Residency Program
Master of Surgery (MS)
Curriculum (Phase-B)

Ophthalmology

Bangabandhu Sheikh Mujib Medical University
Dhaka, Bangladesh
Residency Program

1. Introduction:
Residents will undertake a three year intensive Phase-B training after completion of Phase-A training in order to achieve the level of knowledge, skills and expertise required for clinical practice in the field of ophthalmology. It is a competency-based program emphasizing on meaningful integration and contextualization. The two years Phase-A training programme is designed to introduce and develop broad based core knowledge, skills, attitudes and behaviours required to become a competent physician. The knowledge and skills acquired during Phase-A training are further focused and refined during Phase-B training, which is a 3 years discipline specific training in Ophthalmology. The teaching, learning and assessment of the curriculum is facilitated by the provision of comprehensive, educationally oriented supervision and support, which is provided to all trainees across both the phases of the programme.

2. Goals and Objectives:
2.1 Overall Goals:
1. To prepare ophthalmologist who will be able to meet and respond to the changing healthcare needs and expectation of our society.
2. To prepare them to be competent to practice ophthalmology, safely and effectively.
3. To ensure that they have appropriate foundation for lifelong learning and further training in their specialty.
4. To help them develop to be critical thinkers and problem solvers for management health problems in the community they serve.

2.2 General Objectives:
The educational and training process aims to produce ophthalmologist who -
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- Can address all aspects of the healthcare needs of patients and their families.
- Maintain the highest standards appropriate in their professional field.
- Are aware of current thinking about ethical and legal issues.
- Are able to act as safe independent practitioners whilst recognizing the limitation of their own expertise and are able to recognize their obligation to seek assistance of colleagues where appropriate.
- Are aware of the procedures, and able to take appropriate action, when things go wrong, both in their own practice and in that of others.
- Will be honest and objective when assessing the performance of those they have supervised and trained.
- Can take advantage of information technology to enhance all aspects of patient care.
- Can develop management plan for the “Whole patient” and maintain a knowledge in other areas of medicine which impinge on the specialty of ophthalmology.
- Understand that more effective communication between them and their patients can lead to more effective treatment and care.
- Are competent to perform the core investigations and procedures required in their specialities.
- Develop clinical practice which is based on an analysis of relevant clinical trials and to have an understanding of their research methodologies.
- Are able to apply the knowledge of biological and behavioural sciences in clinical practice.
- Are able to identify and take responsibility for their own educational needs and the attainment of these needs.
- Have developed the skills of an effective teacher.

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2.3 Specific Objectives:
The Residents should be able to:
- Describe the basic epidemiology of the major blinding eye diseases;
- Develop the skills necessary for resource mobilization; clinical diagnosis, medical as well surgical intervention as per needed.
- Create and sustain a therapeutic and ethically sound relationship with patients;
- Develop interpersonal and communication skills.
- Develop system-based practice
- Work effectively with others as a member or leader of a health team.

3. Admission Requirements for Phase-B Training:
1. Residents who has successfully completed Phase-A training and passed Phase-A summative Examination are eligible for enrolment in the Phase-B Programme.
2. Candidates with FCPS / MS in Ophthalmology can be enrolled directly into Phase-B of the residency programme.

4. Phase-B Curriculum Structure:
The training is designed to develop both the generic and specialty-specific attributes necessary to practice independently as a consultant ophthalmologist. The aim is to train individuals to provide the highest standard of service to patients with ophthalmic disorders. This includes the development of positive attitudes towards lifelong learning and the ability to adopt to future technological advances and the changing expectations of society.
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4.1 Phase-B: Ophthalmology Speciality Training:
In-depth speciality-specific educational and training programme in this phase will make the resident competent and prepare them for the speciality qualification. It will provide educational programme covering the speciality of ophthalmology and its subspecialties, Biostatistics, Research Methodology and Medical Education along with rotation in specific clinical training.

4.1.1. Expected outcomes at the completion of the Phase-B Programme:
Residents of this training programme will be equipped to function effectively within the current and emerging professional, medical and social contexts. At the completion of the training programme in ophthalmology as defined by this curriculum, it is expected that a new ophthalmologist will have developed the clinical skills and have acquired the theoretical knowledge for competent ophthalmology practice. It is expected that a new ophthalmologist will be able to:
- Utilize effective communication with patients and their families and with professional colleagues.
- Be devoted to life long learning.
- Be equipped to manage both acute and chronic eye diseases.
- Identify the pathophysiology and manifestations of ophthalmic diseases, and modern therapeutics, which can be applied to patient diagnosis and management.
- Apply appropriate skills to perform necessary diagnostic and therapeutic decisions.
- Demonstrate a capacity to rationally analyze clinical data and published work.
- Develop commitment to ophthalmic, ethical professional behavior.

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- Identify Ophthalmological health issues of importance to the community and contribute constructively to debate about those issues.
- Apply primary and secondary prevention strategies in ophthalmic disease.

5. Teaching and Learning Methods:
The bulk of learning occurs as a result of clinical experiences (experiential learning, on-the-job learning) and self-directed learning. The degree of self-directed learning will increase as trainees become more experienced. Teaching and learning occurs using several methods that range from formal didactic lectures to planned clinical experiences. Aspects covered will include knowledge, skills and practices relevant to the discipline in order to achieve specific learning outcomes and competencies. The theoretical part of the curriculum presents the current body of knowledge necessary for practice.
This can be imparted using lectures, grand teaching rounds, clinico-pathological meetings, morbidity/ mortality review meetings, literature reviews and presentations, journal clubs, self-directed learning, conferences and seminars.

6. Record of Training:
The evidence require to confirm progress through training includes:
- Details of the training rotations, the training plan agreed with weekly timetables and duty rosters and numbers of practical procedures and outcomes.
- Confirmations of attendance at events in the educational programme, at departmental and inter-departmental meetings and other educational events.
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8. Assessment:
The assessment for certification of the MS degree of the University is comprehensive, integrated and phase-centered attempting to identify attributes expected of specialists for independent practice and lifelong learning and covers cognitive, psychomotor and affective domains. It keeps strict reference to the components, the contents, the competencies and the criteria laid down in the curriculum. Assessment includes both Formative Assessment and Summative (Phase final) Examinations.

8.1. Formative Assessment:
Formative assessment will be conducted throughout the training phases. It will be carried out for tracking the progress of residents, providing feedback, and preparing them for final assessment (Phase completion exams). There will be Continuous (day-to-day) and Periodic type of formative assessment.

- Continuous (day-to-day) formative assessment in classroom and workplace settings provides guide to residents learning and a faculty’s teaching/learning strategies to ensure formative lesson/training outcomes.
- Periodic formative assessment is quasi-formal and is directed to assessing the outcome of a block placement or academic module completion. It is held at the end of Block Placement and or Academic Module Completion. The contents of such examinations include Block Units of the Training Curriculum and Academic Module Units of the Academic Curriculum.

End of Block Assessment (EBA) : End of Block Assessment (EBA) is a periodic formative assessment and is undertaken after completion of each training block, assessing knowledge,
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Skills and attitude of the residents. Components of EBA are Written examination, Structured Clinical Assessment (SCA), Medical record review, and Logbook assessment. Unsatisfactory block training must be satisfactorily completed by undergoing further training for the block to be eligible for appearing in the next phase complete examination.

- Formative assessment for Academic modules for Biostatistics and Research Methodology and Medical Education is done in the first nine months of Phase-B training. Residents getting unsatisfactory grade must achieve satisfactory grade by appearing in the re-evaluation examination before sitting for the Phase-B Final Examination for certification.

8.2. Summative Examination:
The Phase-B Final Examination can be undertaken only after passing the Phase-A Final Examination and after successful completion of Phase-B Training. The Phase-B Final Examination is considered as the exit examination.

Phase Final examinations will have following components:

- Written examination
- Clinical examination
  - Long case (1)
  - Short cases (4)
  - SCA (12 Stations)
- Oral examination
- Thesis Evaluation

9. Training Supervision and Monitoring:
Training should incorporate the principle of gradually increasing responsibility and provide each trainee with a sufficient scope, volume and variety of experience in a range of settings that include inpatients, outpatients, emergency and intensive care. All elements of work in training rotation must be supervised with the level of supervision varying depending on the experience of the trainee and the clinical exposure. Outpatient and referral supervision must routinely include the opportunity to personally discuss all cases. As training progresses the trainee should have the opportunity for increasing autonomy, consistent with safe and effective care for the patient. Trainees will at all times have a named Supervisor, responsible for overseeing their education.

Supervisors are responsible for supervision of learning throughout the program to ensure patient and/or laboratory safety, service delivery as well as the progress of the resident with learning and performance. They set the lesson plans based on the curriculum, undertake appraisal, review progress against the curriculum, give feedback on both formative and summative assessments as well as sign the logbook and portfolio. The residents are made aware of their limitations and are encouraged to seek advice and receive help at all times.

The Course Coordinator of each department coordinates all training and academic activities of the programme in collaboration with the Course Manager under the leadership of the Chairman. The Course Director of each faculty directs, guides and manages curricular activities under his/her jurisdiction and is the person to be reported to for all events and performances of the residents and the supervisors.

10. Curriculum Implementation, Review and Updating:
Both Supervisors and Residents are expected to have a good knowledge of the curriculum and should use it as a guide for their training programme.

Since Ophthalmology has historically been rapidly changing specialty the need for review and up-dating of curriculum is evident. The Curriculum is specifically designed to guide an
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Educational process and will continue to be the subject of active redrafting, to reflect changes in both Ophthalmology and educational theory and practice, Residents and Supervisors are encouraged to discuss the curriculum and to feedback on content and issue regarding implementation at Residency Course Director. Review will be time tabled to occur annually for any minor changes to the curriculum. The Curriculum will be reviewed with input from the various subspecialties of Ophthalmology.

Basic, Standard, and Advanced Levels of the Core Curriculum:
The suggested curriculum in all chapters is designed to serve as a content outline for a fund of knowledge. The learning objectives are designed to emphasize recall of information understanding and application of basic sciences (e.g., Anatomy, Physiology, Bio-chemistry, Embryology, Pharmacology), application of pathogenetic mechanisms to clinical problems, ordering and interpreting clinical, laboratory, imaging information, development of a differential diagnosis, implementation of a reasonable and appropriate therapeutic medical and/or surgical plan, and anticipation, recognition, and treatment of complications. This curriculum is not designed to be all-inclusive, and individual programs should modify and apply the content as deemed appropriate to meet local, regional, and national priorities. It is intended solely as a guideline for the training of ophthalmic specialists. It is structured as:

- PG year 1 (Basic level)
- PG year 2 (Standard level)
- PG year 3 (Advanced level)

Basic Level Goals-PGY-1

A. Physical optics
   1. Properties of light
      a) Electromagnetic spectrum
      b) Wave theory
      c) Photon-particle theory
   2. Diffraction
   3. Interference and coherence
   4. Resolution
   5. Polarization
   6. Scattering
   7. Transmission and absorption
   8. Photometry
   9. Lasers
   10. Illumination
   11. Image quality
   12. Brightness and radiance
   13. Light propagation-optical media and refractive index

B. Geometric optics
   1. Reflection (mirrors)
      a) Laws of reflection
      b) Reflection at a plane surface (image and field of a plane mirror)
      c) Images and objects as light sources
      d) Refractive index
      e) Multiple lens system
2. Refraction
   a) Laws of refraction (Snell's law)
      i) Passage of light from one medium to another
      ii) Absolute index of refraction
      iii) Total internal reflection
   b) Refraction at a plane surface
   c) Refraction at curved surface
   d) Critical angle and total internal reflection
   e) Image jump and displacement

3. Prisms
   a) Definition
   b) Notation of prisms (e.g. prism diopters)
   c) Uses in ophthalmology (diagnostic and therapeutic)
   d) Types of prisms (plane, parallel, plate)
   e) Prentice's rule
   f) Fresnel prism
   g) Refraction of light through a prism
   h) Thin prisms
   i) Prismatic effect of lenses

4. Spherical lenses
   a) Cardinal points
   b) Thin lens formula
   c) Thick lens formula
   d) Formation of the image
   e) Vergence of light (diopter, convergence, divergence, vergence formula)
   f) Concave and convex
   g) Magnification (linear, angular, relative* size, electronic)

5. Astigmatic lenses
   a) Cylindrical lenses
      i) Sphero-cylinder lenses and surfaces
      ii) Cross cylinders (e.g. Jackson cross cylinder)
   b) Maddox rod
   c) Toric lenses
   d) Conoid of Sturm

6. Notation of lenses
   a) Spectacle prescribing
   b) Simple transposition
   c) Toric transposition

7. Identification of unknown lenses
   a) Neutralization
   b) Focimeter
   c) Geneva lens measure

8. Aberrations of lenses
   a) Correction of aberrations relevant to the eye (spherical, coma, astigmatism, distortion, pantoscopic tilt)
   b) Duochrome test

9. Lens materials

C. Clinical optics
1. Optics of the eye
2. Transmittance of light by the optic media
3. Schematic and reduced eye
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4. Pupillary response and its effect on the resolution of the optical system (Styles-Crawford effect)
5. Visual acuity
   a) Distance and near acuity measurement
   b) Minimal (visible, perceptible, separable, legible)
   c) Vernier acuity
6. Contrast sensitivity
7. Catoptic images
8. Emmetropia
9. Accommodation
10. Purkinje shift
11. Pinhole
12. Ametropia
   a) Myopia
   b) Hypermetropia (hyperopia)
   c) Astigmatism
   d) Anisometropia
   e) Aniseikonia (Knapp’s rule)
   f) Aphakia
   g) Optical parameters affecting retinal image size
13. Accommodative problems
   a) Insufficiency
   b) Excess
   c) AC/A ratio
14. Refractive errors
   a) Prevalence
   b) Inheritance
   c) Changes with age
   d) Surgically induced
15. Correction of ametropia
   a) Spectacle lenses
   b) Contact lenses

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c) Intraocular lenses
d) Principles of refractive surgery
16. Problems of spectacles in aphakia
17. Effect of spectacles and contact lens correction on accommodation and convergence (amplitude, near point, far point)
18. Effective power of lenses
20. Spectacle magnification
21. Calculation of intraocular lens power
22. Presbyopia (measuring for near adds)
23. Low vision aids
   a) High reading addition
   b) Magnifying lenses
   c) Telescopic aids - Galilean telescope, Keplerian telescope

D. Clinical refraction
1. Retinoscopy
2. Subjective refraction
3. Measurement of back vertex distance (BVD)
4. Muscle balance tests
5. Accommodative power
6. Measurement of interpupillary distance (IPD)
7. Decentration of lenses and prismatic effect
8. Best form lens
9. Prescribing multifocal lenses
10. Prescribing for children
11. Cycloplegic refraction

E. Instruments and tests
1. Direct ophthalmoscope
2. Indirect ophthalmoscope
3. Retinoscope
4. Focimeter
5. Simple magnifying glass (loupe)
6. Lensometer
7. Glare and contrast testing
8. Potential acuity meter
9. Automated refractor
10. Slit lamp bio-microscope (including methods of examination)
11. Stereo tests
12. Corneal topographic measurements (placido disc, keratometer, automated corneal topography)
13. Applanation tonometer
14. Specular microscope
15. Operating microscope
16. Zoom lens principle
17. Corneal pachymeter
18. Lens screen/Hess chart
19. Synoptophore
20. Lenses used for fundus biomicroscopy (panfunduscope, Goldmann lens, Hruby lens, 90 diopter lens, etc)
21. Fundus camera
22. Gonioscope
23. Tonometers
24. Color vision tests (Ishihara color plates; Hardy-Rand-Rittler plates, Farnsworth-Munsell testing)

Standard Level Goal: PGY - 2
Improve proficiency in Basic Level skills

Advanced Level Goals: PGY - 3
Apply, at the highest level of understanding, the relevant optics information in the following situations:
1. Contact lenses, refraction and prescribing of spectacles
2. Intracocular lens calculation
3. Use of prisms for diplopia
4. Low vision aid prescribing

II. Retinoscopy and Refraction :
General Educational Objectives :
1. Identify the principles and indications for retinoscopy
2. Perform the technique of retinoscopy
3. Identify media opacities with retinoscopy
4. Perform an integrated refraction based upon retinoscopic results

Basic Level Goals: PGY - 1
1. Describe the major types of refractive errors
2. Describe basic ophthalmic optics and optical principles of refraction and retinoscopy
3. Perform retinoscopy for detecting simple refractive errors
4. Describe the indications for and use trial lenses or a phoropter for simple refractive error
5. Perform objective and subjective refraction techniques for simple refractive error
6. Perform elementary refraction techniques (e.g. for myopia, hyperopia, near-vision add)
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Standard Level Goals: PGY - 2

1. Describe more complex types of refractive errors, including postoperative refractive errors.
2. Perform more advanced refraction techniques (e.g. astigmatism, complex refractions, asymmetric accommodative add).
3. Describe the more advanced ophthalmic optics and optical principles of refraction and retinoscopy (e.g. postkeratoplasty, post-cataract extraction).
4. Perform objective and subjective refraction techniques for more complex refractive errors, including astigmatism and postoperative refractive error.
5. Perform more advanced techniques of retinoscopy for detecting simple and complex refractive error.
6. Describe and use more advanced techniques using trial lenses or the phoropter for more complex refractive errors, including modification and refinement of subjective manifest refractive error and more complex refractive errors (e.g., advanced and irregular astigmatism, vertex distance).
7. Use the keratometer for detection of more advanced refractive error.

Advanced Level Goals: PGY - 3

1. Describe the most complex types of refractive errors, including postoperative refractive errors, postkeratoplasty and refractive surgery.
2. Perform the most advanced refraction techniques (e.g. irregular astigmatism, pre-and post-refractive surgery).
3. Describe the most advanced ophthalmic optics and optical principles of refraction and retinoscopy, including higher order aberrations.

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4. Utilize the most advanced ophthalmic optics and optical principles for refraction and retinoscopy, including higher order aberrations.
5. Perform objective and subjective refraction techniques in the most complex refractive error, including astigmatism and postoperative refractive error.
6. Perform the most advanced techniques using trial lenses or the phoropter for more complex refractive errors, including motivation and refinement of subjective manifest refractive error, cycloplegic retinoscopy and refraction and post-cycloplegic refraction, irregular astigmatism, post-keratoplasty and refractive surgery cases.
7. Use the keratometer for detection of subtle or complex advanced refractive error.
8. Use more advanced refraction instruments and techniques (e.g. distometer, automated refractor, automated corneal topography).

III. Contact Lens:
Basic Level Goals: PGY - 1

A. General Educational Objectives

1. Basic contact lens (CL) history and examination and be aware of additional basic tests and questions that are required for CL patients with more complex needs.
2. Techniques of retinoscopy, refraction and over refraction in the routine CL patients.
3. Describe the optics of the soft contact lens and hard contact lens (e.g. rigid gas permeable CL); base curve changes, the lacrimal lens, and the optic zone.
4. Describe conversion of a spectacle prescription (Rx) to a CL Rx, including method of converting from plus to minus cylinder.
5. Describe basic CL design, using appropriate terminology.
6. Describe techniques for and perform basic CL fitting.
7. Describe selection of CL candidates with non-complex needs.
8. Use auxiliary CL instruments and tests (e.g. trial set, Fluorescein testing).
9. Perform CL verification for vision correction, fit, and comfort.
10. Describe contraindications for contact lens use.

B. Cognitive skills
1. Describe fundamentals of ophthalmic optics in CL management (e.g. CL choices, techniques for fitting individuals).
2. List indications for contact lenses in non-complex cases.
3. Describe CL choices and techniques for fitting individuals with non-complex CL needs.

C. Technical/Surgical Skills
1. Perform retinoscopy techniques in a CL patient.
2. Perform advanced refraction techniques in a CL patient, including diagnostic fitting.
3. Perform techniques to verify and inspect contact lenses.
4. Utilize appropriate teaching skills to instruct patients in the safe insertion, removal and care of contact lenses.

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Standard Level Goals: PGY - 2

A. General Educational Objectives
1. Describe the more advanced optics of the soft contact lens (SCL) and hard contact lens (e.g. rigid gas permeable CL); base curve changes, the lacrimal lens, and the optic zone.
2. Describe and perform more advanced CL fitting (e.g. post keratoplasty).
3. Describe selection of CL candidates with more complex needs (e.g. posturgical).
4. Use auxiliary CL instruments in patients with more complex needs (e.g. postsurgical topography).
5. Perform CL verification for vision, fit, and comfort in therapeutic CL cases.

B. Cognitive Skills
1. Describe more advanced concepts of ophthalmic optics in CL.
2. Describe indications for more advanced CL (e.g. therapeutic lenses).

C. Technical/Surgical Skills
1. Perform more advanced retinoscopy techniques in a CL patient.
2. Perform more advanced refraction techniques in a CL patient, including diagnostic fitting.
3. Perform advanced techniques to verify and inspect contact lenses inpatients with complex CL needs.
4. Perform more advanced CL fitting in patients with complex needs (e.g. keratoconus, CL in children, active corneal disease).
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| 5. Perform appropriate CL selection (e.g. material selection, CL modification). |
| 6. Perform corneal topography to fit contact lenses. |

### Advanced Level Goals: PGY - 3  
**A. General Educational Objectives**

1. Describe the more advanced optics and applications of soft contact lenses and hard contact lenses (e.g. piggyback CL).
2. Describe the most advanced CL design, using appropriate terminology (e.g. special fittings, special lenses for difficult-to-fit patients).
3. Describe indications for and perform the most advanced CL fitting (e.g. Post-multiple keratoplasty or traumatic corneal repair).
4. Describe indications for and apply the most complex CL in special circumstances or for candidates presenting increased level of difficulty (e.g. postsurgical patients, children).
5. Use the auxiliary CL instruments in patients with the most complex needs (e.g. topography, Fluorescein testing, diagnostic lenses.)

**B. Cognitive Skills**

1. Describe the differences among CL material choices.
2. Describe methods of modifying a contact lens to improve comfort, vision or physiological response.
3. Evaluate and manage CL-induced complications.
4. Perform and interpret corneal topography in CL fitting.

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| C. Technical/Surgical Skills |
| 1. Perform CL modification in complex cases. |
| 2. Select the appropriate CL in more complex cases. |

### IV. Cataract and Lens :

**General Educational Objectives :**

1. Describe the evaluation and management, indications for, and intraoperative and postoperative complications of cataract surgery and related anterior segment procedures.
2. Perform the complete preoperative ophthalmologic examination of cataract patients.
3. Formulate the differential diagnoses of cataract and evaluate the normal and abnormal lens.
5. Develop and exercise clinical and ethical decision-making in cataract patients.
6. Develop good patient communication techniques regarding cataract surgery.
7. Perform routine and advanced cataract surgery and intraocular lens (IOL) placement.
8. Manage basic and advanced clinical and surgical cataract problems.
10. Work effectively as a member of the medical care team.
11. Develop teaching skills about cataract for instructing junior trainees and students.

**Basic Level Goals : PGY - 1**

| A. Cognitive Skills |
| 1. Identify the most common causes and types of |
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cataract (e.g. anterior polar, cortical nuclear sclerotic, posterior sub-capsular).

2. List the basic history and examination steps for preparative cataract evaluation.

3. Describe the steps in cataract surgical procedures.

4. Describe the major etiologies of dislocated or Subluxated lens (e.g. trauma, Marfan’s syndrome, homocystinuria, Weill-Marchesani syndrome, syphilis).

5. Familiarity with the techniques of intracapsular cataract extraction, extracapsular cataract extraction, and phacoemulsification.

6. Describe the following
   a) Types of refractive error in cataract.
   b) Retinoscopy techniques for cataract.
   c) Subjective refraction techniques for cataract patients.
   d) Types of IOLs; IOL power calculation.

B. Technical/Surgical Skills

1. Perform basic slit lamp bio-microscopy, retinoscopy and ophthalmoscopy.

2. Evaluate and classify common types of lens opacities.

3. Perform subjective refraction techniques and retinoscopy in patients with cataract.

4. Perform direct and indirect ophthalmoscopy pre- and post-cataract surgery.

5. Perform basic steps of cataract surgery (e.g. incision, wound closure) in the practice lab.

6. Assist at cataract surgery and perform patient preparation, sterile draping and anesthesia.

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7. Perform the following steps of cataract surgery in the practice lab or under direct supervision, including any or all of the following:
   a) Wound construction
   b) Anterior capsulotomy/capsulorhexis
   c) Instillation and removal of viscoelastics
   d) Extracapsular and phacoemulsification techniques (e.g. sculpting, divide & conquer, phaco chop)
   e) Irrigation and aspiration
   f) Cortical clean-up
   g) IOL implantation (e.g. anterior and posterior)

Standard Level Goal: PGY - 2

A. Cognitive Skills

1. Describe the less common causes of lens abnormalities (e.g. spherophakia, lenticonus, ectopia lentis).

2. Describe the preoperative evaluation of the cataract patient, including:
   a) The systemic diseases of interest or relevance to cataract surgery.
   b) The relationship of external and corneal diseases of relevance to cataract and cataract surgery (e.g. lid abnormalities, dry eye).
   c) The relationships of glaucoma, uveitis, and capsular opacities related to cataract surgery.

3. Describe glare analysis testing for cataract surgery.

4. Describe indications, techniques and complications of surgical procedures, including:
   a) Extracapsular surgery
   b) Intracapsular surgery
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c) Phacoemulsification  
d) Paracentesis  
e) IOL placement  

5. Correlate the level of visual acuity with the lens or capsular opacities.  

6. Describe the common complications of cataract and anterior segment surgery (e.g. intraocular pressure elevation, hyphema, endophthalmitis, cystoid macular edema, retinal detachment, intraocular lens dislocation, lens-induced glaucoma and uveitis).  

7. Describe the indications for, principles of and techniques of YAG laser capsulotomy.

**B. Technical/Surgical Skills**  

1. Implement the basic preparatory procedures for cataract surgery (e.g. obtaining informed consent, identification of instruments, sterile technique, gloving and gowning, prep and drape and other preoperative preparation).  

2. Perform extracapsular surgery 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/capsulorhexis  
   c) Instillation and removal of viscoelastics  
   d) Extracapsular technique  
   e) Beginning phacoemulsification techniques (e.g. sculpting, divide & conquer, phaco chop)  
   f) Irrigation and aspiration  
   g) Cortical clean-up

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h) IOL implantation (e.g. anterior and posterior, special IOLs)  

3. Describe the more advanced applications of viscoelastics in surgery (e.g. control of iris prolapse, elevation of dropped nucleus, viscodissection, aspiration of residual/retdained viscoelastic).  

4. Perform basic postoperative evaluation of the cataract patient.  

5. Recognize and refer or treat common postoperative complications of cataract surgery (e.g. endophthalmitis, elevated intraocular pressure, cystoid macular edema, wound leak, uveitis).

**Advanced Level Goals: PHY - 3**

**A. Cognitive skills**  

1. Define the more complex indications for cataract surgery (e.g. better view of posterior segment), describe the performance of and describe the complications of more advanced anterior segment surgery (e.g. pseudoexfoliation, small pupils, mature cataract, hard nucleus, black cataract, post-traumatic, zonular dehiscence), including more advanced procedures (e.g. secondary IOLs and indication for specialized IOLs, capsular tension rings, iris hooks, use of indocyanine green staining of the anterior capsule).

2. Describe the indications for, techniques of and complication of cataract extraction in the context of the subspecialty disciplines of 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 buckles 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. Independently evaluate complications of cataract and IOL implant surgery (e.g. rare cases may require this procedure, or patients may have has the procedure performed previously).

4. Understand indications for and technique of intracapsular surgery (e.g. rare cases may require this procedure, or patients may have has the procedure performed previously).

5. Describe indications for and instrumentation and techniques used to implant foldable and non-foldable IOLs.

6. Describe the evaluation and management of common and uncommon caused of postoperative endophthalmitis.

7. Describe the government and hospital regulations that apply to cataract surgery.

B. Technical/Surgical Skills

1. Performance of A-scan ultrasonography and calculate of IOL power.

2. Perform phacoemulsification in a practice setting (e.g. animal or practice lab) and then in the operating room, including mastery of the following skills:
   a) Wound construction.

b) Anterior capsulotomy/capsulorrhexis.

c) Viscoelastics.
d) Intracapsular, extracapsular and phacoemulsification techniques (e.g. sculpting, divide & conquer, phaco chop, stop and chop).
e) Instrumentation and techniques of irrigation and aspiration.
f) IOL implantation (e.g. anterior and posterior, special IOLs).
g) IOL repositioning, removal or exchange.

3. Perform implantation of foldable and non-foldable IOLs.

4. Perform intraoperative and postoperative management of any event that may occur during or as a result of cataract surgery, including:
   a) Vitreous loss.
   b) Capsular rupture.
   c) Anterior or posterior segment bleeding.
   d) Positive posterior pressure.
   e) Choroidal detachments.
   f) Expulsive hemorrhage.
   g) Loss of anesthesia.
   h) Elevated intraocular pressure.
   i) Use of topical and systemic medications.
j) Astigmatism.
k) Postoperative refraction (simple and complex).
l) Corneal edema.
m) Wound dehiscence.
n) Hyphema.
o) Residual cortex.
p) Dropped nucleus.
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---|---
q) Uveitis.
r) Cystoid macular edema (CME)
s) Elevated intraocular pressure and glaucoma.
t) Postoperative early and late intraocular infection.

V. Cornea, External Diseases and Refractive Surgery:
Basic Level Goals : PGY - 1

A. Cognitive Skills

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 congenital abnormalities of the cornea, sclera, and globe (e.g. Peter’s anomaly, microphthalmos, birth trauma, buphthalmos).

3. Describe characteristic corneal and conjunctival degenerations (e.g. pterygium, pinguecula, senile plaques of the sclera, keratoconus).

4. Recognize the common corneal dystrophies and degenerations (e.g. map-dot-fingerprint dystrophy, Meesman dystrophy, Reis-Buckler’s dystrophy, Francois syndrome, Schnyder’s crystalline dystrophy, congenital hereditary stromal dystrophy, lattice dystrophy, granular dystrophy, macular dystrophy, congenital hereditary endothelial dystrophy, Fuchs dystrophy, posterior polymorphous dystrophy, Salzmann’s degeneration).

5. Recognize the common corneal inflammations and infections (e.g. herper simplex, herpes zoster, syphilis, interstitial keratitis).

6. Understand the fundamentals of corneal optics and refraction (e.g. keratoconus).

7. Describe the fundamental of ocular microbiology and recognize corneal and conjunctival inflammations and infections (e.g. Staphylococcal hypersensitivity, simple microbial keratitis, trachoma, ophthalmia neonatorum, herpes zoster ophthalmicus, herper simplex keratitis and conjunctivitis).

8. Recognize the basic presentations of ocular allergy (e.g. phlyctenules, seasonal hay fever, vernal conjunctivitis, allergic and atopic conjunctivitis, gran papillary conjunctivitis).

9. Recognize and treat eyelid diseases (e.g. Staphylococcal blepharitis, meibomian gland dysfunction).

10. Describe the features of, diagnose- and treat (or refer) vitamin A deficiency (e.g. Bitot’s spot, dry eye, slowed dark adaptation) and neurotrophic corneal diseases.

11. Describe the basic differential diagnosis of acute and chronic conjunctivitis or “red eye” (e.g. scleritis, episcleritis, conjunctivitis, orbital cellulitis, gonococcal and chlamydial conjunctivitis).

12. Describe the basic mechanisms of traumatic and toxic injury (e.g. alkali burn, lid laceration, orbital fracture etc).

13. Understand the mechanisms of ocular immunology and recognize the external manifestations of anterior segment inflammation (e.g., red eye associated with acute and chronic iritis).
14. Describe the basic principles of ocular pharmacology of anti-infective, anti-inflammatory and immune modulating agents (e.g., indications and contraindications for topical corticosteroids, non-steroidal anti-inflammatory agents, and antibiotics).

15. Recognize corneal lacerations (perforating and non-perforating), pterygia that may require surgery, corneal and conjunctival foreign bodies.

16. Diagnose and treat corneal exposure (e.g., lubrication, temporary tarsorrhaphy).

17. Describe the epidemiology, differential diagnosis, evaluation and management of common benign and malignant lid lesions, including pigmented lesions of the conjunctiva and lid (e.g. nevi, melanoma, primary acquired melanosis).

18. Describe the epidemiology, classification, pathology, indications for surgery, and prognosis of common malpositions of the eyelids (e.g., blepharoptosis, trichiasis, distichiasis, essential blepharospasm, entropion, ectropion) and understand their relationship to secondary diseases of the cornea and conjunctiva (e.g., exposure keratopathy).

19. Recognize and describe the treatment for a chemical burn (e.g., types of agents, medical therapy).

20. Recognize and describe the etiologies of hyphema and microhyphema.

21. Describe the etiologies and treatment of superficial punctate keratitis (e.g., dry eye, Thygeson's superficial punctate keratopathy), blepharitis, toxicity, ultraviolet photokeratopathy, contact lens related).

22. Describe the symptoms and signs, testing and evaluation for, and treatment of exposure keratopathy and dry eye (e.g., Schirmer test).

23. Recognize the anterior segment manifestations of systemic diseases (e.g., Wilson's disease) and pharmacologic side effects (e.g., amiodarone vortex keratopathy).

24. Recognize and treat pyogenic granuloma.

B. Technical/Surgical Skills

1. Perform external examination (illuminated and magnified) and slit lamp biomicroscopy, including drawing of anterior segment findings.

2. Administer topical anesthesia, as well as special topical stains of the cornea (e.g., fluorescein dye and rose bengal).

3. Perform simple tests for dry eye (e.g., Schirmer test).

4. Perform punctal occlusion (temporary or permanent) or insert plugs.

5. Perform simple corneal sensation testing (e.g., cotton tip swab).

6. Perform techniques of sampling for viral, bacterial, fungal, and protozoal ocular infections (e.g., corneal scraping and appropriate culture techniques).

7. Perform and interpret simple stains of the cornea and conjunctiva (e.g. culture techniques, culture media, Gram stain, Giemsa stain, calcofluor white, acid fast).
1. Manage corneal epithelial defects (e.g., pressure pitting and bandage contact lenses).
2. Perform removal of a conjunctival or corneal foreign body (e.g., rust ring).
3. Perform primary pterygium excision.
5. Perform an isolated corneal laceration repair (e.g., linear laceration not extending to limbus).
6. Perform epilation.
7. Perform a lateral tarsorrhaphy.
8. Perform irrigation of chemical burn to the eye.
9. Perform a simple incisional or excisional biopsy of a lid lesion.
10. Perform irrigation of chemical burn to the eye.
11. Treat hyphema and microhyphema (e.g., the complications of increased intraocular pressure and rebleeding.

**Standard Level Goals: PGY-2**

**A. Cognitive Skills**

1. Describe, recognize, evaluate, and treat peripheral corneal thinning (e.g., inflammatory, degenerative, dellen-related, infectious, immunologic).
2. Recognize common conjunctival neoplasms (e.g., benign, malignant tumors).
3. Recognize and treat less common corneal or conjunctival presentations of degenerations (e.g., inflamed, atypical, or recurrent pterygium, band keratopathy).
4. Describe the epidemiology, differential diagnosis, evaluation, and management of Bitot's spots.
5. Describe the differential diagnosis, evaluation, and management of Thygeson's superficial punctate keratopathy.
6. Understand more complex corneal optics and refraction (e.g., irregular astigmatism).
7. Describe differential diagnosis, evaluation, and treatment of interstitial keratitis (e.g., syphilis, viral diseases, non-infectious, immunologic, inflammation).
8. Describe more complex differential diagnosis of the "red eye" (e.g., autoimmune and inflammatory disorders causing scleritis, episcleritis, conjunctivitis, orbital cellulitis).
9. Describe key features of trachoma, including epidemiology, clinical features and staging, and its complications (e.g., cicatrisation), prevention (e.g., facial hygiene), and topical and systemic antibiotic treatment (especially in hyperendemic regions), and surgery (e.g., tarsal rotation).
10. Describe more complex 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).
11. Describe the more complex principles of ocular pharmacology of anti-infective, anti-inflammatory and immune modulating agents (e.g., use of topical nonsteroidal and steroidal agents, topical cyclosporine).
12. Recognize and treat corneal lacerations (perforating and non-perforating).
13. Recognize and treat large, recurrent, or atypical pterygia that may require surgery.
14. Diagnose and treat severe corneal exposure (e.g., lubrication, temporary tarsorrhaphy)
15. Recognize and treat common and uncommon benign and malignant lid lesions.
16. Recognize and treat common malpositions of the eyelids (e.g., entropion, ectropion, and ptosis) as they apply to secondary corneal disease.
17. Recognize and treat recurrent corneal erosions.
18. Recognize and treat more complex hyphemas (e.g., surgical indications).
19. Describe the clinical features, pathology,
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evaluation, and treatment of ocular cicatricial pemphigoid.

20. Recognize, evaluate, and treat the ocular complications of severe diseases, such as chronic exposure keratopathy, contact dermatitis, and Stevens-Johnson syndrome.

21. Describe the epidemiology, clinical features, pathology, evaluation, and treatment of peripheral corneal thinning or ulceration (e.g., Terrien's marginal degeneration, Mogram's ulcer, rheumatoid arthritis-related corneal melt).

B. Technical/Surgical Skills

1. Perform more advanced techniques, including keratometry, keratoscopy, endothelial cell count and evaluation, specular microscopy, and pachymetry.

2. Perform stromal micropuncture.

3. Perform application of corneal glue.

4. Assist in more complex corneal surgery (e.g., penetrating keratoplasty and phototherapeutic keratectomy).

5. Perform more advanced tests for dry eye (e.g., modified Schirmer tests, assessment of tear break-up time, fluorescein dye testing, rose bengal dye).

6. Perform more complex pterygium excision, including conjunctival grafting.

7. Perform more complex lid laceration repair.

Advanced Level Goals: PGY-3

A. Cognitive Skills

1. Diagnose and treat the complex traumatic and toxic injuries to the anterior segment (e.g., total lid avulsion, severe alkali burn).

2. Describe the differential diagnosis and the external manifestations of the complex or uncommon anterior segment inflammations (e.g., syphilitic keratouveitis).

3. Diagnose and treat the severe corneal exposure cases (e.g., conjunctival flap).

4. Understand ocular surface transplantation, including conjunctival autograft/flap, amniotic membrane transplantation, limbal stem cell transplantation.

5. Understand the surgical indications (e.g., Fuchs' dystrophy, aphakic/pseudophakic bullous keratopathy), surgical techniques, and recognition and management of postoperative complications (especially immunologically mediated rejection) of corneal transplantation (e.g., penetrating, lamellar).

6. Understand the preoperative assessment, patient selection, surgical management, and postoperative care of refractive surgical techniques, including keratotomy (radial, astigmatic), photoablation (photorefractive, phototherapeutic, LASIK), corneal wedge resection, thermokeratoplasty, intracorneal rings, phakic intraocular lens, and clear lens extraction.

B. Technical/Surgical Skills

1. Perform and interpret the most advanced corneal techniques (e.g., pachymetry, endothelial microscopy, computerized corneal topography).

2. Understand and perform specialized and complicated contact lens fitting (e.g., post-keratoplasty).

3. Repair complex entropion and ectropion.

4. Perform a thin conjunctival flap (e.g., Gunderson flap).
VI. Glaucoma:
Basic Level Goals: PGY-1
A. Cognitive Skills
1. Describe the epidemiology and genetics of primary open angle glaucoma (POAG) & PACG.
2. Evaluation of POAG, PACG, Ocular hypertension & glaucoma suspect, classify glaucoma.
3. Describe the mechanics of aqueous humor dynamics and the anatomy of the anterior chamber and its angle, and of the ciliary body.
4. Describe basic tonometry and understand the principles of tonography.
5. Describe optic disc and nerve fiber layer anatomy.
6. Describe fundamentals of perimetry, including kinetic and automated static perimetry.
7. Describe principles, indications, and basic techniques of gonioscopy, including normal and abnormal findings.
8. Describe 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, primary angle closure glaucoma).
9. Describe and recognize normal tension glaucoma (*low tension glaucoma*).

B. Technical/Surgical Skills
1. Perform basic tonometry (e.g., applanation, Schiotz [if applicable], tonopen, airpuff) and recognize the pitfalls and artifacts of the testing.
2. Perform basic gonioscopy (e.g., recognize angle structures, identify angle closure).
3. Perform stereo examination of the optic nerve, using 90 diopter or other lens.
4. Interpret manual (e.g., Goldmann) and automated (e.g., Humphrey, Octopus) visual fields in routine glaucoma.
5. Perform corneal pachymetry and relate the findings to interpretation of intraocular pressure.

Standard Level Goals: Cognitve skills—continuation of PGY-1
A. Technical/Surgical Skills
1. Perform YAG laser posterior capsulotomy for uncomplicated posterior capsule opacity.
2. Perform argon or YAG laser peripheral iridotomy for routine angle closure glaucoma.
3. Perform argon laser trabeculectomy.
4. Perform cyclophotocoagulation
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<td>5. Perform routine trabeculectomy without antimetabolites supervision.</td>
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<td>6. Manage a flat anterior chamber.</td>
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**Advanced Level Goals: PGY-3**

**A. Cognitive Skills**

1. Describe the features of primary and secondary open angle glaucoma.
2. Apply in clinical practice tonometric and tonographic methods (e.g., diurnal curve) in complicated or atypical cases of glaucoma.
3. Evaluate atypical or multifactorial glaucomatous cupping (e.g., rim pallor).
4. Describe the principles and indications, and apply to clinical practice, the findings of gonioscopy in the most complex primary and secondary glaucomas.
5. Describe the principles of medical management of the most advanced and complex glaucoma (e.g., advanced POAG previously treated with medicine, laser or surgery; secondary glaucomas).
6. Describe, recognize, and treat the most advanced cases of primary open angle glaucoma (e.g., monocular patients, repeat surgical cases), normal tension glaucoma, and secondary glaucomas (e.g., inflammatory glaucoma, angle recession).
7. Describe the features, recognize, and treat the primary and secondary angle closure glaucoma.
8. Describe the clinical features of ocular hypotony, and recognize and treat common and uncommon etiologies (e.g., choroidal detachment, leaking trabeculectomy bleb).
9. Describe the features of and treat or refer the primary infantile and juvenile glaucomas.

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**B. Technical/Surgical Skills**

1. Perform laser peripheral iridotomy for more advanced glaucoma (e.g., monocular patient, acute angle closure, hazy cornea).
2. Perform laser treatments (e.g., argon laser trabecuoplasty, iridoplasty) for more advanced glaucoma cases (repeat treatments, monocular patient).
3. Perform cyclophotocoagulation for more advanced cases (e.g., prior surgery, monocular).
4. Perform routine and repeat trabeculectomy with or without antimetabolites.
5. Recognize and treat complications of glaucoma surgery blebs.

**VII. Neuro-Ophthalmology:**

**Basic Level Goals: PGY-1**

**A. Cognitive Skills**

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 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, 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, sixth nerve palsy).

7. Describe the features of cavernous sinus and superior orbital fissure syndromes (e.g., infectious, vascular, neoplastic, inflammatory etiologies).

8. Describe the typical features, evaluation, and management of the most common pupillary abnormalities (e.g., relative afferent pupillary defect, anisocoria, Horner's syndrome, third nerve palsy, Adie's tonic pupil).

9. Describe the typical features, evaluation, and management of the most common visual field defects (e.g., optic nerve, optic chiasm, optic radiation, occipital cortex).

10. Describe the clinical features, evaluation, and management of carotid-cavernous fistula.

11. 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, Bergmeister's papilla).

B. Technical/Surgical Skills

1. Perform a basic pupillary examination:
   a) Defect and quantify a relative afferent pupillary defect.
   b) List the causes for light-near dissociation (e.g., Argyll-Robertson pupils, diabetic neuropathy, tonic pupil).

2. Perform a basic ocular motility examination:
   a) Assess ocular alignment using simple techniques (e.g., Hirschberg test, Krimsky method).
   b) Perform basic cover/uncover testing for tropia.
   c) Perform alternate cover testing for phoria.
   d) Perform simultaneous prism and cover testing.
   e) Perform measurement of deviations with prisms.

3. Identify the indications for visual field testing and perform and interpret perimetry studies:
   a) Confrontational field testing (static and kinetic, central and peripheral, red and white targets).
   b) Tangent screen test.
   c) Goldmann perimetry
   d) Automated perimetry, and interpret results.

4. Perform basic direct, indirect, and magnified ophthalmoscopic examination of the optic disc (e.g., recognize optic disc swelling, optic atrophy, neuroretinitis).

5. Describe the indications for and interpret basic echography of orbits.

Standard Level Goals PGY-2

A. Cognitive Skills

1. Describe typical and atypical features, evaluation, and management of the common optic neuropathies (e.g., papilledema, optic neuritis, ischemic, inflammatory, infectious, infiltrative, compressive, and hereditary optic neuropathies).

2. Describe 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 inter-nuclear ophthalmoplegia).

3. Describe typical and atypical features, evaluation, and management of the more complex and less common forms of nystagmus (e.g., rebound, convergence, retraction).

4. Describe typical and atypical features, evaluation, and management of the more complex and less common pupillary abnormalities (e.g., light-near dissociation, pharmacologic miosis).
5. Describe typical and atypical features, evaluation, and management of the more complex and less common visual field defects (e.g., lateral geniculate, monocular temporal crescent).

6. Describe neuro-ophthalmic aspects of common systemic diseases (e.g., hypertension, diabetes, thyroid disease, myasthenia gravis, temporal arteritis, systemic infections and inflammation).

7. Describe neuro-ophthalmologic findings in trauma (e.g., traumatic optic neuropathy, traumatic brain injury).

8. Recognize, evaluate, and treat ocular myasthenia gravis.

B. Technical/Surgical Skills

1. Describe the indications for, administer, and interpret the results of intravenous edrophonium (Tensilon) and Prostigmin tests for myasthenia gravis.

2. Perform a detailed cranial nerve evaluation (e.g., testing of oculomotor, trochlear, trigeminal, and facial nerve function).

3. Describe 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. Describe 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 non-organic spiral or tunnel visual fields).

5. Describe the indications for, perform, and list the complications of temporal artery biopsy.

Advanced Level Goals PGY-3

A. Technical/Surgical Skills

1. Perform and interpret the results of the intravenous edrophonium (Tensilon) and prostigmine tests for myasthenia gravis, and recognize and treat the complications of the procedures.

2. Perform and interpret the complete cranial nerve evaluation and basic neurologic examination in the context of neuro-ophthalmic localization and diseases.

3. Recognize patients with "functional" visual loss (non-organic visual loss) and provide appropriate counseling and follow-up.

VIII. Ophthalmic Histopathology:

Basic Level Goals: PGY-1

A. Cognitive Skills

1. Describe basic ocular anatomy and identify the histology of the major structures of the eye (e.g., conjunctiva, sclera, cornea, anterior chamber angle, iris, ciliary body, lens, vitreous, retina, retinal pigment epithelium, choroid, optic nerve).

2. Describe basic pathophysiology of the common disease processes of the eye and identify the major histologic findings of each (e.g., infection, inflammation, neoplasm).

3. Identify the histology of important intraocular and adnexal diseases (e.g., endophthalmitis, retinoblastoma, choroidal melanoma, microbial keratitis).
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B. Technical Skills (for an ocular pathology laboratory, as available)
1. Describe appropriate steps in the basic handling and processing of gross specimens in the ocular pathology laboratory (e.g., basic preparation of the specimen) and demonstrate proficiency in these steps in the laboratory.
2. Describe specific information necessary for communication with the pathologist regarding special handling of specimens for special stains or studies.
3. Describe indications for frozen sections in ocular pathology.
4. Perform cutting and gross examination of whole globes.
5. Participate under supervision in the microscopic examination of ophthalmology specimens from active cases.

Standard Level Goals: PGY-2
A. Cognitive Skills
1. Describe more advanced ocular anatomy and identify the histology of the major and minor structures of the eye (e.g., conjunctival glands, normal pigment, common variants).
2. Describe more advanced pathophysiology of the disease processes of the eye and identify the major histologic findings of each (e.g., fungal keratitis, skin and adnexal neoplasms, and less common intraocular tumors).

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3. Identify histology of the less common but potentially vision or life threatening intraocular and adnexal diseases (e.g., temporal arteritis, fungal endophthalmitis, extraocular spread of intraocular tumor, metastatic disease to the eye).
4. Describe more advanced techniques in ocular histopathology (e.g., electron microscopy, cytology, immunohistochemistry, flow cytometry, tumor free margins).

B. Technical/Surgical Skills
1. Describe specific indications for special handling and communicate to the pathologist the necessity for special handling of specimens for special stains or studies (e.g., electron microscopy, immunohistochemistry, flow cytometry, cytology).
2. Describe indications and perform and prepare a biopsy specimen for frozen section in ocular pathology.
3. Prepare a basic histologic specimen for review by the pathologist.
4. Participate as an "at-the-elbow" observer during microscopic examination of active ophthalmology cases and perform microscopic examination of a specimen with and without direct supervision.

IX. Oculoplastic Surgery and Orbit:
Basic Level Goals - PGY-1
A. Cognitive Skills
1. Describe basic eyelid, lacrimal, and orbital anatomy and physiology (e.g., eyelid, orbicularis, orbital structures, meibomian glands, lacrimal glands, Zeis
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<td>Glands, 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, extraocular muscles</td>
<td>( \text{lacrimal assessment (e.g., dye testing, punctal dilation, canalicular probing, lacrimal irrigation).} )</td>
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<td>2. Describe basic mechanisms and indications for treatment of eyelid, orbital, and lacrimal trauma</td>
<td>4. Identify indications for and perform the basic assessment of the orbit (e.g., Hertel exophthalmometry, inspection, palpation, auscultation).</td>
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<td>3. Recognize simple orbital trauma (e.g., orbital foreign body, retrobulbar hemorrhage)</td>
<td>5. Identify indications for and perform the basic socket assessment (e.g., types of implants, socket health).</td>
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<td>4. Recognize and treat floppy eyelid syndrome</td>
<td>6. Perform minor lid and conjunctival procedures (e.g., removal of benign eyelid skin lesions, chalazion curettage or excision, conjunctival biopsy).</td>
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<td>5. Recognize and treat localized trichiasis</td>
<td>7. Treat complications of minor operating room procedures (e.g., incision and drainage of chalazia, excision of small eyelid lesions).</td>
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<tr>
<td>7. Describe the differential diagnosis of common orbital tumors in children and adults</td>
<td>9. Recognize and treat trichiasis (e.g., epilation, cryotherapy, surgical therapy).</td>
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<td>8. Describe the differential diagnosis of lacrimal gland mass (e.g., inflammatory, neoplastic, congenital, infectious)</td>
<td>10. Perform a simple enucleation or evisceration under supervision.</td>
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<td>9. Normal orbital anatomy on imaging studies (e.g., magnetic resonance imaging, computed tomography, ultrasound)</td>
<td><strong>Standard Level Goals: PGY-2</strong></td>
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<td>10. Describe the differential diagnosis of proptosis in children and adults</td>
<td><strong>A. Cognitive Skills</strong></td>
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<td>11. Describe techniques and complications of minor operating room procedures (e.g., incision and drainage of chalazia, excision of small eyelid lesions)</td>
<td>1. Describe 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 syndrome, Treacher-Collins syndrome, Waardenburg syndromes).</td>
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<td>12. Describe typical features of orbital cellulitis</td>
<td>2. Describe the clinical features, evaluation and management of congenital orbital deformities (e.g., synophthalmia, anophthalmia, microphthalmia, cryptophthalmia, hypertelorism, hypotelorism).</td>
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<tr>
<td><strong>B. Technical/Surgical Skills</strong></td>
<td>3. Describe the genetics, clinical features, evaluation, and management of common craniosynostoses and other congenital malformations (e.g., Crouzon and Apert syndromes).</td>
</tr>
<tr>
<td>1. Basic office examination techniques for the common oculoplastic and orbital abnormalities</td>
<td>4. Treat (or refer for treatment) congenital eyelid</td>
</tr>
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</table>
5. Perform preoperative and postoperative assessment of patients with simple and more serious oculoplastic disorders (e.g., multidisciplinary procedures).

6. Describe 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).

7. Describe features of, evaluate, and treat more complicated cases of nasolacrimal duct obstruction, canaliculitis, dacryocystitis, acute and chronic dacryoadenitis, preseptal cellulitis, and orbital cellulitis.

8. Recognize, evaluate and treat thyroid ophthalmopathy (e.g., epidemiology, symptoms and signs, associated systemic diseases, orbital imaging, differential diagnosis, surgical, medical and radiation indications, side effects of treatment).

9. Recognize, evaluate, and treat orbital inflammatory pseudotumor (e.g., symptoms and signs, orbital imaging, differential diagnosis, biopsy indications, choice of treat- ments).

10. Recognize, treat, or refer blepharospasm or hemifacial spasm.

11. Recognize less common orbital tumors (e.g., metastatic lesions).

B. Technical/Surgical Skills

1. Describe indications for and perform more advanced examination techniques for less common oculoplastic and orbital abnormalities (e.g., measurement of levator function, orbital ultrasound interpretation).

2. Identify indications for and perform more advanced assessment of eyelids and eyebrows (e.g., hypoglobus, facial asymmetry, brow ptosis).

3. Identify indications for and perform more advanced lacrimal assessment (e.g., interpretation of dye testing, canalicular probing in trauma).

4. Identify indications for and perform more advanced assessment of the orbit (e.g., enophthalmus, interpretation of orbital ultrasound in common conditions).

5. Perform more complicated minor lid procedures (e.g., larger benign skin lesions) or surgery (e.g., recurrent or multiple chalazion).

6. Perform 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 eye- lid lesions).

7. Identify common orbital pathology (e.g., orbital fractures, orbital tumors) on imaging studies (e.g., magnetic resonance imaging, computed tomography, ultrasound).

8. Treat common presentations of preseptal or orbital cellulitis.

9. Perform the basic lacrimal procedures below:
   a) Lacrimal drainage testing (irrigation, dye disappearance test).
   b) Lacrimal intubation.
   c) Dacrycystorhinostomy (external).

Advanced Level Goals: PGY-3

A. Technical/Surgical Skills

1. Describe the indications for and perform more complicated and advanced in office examination techniques for less common but important oculoplastic and orbital abnormalities.

2. Perform preoperative and intraoperative assessment of the eyelids and eyebrows (e.g., intraoperative adjustments).

3. Describe, recognize the indications for and complications of, and perform the eyelid procedures listed below.
   a) Basic biopsy techniques.
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<td>b) Lateral tarsal strip.</td>
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<td>c) Levator advancement.</td>
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<td>d) Eyelid laceration/margin repair.</td>
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<td>e) Tarsorrhaphy.</td>
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<tr>
<td>f) Lateral canthoplasty (canthotomy and cantholysis).</td>
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<td>g) Blepharoplasty.</td>
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<tr>
<td>h) Simple eyelid reconstruction.</td>
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<tr>
<td>i) Orbital approaches and incisions (e.g., Kronlein, Caldwell-Luc, transconjunctival, transnasal).</td>
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</table>

4. Describe, recognize the indications for and complications of, and perform basic orbital skills and procedures:
   Anterior orbitotomy for tumor biopsy/excision.

5. Describe the indications for and interpret CT and MRI scans (e.g., orbital trauma, orbital lesions and tumors).

6. Perform botulinum toxin injections (e.g., blepharospasm).

X. Pediatric Ophthalmology and Strabismus:
Basic Level Goals: PGY-1

A. Cognitive Skills

1. Describe basic examination techniques for strabismus (e.g., ductions and versions, cover and uncover testing, alternate cover testing, prism cover testing).

2. Describe basic visual development and visual assessment of the pediatric ophthalmology patient (e.g., central, steady, maintained fixation; illiterate E, Allen cards, Landolt C rings).

3. Describe basic anatomy and physiology of strabismus (e.g., innervation of extraocular muscles, primary actions, comitant and incomitant deviations, overaction and underaction, restrictive and paretic saccades and pursuit movements).

4. Describe basic sensory adaptations for binocular vision (e.g., normal and anomalous retinal correspondence, suppression, horopter, Panum's area, fusion, stereopsis).

5. Describe and recognize pseudostrabismus.

6. Describe different etiologies of amblyopia (e.g., deprivation, ametropic, strabismic, anisometropic, organic).

7. Describe etiologies of esotropia (e.g., congenital, comitant and incomitant, accommodative and non-accommodative, decompensated, sensory, neurogenic, myogenic, neuromuscular junction).

8. Describe etiologies of exotropia (e.g., congenital, comitant and incomitant, decompensated, sensory, neurogenic, myogenic, neuromuscular junction, restrictive, basic divergence excess, exophoria, convergence insufficiency).

9. Describe various strabismus patterns (e.g., A or V pattern).

10. Describe non-surgical treatment of strabismus.

11. Describe different forms of childhood nystagmus.

12. Describe etiologies and types of pediatric cataract.

13. Describe and recognize ocular findings in child abuse (e.g., retinal hemorrhages) and appropriately refer to child protective services or other authorities.

14. Describe common hereditary or congenital ocular
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motility or lid syndromes (e.g., Duane’s syndrome, Marcus- Gunn jaw-winking, Brown syndrome).

15. Describe typical features of retinoblastoma.
16. Describe basic evaluation of decreased vision in infants and children (e.g., retinopathy of prematurity, hereditary retinal disorders, congenital glaucoma, measles, vitamin A deficiency).
17. Describe identifiable congenital ocular anomalies (e.g., microphthalmia, persistent fetal vasculature).
18. Describe ocular findings in chromosomal abnormalities (e.g., trisomy 21; trisomy 13; trisomy 18; deletion of the short arm of chromosome 11; deletion of the long arm of chromosome 13; Cri du Chat syndrome, Turner’s syndrome).

B. Technical/Surgical Skills
1. Perform an extraocular muscle examination based on knowledge of the anatomy and physiology of ocular motility.
2. Assess ocular motility using testing of ductions and versions.
3. Apply Hering’s and Sherrington’s laws.
4. Perform basic measurement of strabismus (e.g., Hirschberg test, Krimsky method, cover testing, prism cover testing, simultaneous prism cover testing, alternate cover testing, Parks-Bierschowsky three-step test, Lancaster red-green test, Maddox rod testing, double Maddox rod testing).
5. Perform assessment of vision in the neonate, infant, and child.
6. Recognize and apply in a clinical setting the following skills in the ocular motility examination:

<table>
<thead>
<tr>
<th>Standard Level Goals: PGY-2</th>
<th>Cognitive Skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Describe more advanced sensory adaptations (e.g., anomalous head position).</td>
<td>2. Describe basics of binocular sensory testing (e.g., Titmus stereo testing, Randot stereo testing, Worth four-dot, Bagolini lenses, afterimage testing).</td>
</tr>
<tr>
<td>3. Describe and recognize different etiologies of amblyopia</td>
<td>4. Describe and recognize etiologies of esotropia.</td>
</tr>
<tr>
<td>5. Describe and recognize various strabismus patterns (e.g., A or V pattern).</td>
<td>6. Describe and recognize the etiologies of vertical strabismus.</td>
</tr>
<tr>
<td>7. Describe and utilize the non-surgical treatment of strabismus and amblyopia (e.g., patching, atropine penalization, Fresnel and grind-in prism therapy).</td>
<td>8. Describe and recognize retinopathy of prematurity (e.g., stages, treatment indications).</td>
</tr>
</tbody>
</table>
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9. Describe and recognize typical features of retinoblastoma (e.g., differential diagnosis, evaluation, treatment indications and types).
10. Describe recognizable causes of blindness in infants (e.g., albinism, optic nerve hypoplasia, achromatopsia, Leber’s congenital amaurosis, retinal dystrophy, congenital optic atrophy).
11. Describe etiology, evaluation, and management of congenital infections (e.g., toxoplasmosis, rubella, cytomegalovirus, syphilis, herpes).
12. Describe and recognize the common causes of pediatric uveitis.

B. Technical/Surgical Skills

1. Assess more advanced ocular motility problems (e.g., bilateral or multiple cranial neuropathy, myasthenia gravis, thyroid eye disease).
2. Perform assessment of vision in more difficult strabismus patients (e.g., uncooperative child, mentally impaired, nonverbal or preverbal).
3. Perform basic extraocular muscle surgery:
   a) Exercise surgical judgement for the indications and contraindications for strabismus surgery.
   b) Perform preoperative assessment, intraoperative techniques, and describe intraoperative and postoperative complications of strabismus surgery.
   c) Perform the following strabismus surgeries:
      i) Recession.
      ii) Resection.
      iii) Muscle weakening (e.g., tenotomy) and strengthening (e.g., luck) procedures.
   d) Manage the complications of strabismus surgery (e.g., slipped muscle, anterior segment ischemia).

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Advanced Level Goals: PGY-3

A. Cognitive Skills

1. Describe clinical application of the most advanced sensory adaptations (e.g., anomalous head position, anomaous retinal correspondence).
2. Recognize and treat the most complex etiologies of esotropia (e.g., optical, prism-induced, postsurgical/consecutive).
3. Recognize and treat the most complex etiologies of exotropia (e.g., supranuclear, paralytic pontine exotropia, consecutive).
4. Recognize and treat (or refer for treatment) uncommon etiologies and types of pediatric cataract (e.g., congenital, traumatic, metabolic, inherited).
5. Recognize and appropriately evaluate the more complex hereditary ocular syndromes (e.g., bilateral Duane syndrome, Mobius syndrome).
6. Apply 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).
7. Recognize and treat complex pediatric eyelid disorders (e.g., congenital deformities, lid lacerations, lid tumors).
8. Recognize pediatric orbital diseases (e.g., orbital tumors, orbital fractures, rhabdomyosarcoma, severe congenital orbital malformations).

B. Technical/Surgical Skills

1. Perform the preoperative assessment, intraoperative techniques and describe postoperative complications for more complicated
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strabismus surgery (e.g., reoperations, slipped muscle).
1. Perform adjustable sutures in more complicated cases (e.g., thyroid ophthalmopathy).
2. Manage more complex complications of strabismus surgery (e.g., globe perforation, endophthalmitis, overcorrection).

Xl. Vitreoretinal Diseases:
Basic Level Goals: PGY-1
A. Cognitive Skills
1. Describe macular anatomy and function and describe typical features of common macular diseases (e.g., age-related macular degeneration, macular hole, macular dystrophies, macular pucker).
2. Describe fundamentals and demonstrate basic understanding of fluorescein angiography as applied to retinal vascular diseases (e.g., indications, phases of the angiogram).
3. Describe etiologies and mechanisms of retinal detachment.
4. Describe basic principles of laser photocoagulation.
5. Describe and recognize features of commotio retinae, traumatic choroidal rupture, and purtscher's retinopathy.
6. Describe common forms of retinal vascular diseases (e.g., branch, hemi- or central retinal vein and artery occlusion).
7. Describe typical features of retinitis pigmentosa.
8. Describe features of, recognize, and evaluate posterior vitreous detachments and retinal detachments.

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B. Technical/Surgical Skills
1. Perform direct ophthalmoscopy.
2. Perform indirect ophthalmoscopy
3. Perform slit lamp biomicroscopy with the Hruby, + 78, + 90 voll lenses, 3-mirror contact lens, or other contact lenses (e.g., Trans Equator).
4. Interpret basic fluorescein angiography in common retinal disorders (e.g., diabetic retinopathy, cystoid macular edema).

Standard Level Goals: PGY-2
A. Cognitive Goals: PGY-2
1. Describe 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).
2. Describe and recognize typical features of less common macular diseases (e.g., parafoveal telangiectasias, cone dystrophies, inherited macular dystrophies, fundus flavimaculatus, toxic maculopathies).
3. Describe 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).
<table>
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<th>Residency Program</th>
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<tr>
<td>g) Central Vein Occlusion Study (CVOS).</td>
<td>e) Macular pucker (e.g., epiretinal membrane</td>
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<td>h) United Kingdom Prospective Diabetes Study (UKPDS).</td>
<td>f) Macular holes.</td>
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<td>i) Age-Related Eye Disease Study (AREDS).</td>
<td>g) Cystoid macular edema.</td>
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<tr>
<td>j) Treatment of Age-Related Macular Degeneration with Photodynamic Therapy Study (TAP).</td>
<td>h) Central serous choroidopathy (retinopathy)</td>
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<tr>
<td>k) Treatment of Age-Related Macular Degeneration with Photodynamic Therapy Study (TAP).</td>
<td>i) Optic pit and secondary serous detachment.</td>
</tr>
<tr>
<td>4. Describe the fundamentals of, evaluate, and treat peripheral retinal diseases and vitreous pathology (e.g., vitreous hemorrhage, retinal breaks).</td>
<td>j) Retinal pigment epithelial detachment.</td>
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<tr>
<td>5. Describe choroidal detachments, uveal effusion syndrome.</td>
<td>10. Describe the fundamentals of retinal electrophysiology</td>
</tr>
<tr>
<td>6. Identify and evaluate retinoschisis (e.g., juvenile, senile).</td>
<td>11. Describe, recognize, and evaluate hereditary retinal and choroidal diseases (e.g., gyrate atrophy, choroideremia, retinitis pigmentosa, cone dystrophies, Stargardt's disease, Best's disease, congenital stationary night blindness).</td>
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<tr>
<td>7. Diagnose, treat, and recognize the complications of retinopathy of prematurity (e.g., retinal detachment).</td>
<td>12. Recognize, evaluate, and treat (or refer) retinal and choroidal toxicity (e.g., phenothiazine, hydroxychloroquine/chloroquine toxicity, tamoxifen).</td>
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<tr>
<td>8. Diagnose, evaluate, and treat the following retinal vascular diseases:</td>
<td>13. Describe the techniques for retinal detachment repair (e.g., pneumatic retinopexy, scleral buckling, vitrectomy).</td>
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<tr>
<td>a) Arterial and venous obstructions.</td>
<td>14. Describe the basics of surgical vitrectomy (e.g., indications, mechanics, instruments, and technique).</td>
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<tr>
<td>b) Hypertensive retinopathy.</td>
<td>15. Describe the indications for and perform basic laser treatment for diabetic retinopathy (e.g., panretinal photocoagulation, macular grid).</td>
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<td>c) Peripheral retinal vascular occlusive disease.</td>
<td>16. Describe the fundamentals of special vitreoretinal techniques:</td>
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<tr>
<td>d) Acquired retinal vascular diseases.</td>
<td>a) Macular hole repair.</td>
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<td>e) Ocular ischemic syndrome.</td>
<td>b) Epiretinal membrane peeling.</td>
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<tr>
<td>f) Sickle cell retinopathy</td>
<td>c) Complex vitrectomy for proliferative vitreoretinopathy.</td>
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<tr>
<td>g) Retinal pigment epithelial detachment.</td>
<td>d) Use of heavy liquids and intraocular gases (e.g., perfluorocarbons).</td>
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<tr>
<td>a) Age-related macular degeneration (ARMD).</td>
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<td>b) Choroidal neovascularization (e.g., ARMD, histoplasmosis).</td>
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<td>c) High myopia.</td>
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<tr>
<td>d) Macular dystrophies.</td>
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</table>
B. Technical/Surgical Skills

1. Perform indirect ophthalmoscopy with scleral indentation.
2. Perform ophthalmoscopic examination with contact lenses, including panfundusscopic lenses.
3. Interpret fluorescein and ICG angiography.
4. Describe the indications for and interpret retinal imaging technology (e.g., optical coherence tomography, retinal thickness analysis).
5. Perform posterior segment photocoagulation.
7. Perform peripheral scatter photocoagulation (panretinal)
8. Describe the indications for and interpret basic electro-physiological tests (e.g., electoretinogram [ERG], electrooculogram [EOG], visual evoked potential [VEP], dark adaptation).
9. Interpret basic ocular imaging techniques (e.g., B-scan echography, nerve fiber layer analysis).
10. Perform fundus drawings of the retina, showing complex vitreoretinal relationships and findings.
11. Perform scleral buckling.
12. Describe indications, techniques, and complications of pars plana vitrectomy and assist in a retinal surgery or perform the procedure under supervision.

Advanced Level Goals: PGY-3

A. Cognitive Skills

1. Evaluate, treat or refer the most complex macular disease (e.g., subfoveal or recurrent neovascular membranes).

2. Describe the indications for laser photocoagulation, including photodynamic therapy for the most complex retinal pathology (e.g., subfoveal neovascular membranes).
3. Describe the findings of the major studies in retinal diseases and describe the indications and exceptions for application to individual patients:
   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) Treatment of Age-related Macular Degeneration with Photodynamic Therapy (TAP; VIP).
4. Evaluate and treat complications of retinal photocoagulation (e.g., vitreous hemorrhage, chorioretinal anastomoses)
5. Evaluate and treat, or refer the most complex forms of retinal vascular diseases:
   a) Combined arterial and venous obstructions.
   b) Advanced diabetic retinopathy.
   c) Advanced hypertensive retinopathy.
   d) Peripheral retinal vascular occlusive disease.
   e) Acquired retinal vascular diseases.
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6. Apply in clinical practice the more complex principles of surgical management of diabetic retinopathy (e.g., vitrectomy, membrane release).

7. Apply in clinical practice complex vitreoretinal techniques:
   a) Macular hole repair.
   b) Epiretinal membrane peeling.
   c) Complex vitrectomy for proliferative vitreoretinopathy.
   d) Use of heavy liquids.

8. Evaluate, treat or refer the etiologically more complex or uncommon cases of posterior uveitis (e.g., sympathetic ophthalmia) and endophthalmitis (e.g., endogenous).

### B. Technical/Surgical Skills

1. Perform indirect ophthalmoscopy with scleral indentation in complex retinal cases (e.g., multiple holes, documented with detailed retinal drawing).

2. Perform ophthalmoscopic examination with panfundusscopic or other lenses in complex retinal conditions (e.g., giant retinal tears, proliferative vitreoretinopathy).

3. Interpret and apply in clinical practice the results of fluorescein and ICG angiography and optical coherence tomography (OCT) in complex retinal or choroidal pathology (e.g., occult subretinal neovascular membrane).

4. Repeat peripheral scatter photocoagulation (panretinal).

5. Interpret and apply in clinical practice electrophysiology (e.g., ERG, EOG, VEP, dark adaptation) in more complicated retinal pathology.

6. Interpret and apply in clinical practice ocular imaging techniques (e.g., B-scan echography) in more complex cases (e.g., choroidal osteoma).

7. Perform detailed fundus drawings of the retina with vitreoretinal relationships in the most complex retinal cases (e.g., recurrent retinal detachment, retinoschisis with and without retinal detachment).

### XII. Uveal Disease:

**Basic Level Goals: PGY-1**

#### A. Cognitive Skills

1. Describe basic principles of history taking and examination of patients with uveitis, and related diseases (e.g., scleritis, pemphigus).

2. List signs and symptoms of anterior, intermediate & posterior uveitis (e.g., red eye, blurred vision, anterior segment cell and flare, vitreous opacities, pars planitis, retinal or choroidal infiltrates).

3. Describe the different types of uveitis (e.g., acute and chronic uveitis, granulomatous and non-granulomatous uveitis, anterior, intermediate, and posterior uveitis).

4. Describe typical features and differential diagnosis of anterior uveitis, including infectious (e.g., bacterial, viral, protozoal, parasitic), inflammatory (e.g., sarcoid, HLA-B27-associated, Behcet's disease, collagen vascular disease), neoplastic (masquerade syndromes), postsurgical, post-traumatic, Fuchs' heterochromic uveitis, juvenile rheumatoid arthritis.

5. Describe typical features and differential diagnosis of the following intermediate & posterior tuberculosis.
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a) Toxoplasmosis  
b) Sarcoidosis.  
c) Pars planitis.  
d) Acute retinal necrosis.  
e) Vogt-Koyanagi-Harada syndrome.  
f) Large cell lymphoma.  
g) Postoperative uveitis.  
h) Endophthalmitis (e.g., postoperative, traumatic, endogenous, fungal, phacoanaphylactic, sympathetic ophthalmia).  
i) Unusual infectious etiologies for uveitis (e.g., human immunodeficiency virus, herpes simplex virus, herpes zoster virus, pneumocystis carinii, Lyme disease).  
j) Acquired and congenital ocular syphilis.  
k) Cytomegalovirus retinitis.  
l) Multiple sclerosis.  

B. Technical/Surgical Skills

1. Perform an examination of the anterior and posterior segment for uveitis (e.g., slit lamp biomicroscopy, scleral depression, magnified posterior segment exam, vitreous evaluation for cells, retinal, choroidal, and pars plana evaluations).  

2. Describe indications for ancillary testing in the evaluation of uveitis (e.g., fluorescein angiography, ultrasound, laboratory testing, radiologic testing).

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Standard Level Goals: PGY-2

A. Cognitive Skills

1. Describe more advanced principles of history taking and examination of patients with uveitis (e.g., review of systems for Wegener's granulomatosis, polyarteritis nodosa, lupus erythematosus, rheumatoid arthritis, inflammatory bowel disease, systemic necrotizing vasculitis; evaluation of skin, cardiac, respiratory, renal, pulmonary, musculoskeletal systems).

2. List less common signs and symptoms of anterior and posterior uveitis.

3. List differentiating signs of less common forms of uveitis (e.g., iris nodules, conjunctival ulcer or granuloma).

4. Describe the differential diagnosis of less common forms of uveitis (e.g., chronic uveitis, intermediate uveitis [e.g., pars planitis], and infectious [e.g., Whipple disease, syphilis] or inflammatory posterior uveitis; masquerade syndromes, including large cell lymphoma).

5. Evaluate and treat common causes of anterior and posterior uveitis.

B. Technical/Surgical Skills

1. Perform a directed examination of the anterior and posterior segments for uveitis (e.g., slit lamp biomicroscopy, scleral depression, magnified posterior segment exam, vitreous evaluation for cells).

2. Perform ancillary testing in the evaluation of uveitis (e.g., fluorescein angiography, ultrasound, laboratory testing, radiologic testing).
Advanced Level Goals: PGY-3
A. Cognitive Skills
1. Recognize, evaluate and treat uveitis associated with immuno-suppressed individuals (e.g., active and recovered acquired immune deficiency syndrome, pharmacologic immuno-suppression).
2. Recognize, evaluate, and treat acquired and congenital ocular syphilis.
3. Recognize, evaluate, and treat (or refer) less common, rare, or tropical conditions associated with uveitis (e.g., Leishmaniasis).
4. Describe indications and contraindications for corticosteroid treatment of uveitis (e.g., topical, local, systemic), including risks and benefits of therapy.
5. Describe indications and contraindications for immununo-suppressive therapy in uveitis, use of antimetabolites, cyclosporine, alkylating agents.

B. Technical/Surgical Skills
1. Administer steroids in the treatment of uveitis by various routes.
2. Administer immunosuppressive agents in uveitis (or refer for administration).
3. Evaluate and treat the complications of uveitis therapy (e.g., cataract, glaucoma).
4. Biopsy, when indicated, the vitreous or uveal tract.

XIII. Ocular Oncology:
Basic Level Goals: PGY-1
A. Cognitive Skills
1. Describe the basic categorization of common extraocular and intraocular tumors.

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2. Describe the differential diagnosis, epidemiology, evaluation, and management of leukocoria (e.g., inflammatory, infectious, neoplastic, congenital, persistent fetal vasculature, cataract, Coats' disease, vitreous hemorrhage, retinal detachment).
3. Describe major diagnostic features of major intraocular tumor types (e.g., retinoblastoma, choroidal melanoma, metastatic lesions) and describe the differentiating features of similar lesions.

B. Technical/Surgical Skills
1. Perform slit lamp, ophthalmoscopic and ocular transillumination examination of patients with intraocular tumors (e.g., choroidal melanoma).
2. Recognize an ocular tumor and refer appropriately.

Standard Level Goals: PGY-2
A. Cognitive Skills
1. Describe management options for different intraocular tumors.
2. Describe the findings of the Collaborative Ocular Melanoma Study (COMS).
4. Describe basic histopathology of intraocular tumors.
5. List the differential diagnoses for tumors of the iris, ciliary body, choroid, retina and optic disc (e.g., melanoma, retinoblastoma, hemangioma, melanocytoma).
6. Describe diagnostic techniques for common intraocular tumors (e.g., physical examination, imaging, laboratory, oncology referral).
7. Describe the prognostic significance of different types of ocular tumors and be able to guide evaluation for systemic involvement.

B. Technical/Surgical Skills
1. Perform indirect ophthalmoscopy in the diagnosis and localization of intraocular tumors.
2. Perform transillumination for intraocular tumor.
3. Describe indications for an examination under anesthesia for pediatric intraocular tumors.
4. Describe indications for fluorescein angiography of intraocular tumors.
5. Indications for laser photocoagulation for intraocular tumors.
6. Describe indications for and techniques of transpupillary thermal therapy for intraocular tumors.
7. Therapeutic procedures and their complications, and for referral, if necessary, for:
   a) Plaque or other radiotherapy.
   b) Iridectomy and iridocyclotherapy.
   c) Resection of conjunctival tumors.
8. Perform an enucleation.
9. Discuss various treatment options with patients and their families in a detailed, ethical, and compassionate manner.

Advanced Level Goals: PGY-3
A. Cognitive Skills
1. Describe management options for unusual intraocular tumors (e.g., choroidal metastasis, choroidal osteoma).
2. Apply the findings of the Collaborative Ocular Melanoma Study (COMS).

XIV. Low Vision Rehabilitation:
Basic Level Goals: PGY-1
A. Cognitive Skills
1. Describe low vision assessment techniques (e.g., Early Treatment of Diabetic Retinopathy Study charts, Sloane charts).
2. Describe significant co-morbidities that impact low vision rehabilitation.
3. Describe various low vision aids.
4. Describe the optics of low vision devices.
5. Be sensitive to psychological and emotional aspects of visual impairment.
6. Describe challenges commonly encountered by individuals with visual impairments.
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7. Prescribe simple but appropriate rehabilitative therapies and optical devices to help the patient meet their goals. (e.g., magnification, illumination).
8. Describe functional implications of various visual system pathologies and diseases.
9. Describe visual field enhancing techniques for hemianopic field loss.
10. Describe the difference between visual acuity testing at both distance and near and contrast sensitivity testing.
11. Describe the evaluation of and rationale for licensing automobile drivers who are visually impaired; understand the local licensing regulations.
12. Describe evaluation of visual acuity and visual field for determination of disability.

Standard Level Goals: PGY-2

A. Cognitive Skills
   1. Recognize significant co-morbidities that impact low vision rehabilitation.
   2. Recognize and describe clinical applications, indications, and limitations of the various low vision aids (e.g., closed circuit television, magnification, large print, Braille, com-puters with artificial speech).
   3. Describe the more advanced optics of low vision devices.

B. Technical/Surgical Skills
   1. Prescribe more complex rehabilitative therapies and optical devices to help the patient meet their goals.
   2. Apply and prescribe visual field enhancing techniques for hemianopic field loss.

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3. Perform evaluation of vision assessment in licensing drivers who are visually impaired.
4. Evaluate visual acuity and visual field for determination of disability (for legal and insurance purposes).
5. Demonstrate low vision devices and educate low vision patients on the uses and limitations of these devices.

Advanced Level Goals: PGY-3

A. Cognitive Skills
   1. Treat significant co-morbidities that impact low vision rehabilitation.
   2. Describe indications for the most complex low vision aids.
   3. Apply more complex principles of optics of low vision devices.

B. Technical/Surgical Skills
   1. Prescribe the most complex rehabilitative therapies and optical devices to help the patient meet their goals.
   2. Apply and prescribe the most complex visual field enhancing techniques for hemianopic field loss.

XV. Ocular Emergencies & Ocular Trauma

Basic Level Goals: PGY-1

A. Cognitive skills

Ocular emergency:

Urgent Situations:

Therapy should be instituted within one to several hrs-

1. Endophthalmitis
2. Penetrating injury to globe, IOFB
3. Lid Laceration
4. Hyphema
5. Gonococcal conjunctivitis
6. Acute Narrow Angle Glaucoma
7. Pupillary Block Glaucoma
8. Acute ant. Uveitis
9. Orbital cellulitis
10. Corneal Ulcer.
11. Corneal foreign body
12. Corneal abrasion
13. Descemetocele
14. Cavernous sinus thrombosis
15. AION with Giant cell arteritis
16. Acute Vitreous hemorrhage
17. Acute Retinal Detachment
18. Acute Retinal Tear with hemorrhage.

B. Technical/Surgical Skills:
Ocular emergency:
1. Proper history taking
2. Identification of problem and prompt attention of different types of ocular emergencies.
3. Proper investigations and comprehensive ocular examination.
4. Reduction of vision should be thoroughly evaluated.
5. Minimize patients discomfort
6. Use instruments appropriately
7. Ocular Examinations-
   - Visual acuity
   - Refractive error
   - Slit Lamp bio-microscopy
   - Tonometry
   - Pupil & Rapd
8. Systemic evaluation-BP, DR. Br. Asthma

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Standard Level Goals: PGY-2
A. Cognitive skills

True Emergencies
Therapy should be instituted within minutes:
1. Chemical burn of the cornea.
2. Central retinal arterial occlusion

B. Technical/Surgical Skills
1. Fundoscopy by Valk Lens
2. Direct & indirect Ophthalmoscopy
3. Gonioscopy
4. X-ray orbit, PNS, Skull
5. CT-Skull & Orbit
6. MRI-Eye Ball & Brain
7. Ultrasound B-Scan of Eye Ball
8. Sperificial FB removal from eye
9. Lid Repair
10. Sclero-corneal injury repair

Advanced Level Goals: PGY-3
A. Cognitive skills

Semi Urgent situations
Therapy should be instituted within days to weeks:
1. Optic Neuritis
2. Ocular Tumour
3. Acute Exophthalmos
4. Blow-out fracture of the Orbit
5. Old R-D
6. Undiagnosed Ch. Simple Glaucoma
7. Strabimus or amblyopia in very young children

B. Technical/Surgical Skills
Investigations-
1. Visual Field test
2. Ultrasonogram B-Scan
3. OCT disc
Residency Program

4. X-Ray/CT orbit & skull
5. MRI-Eye ball or Brain
6. Temporal Artery Biopsy
7. Vitreous-tap/biopsy
8. Laboratory Invest
9. ECG, ECO
10. Carotid colour Doppler
11. Planning of management
12. Baseline evaluation
13. Grading of glaucomatous damage

Treatment
1. Prompt Medical management
2. When planning for Surgery
3. Surgical skill
4. Patient's instruction
5. Prognosis

XVI. Ophthalmic Practice and Ethics:

Basic Level goals: PGY-1
1. Describe the fundamentals and principles of medical ethics in ophthalmology (e.g., patient care decision-making, informed consent, competency issues, ethics of inter-collegial relations, risk management, privacy issues).
2. Describe the basics of ophthalmic practice management (e.g., contractual negotiations, hiring and supervising employees, financial management, working with associates, billing/collecting).
3. Describe the basics of the health care system and reimbursement, as appropriate to the local, regional, and national market of the trainee (e.g., third party payers, managed care, Medicare (USA), medical documentation, Medicaid (USA), private insurance, nationalized health care systems (UK, Canada, and others).

Residency Program

Standard Level Goals: PGY-2
1. Describe and apply more advanced principles of medical ethics (e.g., life and death patient care decision-making, ethics of optometric and non-physician relations, documentation requirements, insurance claims, and risk management).
2. Describe and apply more advanced aspects of practice management (e.g., business models, documentation requirements and coding, privacy requirements, dealing with patients or employees with disabilities).
3. Describe and apply more advanced aspects of health care reimbursement (e.g., physicians' role in managed care organizations, administrative role, third party reimbursement, capitated programs).

Standard Level Goals: PGY-3
1. Demonstrate proficiency in more advanced principles of medical ethics (e.g., informed consent in children, the mentally ill, disabled, or the demented patient; physician and industry relationships; acceptance and disclosure of gifts or consultation fees).
2. Utilize in clinical practice the principles of practice management (e.g., starting a practice, economics of starting a practice, licensing and credentialing applications).
3. Utilize in clinical practice more advanced aspects of health care reimbursement (e.g., denials of claims, hospital contracting, electronic billing).