



Orbis Global Residency Foundation Curriculum

(Modified by K Golnik)



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Foreword

The International Council of Ophthalmology (ICO) created a residency curriculum designed to be inclusive of all aspects of ophthalmology that could be relevant to any ophthalmology training program in any part of the world (<https://icoph.org/education/residency/>). Thus, this curriculum did not consider regional differences in training needs based on prevalent conditions and public health concerns. Recognizing the need for addressing regional training priorities Orbis has created a “Foundation Curriculum” which contains the essentials that all ophthalmologists should know and be able to do. The ICO residency curriculum was reviewed, and these essentials were extracted to create the Foundation Curriculum. The intent is for any group to create a customized curriculum by adding items relevant to their regional training needs (Dr Karl Golnik, 2024).



Dr. Karl Golnik is Professor at the Barrow Neuroscience Institute, Creighton University and the University of Arizona. He has received the American Academy of Ophthalmology’s Lifetime Achievement award, the North American Neuro-ophthalmology Society’s Merit Award and more than 10 teaching awards throughout his career. He has given more than 1000 invited neuro-ophthalmology and medical education lectures in more than 75 countries and has over 150 publications in these fields. He serves as a Board member and Chair for Education of the Ophthalmology Foundation. He is also Past-President and current Secretary for International Relations of the International Joint Commission on Allied Health Personnel in Ophthalmology (IJCAHPO).



We would like to thank Dr. Karl Golnik, MD, and the Ophthalmology Foundation for their work in the development of the Orbis Global Residency Foundation Curriculum, which aims to assist ophthalmology residents in receiving a solid educational foundation, empowering them to provide excellent eye care to their communities.

Our vision for the foundation curriculum extends beyond its current form. We encourage ophthalmology training programs worldwide to adapt and customize this curriculum to suit their specific regional needs. By adding context-specific items, each group can create a curriculum that aligns with the challenges and opportunities unique to their setting. We see this curriculum outline as one which may be contextualized as needed by ophthalmology residency directors in low and middle-income countries (LMICS).

Hilary Twiggs
Director of Clinical Training, Orbis International

The Orbis Global Residency Foundation Curriculum consists of the following subspecialty sections:

- I.** Optics and Refraction

- II.** Cataract and Lens

- III.** Contact Lenses

- IV.** Cornea and External Diseases

- V.** Glaucoma

- VI.** Neuro-Ophthalmology

- VII.** Ophthalmic Pathology

- XIII.** Oculoplastic Surgery and Orbit

- IX.** Pediatric Ophthalmology and Strabismus

- X.** Vitreoretinal Diseases

- XI.** Uveitis and Ocular Inflammation

- XII.** Ocular Oncology

- XIII.** Low Vision Rehabilitation

- XIV.** Ethics and Professionalism in Ophthalmology

- XV.** Community Eye Health

I. Optics and Refraction

The general educational objectives are to understand the principles, concepts, instruments, and methods of ophthalmology-related optics and refraction; and to apply these to clinical practice. This includes physical, geometric and clinical optics and the ability to use prisms, refract patients.

The resident should be proficient using basic ophthalmoscopic testing and instruments including:

1. retinoscope
2. loose lens refraction
3. direct and indirect ophthalmoscope
4. color vision testing
5. IOL calculations

II. Cataract and Lens

The resident should be able to:

1. Describe the diagnosis, evaluation, and management of intraoperative and postoperative complications of cataract and intraocular lens (IOL) surgery
2. Perform the complete preoperative and postoperative examinations.
3. Perform routine and advanced cataract surgery with IOL placement.
4. Develop and exercise clinical and ethical decision making in cataract patients

III. Contact Lenses

The resident should be able to:

1. List advantages and disadvantages and indications and contraindications of contact lens (CL) wear
2. Insert and remove a trial SCL
3. Instruct patients regarding safe CL insertion and removal, CL wearing schedule, lens care regimens, CL disinfection care, indications, contraindications, and possible complications

IV. Cornea and External Diseases

The resident should be able to:

1. Describe the basic anatomy, embryology, physiology, pathology, microbiology, immunology, genetics, epidemiology, and pharmacology of the cornea, conjunctiva, sclera, eyelids, lacrimal apparatus, and ocular adnexa
2. Describe characteristic corneal and conjunctival degenerations
3. Recognize the classic corneal dystrophies
4. Describe the fundamentals of ocular microbiology and recognize corneal and conjunctival inflammations and infections
5. Recognize and treat lid margin disease
6. Describe the basic differential diagnosis of acute and chronic conjunctivitis or red eye
7. Recognize the basic presentations of ocular allergy
8. Describe the symptoms, signs, testing, and evaluation for dry eye and treatment for dry eye

9. Recognize and describe the etiologies of hyphema and microhyphema
10. Recognize corneal lacerations (perforating and nonperforating), anterior segment trauma, corneal and conjunctival foreign bodies
11. Perform external examination (illuminated and magnified) and slit-lamp biomicroscopy
12. Administer topical anesthesia, as well as special topical stains of the cornea (eg, fluorescein dye and rose bengal)
13. Perform tests for dry eye (eg, Schirmer test, tear film breakup, and dye disappearance)
14. Perform tonometry (eg, applanation, Tono-Pen, Schiøtz, pneumotonometry)
15. Manage corneal epithelial defects (eg, pressure patching and bandage contact lenses)
16. Perform removal of a conjunctival or corneal foreign body (eg, rust ring)
17. Perform simple (nonrecurrent) pterygium excision
18. Perform an isolated corneal laceration repair (eg, linear laceration not extending to limbus, not involving uveal or intraocular structures)
19. Perform epilation
20. Perform irrigation of chemical burn to the eye
21. Perform Seidel test

V. Glaucoma

The resident should be able to:

1. Describe the major features of primary open-angle glaucoma (high and low tension), angle-closure glaucoma, glaucoma suspects, and ocular hypertension
2. Describe the major risk factors for primary open-angle glaucoma and angle-closure glaucoma
3. Describe the steps in evaluating primary open-angle glaucoma and angle-closure glaucoma
4. Describe the basic features of the major glaucomas: primary open-angle glaucoma, angle-closure glaucoma, exfoliative glaucoma, and pigmentary glaucoma
5. Describe the most common types of visual field defects in glaucoma
6. Describe major classes of glaucoma medications, their mechanisms of action, indications, contraindications, and side effects (topical and systemic)

7. Perform basic slit-lamp biomicroscopy
8. Perform basic tonometry
9. Perform basic gonioscopy with Goldmann-type and indentation lenses
10. Perform central corneal pachymetry and relate to IOP findings
11. Describe typical features of glaucomatous optic neuropathy (eg, neuroretinal rim changes, disc hemorrhage, peripapillary atrophy)
12. Interpret visual field results for Goldmann kinetic perimetry and Humphrey or Octopus standard automated perimetry
13. Perform paracentesis to lower acute IOP

VI. Neuro-Ophthalmology

The resident should be able to:

1. Describe the relevant bony and neuro-anatomy
2. Describe the pupillary and accommodative neuroanatomy
3. Describe the typical features, evaluation, and management of the most common optic neuropathies
4. Describe the typical features, evaluation, and management of the most common ocular motor neuropathies
5. Describe the typical features and evaluation of the most common visual field defects
6. Describe the indications for obtaining neuroimaging studies, including computerized tomography (CT) scanning, magnetic resonance imaging (MRI)
7. Describe and detect a relative afferent pupillary defect
8. Perform a basic assessment of ocular alignment
9. Describe and perform basic cover/uncover testing for tropia
10. List the indications for visual field testing and interpret standard clinical perimetry
11. Perform confrontational field testing
12. Perform basic direct, indirect, and magnified ophthalmoscopy examination of the optic disc, macula, vessels, and periphery of the retina and use the findings to generate a differential diagnosis
13. Describe the indications and interpret basic ocular electrophysiology

VII. Ophthalmic Pathology

At least one residency program in each country should aim to maintain an ophthalmic pathology laboratory or be affiliated with an ophthalmic pathology laboratory, which permits ophthalmology residents with a special interest in ophthalmic pathology opportunity to participate in grossing, sectioning, and processing of specimens, as well as related research. Other programs should aim to collaborate with the national or regional ophthalmic pathology laboratory, or with an extramural pathologist who works with the faculty and staff in the ophthalmology department, to develop expertise in ophthalmic pathology. Residents should have access to ophthalmic pathology workshops or teleconferences to complete the curriculum requirements.

The resident should be able to:

1. Describe common methods of specimen acquisition and handling for ophthalmic pathology, especially handling methods that avoid artifacts and ensure representative sampling
2. Describe basic information necessary to communicate to the ophthalmic pathologist regarding study of these specimens
3. Read and interpret reports from these specimens written by the ophthalmic pathologist

VIII. Oculoplastic Surgery and Orbit

The resident should be able to:

1. Perform preoperative and postoperative assessment of patients with common oculoplastic disorders
2. Describe basic orbital anatomy
3. Describe basic mechanisms and indications for treatment of orbital trauma
4. Recite the differential diagnosis of common orbital tumors in children and adults
5. Recite the differential diagnosis of proptosis in children and adults
6. Describe typical features of orbital cellulitis
7. Describe indications for and perform the basic office examination techniques for the most common eyelid abnormalities (eg, margin reflex

distance, palpebral fissure height, levator function, lagophthalmos, lid crease, lid laxity assessment, brow height, dermatochalasis, eversion, double eversion)

8. Perform minor lid and conjunctival procedures
9. Describe indications for and perform a temporary tarsorrhaphy
10. Describe indications for and perform a lateral canthotomy/cantholysis
11. Describe indications for and perform the basic office examination techniques for the most common lacrimal abnormalities (eg, Schirmer test, dye disappearance test, punctal position, punctal dilation, canalicular probing, lacrimal probing and irrigation)
12. Describe indications for and perform the basic office examination techniques for the most common orbital abnormalities (eg, Hertel measurement, inspection, palpation, auscultation)

IX. Pediatric Ophthalmology and Strabismus

The resident should be able to:

1. Describe the different etiologies of amblyopia, including, deprivation, strabismic, anisometric and organic
2. Describe various forms of esotropia and exotropia
3. Describe the nonsurgical treatment of strabismus and amblyopia
4. Describe features, classification, and treatment indications for retinopathy of prematurity
5. Describe etiologies and types of pediatric cataract
6. Describe and recognize ocular findings in child abuse
7. Describe the symptoms, associations, findings, and treatment of childhood glaucoma
8. Describe management of epiphora in children
9. Probe tear ducts to diagnose and treat an obstruction
10. Perform forced duction test (FDT) and force generation test (FGT) in the clinic
11. Perform basic extraocular muscle surgery, and exercise surgical judgment for the indications and contraindications for strabismus surgery
12. Perform preoperative extraocular muscle surgery assessment, intraoperative techniques,

and describe intraoperative and postoperative complications of strabismus surgery

13. Perform horizontal strabismus surgery

X. Vitreoretinal Diseases

The resident should be able to:

1. Describe pathological anatomy, physiopathology, and clinical pictures of the most common vascular diseases
2. Describe features of different types of retinal detachment (ie, rhegmatogenous, tractional, exudative)
3. Describe typical features of common macular diseases (eg, age-related macular degeneration [AMD], macular hole, macular pucker, central serous chorioretinopathy, chloroquine maculopathy, pseudophakic cystoid macular edema)
4. Describe and recognize features of traumatic pathologies, including: commotio retinae, and choroidal rupture
5. Describe typical features of retinitis pigmentosa, main macular dystrophies, and other hereditary pathologie.
6. Describe basic principles of laser photocoagulation (eg, laser response to change in power, duration, and spot size) and photodynamic therapy for retinal treatment
7. Describe basic principles, techniques, and safety of intravitreal injections
8. Diagnose, evaluate, and treat (or refer) postoperative/posttraumatic endophthalmitis
9. Diagnose the presence of common retinal disorders such as exudative AMD, diabetic retinopathy, cystoid macular edema, central serous retinopathy, based on results of fundus examination, fundus photographs, OCT, and fluorescein angiography
10. Diagnose, evaluate, treat, and classify open and closed globe trauma
11. Describe the indications/complications for and perform basic laser treatment for diabetic retinopathy
12. Interpret fluorescein and indocyanine green (ICG) angiography and correlate findings with differential diagnosis
13. Describe the indications for and interpret retinal

imaging technology (eg, OCT, retinal thickness analysis)

14. Perform posterior segment photocoagulation
15. Perform (or assist during) vitreous tap and intravitreal antibiotic injections for the treatment of endophthalmitis
16. Perform intravitreal injection of anti-vascular endothelial growth factor (VEGF) drugs for the treatment of AMD

XI. Uveitis and Ocular Inflammation

The resident should be able to:

1. List the clinical features of common uveitic conditions
2. Describe indications for a tailored approach (based on clinical features) to laboratory investigations, including obtaining tissue and fluid samples for examination and systemic imaging studies
3. Describe the indications and contraindications of topical steroids, nonsteroidal anti-inflammatory drugs (NSAIDs), and cycloplegics
4. Differentiate infective from noninfective causes of uveitis
5. Differentiate serious infective from noninfective causes of uveitis
6. Describe the management of common uveitic syndromes
7. Interpret the results of ancillary tests (eg, fluorescein angiography, OCT, B-scan ultrasonography) for diagnosis
8. Perform a major investigational work up (eg, laboratory testing, radiologic testing) according to epidemiologic data, history, and clinical examination
9. Perform posterior subtenon or transeptal injection of corticosteroids
10. Perform an anterior chamber and vitreous tap for diagnostic purposes and administer intravitreal injection antibiotics in cases of bacterial endophthalmitis

XII. Ocular Oncology

The resident should be able to:

1. Describe the basic categorization of common

- conjunctival and intraocular tumors
2. Describe the clinical features of the major types of ocular tumor
 3. Describe the symptoms and clinical manifestations indicating the presence of an ocular tumor (eg, leukocoria, sentinel vessels)
 4. Describe the differential diagnosis of the major tumors
 5. Describe the examinations and tests by which ocular tumors are diagnosed
 6. Describe the basic management principles of ocular tumors
 7. Describe the methods, risks, and benefits of tumor biopsy
 8. Recognize an ocular tumor and refer to an ocular oncology subspecialist
 9. Describe the management options for ocular tumors with indications and contraindications for each form of management
 10. Perform enucleation, obtaining long optic nerve if appropriate, or refer to a subspecialist for this surgery if necessary

XIII. Low Vision Rehabilitation

The resident should be able to:

1. Describe the definition, categories (types), and degrees of low vision
2. Describe the most common causes of low vision (global and regional epidemiology and its impact on different age groups)
3. Describe the special aspects of vision-assessment techniques for children and adults with low vision
4. Describe various low vision aids
5. Prescribe simple but appropriate rehabilitative therapies and optical devices to help the patient meet their goals (eg, magnification, illumination)
6. Encourage patients with low vision to actively participate in visual rehabilitation

XIV. Ethics and Professionalism in Ophthalmology

The resident should be able to:

1. Provide the definition and basic concepts behind terms used in medical ethics (eg morality versus

- ethics, autonomy, nonmaleficence)
2. Describe the basics of the health care system and reimbursement for services as appropriate to the local, regional, and national market of the trainee
 3. Describe basic medical ethics in the ophthalmic practice including confidentiality of health information, professional competence and maintenance of competence, informed consent, responsibility to report the unethical conduct of others
 4. Describe the framework of patient-care quality as it relates to patient safety, patient advocacy, effectiveness, efficiency, timeliness, and equity.

XV. Community Eye Health

The resident should specifically reference their own country or health district as they consider each of the community health-related items presented below, as not all items may be relevant to each resident.

The resident should be able to:

1. Explain the World Health Organization (WHO) definition of blindness, low vision, disability
2. List the major causes of blindness in different economic settings
3. Describe the magnitude and major causes of blindness in the resident's own country
4. Outline the structure of the health service, and how eye care services are integrated into this structure
5. Describe the principles of primary health care and their application for primary eye care
6. Describe strategies and partnerships with disability support services that can improve quality of life of people with long term visual impairment
7. List the resources available for people with low vision (eg, low-vision devices, low-vision training, and access to wider opportunities in education, livelihoods, and social inclusion)
8. Outline the role of primary eye care in the prevention and treatment of childhood blindness
9. In line with the WHO Universal Eye Health: A Global Action Plan 2014–2019, describe strategies to strengthen inclusive practices related to gender, disability, and other groups within a generic VISION 2020 program.

INCLUDED IN EACH SECTION WOULD BE:

- a. Microbiology
- b. Diagnostics
- c. Pharmacology
- d. Genetics
- e. Urgent care and trauma
- f. Minimum Surgical standards?

1. Needs Assessment:

Identify the core competencies and skills required for ophthalmologists. Conduct surveys and interviews with experienced ophthalmologists, residents, and other stakeholders to understand their perspectives on essential training areas.

2. Review Existing Curricula:

Examine existing residency curricula in ophthalmology from reputable institutions. Analyze what works well and what might need improvement.

3. Define Core Competencies:

Clearly outline the core competencies expected of a well-trained ophthalmologist. Identify areas such as clinical skills, surgical proficiency, communication skills, and professionalism.

4. Develop Learning Objectives:

Specify measurable learning objectives for each core competency. Ensure that objectives are realistic, achievable, and aligned with the overall goals of the residency program.

5. Sequential Progression:

Design a curriculum that progresses logically from foundational to advanced skills. Consider the increasing complexity and independence expected at each stage of residency.

6. Clinical Exposure:

Ensure that residents gain exposure to a diverse range of clinical cases. Develop rotations and experiences that cover the breadth of ophthalmic subspecialties.

7. Integration of Technology:

Incorporate the use of technology and digital tools relevant to ophthalmology. Emphasize the use of electronic health records, imaging technologies, and simulation.

8. Interdisciplinary Training:

Include interdisciplinary components, such as collaboration with optometrists, neurologists, and other healthcare professionals. Encourage interdisciplinary rounds and case discussions.

9. Research and Scholarly Activity:

Integrate opportunities for residents to engage in research and scholarly activities. Emphasize the importance of staying current with the latest advancements in ophthalmology.

10. Assessment and Evaluation:

Develop a robust system for assessing and evaluating residents' progress. Include regular feedback sessions, formative assessments, and objective evaluations.

11. Wellness and Professional Development:

Incorporate elements of wellness and professional development into the curriculum. Address topics such as work-life balance, resilience, and ethical considerations.

12. Flexibility:

Allow for some flexibility in the curriculum to accommodate individual learning needs and advancements in the field.

13. Continuous Improvement:

Establish a mechanism for continuous evaluation and improvement of the curriculum. Regularly solicit feedback from residents, faculty, and other stakeholders.

14. Implementation Plan:

Develop a plan for implementing the new curriculum, including faculty training and resources needed.

15. Monitoring and Adaptation:

Implement a system for monitoring the effectiveness of the curriculum and make necessary adjustments based on feedback and outcomes.

CONSTRUCTIVE ALIGNMENT

Learning Outcomes – Teaching and Learning strategies – Assessment

1. Define Clear Learning Outcomes:

- Clearly articulate the learning outcomes you want residents to achieve by the end of the residency.
- Specify both content-based outcomes (knowledge and skills) and process-oriented outcomes (critical thinking, problem-solving).

2. Align Learning Activities:

- Design learning activities that directly align with the defined learning outcomes.
- Ensure that the activities engage residents in active learning and problem-solving relevant to ophthalmology.

3. Select Appropriate Teaching Methods: Cybersight/ OF

- Choose teaching methods that support the desired learning outcomes.
- Incorporate a mix of didactic sessions, case-based learning, hands-on experiences, and interactive discussions.

4. Integrate Clinical Experiences:

- Align clinical rotations and experiences with the identified learning outcomes.
- Provide opportunities for residents to apply theoretical knowledge in real-world clinical settings.

5. Use Authentic Assessments: OSCARS/EyeQs

- Develop assessments that authentically measure the achievement of learning outcomes.
- Include a variety of assessment methods, such as clinical evaluations, case presentations, written exams, and objective structured clinical examinations (OSCEs).

6. Provide Timely and Formative Feedback:

- Establish a system for providing regular and constructive feedback to residents.
- Ensure that feedback is linked to the learning outcomes and guides further development.

7. Encourage Reflective Practice:

- Integrate reflective activities that prompt residents to think about their learning experiences and how they contribute to their overall development.
- Include opportunities for self-assessment and goal-setting.

8. Promote Active Participation:

- Design learning activities that require active participation from residents.
- Encourage collaborative learning and discussions to enhance understanding and application of concepts.

9. Align with Professional Standards:

- Ensure that the curriculum aligns with professional standards and guidelines for ophthalmology residency programs.
- Stay informed about advancements in the field and update the curriculum accordingly.

10. Consider Individual Differences:

- Recognize the diverse learning styles and preferences of residents.
- Allow for some flexibility in how residents can achieve the learning outcomes, catering to individual needs.

11. Foster Autonomy and Responsibility:

- Encourage residents to take responsibility for their own learning.
- Promote self-directed learning and critical thinking skills.

12. Continuous Improvement:

- Regularly assess the effectiveness of the curriculum in achieving the intended learning outcomes.
- Use feedback from residents and faculty to make continuous improvements

