optimal patient outcomes.

The application of these communication competencies and the nature of the doctor-patient relationship vary for different specialties and forms of medical practice.

### **COLLABORATOR**

As collaborators, physicians work effectively within a healthcare team to achieve optimal patient care.

Physicians work in partnership with others who are appropriately involved in the care of individuals or specific groups of patients. This is increasingly important in a modern multi-professional environment, where the goal of patient-centered care is widely shared. Modern healthcare teams not only include a group of professionals working closely together at one site, such as a ward team, but also extended teams with a variety of perspectives and skills in multiple locations. It is therefore essential for physicians to be able to collaborate effectively with patients, families, and an inter-professional team of expert health professionals for the provision of optimal care, education, and scholarship.

### **MANAGER**

As managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the healthcare system.

Physicians interact with their work environment as individuals, members of teams or groups, and participants in the health system locally, regionally, or nationally. The balance of emphasis among these three levels varies depending on the nature of the specialty, but all specialties have explicitly identified management responsibilities as a core requirement for the practice of medicine in their discipline.

Physicians function as managers in their everyday practice activities involving co-workers, resources, and organizational tasks, such as care processes and policies, as well as balancing their personal lives. Thus, physicians require the ability to prioritize, effectively execute tasks collaboratively with colleagues, and make systematic choices when allocating scarce healthcare resources. The CanMEDS manager role describes the active engagement of all physicians as integral participants in decision making in the operation of the healthcare system.

## **HEALTH ADVOCATE**

As health advocates, physicians responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.

Physicians recognize their duty and ability to improve the overall health of their patients and the society they serve.

Doctors identify advocacy activities as important for the individual patient, patient populations, and communities. Individual patients need physicians to assist them in navigating the healthcare system and accessing appropriate health resources in a timely manner.

Communities and societies need physicians' special expertise to identify and collaboratively address broad health issues and determinants of health. At this level, health advocacy involves efforts to change specific practices or policies on behalf of those served. Framed in this multi-level way, health advocacy is an essential and fundamental component of health promotion. Health advocacy is appropriately expressed both by individual and collective actions of physicians in influencing public health and policy.

## **SCHOLAR**

As scholars, physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application, and translation of medical knowledge.

Physicians engage in a lifelong pursuit of mastering their domain of expertise. As learners, they recognize the need to be continually learning and model this for others. Through their scholarly activities, they contribute to the creation, dissemination, application, and translation of medical knowledge. As teachers, they facilitate the education of their students, patients, colleagues, and others.

## **PROFESSIONAL**

As professionals, physicians are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behavior.

Physicians have a special societal role as professionals who are dedicated to the health and caring of others.

Their work requires the mastery of a complex body of knowledge and skills, as well as the art of medicine.

As such, the professional role is guided by codes of ethics and a commitment to clinical competence, the embracing of appropriate attitudes and behaviors, integrity, altruism, personal well-being, and the promotion of the public good within their domain. These commitments form the basis of a social contract between a physician and society. Society, in return, grants physicians the privilege of profession-led regulation with the understanding that they are accountable to those served.

### c. Residents' Clinical Rotations:

| ROTATION     | ER              | GENERAL         | OC/NO           | AS              | RET/UV          | GL              | PED             | ELECTIVE        |
|--------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <b>R1</b>    | 2 months        | 3 months        | 2 months        | -               | -               | -               | 2 months        | -               |
| <b>R2</b>    | 2 months        | -               | -               | 3 months        | 2 months        | 2 months        | 2 months        | -               |
| <b>R3</b>    | 2 months        | 2 months        | 2 months        | 2 months        | 2 months        | 1 month         | -               | -               |
| <b>R4</b>    | 1 month         | -               | -               | 3 months        | 2 months        | 2 months        | 1 month         | 2 months        |
| <b>TOTAL</b> | <b>7 months</b> | <b>5 months</b> | <b>4 months</b> | <b>8 months</b> | <b>6 months</b> | <b>5 months</b> | <b>5 months</b> | <b>2 months</b> |

### d. Description of Clinical Rotations

#### d.I First Year of Ophthalmology Residency Program (R1)

In the first year of training, the resident will be responsible for evening and weekend calls, and training in the outpatient department. The rotation will give individuals the ability to use many of the techniques that are important in the diagnosis of ocular disorders. The first-year rotation will be scheduled in comprehensive ophthalmology, refraction, low vision, contact lens, pediatric ophthalmology and strabismus, neuro-ophthalmology, oculoplastics, and orbit clinics. During this time, the resident will gradually assume patient care responsibilities. The first-year resident rotation will also include ophthalmic pathology rotation and examination of pathology specimens with an ophthalmic pathologist. The rotation may include wet lab instructions in surgical techniques. During this year, the resident is expected to gain expertise in the diagnosis and management of common ocular disorders; this will also include training and mastering the following additional CanMEDS competencies.

#### Communicator

- Establishes good rapport with patients and families.
- Obtains a complete, organized, and succinct history and physical examination.
- Listens to instruction effectively.
- Produces consultation reports and progress notes that are organized, legible, complete, and signed.
- Dictates reports and consultations that are complete and timely.

#### Collaborator

- Interacts effectively with other health professionals, recognizing their roles and expertise.
- Consults and delegates effectively.
- Demonstrates the ability to receive effective and constructive feedback.

#### Manager

- Punctual in attending to responsibilities.
- Understands and makes effective use of information technology.

### **Scholar**

- Demonstrates understanding and commitment to the need for continuous learning; develops and implements an on-going and effective personal learning strategy.
- Demonstrates the ability to use Medline and other similar database searches for scientific information.
- Acts as an effective teacher of medical interns, medical students, and other staff.
- Demonstrates the ability to effectively prepare and deliver clinical oral presentations.

### **Professional**

- Demonstrates integrity, honesty, compassion, and respect for diversity.
- Understands the principles of ethics and applies these to clinical situations.
- Demonstrates an awareness of own limitations, seeks advice when necessary, accepts advice, and responds appropriately.

### **Health Advocate**

The resident, on completion of each rotation, should undertake the following:

1. Educate patient and families, and promote the importance of long-term healthy behavior and preventive healthcare (i.e., smoking cessation, screening tests, regular check-up, eye protection).
2. Familiarity with current guidelines and patterns of practice for ophthalmology.
3. Respect and empower patient autonomy.
4. Promote equitable health care.
5. Apply the principles of quality improvement and quality assurance.

## **Objectives of Clinical Training Rotations and Training Requirements in the First Year:**

### **I. General Ophthalmology Rotation (3 months)**

#### **General Objectives**

Upon completion of the general ophthalmic clinical experience training, the resident should be able to effectively diagnose and manage most common ophthalmic problems, and be able to develop differential diagnosis and a treatment plan for such patients. He/she should also have the knowledge to appropriately identify and refer patients who need tertiary care, either to a sub-specialist in ophthalmology or other specialties if required.

#### **Specific Objectives**

##### **Medical Expert**

1. Didactic knowledge base.
  - a. The resident should be familiar with the Basic Clinical Science Course booklets from the American Academy of Ophthalmology.
2. Clinical knowledge base in general ophthalmology, pathology, anesthesia, optics, and refractions.

The resident should be able to diagnose, manage, and treat the following clinical conditions, including, but not limited to:

- a. Conjunctivitis—acute and chronic, bacterial and viral, and infectious and non-infectious.
- b. Keratitis—bacterial and viral, and infectious and non-infectious.
- c. Uveitis—acute and chronic, granulomatous and non-granulomatous, and anterior and posterior.
- d. Glaucoma—all types.
- e. Cataract diseases.
- f. Eye lid disorders.
- g. Common retinal disease, including:
  - i. retinal detachment and retinal breaks.
  - ii. diabetic retinopathy.
  - iii. retinal vein occlusions and arterial occlusions.
- h. AION and temporal arteritis.
- i. Thyroid eye diseases.
- j. Traumatic ocular injuries.
- k. Removal of corneal foreign bodies.
- l. Management and treatment of chemical eye injuries.
- m. Diagnose and treat ocular emergencies:
  - i. ruptured globes.
  - ii. globe perforation and penetration.
  - iii. acute angle-closure glaucoma.
  - iv. central retinal artery occlusion.
- n. Familiarity with common ophthalmic medications, including indications and contra-indications:
  - i. diagnostic drops.
  - ii. topical anti-infectives.
  - iii. other topical drops.
  - iv. topical steroids.
  - v. topical glaucoma medications.
  - vi. oral ocular hypotensive medications—carbonic anhydrase inhibitors and hyperosmotics.
  - vii. oral steroids.

The following aspects are included in the general ophthalmology rotation:

#### **I. Residents' Clinic:**

These are teaching clinics in which residents deal directly with patients, and discuss findings and proposed management with the supervising staff person. A small number of patients are seen during each clinic, allowing time for teaching and enabling the resident to comfortably examine each patient.

1. Two residents (one junior, one senior) run the clinic and see all patients. Supervising staff vary on different days to give residents a wide variety of perspectives.

Supervising staff must be available within 5–10 minutes of the call to review patients with residents as needed.

2. Supervision staff are expected to write comments on the charts of each patient seen. This might include a diagnosis, suggested treatment, and whether he/she was in agreement with the various aspects of the examination performed by the resident.
3. Surgical cases can be generated from these clinics to be undertaken by residents under supervision of faculty staff. The senior resident will be responsible for preoperative and postoperative assessment and follow-up, writing and arranging the OR list, and coordinating with staff, colleagues, and OR staff.

## **II. Pathology**

1. Be able to undertake and interpret Gram, Giemsa, and GMS staining for ocular specimens.
2. Be familiar with different histopathology stains.
3. To recognize the histopathological appearance of common ocular diseases, especially ocular dystrophies and ocular neoplasms.
4. Be able to assess the prognosis of various tumors based on the histopathology features.

## **III. Anesthesia**

1. To know the indications and complications of various types of anesthesia used in ocular surgeries.
2. Be able to recognize and manage complications that may be caused by different methods of anesthesia.
3. To be certified with basic cardiopulmonary resuscitation (CPR) during this rotation.
4. To know the indications, contraindications, and complications of general anesthesia.

## **IV. Optics and Refraction**

- a. Light.
- b. Vergence.
- c. Diopters.
- d. Lens systems.
- e. Simple lens formula.
- f. Multiple lens systems.
- g. Lens effectiveness.
- h. Focal points.
- i. Ray tracings—lenses.
- j. Physical optics.
- k. Snell's law of refraction.
- l. Apparent thickness formula.
- m. Law of reflection and critical angle.
- n. Mirrors.
- o. Ray tracing—mirrors.
- p. Prisms.
- q. Prentice's rule.
- r. Magnification.
- s. Telescopes.

- t. Anisometropia and aniseikonia.
- u. Knapp's rule.

\*Clinical Skills—including, but not limited to,

- a. Slit lamp examination.
- b. Goldmann tonometry.
- c. Tono-Pen tonometry.
- d. Pachymetry.
- e. Keratometry with manual keratometer.
- f. Subjective refraction with phoropter.
- g. Streak retinoscopy.
- h. Direct ophthalmoscopy.
- i. Indirect ophthalmoscopy.
- j. Gonioscopy and fundus examination with contact lens.
- k. Foreign body removal at slit lamp.
- l. Suture removal at slit lamp.
- m. YAG laser capsulotomy.
- n. YAG laser iridotomy.
- o. YAG laser selective laser trabeculoplasty.
- p. Be able to perform local anesthesia for ophthalmic procedures.

## 2. Emergency Room Rotation (2 months)

As an R1, he/she is responsible for triaging eye-related emergencies that present to the ER based on urgency and need. Junior residents take overnight calls with the help of more senior residents.

During the ER rotation, the following medical expert objectives are required:

### Medical Expert

1. To be exposed to common ocular emergencies.
2. Be able to work with other medical specialists in managing ER patients for both life- and ocular-saving benefit.
3. The resident is responsible for triaging eye-related emergencies that present to the ER based on urgency and need.
4. Junior residents take overnight calls with the help of more senior residents.
5. To be able to take full systematic and ocular history focusing on the patient complaint.
6. To be able to perform full ocular examination, including slit lamp exam.
7. To be familiar with tonometry exam and fundus exam using indirect ophthalmoscope.
8. To formulate a list of differential diagnoses.
9. To participate in establishing a management plan.
10. To be able to consult and present the case to his seniors.
11. Residents learn to function independently and manage a wide variety of ocular pathology and ocular trauma at an early point in their ophthalmic training.

### Procedures and Technical Skills

1. Assess the general health of trauma patients.
2. Familiarity with basic life support.
3. Perform basic extraocular exam, slit lamp exam, tonometry, funduscopy, pupil, and cranial nerves exam.
4. Perform gonioscopy and interpret the findings.
5. Perform corneal scraping for cultures and sensitivity tests.
6. Manage very urgent ocular emergencies (e.g., chemical burns).
7. Assess YAG PI procedures and know the indications, parameters, and possible complications.

## 3. Oculoplastics/Neuro-ophthalmology Rotations (2 months)

### A) Oculoplastics

During this rotation, residents are expected to familiarize themselves with the content of the basic oculoplastics/orbit text (AAO manual—Section 7, Lacrimal System) and one of the other basic textbooks of oculoplastic surgery (e.g., Nerad, Collin, or McCord).

#### Medical Expert

1. To describe basic eyelid, lacrimal, and orbital anatomy and physiology (e.g., eyelid, orbicularis, orbital structures, meibomian glands, lacrimal glands, glands of Zeis, Whitnall's ligament, Muller's muscle, Lockwood's ligament, canaliculi, puncta, orbital bones, orbital foramina, paranasal sinuses, annulus of Zinn, arterial and venous vascular supply, lymphatics, nerves, and extraocular muscles).
2. To recognize and treat localized trichiasis.
3. To describe typical features of orbital cellulitis.
4. To perform pre-operative and post-operative assessment of patients with common oculoplastic disorders.
5. To recognize different causes of eyelids malposition.
6. To recognize and treat floppy eyelid syndrome.

### Procedures and Technical Skills

1. To identify indications for, and to perform, the basic lacrimal assessment (e.g., dye testing, punctal dilation, canalicular probing, lacrimal irrigation).
2. To identify normal orbital anatomy on imaging studies (e.g., magnetic resonance imaging, computed tomography, ultrasound).
3. To identify indications for, and to perform, the basic assessment of the orbit (e.g., Hertel exophthalmometry, inspection, palpation, auscultation).
4. To perform minor lid and conjunctival procedures (e.g., removal of benign eyelid skin lesions, chalazion curettage, or excision).
5. To perform epilation.
6. To perform a lateral tarsorrhaphy.
7. To perform a simple incisional or excisional biopsy of a lid lesion.
8. To assess and do some steps in dacryocystorhinostomy (DCR)

9. Preparation for OR: Residents are expected to demonstrate the following attributes:
- Punctuality.
  - Knowledge about each case.
  - Knowledge about instruments and their appropriate use.
  - Minimizes tissue trauma in surgery.
  - Appropriate speed of surgery.
  - Knows own limits.
  - Listens and learns from instruction.
  - Assists well, anticipating appropriately.
  - Interacts effectively with all members of OR staff.

## **B) Neuro-Ophthalmology**

Upon completion of the neuro-ophthalmology rotation, a resident is expected to have acquired the skills and knowledge base to effectively diagnose and treat patients with the most common neuro-ophthalmologic problems. He/she should recognize neuro-ophthalmologic emergencies, and have the knowledge to identify and appropriately refer patients who need tertiary care to a sub-specialist in ophthalmology, neurology, or neurosurgery.

### **Medical Expert**

1. Describe the neuro-anatomy of the visual pathways.
2. Describe the neuro-anatomy of the cranial nerves.
3. Describe the pupillary and accommodative neuro-anatomy.
4. Describe the ocular motility and related neuronal pathways.
5. Describe the typical features, evaluation, and management of the most common optic neuropathies (e.g., demyelinating optic neuritis; ischemic optic neuropathy [arteritic and non-arteritic]; toxic or nutritional optic neuropathy; Leber's hereditary optic neuropathy; ethambutol toxicity; neuroretinitis; and compressive, inflammatory, infiltrative, and traumatic optic neuropathies).
6. Describe the typical features, evaluation, and management of the most common ocular motor neuropathies (e.g., third, fourth, and sixth nerve palsy).
7. Describe the typical features of cavernous sinus and superior orbital fissure syndromes (e.g., infectious, vascular, neoplastic, inflammatory, and traumatic etiologies).
8. Describe the typical features, evaluation, and management of the most common causes of nystagmus (e.g., infantile motor and sensory, downbeat, upbeat, gaze-evoked, and drug-induced).
9. Describe the typical features, evaluation, and management of the most common pupillary abnormalities (e.g., relative afferent pupillary defect, anisocoria, Horner syndrome, third nerve palsy, and Adie's tonic pupil).
10. Describe the typical features, evaluation, and management of the most common visual field defects (e.g., optic nerve, optic chiasm, optic radiation, and occipital cortex).
11. Describe the clinical features, evaluation, and management of ocular myasthenia gravis.

12. Describe the clinical features, evaluation, and management of carotid-cavernous fistula.
13. Describe the differential diagnosis, evaluation, and management of congenital optic nerve abnormalities (e.g., optic pit, disc coloboma, papillorenal syndrome, morning glory syndrome, tilted disc, optic nerve hypoplasia, myelinated nerve fiber layer, melanocytoma, disc drusen, and Bergmeister's papilla).

### Procedures and Technical Skills

1. To perform a basic pupillary examination.
  - a. Describe indications for, and perform, basic pharmacologic pupillary testing for Horner syndrome, pharmacologic dilation, and Adie's tonic pupil.
  - b. List the differential diagnosis of anisocoria (e.g., sympathetic or parasympathetic lesion; "physiologic" or normal).
  - c. Describe, detect, and quantitate a relative afferent pupillary defect.
  - d. List the causes for light-near dissociation (e.g., diabetic neuropathy, tonic pupil, and Argyll-Robertson pupils).
2. To perform a basic ocular motility examination.
  - a. Describe the indications for, and perform, forced duction testing.
  - b. Perform an assessment of saccade accuracy and smooth pursuit with optokinetic testing.
  - c. Describe the indications for visual field testing, and perform and interpret perimetry studies.
  - d. Perform confrontational field testing (static and kinetic, central and peripheral, and red and white targets).
  - e. Perform and interpret a tangent screen test.
  - f. Describe the indications for, and perform, basic Goldmann perimetry, and interpret the results.
  - g. Describe the indications for, and perform, basic automated perimetry, and interpret results.
3. To perform basic direct, indirect, and magnified ophthalmoscopic examination of the optic disc (e.g., recognize optic disc swelling, optic atrophy, and neuroretinitis).
4. To describe the anatomy and indications for, order appropriately, and interpret basic radiology studies of the brain and orbits, demonstrating the ability to communicate with radiologists in order to maximize both choice of proper diagnostic tests and accuracy of interpretation.
5. Obtain a history for visual loss.
6. Obtain a history for diplopia.
7. Perform accurate confrontation visual fields.
8. Perform accurate assessment of ocular motility.
9. Perform accurate assessment of pupil and lid function.
10. Interpret visual fields by Humphrey automated and Goldmann perimetry.
11. Perform a basic neurologic exam.
12. Assess the anterior visual pathways and ocular motor structures on CT and MRI.

## 4. Pediatric Ophthalmology Rotation (2 months)

Residents will obtain the skills necessary to assess the strabismus patient. In order to do so, they must spend adequate time in both pediatric and orthoptic workup clinics to measure and understand the nature of strabismus. They are expected to demonstrate basic science and clinical knowledge through the reading of the pediatric ophthalmology text (AAO manual—Section 6, Pediatric Ophthalmology and Strabismus) and the basic textbook of strabismus management (e.g., Kenneth-Wright pediatric requisite).

### Medical Expert

1. Has the necessary basic science and clinical knowledge of common pediatric ophthalmological conditions, as defined in the above-recommended books.
2. Familiarity with content of basic knowledge to request appropriate investigations.
3. Demonstrates awareness of electrophysiology in pediatric ophthalmology diagnosis.
4. Demonstrates awareness of ultrasound, CT, and MRI in childhood eye disease.
5. Demonstrates understanding of genetic inheritance patterns in pediatric eye disease and could counsel family appropriately in important ocular genetic areas at the level of counseling.
6. Recognizes emergency conditions and how to manage them.
7. Recognizes situations in which examination under anesthesia is necessary to clarify the diagnosis.

### Procedures and Technical Skills

1. Ability to obtain history and pertinent examination findings without undue stress to the patient and family.
2. Knowledge of treatment options and specific procedures.
3. Preparation for OR:
  - a. Punctual.
  - b. Knowledgeable about each case.
  - c. Knows instruments and their appropriate use.
4. Minimizes tissue trauma in surgery.
5. Appropriate speed of surgery.
6. Knows own limits.
7. Listens and learns from instruction.
8. Assists well, anticipating appropriately.
9. Interacts effectively with all members of OR staff.

## **d. II Second Year of Ophthalmology Residency Program (R2)**

During the second year of residency, the resident will have two-month rotations throughout the surgical specialties. The surgical responsibilities will be increased based upon the abilities of the resident. As residents gain expertise and confidence, he/she will be expected to perform all or part of the surgical procedures. During this year, the rotations will include glaucoma, retina/vitreous, anterior segment and cataract surgery, pediatric ophthalmology, and strabismus; this will also include training and mastering the other following CanMEDS competencies.

### **Communicator**

- Establishes a good rapport with patients and families.
- Obtains a complete, organized, and succinct history and physical examination.
- Does so in an appropriate length of time.
- Listens effectively to instructions.
- Discusses appropriate information with patients, families, and health care team.
- Writes consultation reports and progress notes that are organized, legible, complete, and signed.
- Dictates reports and consultations are complete and timely.

### **Collaborator**

- Interacts effectively with other health professionals, recognizing their roles and expertise.
- Consults and delegates effectively.
- Demonstrates appropriate leadership within the interdisciplinary health care team.
- Demonstrates the ability to provide and receive effective and constructive feedback.

### **Manager**

- Punctual in attending to responsibilities.
- Understands and makes effective use of information technology.
- Sets realistic priorities and uses time effectively in order to optimize professional performance.
- Makes clinical decisions based on sound evidence and efficient use of available resources with the guide of more senior staff in the team.

### **Scholar**

- Demonstrates the ability to conduct a research project, including generation of a hypothesis, development of a protocol, statistical analysis, and presentation of results.
- Effective teacher of medical interns and medical students.
- Demonstrates the ability to effectively prepare and deliver clinical oral presentations.
- Develops lifelong learning skills.

### **Professional**

- Demonstrates integrity, honesty, compassion, and respect for diversity.
- Fulfills medical and legal obligations of the specialist.

- Understands the principles of ethics and applies these to clinical situations.
- Demonstrates awareness of own limitations.
- Seeks advice when necessary, accepts advice, and responds appropriately.

#### **Health Advocate**

- Familiarity with the current guidelines and patterns of practice for ophthalmic disease.
- Respects and empowers patient autonomy.
- Promotes equitable health care.
- Applies the principles of quality improvement and quality assurance.

### **Objectives of Clinical Training Rotations and Training Requirements in the Second Year:**

#### **1. Emergency Room Rotation (2 months)**

As a resident in R2, he/she is responsible for triaging eye-related emergencies that present to the ER based on urgency and need. Junior residents take overnight calls with the help of more senior residents.

The following medical objectives are targeted:

#### **Medical Expert**

1. Develops experience in management of common ocular emergencies.
2. Works with other medical specialists in managing ER patients for both life- and ocular-saving benefit.
3. Takes full systemic and ocular history focusing on the patient complaint.
4. Performs full ocular examination, including slit lamp exam.
5. Familiarizes with tonometry exam and fundus exam using indirect ophthalmoscope.
6. Formulates list of differential diagnosis.
7. Participates in implementing a management plan.
8. Consults and presents the case to his seniors.
9. Learns to function independently and manage a wide variety of ocular pathology and ocular trauma at an early point in their ophthalmic training.

#### **Procedures and Technical Skills**

1. Assesses the general health of trauma patients.
  2. Is familiar with basic life support.
  3. Performs a basic extraocular exam, slit lamp exam, tonometry, funduscopy, pupil, and cranial nerves exam.
  4. Performs gonioscopy, and interprets the findings.
  5. Performs corneal scraping for cultures and sensitivity tests.
  6. Manages very urgent ocular emergency (e.g., chemical burns).
  7. Assesses emergency surgical cases (e.g., lid laceration repair, removal of superficial corneal foreign body, and removal of corneal suture).
- Assesses YAG PI procedures and knows the indications, parameters, and possible complications.

## 2. Glaucoma Rotation (2 months)

Upon completion of the glaucoma rotation, a resident is expected to have acquired the skills and knowledge base to effectively diagnose and treat patients with glaucoma. He or she should also have the knowledge to identify and appropriately refer patients who need tertiary care, either to a sub-specialist in ophthalmology or to other specialties as required.

### Medical Expert

1. Confirms and applies the knowledge obtained during general rotations.
2. Describes the anatomy of the anterior chamber angle and ciliary body complex.
3. Describes the physiology of aqueous humor.
4. Describes the features of and recognizes primary and secondary angle-closure glaucoma.
5. Performs evaluation of POAG (primary open-angle glaucoma) and PACG (primary angle-closure glaucoma).
6. Understands the principles of and is able to describe and interpret visual field tests.
7. Understands the principles and clinical application of optic nerve head imaging (e.g., OCT, and HRT)
8. Describes the principles of medical management, including indications for and side effects of treatment options (e.g., topical and systemic medications) for simple glaucoma (e.g., POAG, PACG).
9. Describes the clinical features of and to recognize hypotony (e.g., Seidel test for transconjunctival leakage) and realizes the risk of infection, knows the initial steps in managing leaking bleb and blebitis, and identifies bleb-related endophthalmitis.
10. Understands importance of and performs DTC (diurnal tension Curve).
11. Describes the principles, techniques, and indications of YAG laser iridotomy.
12. Describes the principles, techniques, and indications of suture lysis.
13. Demonstrates the ability to diagnose congenital glaucoma, knows the contraindications of medications in pediatrics, and knows the differential diagnosis.

### Procedures and Technical skills

1. Performs basic tonometry (e.g., applanation, pneumotonometry, Schiötz [if applicable], tonopen, airpuff) and recognizes the pitfalls and artifacts of testing; is able to recognize the importance of corneal topography in glaucoma (adjusting IOP according to CCT and adjusting applanation according to the cylinder axis).
2. Performs basic gonioscopy (e.g., recognizes angle structures, identifies angle closure), and is able to perform "compressive gonioscopy" technique and knows its clinical applications.
3. Interprets manual (e.g., Goldmann) and automated (e.g., Humphrey, Octopus) visual fields in routine glaucoma.
4. Stereo assessment of the optic nerve head and importance of OCT of optic nerve head in assessing MRW and invisible extension of Bruch's membrane, which leads to underestimation of the remaining rim.
5. Then assists performing YAG laser iridotomy, and must know laser settings and lenses used.
6. Assists and then starts performing the initial steps for the following procedures under close supervision:
  - a) Simple primary trabeculectomy.

- b) Suture lysis following trabeculectomy; must know laser settings and lenses used.
- c) Bleb management (bleb needling or autologous blood injection).

### 3. Pediatric Ophthalmology Rotation (2 months)

This rotation represents the major pediatric component of the program; emphasis in the R2 rotation is to apply the basic knowledge obtained during PGY1, including orthoptic work-up.

In addition, surgical skills will be more emphasized during the PGY2 and PGY4 rotations. The resident should make every attempt to spend time in pediatric clinics. This will help them to develop a relaxed and child-friendly manner, which, in turn, will allow them to rapidly elicit an accurate and pertinent history, and the relevant clinical signs with minimal stress to the patient and their family.

#### Medical Expert

1. Describes basic examination techniques for extra-ocular muscles (e.g., ductions and versions, cover and uncover testing, alternate cover testing, prism cover testing).
2. Fills the orthoptic work up sheet with strabismus findings and to uses appropriate orthoptic abbreviations.
3. Describes basic visual development and visual assessment of the pediatric ophthalmology patient (e.g., central, steady, maintained fixation, illiterate E, Allen cards, and Landolt C ring).
4. Describes basic anatomy and physiology of extra-ocular muscles (e.g., innervation of extraocular muscles, primary actions, comitant and incomitant deviations, overaction and underaction, restrictive and paretic saccades and pursuit movements).
5. Describes basic sensory adaptations for binocular vision (e.g., normal and anomalous retinal correspondence, suppression, horopter, Panum's area, fusion, and stereopsis, monofixation syndrome).
6. Describes different etiologies of amblyopia (e.g., deprivation, ametropic, strabismic, anisometropic, organic).
7. Describes etiologies of esotropia and principles of treatment (e.g., congenital, comitant vs. incomitant, accommodative vs. non-accommodative, sensory, neurogenic, myogenic, neuromuscular junction, restrictive, nystagmus blockage syndrome, consecutive).
8. Describes etiologies of exotropia and principles of treatment (e.g., congenital, comitant vs. incomitant, intermittent vs. constant, sensory, neurogenic, myogenic, neuromuscular junction, restrictive, basic, divergence excess, exophoria, convergence insufficiency).
9. Describes vertical strabismus patterns (e.g., A or V pattern).
10. Describes etiologies, evaluation, and management of vertical strabismus (e.g., neurogenic, myogenic, neuromuscular junction, oblique overaction or underaction, dissociated vertical deviation, restrictive).
11. Describes non-surgical treatment of strabismus.
12. Describes different forms of childhood nystagmus.
13. Describes features, classification, and treatment indications of retinopathy and prematurity.

14. Describes etiologies and types of pediatric cataracts, surgical indications, and appropriate optical correction based on the age of the patients.
15. Describes the pattern of refractive errors in the pediatric age group, their relation to ocular alignment, and principles of their management.
16. Describes and recognizes ocular findings in child abuse (e.g., retinal hemorrhages) and appropriately refers to child protective services or other authorities.
17. Describes common congenital ocular motility or lid syndromes (e.g., Duane syndrome, Marcus Gunn jaw winking, Brown syndrome),
18. Describes typical features of retinoblastoma, ancillary diagnostic tools, international classification, and current modalities of treatment.
19. Describes basic evaluation of decreased vision in infants and children (e.g., retinopathy of prematurity, hereditary retinal disorders, congenital glaucoma, measles, and vitamin A deficiency).
20. Describes identifiable congenital ocular anomalies and systemic association (e.g., microphthalmia, persistent fetal vasculature, optic nerve diseases).

### Procedures and Technical Skills

1. Performs an extraocular muscle examination based on knowledge of the anatomy and physiology of ocular motility.
2. Assesses ocular motility using testing of ductions and versions, and pursuit and saccades.
3. Performs basic measurement of strabismus (e.g., Hirschberg, Krimsky, alternate prism cover test, simultaneous prism cover test, Parks-Bielschowsky three-step test).
4. Performs assessment of vision in the neonate, infant, and child.
5. Recognizes and applies in a clinical setting the following skills in the ocular motility examination:
  - a. Stereoacuity testing.
  - b. Accommodative convergence/accommodation ratio (e.g., heterophoria method, gradient method).
  - c. Tests of binocularity and retinal correspondence.
  - d. Cycloplegic refraction (retinoscopy).
  - e. Anterior 1 and posterior segment examination.
  - f. Measurement of strabismus.
  - g. Assessment of vision:
    - i. teller acuity cards.
    - ii. fixation preference test.
    - iii. standard subjective visual acuity tests.
    - iv. induced tropia test.
  - h. Assessment of paralytic and restrictive squint by Hiss or Lee screen.
6. Assists a primary surgeon in performing extraocular muscle surgery and other surgeries in the pediatric ophthalmology field and participates in some steps, including:
  - a. Recession.
  - b. Resection.
  - c. Muscle weakening (e.g., tenotomy) and strengthening (e.g., tuck) procedures.
  - d. Transposition.
  - e. Is familiar with the appropriate uses, doses, and side effects of botulinum toxin Type A (Oculinum) in strabismus.

- f. Cataract surgery in pediatric age group.
- g. Congenital glaucoma surgeries.

#### 4. Retina/Uveitis Rotation (2 months)

The retina/uveitis service is committed to providing an excellent learning experience to ophthalmology residents. By the end of their junior residency training, it is expected that they will have a good basic knowledge of vitreoretinal diseases, and good diagnostic skills. Residents should be familiar with the content of the basic retina ophthalmology text (AAO manual—Section 12, Retina and Vitreous) and intraocular inflammation and uveitis text (AAO manual—Section 9, Intraocular Inflammation and Uveitis).

#### Medical Expert

- a) Has the necessary basic science and clinical knowledge.
  - 1. Describes basic principles and retinal anatomy, embryology, and physiology (layers of the retina, retinal and RPE physiology, vascular supply of the eye).
  - 2. Describes basic principles of history taking, examination, and work-up of a patient with retina and uveitis diseases.
  - 3. Describes and recognizes different stages of diabetic retinopathy and retinopathy of prematurity.
  - 4. Describes fundamentals and demonstrates basic understanding of fluorescein angiography as applied to retinal vascular disease (e.g., indications, phases of the angiogram, patterns of hyper- and hypofluorescences).
  - 5. Describes etiologies and mechanisms of retinal detachment.
  - 6. Describes basic principles of laser photocoagulation.
    - Familiarity with management of ocular trauma and surgical complications.
    - Understands the physics of laser delivery systems and lenses.
- b) Has necessary knowledge to request appropriate investigations.
  - 1. Awareness of the place of fluorescein angiogram, OCT, ICG, electrophysiology, and visual field testing in retinal diagnosis.
  - 2. Awareness of the relative place of ultrasound, CT, and MRI in retinal diseases.
- c) Demonstrates understanding of genetic inheritance patterns in retinal diseases and could counsel family appropriately in important ocular genetic areas.
- d) Recognizes emergency retinal conditions and how to manage them.

#### Procedures and Technical Skills

- a) Knowledge of treatment options and specific procedures.
- b) Expected technical skills:
  - Indirect retinal examination.
  - Retinal drawing.
  - Scleral depression.
  - Fundus contact lens use.
  - Vitreous and A/C tap and injections.
- c) Gaining experience with:
  - B-Scan ultrasound examination.

- Panretinal photocoagulation laser.

## 5. Anterior Segment (Cataract, Corneal, and External Disease) Rotation (3 months)

### Medical Expert

#### *Cataract*

1. Shows the basic knowledge obtained in R1 level during general ophthalmology rotation regarding causes and types of cataract, preoperative cataract evaluation, and complications of cataract surgery.
2. Knows the differential diagnosis of dislocated or subluxated lens (e.g., trauma, Marfan syndrome, homocystinuria, Weill-Marchesani syndrome, syphilis).
3. Familiar with the techniques of extracapsular cataract extraction and phacoemulsification.
4. Knows the basic science of IOL calculation and biometry.

#### *Cornea and external disease*

1. Confirms the knowledge obtained in PGY1 level during general ophthalmology rotation, which includes corneal anatomy and basic science in corneal inflammation, infection, corneal laceration, and dry eye.
2. Understands the differential diagnosis of red eye.
3. Describes congenital abnormalities of the cornea and anterior segment (e.g., Peter's, Axenfeld's, and Rieger's anomaly, microphthalmos, aniridia, birth trauma, buphthalmos).
4. Understands the fundamentals of corneal optics and refraction (e.g., keratoconus).
5. Describes the fundamentals of ocular microbiology and recognizes corneal and conjunctival inflammations and infections (e.g., staphylococcal hypersensitivity, simple microbial keratitis, trachoma, ophthalmia neonatorum, herpes zoster ophthalmicus, herpes simplex keratitis, and conjunctivitis).
6. Recognizes the basic presentations of ocular allergy (e.g., phlyctenules, seasonal hay fever, vernal conjunctivitis, allergic and atopic conjunctivitis, giant papillary conjunctivitis).
7. Recognizes and treats lid margin disease (e.g., staphylococcal blepharitis, meibomian gland dysfunction).
8. Knows the basic mechanisms of traumatic and toxic injury to the anterior segment (e.g., alkali burn, lid laceration, orbital fracture, etc.).
9. Understands the mechanisms of ocular immunology and recognizes the manifestations of anterior segment inflammation (e.g., red eye associated with acute and chronic iritis).
10. Describes the basic principles of ocular pharmacology of anti-microbial, anti-inflammatory, and immune modulating agents (e.g., indications and contraindications for topical corticosteroids, non-steroidal anti-inflammatory agents, and antibiotics).
11. Recognizes and describes the treatment of chemical burns (e.g., types of agents, medical therapy).
12. Recognizes and describes the etiologies of hyphema and microhyphema.

13. Describes the etiologies and treatment of superficial punctate keratitis (e.g., dry eye, Thygeson's superficial punctate keratopathy, blepharitis, toxicity, ultraviolet photo keratopathy, contact lens related).
14. Recognizes the anterior segment manifestations of systemic diseases (e.g., Wilson's disease) and pharmacologic side effects (e.g., amiodarone vortex keratopathy).
15. Describes characteristic corneal and conjunctival degenerations (e.g., pterygium, pinguecula, senile plaques of the sclera, keratoconus).
16. Recognizes the common corneal dystrophies and degenerations (e.g., map-dot finger print dystrophy, Meesmann's dystrophy, Reis-Buckler dystrophy, Francois dystrophy, Schnyder dystrophy, congenital hereditary stromal dystrophy, lattice dystrophy, granular dystrophy, macular dystrophy, congenital hereditary endothelial dystrophy, Fuchs' dystrophy, posterior polymorphous dystrophy, Salzmann's degeneration).
17. Recognizes ocular surface tumors.

## Procedures and Technical Skills

### *Cataract*

1. Performs subjective refraction techniques and retinoscopy in patients with cataracts.
2. Performs direct and indirect ophthalmoscopy pre- and post-cataract surgery.
3. Performs local injections of corticosteroids, antibiotics, and anesthetics.
4. Implements the basic preparatory procedure for cataract surgery (e.g., obtaining informed consent, identification of instruments, sterile technique, gloving and gowning, prep and drape, and other pre-operative preparation).
5. Familiarity with the operating microscope and knows how to use the foot pedal.
6. Assists in cataract surgery, including ECCE and phacoemulsification.
7. Performs phacoemulsification in a practice setting (e.g., animal or wet lab).
8. Performs the following steps of cataract surgery under direct supervision, including any or all of the following:
  - a. Wound construction.
  - b. Anterior capsulotomy/capsulorhexis.
  - c. Installation and removal of viscoelastics.
  - d. Phacoemulsification, nuclear disassembly, and lens expression.
  - e. Cortical cleanup.
  - f. IOL implantation.

### *Cornea and External Disease*

1. Performs external examination and slit lamp biomicroscopy, including drawing of anterior segment findings.
2. Performs corneal scrapping and is able to interpret the result (e.g., culture techniques, culture media, Gram stain, Giemsa stain, calcofluor white, acid fast).
3. Performs primary pterygium excision.
4. Performs an isolated corneal laceration repair (e.g., linear laceration not extending to limbus).
5. Knows the medical treatment of hyphema and microhyphema.

### d.III Third Year of Ophthalmology Residency Program (R3)

During the third-year residency, residents are appointed to undertake certain primary responsibilities in the medical and surgical cares of patients. Residents will also assume second on-call in the emergency room. Residents are also expected to perform cataract surgery, including extra capsular procedures and phacoemulsification during this training; it will also include training and mastering the other following CanMEDS competencies.

#### **Communicator**

As well as incorporating previously demonstrated aptitudes, the senior resident will be more accomplished in dealing with less explicit or straightforward communication styles in both patients and medical personnel.

The senior resident will demonstrate greater brevity, accuracy, and clarity in communications.

#### **Collaborator**

As well as meeting targets presented in junior-level years, the senior resident will be more familiar with avenues of collaboration, have a better grasp of the networks of people involved in accomplishing tasks, and be more adept at giving and receiving feedback.

#### **Manager**

The senior resident will demonstrate a better ability to triage and prioritize patient services. He/she will be more aware of the multitude of factors (non-medical) that promote or inhibit efficient operations of a medical unit, an office, or an operating room. The senior will demonstrate tools and techniques used to manage time more effectively.

#### **Scholar**

The senior resident will have completed or have undertaken most of the work on a research topic suitable for publication.

- a) Critically appraises medical information and integrates information from a variety of sources.
- b) Demonstrates the ability to conduct a research project, including generation of hypothesis, development for a protocol, statistical analysis, and presentation of results.
- d) Demonstrates the ability to effectively prepare and deliver clinical oral presentations.
- e) Develops lifelong learning skills.

The senior will demonstrate the ability to quickly and accurately find reference material in support of a particular clinical approach.

#### **Professional**

The senior will continue to demonstrate those personal attributes that comprise professional and collegial behavior. Beyond this, the senior will be able to fluently discuss what is meant by "professional" and what constitutes a breach of professionalism.

#### **Health Advocate**

The senior resident will have a basic grasp of financial, social, and political factors that influence the delivery of medical care to patients. The senior resident will also be able to describe impediments to patients attaining optimum medical care, and is capable of suggesting solutions.

### **Objectives of Clinical Training Rotations and Training Requirements in the Third Year:**

#### **1. Emergency Room Rotation (2 months)**

The aim is to improve the goals and objectives of the junior-level rotations.

##### **Medical Expert**

1. Continues practicing emergency converge and management of emergency cases.
2. Covers the emergency room as a senior resident, which means involvement in triaging patients, leading the ER team, and organizing work among his/her junior colleagues.
3. Works and coordinates with other medical specialists in managing ER patients for both life- and ocular-saving benefits.
4. Takes partial responsibility in ER.
5. Performs full ocular history and examination.
6. Orders and requests specific work up for ER patients who need investigation.
7. Requests special ancillary treating, which aims to reach special diagnosis (e.g., FFA, OCT, B-scan).
8. Participates in implementing a management plan.
9. Consults and presents the case to the on-call consultant and subspecialty team, if needed.
10. Residents learn to function independently and lead the ER team at an early point in their ophthalmic training.

##### **Procedures and Technical Skills**

1. Performs full ocular exam, even in busy environment, such as the ER.
2. Performs corneal scraping for cultures and sensitivity tests, and traces the results.
3. Manages very urgent ocular emergency (e.g., endophthalmitis, acute angle-closure glaucoma, and pupil involvement in third cranial nerve palsy).
4. Manages or participates in the management of surgical cases that present to the ER (e.g., endophthalmitis, corneal laceration, lid laceration, and removal of corneal foreign body).
5. Interprets the results of the requested tests and manages the patients accordingly (e.g., B-scan result and culture results).
6. Diagnoses and manages acute uveitis patients from an emergency point of view (e.g., usage of cycloplegic drops, complete fundus exam, requesting specific work up according to the differential diagnosis).
7. Performs emergency laser treatment after consulting the subspecialty on-call (e.g., YAG PI [peripheral iridotomy], first session of PRP [panretinal photocoagulation] in severe PDR [proliferative diabetic retinopathy] cases).

## 2. Glaucoma Rotation (1 month)

This rotation aims to improve the goals and objectives of R3.

### Medical Expert

1. Confirms and applies the knowledge obtained during the previous level.
2. Describes the epidemiology and performs screening for routine and more advanced primary and secondary open-angle and angle-closure glaucoma.
3. Describes the etiologies for, and evaluation and treatment of, more complex glaucomas (e.g., angle recession, inflammatory, steroid-induced, pigmentary, pseudoexfoliative, phacolytic, neovascular, post-operative, lens particle glaucomas, plateau iris, glaucomatocyclitic crisis, iridocorneal endothelial syndromes, and aqueous misdirection).
4. Describes and performs diurnal tension curve.
5. Describes the features of primary infantile and juvenile glaucomas.
6. Describes and recognizes normal tension glaucoma ("low tension glaucoma").
7. Describes more advanced optic nerve- and nerve fiber-layer anatomy in primary and secondary glaucoma and recognizes typical and atypical features associated with glaucomatous cupping (e.g., rim pallor, rapid progression, central acuity loss, hemianopic or other non-glaucomatous types of visual field loss).
8. Describes more advanced forms of perimetry (e.g., kinetic and automated static visual fields) and perimetry strategies (e.g., threshold testing, supra-threshold testing, special algorithms) and should be able to understand the Garway-Heath map: Mapping the expected area of visual field loss according to the damaged optic nerve rim area. Should be able to distinguish glaucomatous VF damage from retinal and neurological changes.
9. To describe the principles, indications, and more advanced anatomic findings and gonioscopic features of primary and secondary glaucomas (e.g., plateau iris, appositional closure); they also must know the indications of UBM, AS OCT, and their application in glaucoma.

### Procedures and Technical Skills

1. Performs YAG or argon laser procedures in more advanced glaucoma patients (e.g., acute angle closure, hazy cornea repeat laser, vitreous lysis, suture lysis).
2. Prepares the patient for laser and surgeries (i.e., starting medications, postoperative medications, requests antimetabolites, knows the doses, and realizes the need for certain management of patients, such as post-cataract diabetics).
3. Performs cyclophotocoagulation for more advanced cases (e.g., prior surgery, monocular); performs routine and repeat trabeculectomy with or without antimetabolites.
4. Describes, manages, and treats surgically, if necessary, a flat anterior chamber.
5. Recognizes and treats complications of glaucoma surgery.

### 3. General Ophthalmology Rotation (2 months)

This rotation aims to improve the achievement of the first two years' goals and objectives, and to complete the goals and objectives of R3.

#### Medical Expert

Using the same materials outlined in R1, the senior resident will demonstrate greater depth and detail regarding ophthalmic, optics, and refractions knowledge. The senior resident will demonstrate more rapid and accurate synthesis and problem-solving capabilities.

#### Procedures and Technical Skills

For the same procedures in R1, the senior resident will show greater fluency and be more self-directed with preparation, execution, and dealing with complications.

#### Residents' Clinic:

These are teaching clinics in which residents deal directly with patients, and discuss findings and proposed management with the supervising staff. A small number of patients are seen during each clinic, allowing time for teaching and enabling the resident to comfortably examine each patient.

1. Two residents (one junior, one senior) run the clinic and see all patients. Supervising staff vary on different days to give residents a wide variety of philosophies. Supervising staff must be available within 5–10 minutes of the call to review patients with residents as needed.
2. Supervising staff are expected to write comments on the chart of each patient seen. This might include a diagnosis, suggested treatment, and whether he/she was in agreement with the various aspects of the examination performed by the resident.
3. Surgical cases can be generated from these clinics to be undertaken by residents under supervision of faculty staff. The senior resident will be responsible for preoperative and postoperative assessment and follow-up, writing, and arranging the OR list, and coordinating with staff, colleagues, and OR staff.

#### Optics and Refraction

1. Prescribing glasses:
  - a. Lens aberrations.
  - b. Lens materials.
  - c. Multifocal design.
  - d. Image jump.
  - e. Image displacement.
2. Contact lenses:
  - a. Lens types.
  - b. Basic parameters.
  - c. Field of vision.
  - d. Image size.
  - e. Accommodation demands.
  - f. Convergence demands.
  - g. Tear lens.

- h. Correcting astigmatism.
  - i. Correcting presbyopia.
  - j. Correcting keratoconus.
  - k. Correcting aphakia.
3. Low vision rehabilitation:
- a. Types of visual impairment.
  - b. Pathology effect on visual function.
  - c. Low vision devices.
  - d. Function tests.
  - e. Refracting individuals with visual impairments.

#### 4. Retina/Uveitis Rotation (2 months)

By the end of their residency training, residents will have a good knowledge of retinal diseases, and good diagnostic and therapeutic skills. Moreover, they will have the necessary basic science and clinical knowledge. They should be familiar with the basic retina ophthalmology text (AAO manual—Section 12, Retina and Vitreous), and intraocular inflammation and uveitis text (AAO manual—Section 9, Intraocular Inflammation and Uveitis).

#### Medical Expert

##### *Vitreoretinal Conditions:*

1. Recognizes the signs and patterns of retinal vascular disease.
2. Describes the types, stages, and complications of diabetic retinopathy.
3. Describes the fundamentals of OCT.
4. Recalls the basic knowledge and fundamentals obtained in PGY2 level.
5. Describes, recognizes, and knows how to manage different stages of diabetic retinopathy and retinopathy of prematurity.
6. Describes macular anatomy and function, and describes typical features of common macular disease (e.g., age-related macular degeneration, macular hole, macular dystrophies, macular pucker, macular edema, central serous chorioretinopathy).
7. Describes and recognizes features of closed blunt traumatic injuries and understands their management (commotion retinae, traumatic choroidal ruptures peripheral retinal dialysis, Purtscher's retinopathy, etc.).
8. Describes common forms of retinal vascular disease (e.g., branch, hemi- or central retinal vein, and artery occlusion).
9. Describes typical features of retinitis pigmentosa.
10. Describes features of, recognizes, and evaluates posterior vitreous detachments and retinal detachments.
11. Enumerates the causes of peripheral retinal neovascularization and their management.
12. Describes the features of infectious endophthalmitis and their management.
13. Recognizes patterns of retinal diseases and appropriately categorizes encountered pathologies into one category: vascular, inflammatory, degenerative, dystrophic, tumoral, and acquired.

14. Understands the basic fundamental concepts of retinal electrophysiology (ERG, EOG, and VER).
15. Has basic information about vitreous substitutes (e.g., gases, heavy liquids, silicone).
16. Describes fundamentals of, and changes in, OCT in different diseases.
17. Describes the indications, techniques, and complications of intravitreal injections

#### **Uveitis:**

1. Describes signs and symptoms of anterior and posterior uveitis (e.g., keratic precipitates, anterior chamber cells and flare, iris atrophy, transillumination, heterochromia and nodules, posterior vitreous haze and opacities, macular edema, snowbanking, retinal vasculitis, exudative retinal detachment, optic nerve head swelling, hyperemia and infiltration, retinitis, choroiditis).
2. Describes the classification of uveitis (e.g., acute and chronic uveitis, granulomatous and non-granulomatous, anterior, intermediate, and posterior).
3. Describes differential diagnosis of anterior uveitis (e.g., juvenile idiopathic arthritis, HLA-B27 associated uveitis, Fuchs' heterochromic uveitis, herpetic, sarcoidosis, etc.).
4. Describes typical features and differential diagnosis of posterior segment uveitis:
  - a. Behcet's disease.
  - b. Vogt-Koyanagi-Harada disease and sympathetic ophthalmia.
  - c. Sarcoidosis.
  - d. Toxoplasmosis.
  - e. Differential diagnosis of retinal vasculitis.
  - f. Infectious disorders (e.g., Tuberculosis, acute retinal necrosis, human immunodeficiency virus and AIDS, syphilis, cytomegalovirus retinitis, herpes simplex, herpes zoster).
  - g. Endophthalmitis.
  - h. Masquerade syndromes.
5. Describes the immunosuppressive agents used to treat uveitis.

#### **Procedures and Technical Skills:**

##### ***Vitreoretinal Diseases:***

1. Performs direct ophthalmoscopy.
2. Performs indirect ophthalmoscopy.
3. Performs binocular indirect ophthalmoscopy.
4. Performs biomicroscopic examination of the macula.
5. Performs fundus examination with +90 and +78 lenses.
6. Starts performing PRP.
7. Develops competency in the technique of indirect ophthalmoscopy and examines the fundus with + 78 and + 90 lenses, 3-mirror contact lens, and trans-equator (pan-funduscopy) contact lens.
8. Interprets basic fluorescein angiography in common retinal disorders (e.g., diabetic retinopathy, cystoid macular edema).
9. Performs digital massage of the globe (CRAO management).
10. Performs anterior chamber paracentesis in phakic and aphakic eyes (CRAO management).
11. Acquires the skills of pattern recognition for common retinal diseases.

12. Masters the techniques of panretinal photocoagulation.
13. Starts performing intravitreal injection

***Uveitis:***

1. Performs slit-lamp biomicroscopy of the anterior and posterior segment.
2. Performs indirect ophthalmoscopy and scleral depression to evaluate patients with posterior uveitis.
3. Interprets imaging techniques (e.g., fluorescein angiography, indocyanine green angiography, optical coherence tomography, ultrasound).
4. Knowledge of treatment options and specific procedures.
5. Preparation for OR:
  - Punctual.
  - Knowledgeable about each case.
  - Knows instruments and their appropriate use.
  - Assists in surgery/suturing conjunctiva.
6. Minimizes tissue trauma in surgery.
7. Appropriate speed of surgery.
8. Knows own limits.
9. Listens and learns from instruction.
10. Assists well and anticipates appropriately.
11. Interacts effectively with all members of OR staff.

**5. Anterior Segment (Cataract, Corneal, and External Disease) Rotation (2 months)**

**Medical Expert**

***Cataract***

1. Describes the less common causes of lens abnormalities (e.g., lenticonus, ectopia lentis, etc.).
2. Describes the pre-operative evaluation of the cataract patient, including:
  - a. The systemic diseases of interest or relevance to cataract surgery.
  - b. The relationship between external and corneal disease of relevance to cataracts and cataract surgery (e.g., lid abnormalities, dry eye).
  - c. The relationships between glaucoma, uveitis, and capsular opacities related to cataract surgery.
3. Describes glare analysis testing in pre and post cataract surgery.
4. Describes the use of A and B scan ultrasonography in cataract surgery.
5. Describes the instruments and techniques of cataract extraction, including extra-capsular-surgery and phacoemulsification (e.g., trouble-shooting the phacoemulsification machine, altering the machine parameters).
6. Describes the types, indications, and techniques of anesthesia for cataract surgery (e.g., topical, local, general).
7. Describes indications, techniques, and complications of surgical procedures, including
  - a. Extracapsular surgery.
  - b. Intracapsular surgery.
  - c. Phacoemulsification.
  - d. Paracentesis.

- e. IOL implantation.
8. Correlates the level of visual acuity with the lens or capsular opacities.
9. Confirms the knowledge obtained in previous levels of the common complications of cataract and anterior segment surgery (e.g., intraocular pressure elevations, hyphema, endophthalmitis, cystoid macular edema, retinal detachment, intraocular lens dislocation, lens-induced glaucoma, and uveitis).
10. Certain of knowledge regarding the indications, principles, and techniques of YAG laser capsulotomy, and understands the proper timing of YAG laser capsulotomy.

#### *Cornea and External Disease*

1. Knows the more complex anatomy, embryology, physiology, pathology, microbiology, immunology, genetics, epidemiology, and pharmacology of the cornea, conjunctiva, sclera, eyelids, lacrimal apparatus, and ocular adnexa.
2. Identifies the more complex, congenital abnormalities of the cornea, sclera, and globe (e.g., hamartomas and choristomas).
3. Recognizes, evaluates, and treats peripheral corneal thinning (e.g., inflammatory, degenerative, dellen-related, infectious, immunologic).
4. Recognizes common conjunctival neoplasia (e.g., benign, malignant tumors).
5. Recognizes and treats less common corneal or conjunctival presentations of degenerations (e.g., inflamed, atypical or recurrent pterygium, band keratopathy).
6. Describes the epidemiology, differential diagnosis, evaluation, and management of Bitot's spots.
7. Describes the differential diagnosis, evaluation, and management of Thygeson's superficial punctuate keratopathy.
8. Understands more complex corneal optics and refraction (e.g., irregular astigmatism).
9. Correlates the concordance of the visual acuity with the density of media opacity (e.g., cataract) and evaluates the etiology of discordance between acuity and findings from examination of the media.
10. Describes more complex ocular microbiology and describes the differential diagnosis of more complicated corneal and conjunctival infections (e.g., complex, mixed or atypical bacterial, fungal, acanthamoeba, viral or parasitic keratitis).
11. Describes differential diagnosis, evaluation, and treatment of interstitial keratitis (e.g., syphilis, viral diseases, non-infectious, immunologic, inflammation).
12. Describes less common, but more serious, differential diagnosis of "red eye" (e.g., autoimmune and inflammatory disorders causing scleritis, episcleritis, conjunctivitis, and orbital cellulitis).
13. Describes key features of trachoma, including epidemiology, clinical features and staging, and its complications (e.g., cicatrization), prevention (e.g., facial hygiene), topical and systemic antibiotic treatment (especially in hyperendemic regions), and surgery (e.g., tarsal rotations).
14. Describes mechanisms of traumatic and toxic injury to the anterior segment (e.g., long-term sequelae of acid and alkali burn, complex lid laceration involving the lacrimal system, full-thickness laceration).
15. Describes the differential diagnosis and external manifestations of more complex anterior segment inflammation (e.g., acute and chronic iritis with and without systemic disease).

16. Describes the principles of ocular pharmacology for anti-infective, anti-inflammatory, and immune modulating agents (e.g., use of topical non-steroidal agents, topical cyclosporine).
17. Recognizes and treats corneal lacerations (perforating and non-perforating).
18. Recognizes and treats large, recurrent, or atypical pterygia that may require surgery.
19. Describes surgical indications of hyphemas.
20. Recognizes, evaluates, and treats chronic conjunctivitis (e.g., chlamydia, trachoma, molluscum contagiosum, Parinaud's oculoglandular syndrome, ocular rosacea).
21. Describes the clinical features, pathology, evaluation, and treatment of ocular cicatricial pemphigoid.
22. Recognizes, evaluates, and treats the ocular complications of severe diseases, such as chronic exposure keratopathy, contact dermatitis, and Stevens-Johnson syndrome.
23. Recognizes and treats complex corneal lacerations (e.g., lacerations extending beyond the limbus).
24. Describes the epidemiology, clinical features, pathology, evaluation, and treatment of peripheral corneal thinning of ulceration (e.g., Terrien's marginal degeneration, Mooren's ulcer, rheumatoid arthritis-related corneal melt).
25. Familiarity with, and master interpretation of, different modalities of keratometry (e.g., orb scan, pentacam).

## Procedures and Surgical Skills

### *Cataract*

1. Performs extracapsular surgery in uncomplicated cases and start undertaking some steps in difficult cases (e.g., corneal scarring).
2. Performs phacoemulsification in a practice setting (e.g., animal or practice lab) and then in the operating room under supervision, including mastery of the following skills:
  - a. Wound construction.
  - b. Anterior capsulotomy.
  - c. Installation and removal of viscoelastics.
  - d. Extracapsular technique.
  - e. Beginning phacoemulsification techniques (e.g., sculpting, divide and conquer, phaco-chop).
  - f. Irrigation and aspiration.
  - g. Cortical cleanup.
  - h. IOL implantation (e.g., anterior and posterior chamber and special IOLs).

### *Cornea and External Disease*

1. Performs techniques that include keratometry, keratoscopy, endothelial cell count and evaluation, specular microscopy, and pachymetry.
2. Performs stromal micropuncture.
3. Performs application of corneal glue.
4. Assists in more complex corneal surgery (e.g., penetrating keratoplasty and photo therapeutic keratectomy).

5. Performs more complex pterygium excision, including conjunctival grafting.
6. Performs manual superficial or lamellar keratectomy.
7. Performs more complex corneal laceration repair (e.g., stellate perforating laceration).

## 6. Oculoplastic/Neuro-ophthalmology Rotations (2 months)

### A) Oculoplastics

The aim is to improve upon goals and objectives of the first year, and to confirm the knowledge of the medical and surgical techniques completed in the previous levels. Using the same materials outlined in the first year, the third-year resident will demonstrate more depth and detail of knowledge.

#### Medical Expert

1. Describes more advanced eyelid, lacrimal, and orbital anatomy and physiology (e.g., lacrimal apparatus, orbital vascular anatomy).
2. Recognizes and treat common and uncommon benign and malignant lid lesions.
3. Recognizes and treats common malpositions of the eyelids (e.g., entropion, ectropion, and ptosis).
4. Describes the genetics (where known), clinical features, evaluation, and treatment of congenital eyelid deformities (e.g., coloboma, distichiasis, epicanthus, telecanthus, blepharophimosis, ankyloblepharon, epiblepharon, euryblepharon, and Goldenhar, treacher-Collins, Waardenburg syndromes).
5. Describes the clinical features, evaluation, and management of congenital orbital deformities (e.g., anophthalmia, microphthalmia, cryptophthalmia, hypertelorism).
6. Performs pre-operative and post-operative assessment of patients with simple and more serious oculoplastic disorders (e.g., multi-disciplinary procedures).
7. Describes the mechanisms and indications for treatment of more advanced eyelid, orbital, and lacrimal trauma (e.g., full thickness lid laceration, chemical burns to the face).
8. Describes features of, evaluates, and treats more complicated cases of nasolacrimal duct obstruction, canaliculitis, dacryocystitis, acute and chronic dacryoadenitis, preseptal cellulitis, and orbital cellulitis.
9. Recognizes, evaluates, and treats thyroid ophthalmopathy (e.g., epidemiology, symptoms and signs; associated systemic diseases; orbital imaging; differential diagnosis; surgical, medical, and radiation indications; side effects of treatment)
10. Recognizes, evaluates, and treats orbital inflammatory pseudotumor (e.g., symptoms and signs, orbital imaging, differential diagnosis, biopsy indications, choice of treatments).
11. Recognizes, treats, or refers blepharospasm and hemifacial spasm.
12. Recognizes less-common orbital tumors (e.g., metastatic lesions).
13. Recognizes periorbital changes with age and the management for these changes (e.g., dermatochalasis).

## Procedures and Technical Skills

For the same procedures present in R1, the R3 resident will show greater fluency and be more self-directed regarding preparation, execution, and dealing with complications.

1. Confirms the knowledge of the surgical techniques completed in the previous levels.
2. Identifies indications for and performs more advanced assessment of eyelids and eyebrows (e.g., facial symmetry, brow ptosis).
3. Identifies indications for and performs more advanced lacrimal assessment (e.g., interpretation of dye testing, canalicular probing in trauma).
4. Performs more complicated minor lid procedures (e.g., large benign skin lesions) or surgery (e.g., recurrent or multiple chalazion and lid laceration repair).
5. Recognizes the indications and complications, and performs more complex minor operating room or limited operating room procedures (e.g., incision and drainage of recurrent or larger chalazia, excision of moderate sized benign eyelid lesions).
6. Recognizes and treats orbital trauma (e.g., intraorbital foreign body, retrobulbar hemorrhage, fracture).
7. Identifies common orbital pathology (e.g., orbital fractures, orbital tumors) on imaging studies (e.g., magnetic resonance imaging, computed tomography, ultrasound).
8. Treats common presentations of preseptal or orbital cellulitis.
9. Describes and performs the basic lacrimal procedures below (also, he/she should know the indication and complications of these procedures):
  - a. Lacrimal drainage testing (irrigation, dye disappearance test).
  - b. Lacrimal intubation.
  - c. Dacryocystorhinostomy (external).
  - d. Repairs simple lacerations of the lacrimal apparatus.

## B) Neuro-Ophthalmology

The aim of this rotation is to complete the first-year goals and objectives.

### Knowledge Base

1. Describes typical and atypical features, evaluation, and management of the most common optic neuropathies (e.g., papilledema, optic neuritis, ischemic, inflammatory, infectious, infiltrative, compressive, and hereditary optic neuropathies).
2. Familiarity with international studies (e.g., Optic neuritis study) and their applications.
3. Describes typical and atypical features, evaluation, and management of the more complex supranuclear and internuclear palsies and less common ocular motor neuropathies (e.g., progressive supranuclear palsy and internuclear ophthalmoplegia).
4. Describes typical and atypical features, evaluation, and management of the more complex and less common forms of nystagmus (e.g., rebound, convergence-retraction).
5. Describes typical and atypical features, evaluation, and management of the more complex and less common pupillary abnormalities (e.g., light-near dissociation, pharmacologic miosis and mydriasis).

6. Describes typical and atypical features, evaluation, and management of the more complex and less common visual field defects (e.g., lateral geniculate, monocular temporal crescent).
7. Describes more advanced aspects of visual field indications, selection, and interpretation (e.g., artifacts of automated perimetry, testing, and thresholding strategies).
8. Describes neuro-ophthalmic aspects of common systemic diseases (e.g., hypertension, diabetes, thyroid disease, myasthenia gravis, temporal arteritis, systemic infections, and inflammation).
9. Describes neuro-ophthalmologic findings in trauma (e.g., traumatic optic neuropathy, traumatic strabismus).
10. Describes typical features of inherited neuro-ophthalmologic diseases (e.g., Leber's hereditary optic neuropathy, autosomal dominant optic atrophy, spinocerebellar degenerations).
11. Recognizes, evaluates, and treats ocular myasthenia gravis.

### **Procedures and Technical Skills**

1. Describes the indications for, administers, and interprets the results of intravenous edrophonium (Tensilon and Prostigmine) tests for myasthenia gravis, and other tests used to diagnose myasthenia gravis (e.g., ice test).
2. Performs a detailed cranial nerve evaluation (e.g., testing of oculomotor, trochlear, trigeminal, and facial nerve function).
3. Describes the more advanced interpretation of neuro-radiologic images (e.g., indications and interpretation of orbital tumors, thyroid eye disease, pituitary adenoma, optic nerve glioma, optic nerve sheath meningioma).
4. Describes the evaluation, management, and specific testing (e.g., stereopsis, mirror test, red green testing) of patients with "functional" (non-organic) visual loss (e.g., recognize nonorganic spiral or tunnel visual fields).
5. Describe the indications and the complications of temporal artery biopsy.

#### **d. IV Fourth Year of Ophthalmology Residency Program (R4)**

During the fourth year of training, the resident is expected to rotate throughout the anterior segment, cornea, vitreo-retina, glaucoma, pediatric ophthalmology, and strabismus, and assume a leadership role in covering the ER during the specific rotations; this will also include training and mastering the following additional CanMEDS competencies:

##### **Communicator**

As well as encompassing previously demonstrated aptitudes, the senior resident will be more accomplished in dealing with less explicit or straightforward communication styles in both patients and medical personnel.

The senior resident will demonstrate greater brevity, accuracy, and clarity in communications.

##### **Collaborator**

As well as meeting targets present in junior years, the senior will be more familiar with avenues of collaboration, have a better grasp of the networks of people involved in accomplishing tasks, and be more adept at giving and receiving positive criticism.

##### **Manager**

The senior resident will demonstrate a better ability to triage and prioritize than the junior resident. The senior will be more aware of the multitude of factors (non-medical) that promote or inhibit efficient operations of a medical unit, office, and operating room. The senior will demonstrate tools and techniques used to manage time more effectively.

##### **Scholar**

- The senior resident will have completed a research topic suitable for publication (not limited to this subspecialty topic).
- The senior will demonstrate the ability to quickly and accurately find reference material in support of a particular clinical approach.
- At the end of the year, he/she will present his/her residency thesis in a local or international meeting.
- Effective teacher of residents, medical students, and other staff.

##### **Professional**

The senior will continue to demonstrate those personal attributes that comprise professional and collegial behavior. Beyond this, the senior will be able to fluently discuss what is meant by "professional" and what constitutes a breach of professionalism.

##### **Health Advocate**

The resident, on completion of the rotation, should be able to do the following:

1. Have familiarity with the current guidelines and patterns of practice for ophthalmic disease.
2. Respect and empower patient autonomy.
3. Promote equitable health care.
4. Apply the principles of quality improvement and quality assurance.

## **Objectives of Clinical Training Rotations and Training Requirements in the Fourth Year:**

### **1. Emergency Room Rotation (1 month)**

The aim is to improve on the goals and objectives of the previous training years.

#### **Medical Expert**

1. Continues to provide emergency coverage and management of emergency cases during senior level.
2. Is in charge of the ER in order to strengthen leadership skills
3. Works and coordinates with other medical specialists in managing ER patients for both life- and ocular-saving benefit.
4. Performs full ocular history and examination.
5. Orders and requests specific work up for ER patients who need investigations.
6. Requests special ancillary testing aiming to reach special diagnosis (e.g., FFA, ICG, PCR).
7. Distributes the work among his/her colleagues and tries to organize the work.
8. Consults and presents the case to the consultant on-call and for subspecialty team, if needed.

#### **Procedures and Technical Skills**

1. Performs detailed ocular exam, even in a busy environment, such as the ER.
2. Supervises and teaches his or her junior colleagues.
3. Manages very urgent ocular emergencies (e.g., endophthalmitis, acute angle-closure glaucoma, pupil evolved 3<sup>rd</sup> cranial N. palsy) and understands the appropriate triaging of patients.
4. Manages or participates in management of surgical cases that present to the ER (e.g., endophthalmitis, corneal laceration, lid laceration, and removal of corneal foreign body).
5. Interprets the results of the requested tests and manages patients accordingly (e.g., B-scan result, FFA results, OCT, and PCR).
6. Diagnoses and manages acute uveitis patients from an emergency point of view (e.g., use of cycloplegic drops, complete fundus exam, requesting specific work up according to the differential diagnosis).
7. Orders the appropriate imaging modalities of ER cases (e.g., CT scan OR MRI)
8. Performs emergency laser treatment after consulting the subspecialty on-call (e.g., YAG PI, first session of PRP in severe PDR cases).
9. Performs vitreous tap/biopsy and intravitreal injection for endophthalmitis.

### **2. Glaucoma Rotation (R4) (2 months)**

To improve on the goals and objectives of R4.

#### **Medical Expert**

Using the same materials outlined in the third year, the senior resident will demonstrate more depth and detail of knowledge.

1. Describes the clinical features of, recognizes, and treats less common etiologies of ocular hypotony.
2. Describes the results and applies the conclusions to clinical practice of the major clinical trials in glaucoma (e.g., Ocular Hypertension Treatment Study, Glaucoma Laser Trial, Normal Tension Glaucoma Study, and Advanced Glaucoma Intervention Study).
3. Describes the principles of laser treatments of glaucoma (e.g., indications, techniques, and complications, and use of various types of laser energy, spot size, laser wavelengths).
4. Describes the features of, and recognizes, the more complex and advanced forms of primary and secondary open-angle and angle-closure glaucoma.
5. Describes the surgical treatment of glaucoma: (e.g., trabeculectomy, combined cataract and trabeculectomy and cyclodestructive procedures, including indications, techniques and complications).
6. Describes and applies specific medical treatments for more advanced and complex forms of primary and secondary open-angle glaucoma and angle-closure glaucoma.
7. Describes the aqueous humor dynamics and their treatment in the more advanced and complex etiologies of glaucoma (e.g., angle recession, combined or multifactorial glaucoma, traumatic or inflammatory glaucoma, pigmentary dispersion glaucoma).
8. Applies the most advanced knowledge of optic nerve- and nerve fiber-layer anatomy and describe techniques, methods, and tools for analyzing the optic nerve head and nerve fiber layer, including:
  - a. Optic nerve head OCT; understands the principle of OCT and MRW.
  - b. Ability to read and correlate glaucomatous VF damage with ONH damage and predict the possible future zone of damage.
  - c. Ability to read AS OCT and UBM, and correlate the findings with glaucoma mechanism and future planning for management.

### **Procedures and Technical Skills**

1. For the same procedures present in R3, the senior resident will show greater fluency and be more self-directed regarding preparation, execution, and dealing with complications.
2. Performs combined procedures (e.g., Trab + Phaco or ECCE).
3. Assists and then performs some steps in advanced procedures (e.g., glaucoma drainage devices, non-penetrating surgeries).
4. Understands the indications and complications of tube surgeries, and is able to perform the procedure's steps under direct supervision.

### 3. Retina Rotation (2 months)

This rotation is designed to improve on the goals and objectives of R4.

#### Medical Expert

##### *Vitreoretinal Diseases:*

1. Describes detailed retinal anatomy and physiology.
2. Describes more advanced concepts of fluorescein/indocyanine green (ICG) angiography as applied to retinal vascular and other diseases (e.g., indications, phases of the angiogram).
3. Describes principles of retinal detachment recognition, various types of retinal detachment (e.g., exudative, rhegmatogenous, tractional), and their evaluation, management and repair (e.g., identify retinal break).
4. Describes and recognizes typical features of less common macular diseases (e.g., parafoveal telangiectasias, cone dystrophies, inherited macular dystrophies, fundus flavimaculatus, toxic maculopathies, vitreomacular traction).
5. Describes the findings in the major studies of anti-VEGF treatment for CNV, DME, and retinal vein occlusions.
6. Describes indications for and complications of laser photocoagulation.
7. Describes the findings of major studies in retinal diseases, including the following:
  - a. Diabetic Retinopathy Study (DRS).
  - b. Diabetic Vitrectomy Study (DVS).
  - c. Early Treatment of Diabetic Retinopathy Study (ETDRS).
  - d. Macular Photocoagulation Study (MPS).
  - e. Diabetes Control and Complications Trial (DCCT).
  - f. Branch Vein Occlusion Study (BVOS).
  - g. Central Vein Occlusion Study (CVOS).
  - h. United Kingdom Prospective Diabetes Study (UKPDS).
  - i. Age-Related Eye Disease Study (AREDS).
  - j. Verteporfin in Photodynamic Therapy Study (VIP).
  - k. Treatment of Age-Related macular Degeneration with Photodynamic Therapy Study (TAP).
  - l. Endophthalmitis Vitrectomy Study (EVS).
8. Describes the fundamentals, evaluations, and management of peripheral retinal disease and vitreous pathology (e.g., vitreous hemorrhage, retinal breaks) and the criteria to refer.
9. Describes, evaluates, and treats choroidal detachments and uveal effusion syndrome.
10. Identifies and evaluates retinoschisis (e.g., juvenile, senile).
11. Diagnoses, treats, and recognizes the complications of retinopathy of prematurity (e.g., retinal detachment).
12. Diagnoses, evaluates, and treats the following retinal vascular diseases:
  - a. Arterial and venous obstructions.
  - b. Diabetic retinopathy.
  - c. Hypertensive retinopathy.
  - d. Peripheral retinal vascular occlusive disease.
  - e. Acquired retinal vascular diseases.

- f. Ocular ischemic syndrome.
  - g. Sickle cell retinopathy.
13. Describes and recognizes common and uncommon macular disorders:
    - a. Age-related macular degeneration (ARMD).
    - b. Choroidal neovascularization.
    - c. High myopia.
    - d. Macular dystrophies.
    - e. Macular pucker (e.g., epiretinal membrane).
    - f. Macular holes.
    - g. Cystoid macular edema.
    - h. Central serous choroidopathy (retinopathy).
    - i. Optic pit and secondary serous detachment.
    - j. Retinal pigment epithelial detachment.
  14. Describes the fundamentals of retinal electrophysiology.
  15. Describes, recognizes, and evaluates hereditary retinal and choroidal diseases (e.g., gyrate atrophy, choroideremia, retinitis pigmentosa, cone dystrophies, Stargardt's disease, Best's disease, congenital stationary night blindness).
  16. Describes the techniques for retinal detachment repair (e.g., pneumatic retinopexy, scleral buckling, vitrectomy).
  17. Describes the basics of surgical vitrectomy (e.g., indications, mechanics instruments, and technique).
  18. Performs peripheral scatter photocoagulation (sector or panretinal).
  19. Describes the fundamentals of special vitreoretinal techniques:
    - a. Macular hole repair.
    - b. Epiretinal membrane peeling.
    - c. Complex vitrectomy for proliferative vitreoretinopathy.
    - d. Use of heavy liquids and intraocular gases (e.g., perfluorocarbons).
  20. Describes, evaluates, and treats posterior uveitis syndromes and endophthalmitis.
  21. Describes the fundamentals of the various vitreous substitutes namely gases, silicone oil, and heavy liquid perfluorocarbons.
  22. Assists in performing scleral buckling.
  23. Recognizes and treats infectious endophthalmitis.
  24. Performs vitreous tap/biopsy and intravitreal injection for endophthalmitis.
  25. Describes the mechanisms of retinal breaks and rhegmatogenous retinal detachment in blunt closed globe injuries and their management.
  26. Describes the sequelae of open globe injuries, the mechanism of retinal detachment in this setting, and the rule and principles of vitrectomy for their management.
  27. Masters indications of prophylactic laser therapy for peripheral retinal lesions.
  28. Describes the indications for conventional in the treatment of CSCR.
  29. Describes and recognizes retinopathy of prematurity (e.g., stages and treatment indications).
  30. Understands the role and describes the indications of intravitreal injections (e.g., Avastin, Lucentis, and triamcinolone) as adjuvant therapy for macular edema complicating retinal vascular disease, retinal venous occlusive disease, and choroidal neovascularization.

### ***Uveitis***

1. Understands the knowledge gained in R2 level.
2. Describes basic immune mechanisms in uveitis.
3. Describes immunosuppressive agents used to treat uveitis, including indication, route of administration, dosage, side effects, and patient monitoring.
4. Describes antimicrobial agents used to treat infectious uveitis (e.g., tuberculosis, toxoplasmosis, syphilis, viral infections).
5. Describes complications of uveitis and their management.
6. Describes different types of endophthalmitis (acute postoperative, chronic postoperative, post-traumatic, and endogenous).
7. Has the necessary basic science and clinical knowledge.
8. Recognizes the role of a visual ophthalmic consultant.
9. Recognizes the responsibility of an ophthalmic consultant.
10. Describes (or develops an understanding of) the pathophysiology, diagnosis, and management of macular diseases.
11. Describes the role of ICG and dye testing.
12. Develops an understanding of surgical management of retinal diseases.
13. Familiarity with content of the basic retina ophthalmology text (AAO manual—Section 12, Retina and Vitreous).
14. Develops competency in management of ocular trauma and surgical complications.
15. Understands the physics of laser delivery systems and lenses.
16. Understands systemic and ocular manifestation of diabetes.
17. Has necessary knowledge to request appropriate investigations:
  - a. Recognizes role of fluorescein angiogram, OCT, ICG, electrophysiology, and visual field testing in retinal diagnosis.
  - b. Recognizes the role of ultrasound, CT, and MRI in retinal diseases.
18. Demonstrates an understanding of genetic inheritance patterns in retinal diseases and could counsel family appropriately in important ocular genetic areas.
19. Recognizes emergency retinal conditions and how to manage them.

### **Procedures and Technical Skills**

- a) Knowledge of treatment options and specific procedures.

### ***Vitreoretinal Diseases:***

1. Knowledge of how to perform the examination techniques completed in previous levels and interpret the investigation results.
2. Performs indirect ophthalmoscopy with scleral indentation.
3. Performs laser retinopexy (demarcation) for isolated retinal breaks.
4. Performs laser therapy for ROP.
5. Describes indications and interpret basic electrophysiological tests (e.g., electroretinogram [ERG], electrooculogram [EOG], visual evoked potential [VEP], dark adaptation).
6. Interprets basic ocular imaging techniques (e.g., B-scan echography, nerve fiber layer analysis).
7. Performs fundus drawings of the retina, showing complex vitreoretinal relationships and findings.

8. Performs cryotherapy of retinal holes and other pathology.
9. Describes indications, techniques, and complications of pars plana vitrectomy and assists in a retinal surgery or performs part of the procedure under supervision.
10. Takes vitreous samples for endophthalmitis cases.
11. Performs intravitreal injections of antibiotics/steroids and other treatment agents.
12. Starts to perform macular laser in macular edema in DME and BRVO.
13. Masters the examination techniques and interpretation of the results of investigation undertaken in the previous levels.
14. Performs posterior segment photocoagulation in more complicated retinal cases:
  - a. Diabetic focal/grid macular treatment (e.g., monocular patient, repeat treatment).
  - b. Repeat peripheral scatter photocoagulation (panretinal).
  - c. Laser retinopexy (demarcation) of large or multiple breaks; cryotherapy.
  - d. LIO for ROP.
15. Performs detailed fundus drawings of the retina with vitreoretinal relationships in the most complex retinal cases (e.g., recurrent retinal detachment, and retinoschisis with and without retinal detachment).
16. Assists in performing scleral buckle/vitrectomy in retinal detachment.
17. Assists in performing parts of pars plana vitrectomy surgery.
18. Independently performs vitreous tap/biopsy and intravitreal injection for endophthalmitis.
19. Fully understands the indications for intravitreal anti-VEGF therapy and describes the diagnoses in which it can be used.
20. Independently performs intravitreal injections for diabetic macular edema, CNV, and retinal vein occlusion.

### ***Uveitis***

1. Understands skills acquired in previous levels.
2. Participates actively in the management of uveitis patients.
3. Undertakes a vitreous biopsy and gives intravitreal injections.
4. Undertakes periocular injections.
5. Preparation for OR:
  - Punctual.
  - Knowledgeable about each case.
  - Knows instruments and their appropriate use.
  - Assisting in surgery/suturing conjunctiva.
  - Assisting in surgery of scleral buckle and vitrectomy.
6. Minimizes tissue trauma in surgery.
7. Appropriate speed of surgery.
8. Knows own limits.
9. Listens and learns from instruction.
10. Assists well, anticipating appropriately.
11. Interacts effectively with all members of OR staff.
12. Understand the role and responsibility of ophthalmic consultant in surgical management.

#### 4. Anterior Segment (Cataract, Corneal, and External Disease) Rotation (3 months)

The objectives of this rotation are an extension of those expressed in the R3 Anterior Segment Rotation description. This rotation should not be seen as a repetition of that rotation, as higher expectations are made of each resident at this level. At the end of this block, the resident should present as a mature, confident surgeon capable of managing the pre-operative, intra-operative, and post-operative situations of all anterior segment procedures as listed in the R3 rotation.

The objective of this rotation is to acquire the full knowledge and capability to perform those procedures listed, and also be capable of handling complications confidently.

The resident should also be able to recognize his/her limit of capabilities and, therefore, when to refer a patient to more expert colleagues.

#### Medical Expert

##### *Cataract*

1. Describes the techniques and complications of more advanced anterior segment surgery (e.g., pseudoexfoliation, small pupils, mature cataract, hard nucleus, black cataract, post-traumatic, zonular dehiscence, secondary IOLs, indications for premium IOLs, capsular tension rings, iris hooks, use dye to stain the anterior capsule).
2. Describes the indications, techniques, and complications of cataract extraction combined with other ocular disease: glaucoma (e.g., combined cataract and glaucoma procedures, glaucoma in cataractous eyes, cataract surgery in patients with prior glaucoma surgery), retina (e.g., cataract surgery in patients with scleral buckle or prior vitrectomy), cornea (e.g., cataract extraction in patients with corneal opacities), ophthalmic plastic surgery (e.g., ptosis following cataract surgery), and refractive surgery (e.g., cataract surgery in eyes that have undergone refractive surgery).
3. Recognizes intraoperative complications of cataract and IOL implant surgery (e.g., posterior capsular tears, zonular dialysis, vitreous prolapse, dropped lens fragments, choroidal effusions).
4. Performs IOL calculation in complex cases (post-refractive surgery).
5. Assists in teaching junior residents.

##### *Cornea and External Disease*

1. Describes the differential diagnosis and the external manifestations of the most complex or uncommon anterior segment inflammations (e.g., syphilitic keratouveitis).
2. Diagnoses and treats the most severe corneal exposure cases.
3. Understands ocular surface reconstruction, limbal stem cell transplantation.
4. Recognizes and manages postoperative corneal surgery complications (especially immunologically-mediated rejection).
5. Understands the new modality in corneal surgeries, and the indications and complications (e.g., Descemet's stripping automated endothelial keratoplasty and keratoprosthesis).
6. Understands the preoperative assessment, patient selection, surgical management, and postoperative care for refractive surgery.

## Procedures and Surgical Skills

### *Cataract*

1. Comfortable in performing phacoemulsification in straightforward cases and encouraged to start undertaking more complex cases (e.g., poor pupil dilation).
2. Performs implantation of different IOL design (e.g., foldable 1-piece or 3-piece IOL).
3. Deals with intraoperative complications under direct supervision.
5. Manage patients with traumatic cataract, including pre-op, intra-op, and post-op management.
6. Participates in surgeries for secondary IOL implantation and IOL exchange.
7. Performs intravitreal tap and injects for endophthalmitis when it is indicated.

### *Cornea and External Disease*

1. Understands and performs complicated contact lens fitting (e.g., post keratoplasty).
2. Encouraged to perform some steps in corneal transplant surgery.
3. Performs other complex ocular surface surgery (e.g., amniotic membrane, conjunctival autograft).
4. Performs basic non-laser refractive surgery techniques (e.g., relaxing keratotomy and astigmatic keratotomy).
5. Manages and treats more complex neoplasms of the conjunctiva (e.g., carcinoma, melanoma).

## 5. Pediatrics Rotation (1 month)

This rotation is designed to improve the fulfillment of goals and objectives of previous levels, with greater emphasis on the following:

1. Develops comfort and confidence dealing with children, and fast, accurate loose lens refraction.
2. Develops competence in principles of genetic counseling pertaining to major ophthalmological conditions.
3. Develop surgical competence in the management of pediatric and adult comitant and incomitant strabismus including formulation of surgical plan; discussion for consent, including complications and their management; rectus muscle surgery, and post-operative management.
4. Recognizes the differences between child and adult ocular tissues and repair, and reasons for the differences in surgical and refractive management of aphakia, glaucoma, etc.
5. Develops comfort and confidence in evaluating and managing children with lens disorders.
6. Develops comfort and confidence in prescribing glasses for children.
7. Develops familiarity with the major syndromes that involve the eye.

## Medical Expert

1. Reviews basic knowledge and examination techniques undertaken in the previous levels.
2. Describes more advanced anatomy and physiology of strabismus (e.g., torsion, tertiary actions, and consecutive deviations).
3. Describes more advanced sensory adaptations (e.g., normal and anomalous retinal correspondence, suppression, phoropter, Panum's area, fusion, and stereopsis, monofixation syndrome).
4. Describes basics of binocular sensory testing (e.g., Titmus stereo test, Randot stereo test, Worth 4-dot, Bagolini lenses).
5. Describes and recognizes different etiologies of amblyopia.
6. Describes and recognizes etiologies of esotropia.
7. Describes and recognizes etiologies of exotropia.
8. Describes and recognizes vertical strabismus patterns (e.g., A or V pattern).
9. Describes etiologies, evaluation, and management of vertical strabismus (e.g., neurogenic, myogenic, neuromuscular junction, oblique overaction or underaction, dissociated vertical deviation, restrictive).
10. Describes and uses the non-surgical treatments, strabismus and amblyopia (e.g., patching, atropine penalization, Fresnel, and grind-in prism therapy).
11. Describes and recognizes the different forms of childhood nystagmus (e.g., sensory, motor, congenital, acquired).
12. Describes and recognizes less common hereditary or malformative ocular anomalies and syndromes (e.g., Mobius, Goldenhar syndrome).
13. Describes the main features of dyslexia and its relationship to vision.
14. Describes basic evaluation and differential diagnosis of decreased vision in infants and children (e.g., retinal and optic nerve etiologies, amblyopia).
15. Describes recognizable cause of blindness in infants (e.g., albinism, optic nerve hypoplasia, achromatopsia, Leber's congenital amaurosis, retinal dystrophy, congenital optic atrophy).
16. Describes etiology, evaluation, and management of congenital infections (e.g., toxoplasmosis, rubella, cytomegalovirus, syphilis, herpes).
17. Describes and recognizes the common causes of pediatric uveitis.
18. Describes and performs the most advanced strabismus examination techniques (e.g., prism cover testing in multiple cranial neuropathies, patients with nystagmus, dissociated vertical deviation, double Maddox rod testing).
19. Performs the most advanced techniques of assessment of visual development in complicated or non-cooperative pediatric ophthalmology patients (e.g., less common objective measures of visual acuity, electrophysiologic testing).
20. Applies the more advanced knowledge of strabismus anatomy and physiology (e.g., spiral of Tillaux, secondary and tertiary actions, primary and secondary deviation, spread of comitance) in evaluation of patients.
21. Describes clinical application of the most advanced sensory and motor adaptations (e.g., anomalous head position, anomalous retinal correspondence).
22. Recognizes and treats the most complicated etiologies of amblyopia (e.g., refraction non-compliance, patching failures, pharmacologic penalization).
23. Recognizes and helps treating all etiologies of esotropia (e.g., post-surgical/consecutive).

24. Recognizes and helps treating all etiologies of exotropia (e.g., supranuclear, consecutive, paralytic).
25. Recognizes the most complex strabismus patterns and principle of treatment (e.g., aberrant, regeneration, post-surgical, thyroid ophthalmopathy, and myasthenia gravis).
26. Recognizes and treats the most complex etiologies of vertical strabismus (e.g., skew deviation, post-surgical, restrictive).
27. Applies non-surgical treatment (e.g., patching, atropine penalization) of more complicated forms of amblyopia (e.g., non-compliant, patching failures).
28. Recognizes and evaluates the less common congenital ocular anomalies (e.g., unusual genetic syndromes).
29. Applies the most advanced principles of binocular vision and amblyopia (e.g., physiology of binocular vision, diplopia, confusion and suppression, normal and abnormal retinal correspondence, classification and characteristics of amblyopia).
30. Recognizes and understands principles of treatment for complex pediatric glaucoma.
31. Recognizes complex pediatric eyelid disorders (e.g., congenital deformities, lid lacerations, lid tumors).
32. Recognizes and treats (or refer) pediatric orbital diseases (e.g., orbital tumors, orbital fractures, rhabdomyosarcoma, severe congenital orbital malformations).
33. Recognizes the pattern of refractive errors in children and prescribe glasses.

### **Procedures and Technical Skills**

1. Assesses more advanced ocular motility problems (e.g., bilateral or multiple cranial neuropathy, myasthenia gravis, thyroid eye disease).
2. Applies Hering's and Sherrington's laws in more advanced cases (e.g., pseudoparesis of the contralateral antagonist, enhancement of ptosis in myasthenia gravis).
3. Performs more advanced measurements of strabismus (e.g., double Maddox rod testing, Lancaster red green testing, use of synoptophore or amblyoscope).
4. Performs assessment of vision in more difficult patients (e.g., uncooperative child, mentally impaired, nonverbal or preverbal).
5. Performs basic extraocular muscle surgery.
6. Exercises surgical judgment for the indications and contraindications for strabismus surgery.
7. Performs pre-operative assessment and intraoperative techniques and describe intraoperative and post-operative complications of strabismus surgery.
8. Performs the following strabismus surgeries:
  - a. Recession.
  - b. Resection.
  - c. Muscle weakening (e.g., tenotomy) and strengthening (e.g., tuck) procedures.
  - d. Transposition.
9. Manages the complication of strabismus surgery (e.g., slipped muscle, anterior segment ischemia).
10. Familiarity with the appropriate uses, doses, and side effects of botulinum toxin Type A in strabismus.

11. Describes and performs the pre-operative assessment and intraoperative techniques, and describe postoperative complications for more complicated strabismus surgery (e.g., re-operation, slipped muscle).
12. Describes indications for adjustable sutures in more complicated cases (e.g., thyroid ophthalmopathy).
13. Describes and manages more complex complications of strabismus surgery (e.g., globe perforation, endophthalmitis, over correction).
14. Describes fully principles of management of pediatric cataract (including evaluation for causes, evaluation for significance, timing and type of surgery, and options for aphakia correction).
15. Performs accurate cycloplegic refraction and prescribes glasses for children whenever needed.

### **Elective Rotation (2 months)**

The objectives of elective rotation are to

1. Provides opportunity to fill the gaps of training that may be caused by unavoidable causes (sick leave, low surgical cases number).
2. Creates opportunity for advanced training in reputable international training centers.
3. Gives the residency training committee a space during the training in case of deficiency in any subspecialty training, which then can be compensated during this rotation.

Note: Part of the elective rotation can be used to complete a research project.

The following conditions must be met on an elective rotation:

1. The elective period is planned prospectively by the program director and the resident, and approved by the Residency Training Committee in full.
2. There is a clearly designated elective supervisor.
3. The educational objectives of the elective are understood by the resident, elective supervisor, and program director.
4. There is a defined mechanism within the in-training evaluation system to include evaluation of the resident during the elective period. The mechanism for evaluation of the resident's performance during the elective is clearly understood beforehand by the resident, elective supervisor, and program director, and is based on the educational objectives of the elective.
5. The elective period is recognized by the program director and residency training committee as acceptable in the fulfillment of specialty training requirements.

## Final Required Surgical Competencies in Saudi Board Ophthalmology Residency Training Program

### CATARACT SURGERY

#### Expected to perform

- Familiarity with small incision phacoemulsification surgery.
- Extracapsulation cataract extraction with deferent ways of suturing.
- Intraocular lens implantation.
- YAG laser capsulotomy.
- Management of lens trauma in globe lacerations.
- Anterior vitrectomy.
- Regional blocks.

#### Not expected to perform

- Congenital cataracts.
- Lens subluxation.

### CORNEA AND EXTERNAL DISEASE

#### Required knowledge

- Principles of surgical repair of the cornea.
- Principles and complications of keratorefractive surgery.

#### Expected to perform

- Tarsorrhaphy.
- Pterygium +/- mitomycin.
- Conjunctival tumor excision.
- Anterior segment foreign body removal.
- Use of tissue glue.
- AC taps.
- Repair and management of anterior segment trauma.

#### Not expected to perform

- Penetrating keratoplasty.
- Iridocyclectomy.
- Conjunctival flaps.

### GLAUCOMA

#### Expected to perform

- Iridotomy and iridectomy.
- Laser trabeculoplasty.
- Partial thickness filtering surgery.
- Cycloablative therapy.
- Cataract surgery on glaucoma patient.
- Combined cataract and glaucoma surgery.

### **Not expected to perform**

- Full thickness filtering surgery.
- Cyclodialysis.
- Ahmed valve implantation.

### **LACRIMAL**

#### **Expected to perform**

- Lacrimal probing.
- Dacryocystorhinostomy.
- Simple punctal malpositions.
- Repair canalicular lacerations.

### **Not expected to perform**

- Conjunctival dacryocystorhinostomy.

### **NEURO-OPHTHALMOLOGY**

#### **Expected to perform**

- Temporal artery biopsy.

### **OCULOPLASTIC SURGERY**

#### **Expected to perform**

- Temporary and permanent Tarsorrhaphy.
- Biopsy of eye lid conjunctiva or cornea.
- Management of entropion and ectropion.
- Acute eye lid reconstruction following trauma or surgery.
- Blepharoplasty.
- Simple Fasanella procedure.
- Anterior levator resection (for acquired ptosis).

### **Not expected to perform**

- Cryotherapy to the eye and ocular adnexa.
- Split thickness and full thickness skin grafts.
- Mucous membrane grafts.
- Brow lift.
- Other ptosis procedures.
- Mullerectomy.

### **ORBITAL**

#### **Expected to perform**

- Evisceration.
- Enucleation.
- Anterior orbital decompression.
- Lateral canthotomy and cantholysis.
- Anterior orbitotomy for biopsy of lesion.
- Biopsy of lacrimal gland.

**Not expected to perform**

- Repair blowout fracture.
- Repair tripartite fracture.
- Drainage of acute orbital abscess.
- Biopsy and removal of posterior orbital lesions.

**PEDIATRICS****Expected to perform**

- Recess-resect strabismus procedures.
- Inferior oblique myectomy.
- Botulinum injection.

**Not expected to perform**

- Congenital and infantile cataracts.
- Congenital and infantile glaucoma.
- Complicated strabismus.
- Adjustable suture strabismus technique.
- Vertical or cyclovertical deviations.
- Treatment of retinoblastoma and other childhood oncology.

**RETINA****Expected to perform**

- Pan-retinal photocoagulation.
- Cryotherapy.
- Peripheral laser or peripheral cryotherapy.
- Vitreous tap for aspiration and injection.
- Repair of simple retinal breaks with laser photocoagulation.
- Focal treatment for macular edema with laser.
- Intravitreal injections.

**Not expected to perform**

1. Laser of choroidal neovascular membranes.
2. Posterior vitrectomy.
3. Radioactive plaques.
4. Pneumatic retinopexy.

## Surgical Requirements upon Completion of Residency Training:

Trainees should accomplish within the 4 years of training the performance of the operative and laser procedure requirements as specified below.

### Major Surgery:

|                                                          |                                                 |
|----------------------------------------------------------|-------------------------------------------------|
| ECCE + IOL                                               | 30 cases with minimum 15 cases as main surgeon  |
| Phaco + IOL                                              | 120 cases with minimum 80 cases as main surgeon |
| PKP/Lamellar Keratoplasty                                | Minimum 6 cases as assistant surgeon            |
| Ocular Trauma/Rupture Globe                              | 8 cases with minimum 4 cases as main surgeon    |
| Vitreous Tap                                             | Minimum 2 cases as main surgeon                 |
| Filtering Procedures with or without<br>Cataract Surgery | 20 cases with minimum 8 cases as main surgeon   |
| DCR                                                      | 10 cases with minimum 3 cases as main surgeon   |
| Enucleation/Evisceration                                 | 8 cases with minimum 2 cases as main surgeon    |
| Ptosis                                                   | 10 cases as assistant surgeon                   |
| Entropion                                                | 6 cases with minimum 3 cases as main surgeon    |
| Probing +/- Stent                                        | 10 cases with minimum 5 cases as main surgeon   |
| Strabismus                                               | 40 cases with minimum 15 cases as main surgeon  |
| Vitreoretinal                                            | 30 cases as assistant surgeon                   |
| Intravitreal Injection                                   | 20 cases minimum as main surgeon                |

### Minor Surgery:

|                                                                                                                  |                                  |
|------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Chalazia, tarsotomy, tarsorrhaphy,<br>conjunctival flap, hyfrecation, removal of<br>superficial corneal FB, etc. | Minimum 50 cases as main surgeon |
|------------------------------------------------------------------------------------------------------------------|----------------------------------|

#### Laser Procedure:

|                       |                                                |
|-----------------------|------------------------------------------------|
| YAG Laser PI          | Minimum 10 cases as main surgeon               |
| YAG Laser Capsulotomy | Minimum 10 cases as main surgeon               |
| Cyclophotocoagulation | 10 cases with minimum 5 cases as main surgeon  |
| Retinal Laser (PRP)   | 60 cases with minimum 30 cases as main surgeon |
| Retinal Laser (Focal) | 30 cases with minimum 15 cases as main surgeon |

# Assessment

Residents' evaluation and assessment throughout the program is undertaken in accordance with the Commission's training and examination rules and regulations. This includes the following:

## A. Annual Assessment:

### 1. Continuous Appraisal

This assessment is conducted toward the end of each training rotation throughout the academic year and at the end of each academic year as continuous assessment in the form of formative and summative evaluation.

#### 1.1 Formative Continuous Evaluation:

To fulfill the CanMEDS competencies based on the end of rotation evaluation, the resident's performance will be evaluated jointly by relevant staff for the following competencies:

1. Performance of the trainee during daily work.
2. Performance and participation in academic activities.
3. Performance in a 10–20-minute direct observation assessment of trainee-patient interactions. Trainers are encouraged to perform at least one assessment per clinical rotation, preferably near the end of the rotation. Trainers should provide timely and specific feedback to the trainee after each assessment of a trainee-patient encounter.
4. Performance of diagnostic and therapeutic procedural skills by the trainee. Timely and specific feedback for the trainee after each procedure is mandatory.
5. The CanMEDS-based competencies end-of-rotation evaluation form must be completed within two weeks following the end of each rotation (preferably in an electronic format) and signed by at least two consultants. The program director will discuss the evaluation with the resident, as necessary. The evaluation form will be submitted to the Regional Training Supervisory Committee of the SCFHS within four weeks following the end of the rotation.
6. The assessment tools, in a form of educational portfolio (i.e., monthly evaluation, rotational Mini-CEX\* and CBDs\*\*, etc.).
7. The academic or clinical assignments should be documented by an electronic tracking system (**e-Logbook** when applicable) on an annual basis. Evaluations will be based on accomplishment of the minimum requirements of the procedures and clinical skills as determined by the program.

\*Mini-clinical Evaluation Exercise

\*\*Case-based Discussion

### **1.2 Summative Continuous Evaluation:**

This is a summative continuous evaluation report prepared for each resident at the end of each academic year, which might also involve clinical, oral examination, OSPE, and OSCE.

## **2. End-of-year Examination:**

The end-of-year examination will be limited to R1, R2, and R3. The number of exam items, eligibility, and passing score will be in accordance with the commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, [www.scfhs.org.sa](http://www.scfhs.org.sa)

### **B. Principles of Ophthalmology Examination (Saudi Board Examination: Part I)**

This exam is conducted in the form of a written examination with a MCQ format, and it is held at least once a year. The number of exam items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, [www.scfhs.org.sa](http://www.scfhs.org.sa)

### **C. Final In-training Evaluation Report (FITER)/Comprehensive Competency Report (CCR)**

In addition to the approval of completion of the clinical requirements (resident's logbook) by the local supervising committee, the FITER is also prepared by the program's directors for each resident at the end of his/her final year in residency (R4). This might also involve clinical, oral exams, and completing other academic assignment(s).

### **D. Final Ophthalmology Board Examination (Saudi Board Examination: Part II)**

The final Saudi Board Examination comprises two parts:

#### **1. Written Examination**

This examination assesses the theoretical knowledge base (including recent advances) and problem-solving capabilities of candidates in the specialty of ophthalmology. It is delivered in a MCQ format and is held at least once a year. The number of exam items, eligibility, and passing score will be in accordance with the Commission's training and examination rules and regulations. Examination details and blueprint are published on the commission website, [www.scfhs.org.sa](http://www.scfhs.org.sa)

## **2. Clinical Examination**

This examination assesses a broad range of high-level clinical skills, including data gathering, patient management, communication, and counseling skills. The examination is held at least once a year, preferably in an objective structured clinical examination (OSCE) format in the form of patient management problems (PMPs). The exam eligibility and passing score will be in accordance with the Commission's training and examination rules and regulations.

Examination details and blueprint are published on the commission website, [www.scfhs.org.sa](http://www.scfhs.org.sa)

### **E. Certification:**

Certificate of training completion will only be issued upon the resident's successful completion of all program requirements. Candidates passing all components of the final specialty examination are awarded the "Saudi Board of Ophthalmology" certificate.

## Appendices

The following are examples of evaluation forms for assessing the various aspects of resident performance during the residency programs.

### Appendix A

#### EDUCATIONAL PORTFOLIO

#### RESIDENT ASSESSMENT

|                                                                                                                                           |                                                                       |                                                                                                                           |                   |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|-------------------|
| RESIDENT NAME                                                                                                                             |                                                                       | TRAINING YEAR                                                                                                             | R1 - R2 - R3 - R4 |
| ROTATION                                                                                                                                  |                                                                       | ASSESSMENT PERIOD                                                                                                         |                   |
| CONTRIBUTORS TO EVALUATION                                                                                                                |                                                                       | HOSPITAL                                                                                                                  |                   |
| SCALE KEY                                                                                                                                 | Please compare the resident with other residents at his/her training. |                                                                                                                           |                   |
| LEVEL:                                                                                                                                    |                                                                       |                                                                                                                           |                   |
| N/A                                                                                                                                       | Not applicable                                                        | There was no opportunity to enable evaluation of this item.                                                               |                   |
| 2                                                                                                                                         | Unsatisfactory*                                                       | Clearly inadequate in functioning and/or not improving.                                                                   |                   |
| 3                                                                                                                                         | Borderline/Marginal*                                                  | Inconsistently meets expectations for domain being evaluated.                                                             |                   |
| 4                                                                                                                                         | Meets expectations                                                    | A solid performance at his/her level in the program—most residents will fit into this category.                           |                   |
| 5                                                                                                                                         | Exceeds expectations*                                                 | Performed in a fashion that exceeds your expectations for most residents in the program and residents at a similar level. |                   |
| Performance of advance residents and experienced practitioners.                                                                           |                                                                       |                                                                                                                           |                   |
| This rating should be given to only a small number of residents and would place them at >90th percentile.                                 |                                                                       |                                                                                                                           |                   |
| *Written comments should accompany and support this rating.                                                                               |                                                                       |                                                                                                                           |                   |
| Please note that observed progress and evaluation should incorporate sequential integration of prior learning, new knowledge, and skills. |                                                                       |                                                                                                                           |                   |

|                                                                                              | N/A | 2 | 3 | 4 | 5 | Comments |
|----------------------------------------------------------------------------------------------|-----|---|---|---|---|----------|
| <b>A. COMMUNICATION SKILLS</b>                                                               |     |   |   |   |   |          |
| 1. Ability to elicit relevant, concise, and accurate history from patient/parent(s).         |     |   |   |   |   |          |
| 2. Ability to present clinical data in an organized, problem-oriented manner at rounds.      |     |   |   |   |   |          |
| 3. Ability to effectively discuss relevant information with attending, and health care team. |     |   |   |   |   |          |
| 4. Establishes a therapeutic relationship with patients and communicates well with family.   |     |   |   |   |   |          |

|                                                                                                                                                                                          |     |   |   |   |   |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|---|---|----------|
| 5. Adequate, appropriate, and organized documentation.                                                                                                                                   |     |   |   |   |   |          |
| <b>B. MEDICAL EXPERTISE DEVELOPMENT: KNOWLEDGE/CLINICAL JUDGMENT/SKILLS/PERFORMANCE</b>                                                                                                  |     |   |   |   |   |          |
| 6. Basic science.                                                                                                                                                                        |     |   |   |   |   |          |
| 7. Knowledge of common problems (related to subspecialty and level of training).                                                                                                         |     |   |   |   |   |          |
| 8. Accurate and efficient in conducting a complete and problem-focused physical examination (must be witnessed even if partial; e.g., eye motility exam, anterior segment, fundus exam). |     |   |   |   |   |          |
| 9. Formulation of differential diagnoses, and ability to prioritize and solve problems.                                                                                                  |     |   |   |   |   |          |
| 10. Interpretation of relevant laboratory and diagnostic imaging tests.                                                                                                                  |     |   |   |   |   |          |
| 11. Competency in performance of procedural tasks related to subspecialty.                                                                                                               |     |   |   |   |   |          |
| 12. Recognition and performance in acute and emergency situations.                                                                                                                       |     |   |   |   |   |          |
| <b>C. HEALTH CARE ADVOCATE</b>                                                                                                                                                           |     |   |   |   |   |          |
| 13. Identifies important determinants of health affecting patients. (e.g., poverty, socio-economic status).                                                                              |     |   |   |   |   |          |
| 14. Recognizes opportunity for and provides health promotion and anticipatory guidance (e.g., vision for preschoolers, recommending immunization).                                       |     |   |   |   |   |          |
|                                                                                                                                                                                          | N/A | 2 | 3 | 4 | 5 | Comments |
| <b>D. COLLABORATOR and MANAGER</b>                                                                                                                                                       |     |   |   |   |   |          |
| 15. Uses resources effectively where appropriate (e.g., evaluates need for and appropriately orders lab/DI tests).                                                                       |     |   |   |   |   |          |
| 16. Displays appropriate time management skills. Prioritizes tasks and performs procedural interventions in a timely and efficient manner.                                               |     |   |   |   |   |          |
| 17. Understands own limitations, seeks help when required, receptive to constructive criticism, and able to adequately handle feedback.                                                  |     |   |   |   |   |          |
| 18. Ability to function in a multidisciplinary team setting.                                                                                                                             |     |   |   |   |   |          |
| 19. Ability to follow up outstanding issues in a timely fashion.                                                                                                                         |     |   |   |   |   |          |
| <b>E. SCHOLARLY ACTIVITY</b>                                                                                                                                                             |     |   |   |   |   |          |
| 20. Ability to execute a systematic search for evidence (literature review, chart audit, etc.) in order to optimize clinical decision making and clinical care.                          |     |   |   |   |   |          |
| 21. Ability to critically appraise sources of medical information.                                                                                                                       |     |   |   |   |   |          |

|                                                                                                                                                     |                          |                      |  |  |                          |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|----------------------|--|--|--------------------------|--|
| 22. Teaching ability (formal/informal, e.g., clinical clerks, juniors).                                                                             |                          |                      |  |  |                          |  |
| <b>F. PROFESSIONAL ATTITUDE AND PERFORMANCE</b>                                                                                                     |                          |                      |  |  |                          |  |
| 23. Demonstrates initiative in achieving educational objectives (e.g., preparation for rounds, reading around cases, discussion on how to improve). |                          |                      |  |  |                          |  |
| 24. Courteous and respectful (to patients/parents and staff). Open minded to the needs and expectations of parents. Active listener.                |                          |                      |  |  |                          |  |
| 25. Displays empathy for sick patients and their families.                                                                                          |                          |                      |  |  |                          |  |
| 26. Demonstrates gender and cultural sensitivity.                                                                                                   |                          |                      |  |  |                          |  |
| 27. Displays dedication/enthusiasm, sense of responsibility, and punctuality.                                                                       |                          |                      |  |  |                          |  |
| 28. Delivers highest quality of care with integrity, honesty, and compassion.                                                                       |                          |                      |  |  |                          |  |
| 29. Displays and is able to handle appropriate level of responsibility for level of training.                                                       |                          |                      |  |  |                          |  |
| 30. Establishes effective relationship with seniors, peers, and health professionals.                                                               |                          |                      |  |  |                          |  |
| <b>G. OVERALL COMPETENCE</b>                                                                                                                        |                          |                      |  |  |                          |  |
| 31. Overall assessment for rotation.                                                                                                                |                          |                      |  |  |                          |  |
| <b>No. of Laser/Surgeries</b>                                                                                                                       | <b>Name of Procedure</b> | <b>Main Surgeon*</b> |  |  | <b>Assistant Surgeon</b> |  |
|                                                                                                                                                     |                          |                      |  |  |                          |  |
|                                                                                                                                                     |                          |                      |  |  |                          |  |
|                                                                                                                                                     |                          |                      |  |  |                          |  |
|                                                                                                                                                     |                          |                      |  |  |                          |  |
| *Main Surgeon means doing more than 75% of the procedure                                                                                            |                          |                      |  |  |                          |  |
| Strengths                                                                                                                                           |                          |                      |  |  |                          |  |
| Areas requiring further work                                                                                                                        |                          |                      |  |  |                          |  |
| Other comments:                                                                                                                                     |                          |                      |  |  |                          |  |
| Resident comments:                                                                                                                                  |                          |                      |  |  |                          |  |
| <b>Official Use</b>                                                                                                                                 |                          |                      |  |  |                          |  |
| Total score                                                                                                                                         | x 20% =                  |                      |  |  |                          |  |
| No. of evaluated items                                                                                                                              |                          |                      |  |  |                          |  |

### Mini-CEX

Ophthalmology residents will be responsible for conducting at least one Mini-CEX session each rotation. The process will end with a structured discussion with the supervisor or assessor:

- A selected case from the in-patient or out-patient setting to be interviewed under direct supervision.
- The case should be presented with a conclusion. It should take no longer than 15 minutes.

- This should be followed immediately by feedback lasting 15 minutes, which includes things undertaken correctly and those that need improvement.
- A Mini-CEX form should be completed in the presence of residents.
- The assessment form should be part of the educational portfolio.

### Case-based Discussion (CBDs)

Competence in patient investigation, patient management, health promotion and disease prevention, and some aspects of both attitudes/ethics and continuing professional development is assessed using a CBDs form. These forms can be completed by trainers in the following circumstances:

- During an out-patient clinic. Trainers and trainees may wish to allocate 5–10 minutes to discuss the management of a patient seen during an outpatient clinic.
- Case selection would be determined by either the trainee or trainer. The trainee should have had some direct clinical role with the patient (e.g., history taking, clinical examination, investigations ordered or interpreted, management decisions, management of complications, critical incidents, etc.).
- At the end of an outpatient clinic. Trainers and trainees may wish to allocate some time at the end of clinic to review a small number of case notes where the trainee has had a significant role in the management of the patient.
- Case presentations during postgraduate teaching. Trainees are often asked to present cases at local or regional postgraduate teaching sessions. A nominated trainer should complete a CBDs form after the presentation.
- During a designated teaching session. Trainers and trainees may wish to allocate a period of one-to-one teaching or small group teaching where cases are discussed and a CBDs form is completed.

A list of Clinical Scenarios (approximately 40) that cover most of the SBO curriculum. Trainees should aim to cover all these scenarios in their case-based discussions if possible so that their portfolio reflects a wide range of clinical management situations.

It is recommended that about half the cases for CBDs are chosen by the trainee and half by the trainer.

As a guide, trainees should ensure that a minimum of one case per annual quarter is discussed and a CBDs form completed. By the end of training, a trainee's portfolio should contain at least 15 CBDs forms.

### CBDs Scenarios:

- The ophthalmology resident is expected to manage a range of clinical scenarios. This may involve referrals from other health professionals, patient self-referrals, or screening for ophthalmic disease.

| Symptoms               | Signs                             |
|------------------------|-----------------------------------|
| Foreign Body Sensation | Ametropia                         |
| Decreases Vision       | Cataract                          |
| - Transient            | Corneal Opacities                 |
| - Sudden               | Corneoscleral laceration          |
| - Gradual              | Corneal Foreign Body              |
| - Painful              | Conjunctival Pigmentation         |
| Diplopia               | Dysgenesis/Coloboma               |
| Distortion             | Intra-ocular Foreign Body         |
| Dry Eyes               | Lid Lumps                         |
| Floaters               | Lid Malposition                   |
| Headache               | Leukocoria                        |
| Night Blindness        | Macular Exudation                 |
| Pain                   | Nystagmus                         |
| - Ocular               | Ocular Tumors                     |
| - Periocular           | Periorbital Swelling              |
| Photophobia            | Optic Nerve Atrophy/Swelling      |
| Red Eye                | Buphthalmos                       |
| Trauma                 | Proptosis                         |
| Visual Disturbance     | Pupil Abnormalities               |
| Tearing                | Raised Intraocular Pressure       |
|                        | Retinal Hemorrhages               |
|                        | Retinal Pigmentation              |
|                        | Strabismus                        |
|                        | Visual Field Defects              |
|                        | Retinal Vasculature Abnormalities |
|                        | Retinal Detachment                |
|                        | Retinoblastoma                    |

### Competencies Assessed in Mini-CEX

- Professional approach to patient.
- History-taking skills.
- Physical examination skills.
- Clinical diagnostic skills.
- Clinical judgment and synthesis.
- Patient management skills.
- Communication skills.
- Overall clinical competences.

\* See Appendix B

**Appendix B**  
**Educational Portfolio**  
**Mini-CEX Form**

|                                                                                                                |                       |                           |                                   |                       |                       |                       |
|----------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------|-----------------------------------|-----------------------|-----------------------|-----------------------|
| Resident's Name                                                                                                |                       |                           |                                   |                       |                       |                       |
| Clinical Setting                                                                                               |                       |                           |                                   |                       |                       |                       |
| Title of Procedure                                                                                             |                       |                           |                                   |                       |                       |                       |
| <b>Clinical Problem Category</b>                                                                               |                       |                           |                                   |                       |                       |                       |
| Anterior Segment                                                                                               | Glaucoma              | Uveitis                   | Retina                            | OP                    | NO                    | Ped & Strabismus      |
| <input type="radio"/>                                                                                          | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| If Other please specify                                                                                        |                       |                           |                                   |                       |                       |                       |
| New or FU?                                                                                                     |                       |                           |                                   |                       |                       |                       |
| <b>Focus of clinical encounter</b>                                                                             |                       |                           |                                   |                       |                       |                       |
| History                                                                                                        | Diagnosis             | Management                | Explanation                       |                       |                       |                       |
| <input type="radio"/>                                                                                          | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             |                       |                       |                       |
| Number of times patient seen before by trainee:                                                                |                       |                           |                                   |                       |                       |                       |
| Complexity of case:                                                                                            |                       |                           |                                   |                       |                       |                       |
| Assessor's position:                                                                                           |                       |                           |                                   |                       |                       |                       |
| Number of previous mini-CEX observed by assessor with any trainee:                                             |                       |                           |                                   |                       |                       |                       |
| Please grade the following area using the scale below:                                                         |                       |                           |                                   |                       |                       |                       |
| <i>Please mark as "Insufficient Evidence" if you have not observed the behavior and feel unable to comment</i> |                       |                           |                                   |                       |                       |                       |
| <b>History Taking</b>                                                                                          |                       |                           |                                   |                       |                       |                       |
| Insufficient evidence                                                                                          | Below expectations    | Borderline for completion | Meets expectations for completion | Above expectation     |                       |                       |
| <input type="radio"/>                                                                                          | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input type="radio"/> |                       |                       |
| <b>Physical Examination Skills</b>                                                                             |                       |                           |                                   |                       |                       |                       |
| Insufficient evidence                                                                                          | Below expectations    | Borderline for completion | Meets expectations for completion | Above expectation     |                       |                       |
|                                                                                                                |                       |                           |                                   |                       |                       |                       |
| <b>Communication Skills</b>                                                                                    |                       |                           |                                   |                       |                       |                       |
| Insufficient evidence                                                                                          | Below expectations    | Borderline for completion | Meets expectations for completion | Above expectation     |                       |                       |
| <input type="radio"/>                                                                                          | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input type="radio"/> |                       |                       |
| <b>Clinical Judgment</b>                                                                                       |                       |                           |                                   |                       |                       |                       |
| Insufficient evidence                                                                                          | Below expectations    | Borderline for completion | Meets expectations for completion | Above expectation     |                       |                       |
| <input type="radio"/>                                                                                          | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input type="radio"/> |                       |                       |
| <b>Professionalism</b>                                                                                         |                       |                           |                                   |                       |                       |                       |
| Insufficient evidence                                                                                          | Below expectations    | Borderline for completion | Meets expectations for completion | Above expectation     |                       |                       |
| <input type="radio"/>                                                                                          | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input type="radio"/> |                       |                       |
| <b>Organization/Efficiency</b>                                                                                 |                       |                           |                                   |                       |                       |                       |
| Insufficient evidence                                                                                          | Below expectations    | Borderline for completion | Meets expectations for completion | Above expectation     |                       |                       |
| <input type="radio"/>                                                                                          | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input type="radio"/> |                       |                       |
| <b>Overall Clinical Care</b>                                                                                   |                       |                           |                                   |                       |                       |                       |
| Insufficient evidence                                                                                          | Below expectations    | Borderline for completion | Meets expectations for completion | Above expectation     |                       |                       |
| <input type="radio"/>                                                                                          | <input type="radio"/> | <input type="radio"/>     | <input type="radio"/>             | <input type="radio"/> |                       |                       |

|                                          |
|------------------------------------------|
| Anything especially good                 |
|                                          |
| Suggestions for development              |
|                                          |
| Agreed action                            |
|                                          |
| Time taken for observation: (in minutes) |
|                                          |
| Assessor's Name:                         |
|                                          |

#### Competencies Assessed in Case-based Discussion

- Professional approach to patient.
- Data gathering and interpretation.
- Making diagnosis and decisions.
- Clinical management.
- Managing medical complexity.
- Working with colleagues and in teams.
- Maintaining an ethical approach.
- Fitness to practice.

\* See Appendix C

## Appendix C Form

### Educational Portfolio: CBD Form

|                 |  |                   |  |
|-----------------|--|-------------------|--|
| Trainer's Name: |  | Date (dd/mm/year) |  |
|-----------------|--|-------------------|--|

|                          |                          |                          |                          |                                       |
|--------------------------|--------------------------|--------------------------|--------------------------|---------------------------------------|
| R1 <input type="radio"/> | R2 <input type="radio"/> | R3 <input type="radio"/> | R4 <input type="radio"/> | Other (specify) <input type="radio"/> |
|                          |                          |                          |                          |                                       |

|                                     |                                  |                                                  |                                 |                       |                       |                       |
|-------------------------------------|----------------------------------|--------------------------------------------------|---------------------------------|-----------------------|-----------------------|-----------------------|
| Assessor's Name:                    |                                  |                                                  |                                 |                       |                       |                       |
| Assessor's Status:                  | <input type="radio"/> Consultant | Residents (R1, R2, R3, R4) <input type="radio"/> |                                 | Other (specify)       |                       |                       |
|                                     |                                  |                                                  |                                 |                       |                       |                       |
| Clinical scenario (see study guide) |                                  |                                                  |                                 |                       |                       |                       |
| Brief description of case:          |                                  |                                                  |                                 |                       |                       |                       |
| Overall difficulty of case:         | <input type="radio"/> Simple     | <input type="radio"/> Intermediate               | <input type="radio"/> Difficult |                       |                       |                       |
|                                     |                                  |                                                  |                                 |                       |                       |                       |
| <b>Subspecialty</b>                 | Plastic/Lac/Orbits               | Cornea/Ext                                       | Cataract/Ref                    | Glaucoma              | Retina/Uvea/Oncol     | Neuro Peds/Strab      |
|                                     | <input type="radio"/>            | <input type="radio"/>                            | <input type="radio"/>           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

| Topic                                         | Poor | Fair | Good | V. Good | N/A |
|-----------------------------------------------|------|------|------|---------|-----|
| Medical Record Documentation                  |      |      |      |         |     |
| Clinical Assessment                           |      |      |      |         |     |
| Investigation and Referrals                   |      |      |      |         |     |
| Treatment                                     |      |      |      |         |     |
| Follow-up and Future Planning                 |      |      |      |         |     |
| Professionalism                               |      |      |      |         |     |
| Clinical Judgment                             |      |      |      |         |     |
| Leadership/Manager Issues                     |      |      |      |         |     |
| <b>Overall performance in this assessment</b> | Poor | Fair | Good | V. Good |     |
|                                               |      |      |      |         |     |

Meets expectations/Does not meet expectations (for stage of training)

|                           |                              |
|---------------------------|------------------------------|
| Anything especially good? | Suggestions for development: |
| Agreed action:            |                              |

|                        |                       |
|------------------------|-----------------------|
| Signature of Assessor: | Signature of Trainee: |
|------------------------|-----------------------|

**Appendix D**  
**Educational Portfolio**  
**Reflection Form**

Rotation (\_\_\_\_): Comprehensive Ophthalmology

**1. Clinical Management:**

- Strength:
- Areas of Improvement:
- New Skills:

**2. Medical Practice:**

- Strength:
- Areas of Improvement:
- New Skills:

**3. Professionalism:**

- Strength:
- Areas of Improvement:
- New Skills:

**4. Communication Skills:**

- Strength:
- Areas of Improvement:
- New Skills:

**5. Leadership and Teamwork:**

- Strength:
- Areas of Improvement:
- New Skills:

## Appendix E

### Appendix F: Examiner Evaluation Sheet for each candidate (Final Board Examination)

#### SAUDI COMMISSION FOR HEALTH SPECIALTIES OPHTHALMOLOGY ORAL EXAMINATION

Name of Candidate: \_\_\_\_\_

Number: \_\_\_\_\_

| Case No. | Grade |   |    |   |   |   | Comments |
|----------|-------|---|----|---|---|---|----------|
| 1        | R     | F | Bp | P | V | O |          |
| 2        | R     | F | Bp | P | V | O |          |
| 3        | R     | F | Bp | P | V | O |          |
| 4        | R     | F | Bp | P | V | O |          |
| 5        | R     | F | Bp | P | V | O |          |
| 6        | R     | F | Bp | P | V | O |          |
| 7        | R     | F | Bp | P | V | O |          |
| 8        | R     | F | Bp | P | V | O |          |

R 40% (missing essential action), F 60% (fail), Bp 70% (barely pass), P 71%–80% (pass) V 80%–90% (very good), O 90% (outstanding)

Name of the Committee:

Name of Examiner:

Signature:

## Appendix G: Committee Evaluation Sheet for each candidate

### SAUDI COMMISSION FOR HEALTH SPECIALTIES

Saudi Board of Ophthalmology

Final Board Exam

Date xx/xx/xxxx

Name of Candidate: \_\_\_\_\_

Exam Subject: GL ☐

Comment on weaknesses and justify high score or red flag if applicable:

|  |
|--|
|  |
|  |
|  |
|  |
|  |
|  |

Mark

%

#### SCORE GUIDE

|               |        |
|---------------|--------|
| Above Average | 71–100 |
| Pass          | 70     |
| Fail          | <70    |
| Red Flag      | <40    |

Examiner's Name: \_\_\_\_\_

Signature: \_\_\_\_\_

Appendix H  
Committee Evaluation Sheet for the Whole Batch  
Glaucoma Committee

| Candidate Name | Mark % |
|----------------|--------|
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |
|                |        |

Examiner's Name: \_\_\_\_\_

Signature: \_\_\_\_\_

## References

- Frank JR, Snell L, Sherbino J, editors. CanMEDS 2015 Physician Competency Framework. Ottawa: Royal College of Physicians and Surgeons of Canada; 2015.).



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