1 Cataract and Anterior Segment (10%)

1.1 Basic Anatomical and Scientific Aspects
1.1.1 The Normal Lens
1.1.1.1 Anatomy

1.2 Assessment Techniques

1.2.1 History-Taking and Preoperative Examination of Ocular Structures
1.2.1.1 Take patient history
1.2.1.2 Examine ocular structures
1.2.1.3 Signs and symptoms
1.2.1.4 Indications for surgery
1.2.1.6 External examination
1.2.1.7 Slit-lamp examination
1.2.1.8 Fundus evaluation
1.2.1.9 Impact on visual functioning and quality of life

1.2.2 Measurement of Visual and Macular Function
1.2.2.1 Visual acuity testing
1.2.2.2 Test visual acuity
1.2.2.5 Visual field testing
1.2.2.6 Test visual field
1.2.2.7 Cataract's effect on visual acuity
1.2.2.8 Estimate cataract's effect on visual acuity
1.2.2.10 Measure visual (and macular) function
1.2.4.3 Evaluate glare disability: subjective and objective

1.3 Clinical Disease Conditions and Manifestations

1.3.1 Types of Cataract
1.3.1.1 Identify types of cataracts

1.3.2 Anterior Segment Disorders
1.3.2.1 Diagnose anterior segment disorders
1.3.2.2 Cataract associated with uveitis
1.3.2.3 Diabetes mellitus and cataract formation
1.3.2.4 Lens-induced glaucoma
1.3.2.4.1 Lens particle
1.3.2.4.2 Phacolytic
1.3.2.4.3 Phacomorphic
1.3.2.5 Trauma and cataracts
   1.3.2.5.2 Manifestations of trauma
1.3.3 Selected Lens-Related Pathologies in Childhood
   1.3.3.1 Diagnose lens-related pathologies in childhood
   1.3.3.2 Congenital Anomalies and Abnormalities
      1.3.3.2.9 Congenital and infantile cataract
1.5 Laser and Incisional Cataract Surgery
   1.5.4 Complications of Cataract Surgery: Diagnosis, Prevention, Treatment
      1.5.4.2 Ciliary block glaucoma (malignant glaucoma, aqueous misdirection)
      1.5.4.3 Corneal complications
      1.5.4.4 Cystoid macular edema
      1.5.4.5 Endophthalmitis
      1.5.4.7 Hemorrhages (e.g., retrobulbar, suprachoroidal)
      1.5.4.18 Recognize postoperative complications
      1.5.4.19 Retinal detachment
      1.5.4.28 Pupillary capture
      1.5.4.29 Prevent complications

2 Cornea and External Disease (12%)
2.1 Basic Anatomical and Scientific Aspects
   2.1.1 Anatomy
      2.1.1.1 Anatomy of the eye
      2.1.1.2 Biomechanics of the cornea
   2.1.2 Physiology and Biochemistry
      2.1.2.1 Cornea
      2.1.2.2 Conjunctiva
      2.1.2.3 Eyelids
      2.1.2.4 Physiology of the tear film
      2.1.2.5 Sclera
2.2 Assessment Techniques
   2.2.1 General Assessment Considerations
      2.2.1.1 Vision
      2.2.1.2 External examination
      2.2.1.3 Conduct external examination
      2.2.1.4 Slit-lamp biomicroscopy
2.2.1.5 Conduct slit-lamp biomicroscopy
2.2.1.6 Corneal pachymetry
2.2.1.7 Evaluate corneal thickness/pachymetry
2.2.1.8 Esthesiometry
2.2.1.9 Evaluate corneal sensation
2.2.1.10 Vital dye staining
2.2.1.11 Biometry
2.2.1.12 Gonioscopy
2.2.1.13 Evaluate tear film
2.2.2 Anterior Segment Imaging
   2.2.2.1 External and slit-lamp photography
   2.2.2.6 Identify indications for anterior segment imaging
   2.2.2.8 Identify and distinguish signs of inflammation
2.2.3 Corneal Topography
   2.2.3.1 Identify indications for corneal topography
   2.2.3.4 Keratometry
2.2.3.10 Identify contact lens therapeutic and cosmetic indications
2.3 Clinical Diseases/Condition and Manifestations
2.3.1 Pertinent Elements of Disease Diagnosis
   2.3.1.1 Etiology
   2.3.1.2 Epidemiology
   2.3.1.3 Elements of history
   2.3.1.4 Clinical features
   2.3.1.5 Diagnostic testing and evaluation
   2.3.1.6 Perform diagnostic testing (e.g., Schirmer test, tear-breakup time, gonioscopy, dye staining)
   2.3.1.7 Evaluate results of diagnostic tests (e.g., Schirmer test, tear-breakup time, gonioscopy, dye staining)
   2.3.1.8 Risk factors
   2.3.1.9 Differential diagnosis
2.3.2 Patient Management
   2.3.2.1 Medical therapy
   2.3.2.2 Identify common medical therapies (e.g., contact lenses, eye drops, punctal occlusion)
   2.3.2.3 Manage common medical therapies (e.g., contact lenses, eye drops, punctal occlusion)
   2.3.2.4 Surgical therapy
2.3.2.5 Identify indications for corneal surgical therapies
2.3.2.7 Disease-related complications
2.3.2.8 Identify disease-related complications
2.3.2.10 Patient instructions
2.3.3 Ocular Surface Disorders
2.3.3.1 Identify various types of ocular surface disorders
2.3.3.2 Manage various types of ocular surface disorders
2.3.3.3 Aqueous tear deficiency; Sjögren syndrome; Non-Sjögren syndrome
2.3.3.4 Conjunctivochalasis
2.3.3.5 Meibomian gland dysfunction, rosacea, and seborrheic blepharitis
2.3.3.6 Floppy eyelid syndrome
2.3.3.7 Hordeolum and chalazion
2.3.3.8 Trichiasis and distichiasis
2.3.3.9 Ocular surface problems related to contact lens wear
2.3.3.10 Keratopathy
   2.3.3.10.1 Exposure keratopathy
   2.3.3.10.2 Filamentary keratopathy
   2.3.3.10.3 Neurotrophic keratopathy
2.3.3.11 Recurrent erosion
2.3.3.12 Persistent corneal epithelial defect
2.3.4 Infectious Diseases
2.3.4.1 Identify infectious disease of the cornea, conjunctiva, and sclera
2.3.4.2 Manage infectious diseases of the cornea, conjunctiva, and sclera
2.3.4.3 Conjunctivitis
   2.3.4.3.1 Acute conjunctivitis
   2.3.4.3.2 Chronic conjunctivitis
2.3.4.4 Herpes simplex virus
   2.3.4.4.1 Herpes simplex virus blepharitis, conjunctivitis, and blepharoconjunctivitis
   2.3.4.4.2 Herpes simplex virus epithelial keratitis
   2.3.4.4.3 Herpes simplex virus stromal keratitis and endotheliitis
2.3.4.5 Varicella zoster virus
   2.3.4.5.1 Varicella zoster virus dermatoblepharitis and conjunctivitis
   2.3.4.5.2 Varicella zoster virus epithelial keratitis
   2.3.4.5.3 Varicella zoster virus stromal keratitis
2.3.4.6 Adenovirus conjunctivitis and keratoconjunctivitis
2.3.4.7 Staphylococcal blepharitis
2.3.4.8 Chronic blepharitis
2.3.4.9 Bacterial conjunctivitis
   2.3.4.9.1 In children and adults
   2.3.4.9.2 In neonates
2.3.4.10 Adult chlamydial keratoconjunctivitis
2.3.4.11 Keratitis
   2.3.4.11.1 Bacterial keratitis
   2.3.4.11.2 Fungal keratitis
   2.3.4.11.3 Acanthamoeba keratitis
2.3.4.12 Microbial scleritis and sclerokeratitis
2.3.5 Immune-Mediated Disorders
   2.3.5.1 Identify immune-mediated disorders of the cornea, conjunctiva, and sclera
   2.3.5.2 Manage immune-mediated disorders of the cornea, conjunctiva, and sclera
   2.3.5.3 Conjunctival inflammation with scarring
   2.3.5.4 Allergic conjunctivitis
   2.3.5.5 Keratoconjunctivitis
      2.3.5.5.1 Vernal keratoconjunctivitis
      2.3.5.5.2 Atopic keratoconjunctivitis
   2.3.5.6 Contact lens-induced conjunctivitis
   2.3.5.7 Stevens-Johnson syndrome
   2.3.5.8 Ocular mucous membrane pemphigoid
   2.3.5.9 Keratitis
      2.3.5.9.2 Non-ulcerative Keratitis
      2.3.5.9.3 Ulcerative Keratitis
      2.3.5.9.4 Peripheral ulcerative keratitis associated with systemic immune-mediated diseases
      2.3.5.9.5 Peripheral ulcerative keratitis without associated systemic immune-mediated diseases
      (Mooren ulcer)
   2.3.5.10 Marginal corneal infiltrates associated with blepharoconjunctivitis
   2.3.5.11 Episcleritis
   2.3.5.12 Scleritis
2.3.6 Neoplastic Disorders
   2.3.6.1 Identify neoplastic disorders
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2.3.6.4 Ocular surface squamous neoplasia
2.3.6.5 Sebaceous gland carcinoma of the eyelid margin and conjunctiva
2.3.6.6 Primary acquired melanosis of the conjunctiva
2.3.6.7 Melanoma of the conjunctiva
2.3.7 Corneal Dystrophies
  2.3.7.1 Identify corneal dystrophies
  2.3.7.2 Manage corneal dystrophies
  2.3.7.3 Corneal epithelial basement membrane dystrophy/degeneration
  2.3.7.8 Fuchs endothelial dystrophy
  2.3.7.10 Keratoconus
  2.3.7.11 Pellucid marginal corneal degeneration
2.3.8 Degenerative Disorders
  2.3.8.1 Identify degenerative disorders
  2.3.8.2 Manage degenerative disorders
  2.3.8.3 Degenerative and aging processes
  2.3.8.4 Pterygium
  2.3.8.5 Salzmann nodular degeneration
  2.3.8.6 Band keratopathy
  2.3.8.8 Postinflammatory, post-traumatic, and postsurgical corneal opacity
  2.3.8.10 Pingueculum
2.4 Toxic and Traumatic Injuries
  2.4.1 Cornea and Conjunctiva
    2.4.1.1 Identify acute toxic and traumatic injuries to the cornea and conjunctiva
    2.4.1.2 Manage acute toxic and traumatic injuries to the cornea and conjunctiva
  2.4.2 Chemical (alkali and acid) injury
    2.4.2.1 Injury of the conjunctiva
    2.4.2.2 Injury of the cornea
  2.4.3 Toxic medication injury
    2.4.3.1 Injury of the conjunctiva
    2.4.3.2 Injury of the cornea
  2.4.4 Subconjunctival hemorrhage
    2.4.4.1 Subconjunctival hemorrhage
  2.4.5 Laceration
    2.4.5.1 Conjunctival laceration
2.4.5.2 Corneal laceration
2.4.5.3 Corneoscleral laceration
2.4.6 Foreign body
  2.4.6.1 Conjunctival foreign body
  2.4.6.2 Corneal foreign body
  2.4.6.3 Remove corneal or conjunctival foreign body
2.4.7 Traumatic corneal abrasion
  2.4.7.1 Traumatic corneal abrasion
2.4.8 Corneal injuries
  2.4.8.1 Corneal perforation
  2.4.8.2 Corneal edema
  2.4.8.3 Postsurgical corneal edema
  2.4.8.4 Surgical injury of Descemet membrane and corneal endothelium
  2.4.8.5 Visual rehabilitation
  2.4.8.6 Tetanus propholaxyis post injury
2.5 Procedures for the Cornea and Ocular Surface
2.5.1 Basic concepts
  2.5.1.1 Indications/contraindications
  2.5.1.2 Pre-procedure evaluation
  2.5.1.3 Treatment alternatives
  2.5.1.5 Complications of the procedure
  2.5.1.6 Follow-up care
  2.5.1.7 Postoperative patient instructions
  2.5.1.8 Provide ongoing care to patients including identification of post-surgical complications
  2.5.1.10 Universal precautions
  2.5.1.11 Take universal precautions
2.5.2 Principles
  2.5.2.1 Punctal occlusion
  2.5.2.2 Perform punctal occlusion
  2.5.2.3 Tarsorrhaphy
  2.5.2.4 Perform tarsorrhaphy
  2.5.2.9 Corneal epithelial debridement
  2.5.2.15 Repair of corneal laceration and suture closure of corneal wound
  2.5.2.16 Perform repair of corneal laceration and suture closure of corneal wound
2.5.2.17 Descemetocele and corneal perforation by bandage contact lens
2.5.2.18 Treat descemetocele and corneal perforation by bandage contact lens
2.5.2.23 Keratoplasty techniques
2.5.2.24 Allograft rejection
2.5.2.25 Identify allograft rejection

2.6 Clinical Trials
2.6.1 Specific cornea Trials
2.6.1.1 HEDS trial

3 Glaucoma (14%)
3.1 Basic Anatomical and Scientific Aspects
3.1.1 Intraocular Pressure and Aqueous Humor Dynamics
3.1.1.4 Intraocular pressure
3.1.2 Anatomical Structures
3.1.2.1 Optic nerve
3.1.2.2 Retinal nerve fiber layer
3.1.2.3 Cornea
3.1.2.4 Anterior chamber
3.1.2.5 Angle
3.2 Assessment Techniques
3.2.1 Examination Aspects and Considerations
3.2.1.1 Indications and contraindications
3.2.1.2 Limitations
3.2.1.3 Preprocedural evaluation
3.2.1.7 Patient instructions
3.2.1.8 Follow-up care
3.2.2 Examination of the Optic Nerve
3.2.2.1 Optic nerve exam by slit-lamp biomicroscopy
3.2.2.4 Examine the optic nerve
3.2.4 Examination of the Angle
3.2.4.1 Gonioscopy
3.2.4.4 Examine the angle
3.2.6 Examination of Functional Status/Visual Field
3.2.6.1 Standard automated static perimetry
3.2.7 Assessment of Intraocular Pressure and Aqueous Humor Dynamics
3.2.7.2 Intraocular pressure measurement: tonometry
3.2.7.3 Assess intraocular pressure
3.2.7.4 Assess patient impact (e.g., reading, driving, television viewing, other ADL's)

3.3 Clinical Management
3.3.1 Disease Diagnosis and Subsequent Patient Management
   3.3.1.1 Risk factors
   3.3.1.5 Establish the diagnosis
   3.3.1.6 Establish initial treatment

3.3.2 Open-Angle Glaucomas
   3.3.2.1 Primary open-angle glaucoma
   3.3.2.2 Primary open-angle glaucoma suspect
   3.3.2.3 Normal-tension glaucoma
   3.3.2.4 Pigmentary glaucoma
   3.3.2.5 Pseudoexfoliation (exfoliation syndrome)
   3.3.2.7 Corticosteroid-induced Glaucoma (steroid glaucoma)

3.3.3 Angle-Closure Glaucoma
   3.3.3.1 Acute primary angle-closure glaucoma
   3.3.3.3 Chronic angle-closure glaucoma
   3.3.3.7 Aqueous misdirection (Malignant Glaucoma, Ciliary Block Glaucoma)

3.3.4 Congenital/Developmental Glaucomas
   3.3.4.1 Primary congenital or infantile glaucoma

3.3.5 Other Glaucomas (and Related Conditions)
   3.3.5.3 Hyphema
   3.3.5.4 Lens-induced glaucoma
   3.3.5.5 Neovascular glaucoma

3.4 Medical Therapies For Glaucoma
3.4.1 Considerations in Using Particular Drug Classes
   3.4.1.1 Agents
   3.4.1.2 Indications and contraindications/precautions
   3.4.1.3 Decide on the appropriate medical therapy
   3.4.1.4 Conduct pre-therapy evaluation
   3.4.1.5 Consideration of alternatives to a particular therapy
   3.4.1.6 Method of action
   3.4.1.7 Dosing technique
3.4.1.8 Complications of the ocular therapy
3.4.1.9 Prevent complications
3.4.1.11 Follow-up care
3.4.1.13 Patient instructions
3.4.2 Medication Classes
3.4.2.1 α-adrenergic agonists
3.4.2.2 β-adrenergic antagonists
3.4.2.3 Carbonic anhydrase inhibitors
3.4.2.6 Prostaglandin analogues (hypotensive lipids)

3.5 Laser And Incisional Surgeries For Glaucoma
3.5.1 General Principles
3.5.1.9 Decide on urgency of surgical intervention, considering IOP/optic nerve cupping/patient discomfort

3.6 Laser Surgeries For Glaucoma
3.6.2 Laser Iridotomy for Angle Closure
3.6.2.1 Indications, alternatives, and contraindications
3.6.2.2 Slit-lamp biomicroscopic evaluation of anterior chamber depth
3.6.2.3 Gonioscopy

3.7 Incisional Surgeries For Glaucoma
3.7.1 Incisional Filtering Surgery for Open-Angle Glaucoma
3.7.3 Aqueous Shunt Surgery (Glaucoma Drainage-Device Surgery)
3.7.3.1 Indications, alternatives, and contraindications
3.7.3.5 Other late tube/plate complications and their prevention/management
3.7.4 Incisional Surgery For Angle Closure
3.7.4.1 Indications, alternatives, and contraindications
3.7.4.4 Paracentesis

4 Neuro-Ophthalmology and Orbit (10%)
4.1 Basic Anatomical/Scientific Aspects
4.1.1 Anatomy
4.1.1.1 Anatomy of the visual sensory system
4.1.1.3 Bony anatomy (e.g., skull base, face, orbit)
4.1.1.4 Neuro-vascular anatomy
4.1.1.5 Efferent visual system (ocular motor pathways) (e.g., cortical input, brainstem, ocular motor cranial nerves, extraocular muscles)
4.1.6 Sensory and facial motor anatomy (e.g., trigeminal nerve [CNV], facial nerve [CNVII], eyelids)

4.1.7 Ocular autonomic pathways (e.g., sympathetic pathways, parasympathetic pathways)

4.2 Neuro-Ophthalmic Examination Assessment Techniques

4.2.2 Assessment of Visual Function

4.2.2.1 Assess visual function

4.2.2.2 Visual acuity

4.2.2.3 Assess visual acuity

4.2.2.6 Color vision

4.2.2.7 Assess color vision

4.2.2.8 Amsler grid

4.2.2.11 Visual field testing

4.2.2.12 Assess visual field (e.g., confrontation, Amsler grid)

4.2.2.16 Functional visual loss

4.2.2.18 Nerve fiber analysis (OCT/GDx/Heidelberg)

4.2.3 Technique of Pupillary Examinations

4.2.3.1 Perform pupillary examination

4.2.3.2 Size

4.2.3.3 Measure pupil size

4.2.3.4 Shape

4.2.3.5 Assess pupil shape

4.2.3.6 Response

4.2.3.7 Assess light and near response

4.2.3.8 Detect relative afferent pupillary defect

4.2.4 Ocular Motility

4.2.4.11 Alignment (e.g., cover-uncover; alternate cover, Maddox rod)

4.2.5 Eyelids

4.2.5.1 Identify eyelid abnormalities

4.2.5.2 Assess position and function

4.2.5.3 Ptosis

4.2.5.4 Lid retraction

4.2.5.6 Blepharospasm

4.2.5.7 Signs of aberrant regeneration, orbital bruit

4.2.6 Orbital and Periocular Abnormalities

4.2.6.1 Proptosis
4.2.6.4 Identify orbital and periocular abnormalities
4.2.6.6 Assess globe position
4.2.6.7 Perform slit-lamp examination
4.2.6.8 Measure intraocular pressure
4.2.6.9 Perform funduscopy
4.2.6.10 Examine the optic nerve
4.2.6.11 Assess cranial nerves

4.2.7 Cranial Nerve abnormalities
4.2.7.1 Cranial nerve III
4.2.7.2 Cranial nerve IV
4.2.7.3 Trigeminal function (Cranial Nerve V)
4.2.7.4 Assess trigeminal function
4.2.7.5 Cranial Nerve VI
4.2.7.6 Cranial Nerve VII

4.3 Diagnostic Tests
4.3.1 Automated Static Perimetry
4.3.1.1 Indications
4.3.1.2 Alternatives to the procedure
4.3.1.3 Instrumentation and technique
4.3.1.4 Considerations in interpretation of the procedure
4.3.2 Kinetic Perimetry
4.3.2.1 Indications
4.3.2.2 Alternatives to the procedure
4.3.2.4 Considerations in interpretation of this diagnostic procedure
4.3.3 Computed Tomography
4.3.3.1 Indications/ contraindications
4.3.3.2 Pre-procedure evaluation
4.3.3.3 Alternatives to the procedure
4.3.3.4 Image orientation and use of contrast
4.3.3.5 Complications of procedure
4.3.3.6 Interpretation of the clinically-relevant imaging abnormalities
4.3.4 Magnetic Resonance Imaging (MRI)
4.3.4.1 Indications/ contraindications
4.3.4.2 Pre-procedure evaluation
4.3.4.3 Alternatives to the procedure
4.3.4.4 Imaging sequence and use of contrast
4.3.4.5 Complications of procedure
4.3.4.6 Interpretation of the clinically-relevant imaging abnormalities

4.3.5 Other Diagnostic Tests
4.3.5.1 Nerve fiber analysis (OCT/GDx/Heidelberg)
4.3.5.4 Order and interpret diagnostic tests
4.3.5.5 Prevent complications from diagnostic tests
4.3.5.6 Manage complications from diagnostic tests
4.3.5.7 Identify alternative diagnostic tests

4.4 Clinical Diseases/Conditions and Manifestations
4.4.1 Elements of Disease Diagnosis
4.4.1.1 Diagnose neuro-ophthalmic and orbital diseases and manifestations
4.4.1.2 Etiology
4.4.1.3 Epidemiology
4.4.1.4 Elements of history
4.4.1.5 Clinical features
4.4.1.6 Diagnostic testing and evaluation
4.4.1.7 Evaluate diagnostic test results
4.4.1.8 Risk factors
4.4.1.9 Consider risk factors for the disease
4.4.1.10 Differential diagnosis

4.4.2 Patient Management
4.4.2.1 Manage patient disease including referrals as appropriate
4.4.2.2 Indications for medical therapy
4.4.2.3 Indications for surgical therapy
4.4.2.5 Patient instructions
4.4.2.6 Counsel patient on the disease

4.4.3 Headache
4.4.3.1 Primary headache syndromes (e.g., migraine, trigeminal autonomic cephalgia)
4.4.3.2 Secondary headache syndromes (e.g., giant cell arteritis)

4.4.4 Increased Intracranial Pressure/Papilledema
4.4.4.1 Idiopathic intracranial hypertension
4.4.4.2 Cerebral venous sinus disease
4.4.4.3 Intracranial mass
4.4.4.4 Hydrocephalus

4.4.5 Systemic Infections with Neuro-ophthalmic Manifestations
   4.4.5.1 Viral (e.g., herpes simplex, herpes Zoster)
   4.4.5.2 Fungal (e.g., aspergillosis, mucor)
   4.4.5.3 Bacterial (e.g., tuberculosis, Bartonella, spirochetes)

4.4.6 Optic Neuropathy
   4.4.6.1 Nonarteritic anterior ischemic optic neuropathy
   4.4.6.2 Arteritic anterior ischemic optic neuropathy
   4.4.6.3 Optic disc drusen
   4.4.6.4 Optic atrophy
   4.4.6.5 Demyelinating optic neuritis
   4.4.6.7 Atypical optic neuritis (e.g., neuroretinitis, sarcoid)
   4.4.6.8 Other optic neuropathies (e.g., toxic, nutritional, traumatic)

4.4.7 Chiasmal Disorders
   4.4.7.1 Compressive lesions (e.g., pituitary tumor, meningioma)
   4.4.7.2 Other etiologies (e.g., demyelination, glioma)

4.4.9 Motility
   4.4.9.1 Cranial nerve III lesion (e.g., status of pupil, aberrant regeneration)
   4.4.9.2 Cranial nerve IV lesions
   4.4.9.3 Restrictive strabismus

4.4.10 Vascular
   4.4.10.1 Thromboembolic phenomena
   4.4.10.2 Cerebrovascular disease/stroke
   4.4.10.3 Cerebral aneurysms
   4.4.10.4 Dissecting aneurysms
   4.4.10.5 Dural cavernous fistula and traumatic carotid cavernous fistula
   4.4.10.6 Ocular ischemic syndrome

4.4.11 Eyelid Disorders
   4.4.11.1 Benign essential blepharospasm
   4.4.11.2 Facial nerve paresis
   4.4.11.3 Hemifacial spasm
   4.4.11.4 Ptosis

4.4.12 Orbit
4.4.12.1 Idiopathic orbital inflammatory disease (nonspecific orbital inflammation)
4.4.12.2 Optic nerve tumor (e.g., meningioma, glioma)
4.4.12.3 Orbital fractures
4.4.12.4 Orbital hemorrhage
4.4.12.5 Orbital tumor

4.4.13 Pupils
   4.4.13.1 Pharmacologic mydriasis
   4.4.13.2 Horner syndrome
   4.4.13.3 Adie pupil
   4.4.13.4 Afferent pupillary defect
   4.4.13.5 Approach to anisocoria

4.4.14 Systemic Diseases in Neuro-ophthalmology
   4.4.14.1 Myasthenia gravis
   4.4.14.2 Multiple sclerosis
   4.4.14.3 Giant cell arteritis
   4.4.14.8 Thyroid eye disease

4.4.15 Miscellaneous
   4.4.15.1 Functional visual loss

4.5 Medical Therapy
   4.5.1 Systemic Corticosteroids in Neuro-Ophthalmology
      4.5.1.1 Take or delegate responsibility for medical therapy
      4.5.1.2 Effects of corticosteroids
      4.5.1.3 Neuro-ophthalmic indications for corticosteroids
         4.5.1.3.1 Giant cell arteritis
         4.5.1.3.4 Idiopathic orbital inflammatory disease
         4.5.1.3.5 Compressive optic neuropathies
         4.5.1.3.6 Thyroid orbitopathy
         4.5.1.3.8 Neoplastic disease (e.g., use in therapy, danger of masking neoplastic disease)
      4.5.1.4 Contraindications
      4.5.1.5 Alternatives to the therapy for systemic use
      4.5.1.6 Routes of administration indications and/or contraindications
      4.5.1.7 Complications of therapy
      4.5.1.9 Provide or delegate follow-up care
      4.5.1.10 Monitor for complications of disease and therapy
4.6 Surgical Therapy
  4.6.1 Orbital Surgery
    4.6.1.1 Provide plan for surgical therapy
    4.6.1.2 Obtain informed consent
    4.6.1.3 Manage or appropriately refer post-surgical care or complications
    4.6.1.4 Orbital decompression
    4.6.1.5 Orbital tumor
    4.6.1.7 Spectrum and sequence of surgeries for thyroid eye disease
  4.6.2 Temporal Artery Biopsy
    4.6.2.1 Indications and complications

4.7 Clinical Trials
  4.7.1 Clinical Trials
    4.7.1.1 Optic neuritis treatment trial (ONTT)
    4.7.1.2 Ischemic optic neuropathy decompression trial (IONDT)

5 Oculoplastics and Orbit (10%)

5.1 Anatomy and examination techniques: orbital, eyelid, lacrimal, facial
  5.1.1 Anatomy
    5.1.1.3 Topographic Relationships
    5.1.1.4 Apertures
    5.1.1.5 Soft tissues
    5.1.1.7 Identify orbital structures
    5.1.1.9 Examine the orbit
  5.1.2 Primary Studies
    5.1.2.1 Computed tomography
    5.1.2.2 Magnetic Resonance Imaging
    5.1.2.4 Evaluate results from computed tomography and other imaging technology
  5.1.4 Laboratory Studies
    5.1.4.1 Pathology
    5.1.4.3 Thyroid function studies
    5.1.4.5 Antineutrophil cytoplasmic antibodies
  5.2 Orbital disorders and surgery: neoplasm, infection, inflammation
    5.2.1 Basic Concepts in the Diagnosis of Orbital Disorders
    5.2.1.3 Elements of History
    5.2.1.4 Take patient history
5.2.1.9 Risk factors

5.2.2 Orbital Infections/Inflammatory Disorders

5.2.2.1 Preseptal cellulitis
5.2.2.2 Orbital cellulitis
5.2.2.3 Necrotizing fasciitis
5.2.2.5 Idiopathic orbital inflammation (orbital inflammatory syndrome, orbital pseudotumor)
5.2.2.6 Giant cell arteritis
5.2.2.7 Granulomatosis with polyangiitis (Wegener)
5.2.2.8 Ocular manifestations of AIDS
5.2.2.9 Zygomyces
5.2.2.12 Sarcoidosis

5.2.2.13 Diagnose various types of orbital infections and inflammatory disorders
5.2.2.14 Manage various types of orbital infections and inflammatory disorders

5.2.3 Orbital Neoplasms, Periorbital Cysts and Malformations

5.2.3.1 Vascular Tumors, Malformations, and Fistulas

5.2.3.1.1 Capillary hemangioma
5.2.3.1.2 Cavernous hemangioma
5.2.3.1.5 Dural cavernous fistula and traumatic carotid cavernous fistula
5.2.3.1.7 Spontaneous orbital hemorrhage

5.2.3.2 Cystic Tumors
5.2.3.2.1 Dermoid cysts

5.2.3.3 Neural Tumors

5.2.3.3.1 Optic nerve sheath meningioma
5.2.3.3.5 Neurofibromatosis 1

5.2.3.4 Mesenchymal Tumors
5.2.3.4.1 Rhabdomyosarcoma

5.2.3.5 Lymphoid Tumors
5.2.3.5.1 Lymphoid hyperplasia
5.2.3.5.2 Lymphoma

5.2.3.6 Lacrimal Gland Tumors
5.2.3.6.2 Adenoid cystic carcinoma of the lacrimal gland

5.2.3.9 Secondary Tumors
5.2.3.9.1 Globe
5.2.3.9.2 Eyelid
5.2.3.10 Metastatic Tumors
   5.2.3.10.1 Neuroblastoma
   5.2.3.10.2 Leukemia
   5.2.3.10.3 Breast
   5.2.3.10.4 Lung
   5.2.3.10.5 Prostate
5.2.4 Basic concepts in the Treatment of Orbital Disorders and Tumors
   5.2.4.9 Identify complications of surgery
5.2.7 Complications of Orbital Surgery
5.3 Thyroid Eye Disease/Orbitopathy
   5.3.1 Thyroid Eye Disease
      5.3.1.2 Proptosis
      5.3.1.4 Compressive optic neuropathy
      5.3.1.6 Exposure keratopathy
      5.3.1.7 Strabismus
      5.3.1.8 Upper eyelid retraction
      5.3.1.9 Diagnose upper eyelid retraction
5.4 Anophthalmic socket: enucleation, evisceration, exenteration
   5.4.1 Anophthalmic socket
      5.4.1.1 Enucleation
      5.4.1.3 Evisceration
5.5 Eyelid and orbital trauma
   5.5.1 Orbital Fractures
      5.5.1.3 Orbital Floor Fractures
      5.5.1.5 Identify injury to globe
      5.5.1.6 Evaluate penetrating and non-penetrating orbital soft tissue injuries (hematoma, foreign bodies, severed extraocular muscles, etc)
   5.5.2 Orbital Hemorrhage
   5.5.3 Orbital Foreign Bodies
   5.5.4 Eyelid Trauma
      5.5.4.1 Manage eyelid trauma
      5.5.4.2 Blunt trauma to the eyelids
      5.5.4.3 Penetrating trauma to the eyelids
      5.5.4.4 Burns
5.6 Eyelid malpositions and deformities

5.6.2 Basic concepts in the diagnosis of Periocular Malpositions and Involutional Changes

5.6.2.3 Elements of History
5.6.2.4 Take patient history
5.6.2.12 Diagnose periocular disorders
5.6.2.13 Diagnose periocular malpositions and involutional changes
5.6.2.19 Identify disease-related sequelae

5.6.3 Ectropion

5.6.3.1 Involutional Ectropion
5.6.3.2 Paralytic Ectropion
5.6.3.3 Cicatricial ectropion

5.6.4 Entropion

5.6.4.1 Involutional entropion
5.6.4.2 Cicatricial entropion
5.6.4.3 Trichiasis

5.6.5 Blepharoptosis

5.6.5.5 Aponeurotic ptosis
5.6.5.6 Oculomotor (cranial nerve III) palsy
5.6.5.7 Horner Syndrome
5.6.5.8 Myasthenia gravis with ptosis
5.6.5.10 Differentiate types of ptosis
5.6.7 Floppy Eyelid Syndrome
5.6.7.1 Floppy eyelid syndrome

5.7 Aesthetic and involutional eyelid and facial conditions and procedures

5.7.1 Involutional and gravitational changes of the face (diagnosis and management)

5.7.1.1 Identify age-related changes
5.7.1.12 Identify indications and contraindication of upper blepharoplasty (e.g. poor bell's, dry eye, incomplete blink, lasiks surgery, corneal hypesthesia, etc.)

5.8 Eyelid, canthal, facial reconstruction

5.8.1 Eyelid neoplasms, lesions, inflammation

5.8.1.4 Molluscum contagiosum
5.8.1.5 Xanthelasma
5.8.1.6 Sebaceous gland tumors
5.8.1.9 Basal cell carcinoma of the eyelid
5.8.1.10 Squamous cell carcinoma of the eyelid
5.8.1.11 Malignant melanoma of the eyelid
5.8.1.16 Hordeolum/Chalazion
5.8.1.17 Manage (medical and surgical) chalazion
5.8.1.18 Eyelid Edema
5.8.1.19 Treatment of Malignant Eyelid Tumors
5.8.1.20 Diagnose malignant eyelid tumors

5.9 Lacrimal outflow abnormalities and procedures
5.9.1 Disorders of the Nasolacrimal System
   5.9.1.1 Identify injury to lacrimal system (canalicular trauma)
   5.9.1.2 Evaluation of reflex tearing
   5.9.1.3 Evaluate reflex tearing
   5.9.1.4 Identify nasolacrimal system disorders
   5.9.1.13 Canaliculitis
   5.9.1.14 Dacryocystitis

5.10 Facial paralysis/dystonia
   5.10.1 Facial Paralysis
      5.10.1.1 Facial nerve palsy
   5.10.2 Dystonia
      5.10.2.3 Hemifacial spasm
      5.10.2.4 Diagnose hemifacial spasm

5.11 Miscellaneous oculoplastic procedures
   5.11.1 Tarsorrhaphy
   5.11.2 Temporal artery biopsy

6 Ophthalmic Pathology and Oncology (6%)
6.1 Trauma and Wound Care
   6.1.1 Wound repair
      6.1.1.1 General aspects
      6.1.1.2 Healing in specific ocular tissues
      6.1.1.3 Perform wound repair
      6.1.1.4 Identify complications
      6.1.1.5 Manage complications

6.2 Basic Anatomical/Scientific Aspects
   6.2.1 Specimen Handling
6.2.1.1 Communication
6.2.1.2 Biopsy and scraping techniques
6.2.1.3 Biopsy and scrape the conjunctiva and cornea
6.2.1.4 Orientation
6.2.1.5 Orient and submit specimens
6.2.1.11 Interpret pathology reports

6.2.2 Special Procedures
6.2.2.7 Culture techniques (e.g., different media, pathogens)
6.2.2.8 Laboratory testing (e.g., chemistry, hematology, molecular biology, immunologic testing, genetic testing)

6.2.3 Conjunctiva
6.2.3.1 Anatomy
6.2.3.2 Congenital anomalies
6.2.3.4 Degenerations
6.2.3.5 Neoplasia

6.2.4 Cornea
6.2.4.1 Anatomy
6.2.4.2 Corneal pathology
6.2.4.4 Inflammations
6.2.4.5 Degenerations
6.2.4.7 Neoplasia

6.2.5 Anterior Chamber and Trabecular Meshwork
6.2.5.1 Anatomy
6.2.5.3 Degenerations

6.2.6 Sclera
6.2.6.1 Anatomy
6.2.6.3 Inflammations

6.2.7 Lens
6.2.7.1 Anatomy
6.2.7.2 Congenital anomalies
6.2.7.3 Inflammations
6.2.7.4 Degenerations
6.2.7.5 Association with systemic disorders

6.2.8 Vitreous
6.2.8.1 Anatomy
6.2.8.3 Inflammations
6.2.8.4 Degenerations
6.2.8.5 Neoplasia

6.2.9 Retina and Retinal Pigment Epithelium
   6.2.9.1 Anatomy
   6.2.9.2 Congenital anomalies
   6.2.9.3 Inflammations
   6.2.9.4 Degenerations
   6.2.9.5 Dystrophies
   6.2.9.6 Neoplasia

6.2.10 Uveal Tract
   6.2.10.1 Anatomy
   6.2.10.3 Inflammations
   6.2.10.4 Degenerations
   6.2.10.6 Neoplasia
   6.2.10.7 Trauma

6.2.11 Eyelids
   6.2.11.1 Anatomy
   6.2.11.3 Inflammations
   6.2.11.4 Degenerations
   6.2.11.5 Neoplasia
   6.2.11.6 Cysts

6.2.12 Orbit
   6.2.12.1 Anatomy
   6.2.12.2 Congenital anomalies
   6.2.12.3 Inflammations
   6.2.12.5 Neoplasia

6.2.13 Optic Nerve
   6.2.13.1 Anatomy
   6.2.13.2 Congenital anomalies
   6.2.13.3 Inflammations
   6.2.13.4 Degenerations
   6.2.13.5 Neoplasia
MOC PORT/DOCK Practice Core Modules Content Outline

6.2.13.6 Identify anatomical structures
6.2.13.7 Identify congenital anomalies
6.2.13.8 Diagnose inflammations
6.2.13.9 Diagnose degenerations
6.2.13.10 Diagnose neoplasias

6.3 Intraocular Tumors
6.3.1 Basic Concepts
   6.3.1.1 Diagnostic evaluation
   6.3.1.3 Interpret-evaluate diagnostic test results
   6.3.1.4 Differential diagnosis
   6.3.1.6 Classify intraocular tumors
6.3.2 Melanocytic Tumors
   6.3.2.1 Iris nevus
   6.3.2.2 Nevus of the ciliary body or choroid
   6.3.2.4 Iris melanoma
   6.3.2.5 Melanoma of the ciliary body or choroid
6.3.3 Angiomatous Tumors
   6.3.3.1 Hemangiomas
6.3.4 Retinoblastoma
   6.3.4.2 Diagnostic evaluation
6.3.5 Ocular Involvement in Systemic Malignancies
   6.3.5.1 Secondary Tumors of the Eye
      6.3.5.1.1 Metastatic malignancies
      6.3.5.1.2 Direct intraocular extension
      6.3.5.1.3 Primary intraocular lymphoma
   6.3.5.2 Ocular manifestations of leukemia
6.4 Eyelid and Orbital Tumors
6.4.1 Epithelial Tumors
   6.4.1.1 Diagnostic evaluation
   6.4.1.2 Differential diagnosis
6.4.2 Lymphoid Tumors
   6.4.2.1 Diagnostic evaluation
   6.4.2.2 Differential diagnosis
6.4.3 Soft Tissue Tumors
6.4.3.1 Diagnostic evaluation
6.4.3.2 Differential diagnosis

6.4.4 Vascular Tumors
6.4.4.1 Diagnostic evaluation
6.4.4.2 Differential diagnosis

6.4.5 Neurogenic Tumors
6.4.5.2 Differential diagnosis

6.4.6 Cysts
6.4.6.1 Diagnostic evaluation
6.4.6.2 Differential diagnosis

7 Pediatric Ophthalmology and Strabismus (10%)
7.1 Assessment Techniques
7.1.1 Tests and Measurements
   7.1.1.1 Cover tests
   7.1.1.8 Test corneal light reflex
   7.1.1.11 Test red reflex
7.1.2 Forced Ductions
   7.1.2.1 Forced ductions
   7.1.2.2 Evaluate ductions and versions/positions of gaze
7.1.3 Refraction
   7.1.3.1 Cycloplegic refraction
   7.1.3.3 Test visual acuity

7.2 Diagnosis of Pediatric Ophthalmology Disorders
7.2.1 Management
   7.2.1.1 Non-surgical
   7.2.1.2 Surgical
   7.2.1.3 Complications
   7.2.1.4 Take patient history
   7.2.1.7 Monitor for disease-related complications
   7.2.1.8 Provide patient instructions

7.3 Genetics
7.3.1 Basic Concepts
   7.3.1.1 Mendelian inheritance
   7.3.1.3 Genetic counseling
7.4 Congenital-Genetic Disorders

7.4.1 Congenital Disorders

7.4.1.2 Congenital/infantile glaucoma
7.4.1.3 Congenital and acquired cataracts in children
7.4.1.7 Diagnose congenital/genetic disorders
7.4.1.8 Develop patient care plan
7.4.1.9 Identify need for genetic counseling

7.5 Visual Development and Associated Abnormalities

7.5.2 Role of ophthalmologist in learning disabilities

7.5.4 Functional Vision Loss

7.5.4.1 Diagnostic techniques

7.6 Infectious and Allergic Diseases

7.6.1 Ophthalmia Neonatorum

7.6.1.1 Caused by Neisseria
7.6.1.2 From Chlamydia trachomatis

7.6.2 Conjunctivitis

7.6.2.1 Bacterial conjunctivitis
7.6.2.2 Seasonal allergic conjunctivitis

7.6.3 Keratoconjunctivitis

7.6.3.1 Epidemic keratoconjunctivitis
7.6.3.2 Vernal keratoconjunctivitis

7.6.4 Herpes

7.6.4.1 Herpes zoster ophthalmicus
7.6.4.2 Herpes simplex complex

7.6.5 Cellulitis

7.6.5.1 Preseptal cellulitis
7.6.5.2 Orbital cellulitis

7.6.6 Congenital Infection Syndromes

7.6.6.1 TORCH infections
7.6.6.2 Diagnose infectious and allergic diseases
7.6.6.3 Treat infectious and allergic diseases

7.7 Ocular Manifestations of Systemic Diseases

7.7.1 Syndromes
7.7.1.5 Neurofibromatosis
7.7.1.9 Stevens-Johnson syndrome

7.7.2 Other
7.7.2.1 Diabetes mellitus
7.7.2.2 Leukemia
7.7.2.3 Idiopathic intracranial hypertension (pseudotumor cerebri)

7.8 Pediatric Uveitis
7.8.1 Anterior Uveitis
7.8.1.1 Juvenile idiopathic arthritis
7.8.1.2 Traumatic uveitis
7.8.1.3 Herpes simplex
7.8.1.4 Herpes zoster
7.8.1.5 Sympathetic ophthalmia
7.8.1.7 Lyme disease
7.8.1.8 Toxoplasmosis
7.8.1.9 Sarcoidosis

7.8.2 Posterior Uveitis
7.8.2.1 Toxoplasmosis
7.8.2.2 Ocular histoplasmosis
7.8.2.5 Sarcoidosis
7.8.2.6 Vogt-Koyanagi-Harada syndrome
7.8.2.7 Sympathetic ophthalmia
7.8.2.8 Herpes simplex

7.8.3 Intermediate Uveitis
7.8.3.1 Idiopathic (pars planitis)
7.8.3.2 Lyme disease
7.8.3.3 Sarcoid

7.8.5 Treatment of Uveitis
7.8.5.1 Corticosteroids
7.8.5.2 Mydriatic/cycloplegic agents
7.8.5.3 Systemic medications
7.8.5.4 Diagnose and localize sub-type of uveitis
7.8.5.5 Initiate workup for uveitis
7.8.5.6 Treat uveitis
7.8.5.7 Develop patient care plan

7.9 Vitreous and Retinal Disorders

7.9.1 Genetic Disorders

7.9.1.9 Rod and cone dystrophy

7.9.1.9.1 Retinitis pigmentosa

7.9.2 Other

7.9.2.3 Diagnose vitreous and retinal disorders

7.9.2.4 Arrange treatment of vitreous and retinal disorders

7.10 Eyelid-Lacrimal Disorders

7.10.1 Congenital Disorders

7.10.1.1 Congenital ptosis

7.10.2 Lacrimal Disorders

7.10.2.1 Nasolacrimal duct obstruction

7.10.2.2 Dacryocystitis

7.10.2.3 Interpret patient symptoms

7.10.2.4 Diagnose eyelid and lacrimal disorders

7.10.2.5 Develop patient care plan

7.10.2.6 Treat eyelid and lacrimal disorders

7.11 Optic Disc Disorders

7.11.1 Optic Nerve

7.11.1.1 Optic nerve hypoplasia

7.11.1.2 Optic atrophy

7.11.1.3 Optic nerve drusen

7.11.1.4 Peripapillary staphyloma

7.11.1.5 Optic neuritis

7.11.1.6 Optic nerve coloboma

7.11.1.7 Papilledema

7.11.1.8 Pseudopapilledema

7.11.1.10 Tilted disc syndrome

7.11.2 Other

7.11.2.1 Myelinated nerve fibers

7.11.2.2 Diagnose optic disc disorders

7.11.2.3 Develop patient care plan

7.12 Tumors and Orbital Disease
7.12.1 Tumors
   7.12.1.1 Rhabdomyosarcoma
   7.12.1.2 Neuroblastoma
   7.12.1.3 Capillary hemangioma
   7.12.1.6 Retinoblastoma
   7.12.1.9 Metastatic disease
7.12.2 Diseases
   7.12.2.1 Idiopathic orbital inflammatory disease (orbital pseudotumor)
7.12.3 Tissues
   7.12.3.2 Tumors of neural origin
   7.12.3.3 Remnant/dermoid tissue
   7.12.3.4 Diagnose presence of ocular and orbital tumors
   7.12.3.5 Develop patient care plan
7.13 Childhood Nystagmus and Related Eye Movement Disorders
   7.13.3 Acquired Nystagmus in Children
      7.13.3.1 Acquired nystagmus
7.14 Amblyopia
   7.14.1 Types of Amblyopia
      7.14.1.1 Strabismic amblyopia
      7.14.1.2 Refractive amblyopia
         7.14.1.2.1 anisometropic amblyopia
         7.14.1.2.2 bilateral amblyopia due to high refractive error (ametropic amblyopia)
      7.14.1.3 Deprivation amblyopia
      7.14.1.4 Diagnose types of amblyopia
   7.14.2 Medical Treatment of Amblyopia
      7.14.2.1 Refractive correction
      7.14.2.2 Occlusion
7.15 Strabismus
   7.15.2 Pseudoesotropias
      7.15.2.1 Pseudoesotropias
   7.15.3 Esodeviations
      7.15.3.2 Refractive accommodative esotropia
      7.15.3.6 Acute esotropia
      7.15.3.9 Incomitant esotropia
7.15.5 Exodeviations
   7.15.5.3 Intermittent exotropia
   7.15.5.4 Sensory exotropia
   7.15.5.5 Convergence insufficiency
   7.15.5.6 Constant exotropia
   7.15.5.7 Consecutive exotropia
7.15.7 Vertical Deviations
   7.15.7.4 Vertical deviations due to orbital floor fracture (blowout fracture)
7.15.8 Special Forms of Strabismus
   7.15.8.1 Cranial nerve palsy
      7.15.8.1.1 third (oculomotor) cranial nerve palsy
      7.15.8.1.2 sixth (abducens cranial nerve palsy)
   7.15.8.2 Thyroid eye disease associated with strabismus
   7.15.8.3 Myasthenia gravis associated with strabismus
   7.15.8.4 Strabismus following ocular surgery
   7.15.8.9 Diagnose types of strabismus
7.15.10 Treatment of Strabismus
   7.15.10.1 Eyeglasses, including bifocals and prisms
   7.15.10.5 Ocular complications for strabismus surgery
      7.15.10.5.1 malignant hyperthermia
      7.15.10.5.2 other ocular complications
7.16 Ocular Trauma
   7.16.1 Non-Accidental Trauma
      7.16.1.1 Abusive head trauma/shaken baby syndrome
   7.16.2 Injuries
      7.16.2.1 Superficial ocular injury
      7.16.2.2 Penetrating injury
   7.16.3 Hyphema
   7.16.3.1 Hyphema
   7.16.4 Orbital fractures
      7.16.4.1 Orbital fractures

8 Refractive Management and Optics (8%)
  8.1 Scientific Aspects of Optics
     8.1.1 Optics
8.1.1.1 Physical optics (i.e., properties of light)
8.1.1.2 Geometric optics
8.1.1.3 Corneal optics
8.1.2 Optical System
  8.1.2.1 The human eye as an optical system
  8.1.2.2 Biology of the eye in the optical system

8.2 Diagnostic Tests
  8.2.1 Refraction
    8.2.1.1 Refractive stability
    8.2.1.2 Examine patient for refractive intervention
    8.2.1.3 Evaluate patient's expectations and refractive needs
    8.2.1.4 Cross-cylinder technique for subjective refraction
    8.2.1.5 Manifest
    8.2.1.6 Cycloplegic
    8.2.1.7 Measure Snellen fraction visual acuity
    8.2.1.8 Test near vision
    8.2.1.9 Test quality of vision (e.g., contrast sensitivity, BAT, Amsler grid)
  8.2.2 Non-refraction
    8.2.2.1 Corneal pachymetry
    8.2.2.3 Lensometry
    8.2.2.4 Measure and analyze corneal thickness
  8.2.3 Lens Conventions
    8.2.3.1 Plus notation and conversion
    8.2.3.2 Minus notation and conversion
  8.2.4 Alternative Visual Assessment
    8.2.4.5 Assess visual acuity function in preverbal children or neurologically impaired patients
    8.2.4.6 Refer patient to subspecialist when there is unexplained visual symptoms outside doctor's expertise
  8.2.5 Basic Concepts
    8.2.5.1 Indications
    8.2.5.2 Contraindications
    8.2.5.4 Take patient history

8.3 Refractive Errors
  8.3.1 Types of Refractive Errors
8.3.1.1 Myopia
8.3.1.2 Hyperopia
8.3.1.3 Anisometropia
8.3.1.4 Aniseikonia
8.3.1.5 Regular and irregular astigmatism
8.3.1.6 Presbyopia
8.3.1.7 Keratoconus
8.3.1.9 Unilateral aphakia
8.3.1.10 Surgically-induced refractive errors

8.3.2 Elements of Diagnosis
8.3.2.1 Etiology
8.3.2.3 Elements of history
8.3.2.4 Clinical features
8.3.2.5 Recognize that an uncorrected refractive error is present
8.3.2.6 Diagnostic testing and evaluation
8.3.2.7 Conduct diagnostic testing and evaluate refractive errors
8.3.2.8 Risk factors
8.3.2.9 Discuss risk factors associated with refractive errors
8.3.2.10 Address medical cause for refractive errors

8.3.3 Patient Management
8.3.3.1 Medical therapy
8.3.3.2 Surgical therapy
8.3.3.5 Disease-related complications

8.4 Refractive Management
8.4.1 Medical
8.4.1.1 Eyeglasses
8.4.1.3 Contact lenses for refractive errors
8.4.1.6 Bandage contact lens
8.4.1.7 Monovision for correction of presbyopia
8.4.1.8 Ocular surface problems related to contact lenses
8.4.1.9 Discuss contact lens related complications with patient
8.4.2 Prescribing Lenses (eyeglasses, contact lenses)
8.4.2.5 Indications
8.4.2.6 Contraindications
8.4.2.7 Patient suitability for lenses
8.4.2.8 Alternatives
8.4.2.12 Low vision (e.g., visual disabilty, visual impairment)

8.5 Operative Evaluation, Testing and Complications
8.5.3 Post Surgical Considerations
8.5.3.1 Corneal thickness effect on intraocular pressure measurements
8.5.3.2 IOL power determination

9 Retina and Vitreous (14%)

9.1 Basic Anatomy
9.1.1.1 Vitreous
9.1.1.2 Neurosensory retina
9.1.1.3 Retinal pigment epithelium
9.1.1.5 Choroid
9.1.1.6 Sclera

9.2 Evaluation Techniques
9.2.1 Patient Examination
9.2.1.1 Take a thorough family history
9.2.1.2 Perform dilated indirect peripheral fundus exam with scleral depression or contact lens

9.2.3 Clinical Indications for Electrophysiology or Psychophysical Procedures
9.2.3.1 Assess retinal function with opaque media
9.2.3.2 Differentiate between macular disease, optic nerve disease, higher center disorders, and hysteria

9.2.4 Fluorescein Angiography
9.2.4.1 Indications
9.2.4.2 Contraindications
9.2.4.4 Alternatives to this procedure
9.2.4.6 Complications
9.2.4.7 Counsel patients on possible side effects and/or complications from angiography

9.2.5 Optical coherence tomography
9.2.5.2 Indications
9.2.5.3 Alternatives to this procedure
9.2.5.4 Techniques/methods
9.2.5.5 Interpretation of this procedure
9.2.5.6 Interpret optical coherence tomography
9.2.6 Ocular Ultrasound (Echography)
  9.2.6.1 Indications for use in vitreoretinal conditions
  9.2.6.2 Contraindications
  9.2.6.3 Pre-procedure evaluation
  9.2.6.4 Alternative tests to this procedure
  9.2.6.5 Instrumentation and technique

9.2.7 Genetic testing
  9.2.7.2 Counseling requirements
  9.2.7.3 Recommend an exam for other family members that may be affected by inherited retina-vitreous diseases

9.3 Clinical Diseases/Conditions and Manifestations

9.3.1 Elements of Disease Diagnosis
  9.3.1.1 Etiology
  9.3.1.3 Elements of History
  9.3.1.4 Clinical features
  9.3.1.5 Differential diagnosis
  9.3.1.6 Perform diagnostic testing and evaluation
  9.3.1.7 Identify risk factors during disease diagnosis

9.3.2 Patient Management
  9.3.2.1 Treatment
  9.3.2.2 Manage medical therapy
  9.3.2.4 Disease-related complications
  9.3.2.5 Identify or assess disease-related complications
  9.3.2.6 Patient instructions

9.3.3 Macular Diseases
  9.3.3.1 Age-related macular degeneration
  9.3.3.2 Ocular histoplasmosis syndrome
  9.3.3.4 Pathologic myopia (myopic degeneration)
  9.3.3.5 Idiopathic central serous chorioretinopathy
  9.3.3.6 Epiretinal membrane
  9.3.3.7 Vitreomacular traction syndrome
  9.3.3.8 Macular hole
  9.3.3.13 Diagnose macular diseases

9.3.4 Retinal Vascular Diseases
9.3.4.1 Hypertensive retinopathy
9.3.4.2 Diabetic retinopathy
9.3.4.3 Sickle retinopathy
9.3.4.4 Retinopathy of prematurity
9.3.4.6 Branch retinal vein occlusion
9.3.4.7 Central retinal vein occlusion
9.3.4.8 Branch retinal artery occlusion
9.3.4.9 Central retinal artery occlusion
9.3.4.12 Cystoid macular edema
9.3.4.14 Ophthalmic artery occlusion
9.3.4.18 Retinal vasculitides
9.3.4.19 Toxemia of pregnancy
9.3.4.20 Blood dyscrasias
  9.3.4.20.1 Anemia
  9.3.4.20.2 Hyperviscosity
  9.3.4.20.3 Leukemia
9.3.5 Chorioretinal Inflammations
  9.3.5.5 Endophthalmitis
    9.3.5.5.1 Associated with filtering or inadvertent blebs
    9.3.5.5.2 Acute onset postoperative endophthalmitis
    9.3.5.5.3 Endogenous endophthalmitis
    9.3.5.5.4 Chronic or delayed onset endophthalmitis following cataract surgery
  9.3.5.7 Toxoplasmosis
  9.3.5.8 Syphilitic panuveitis
  9.3.5.10 Cytomegalovirus retinitis
  9.3.5.11 Tuberculosis
  9.3.5.20 Identify chorioretinal inflammations
9.3.6 Retinal/ Choroidal/ Macular Dystrophies
  9.3.6.1 Retinitis pigmentosa
  9.3.6.2 Stargardt disease-fundus flavimaculatus
  9.3.6.3 Best disease (Vitelliform dystrophy)
  9.3.6.6 Choroidal Dystrophies
    9.3.6.6.3 Degenerative myopia
9.3.7 Drug Toxicities
9.3.7.1 Chloroquine and its derivatives
9.3.7.2 Phenothiazines
9.3.7.4 Nicotinic acid

9.3.8 Diseases of the Vitreous
9.3.8.1 Spontaneous vitreous hemorrhage
9.3.8.2 Posterior vitreous detachment
9.3.8.3 Developmental anomalies
   9.3.8.3.1 Vascular anomalies
   9.3.8.3.2 Mittendorf dot
   9.3.8.3.3 Bergmeister papilla
   9.3.8.3.4 Persistent Fetal Vasculature (PFV)
9.3.8.4 Asteroid hyalosis
9.3.8.8 Indications for surgery
9.3.8.11 Complications of vitreous surgery
9.3.8.12 Examine patient for diseases of the vitreous

9.3.9 Peripheral Retinal Abnormalities
9.3.9.1 Retinal holes, tears, breaks, and tufts
9.3.9.2 Management of retinal holes, tears, breaks, and tufts
9.3.9.3 Lattice degeneration
9.3.9.6 Detect peripheral retinal abnormalities

9.3.10 Retinal Detachments
9.3.10.1 Rhegmatogenous retinal detachment
9.3.10.2 Traction retinal detachment
9.3.10.3 Exudative retinal detachment (e.g., uveal effusion syndrome, sympathetic ophthalmia, VKH, posterior scleritis)
9.3.10.4 Posterior vitreous detachment
9.3.10.5 Identify retinal detachments

9.3.13 Posterior Segment Trauma
9.3.13.1 Commotio retinae
9.3.13.2 Choroidal rupture
9.3.13.4 Scleral ruptures and lacerations
9.3.13.5 Ocular penetrating and perforating injury
9.3.13.6 Intraocular foreign body
9.3.13.7 Choroidal Detachment
9.3.13.7.1 Hemorrhagic choroidal detachment
9.3.13.7.2 Serous choroidal detachment
9.3.13.8 Endophthalmitis
9.3.13.9 Post-traumatic endophthalmitis
9.3.13.10 Sympathetic ophthalmia
9.3.13.11 Shaken baby syndrome
9.3.13.12 Blunt trauma
9.3.13.13 Penetrating/perforating trauma
9.3.13.14 Retained intraocular foreign bodies
9.3.13.15 Assess posterior segment trauma

9.3.14 Tumors
9.3.14.1 Nevus of the choroid
9.3.14.2 Melanoma
  9.3.14.2.1 Ciliary body
  9.3.14.2.2 Choroidal
9.3.14.3 Retinoblastoma
9.3.14.7 Choroidal metastasis
9.3.14.8 Lymphoma
  9.3.14.8.1 Ocular lymphoma
  9.3.14.8.2 Central nervous system lymphoma
9.3.14.10 Differentiate common types of tumors

9.4 Surgery
9.4.1 Pertinent Elements of Indications/Contraindications
  9.4.1.1 Common indications
9.4.2 Lasers
  9.4.2.1 Lasers
9.4.8 Photocoagulation
  9.4.8.3 General indications
  9.4.8.5 Complications

10 Uveitis (6%)
10.1 Basic Anatomical/Scientific Aspects
  10.1.1 Principles of Immunology
    10.1.1.7 Ocular immune responses
10.2 Evaluation Techniques
10.2.1 History of present illness
   10.2.1.1 Take patient's medical history
   10.2.1.2 Ocular symptoms
   10.2.1.3 Systemic symptoms
      10.2.1.3.1 Identify ocular and systemic symptoms
   10.2.1.4 Onset
   10.2.1.5 Duration
   10.2.1.6 Course

10.2.3 Medical and Surgical History
   10.2.3.1 Medication history
   10.2.3.3 Personal history of autoimmune disorders
   10.2.3.4 Review of systems
   10.2.3.5 Prior ocular surgery
   10.2.3.6 Travel and exposure history
   10.2.3.7 Social history

10.2.4 Systemic testing
   10.2.4.1 Laboratory testing
      10.2.4.1.1 Identify indications for lab testing (e.g., blood, x-ray, radiology)
      10.2.4.1.2 Utilize results of lab testing (e.g., blood, x-ray, radiology) appropriately
   10.2.4.2 Blood tests
   10.2.4.3 Radiologic studies
   10.2.4.5 Indications for lab testing

10.2.5 Ancillary ocular imaging
   10.2.5.1 Posterior segment angiography: fluorescein angiography
   10.2.5.2 Optical coherence tomography - in uveitis
   10.2.5.5 Ultrasoundography
   10.2.5.6 Indications for ancillary ophthalmic testing
   10.2.5.7 Identify indications for ancillary ophthalmic testing (e.g., FAICG, ultrasound, echo)
   10.2.5.8 Utilize results of ancillary ophthalmic testing (e.g., FAICG, ultrasound, echo) appropriately

10.2.6 Ocular biopsy
   10.2.6.2 Vitreous biopsy

10.2.7 Ocular specimen testing
   10.2.7.1 Microbiology study; culture and PCR

10.3 Clinical Disease Conditions and Manifestations
10.3.1 Basic Concepts in Disease Diagnosis
   10.3.1.1 Diagnose intraocular inflammation and uveitis
   10.3.1.4 Risk factors
   10.3.1.5 Differential diagnosis
   10.3.1.6 Disease-related complications
   10.3.1.7 Identify uveitis disease-related complications
   10.3.1.8 Manage uveitis disease-related complications
   10.3.1.11 Identify common medical therapies
   10.3.1.12 Identify common surgical therapies
   10.3.1.13 Manage common medical therapies
   10.3.1.14 Manage common surgical therapies

10.4 Non-infectious Uveitis
   10.4.1 Acute, limited anterior uveitis
      10.4.1.1 Acute anterior uveitis
      10.4.1.2 Traumatic uveitis
      10.4.1.3 Lens-induced uveitis
      10.4.1.4 Postoperative iridocyclitis
   10.4.2 Chronic Anterior Uveitis
      10.4.2.1 Juvenile idiopathic arthritis associated
      10.4.2.2 Chronic iridocyclitis in children
      10.4.2.3 Chronic iridocyclitis in adults
      10.4.2.6 Sarcoidosis
   10.4.3 Intermediate Uveitis
      10.4.3.1 Intermediate uveitis, including pars planitis
      10.4.3.2 Intermediate uveitis related to systemic disease
   10.4.5 Retinal Vasculitis
      10.4.5.1 Systemic vasculitis- intraocular manifestations
         10.4.5.1.1 Behçet disease
         10.4.5.1.2 Systemic lupus erythematosus
   10.4.6 Panuveitis
      10.4.6.1 Sarcoidosis panuveitis
      10.4.6.2 Sympathetic ophthalmia
   10.4.7 Scleritis and Epi scleritis
      10.4.7.1 Idiopathic
10.4.7.2 Associated with systemic disease

10.5 Infectious Uveitis

10.5.1 Infectious Uveitis
  10.5.1.1 Classify type of uveitis based on etiology
  10.5.1.2 Classify type of uveitis based on anatomy
  10.5.1.3 Diagnose type of infectious uveitis
  10.5.1.6 Recognize that a patient has or may have infectious uveitis

10.5.2 Other Conditions
  10.5.2.1 Scleritis-infectious: post-surgical and traumatic infectious scleritis
  10.5.2.2 Chorioretinitis

10.5.3 Endophthalmitis
  10.5.3.1 Candida and Aspergillus
  10.5.3.2 Postoperative
  10.5.3.3 Post-traumatic
  10.5.3.7 Diagnosis (differential diagnosis, obtaining intraocular specimens, cultures and laboratory specimens)
  10.5.3.8 Treatment (surgical and medical)

10.5.4 Viral Uveitis
  10.5.4.1 Herpes simplex anterior uveitis
  10.5.4.2 Herpes zoster anterior uveitis
  10.5.4.5 Necrotizing herpetic retinitis: acute retinal necrosis and progressive outer retinal necrosis
  10.5.4.6 Herpes simplex associated necrotizing retinitis
  10.5.4.7 Varicella associated necrotizing retinitis
  10.5.4.8 Cytomegalovirus retinitis

10.5.5 Bacterial Uveitis
  10.5.5.1 Syphilitic uveitis
  10.5.5.2 Lyme disease

10.5.6 Fungal Uveitis
  10.5.6.1 Ocular histoplasmosis syndrome
  10.5.8 Protozoal Uveitis
  10.5.8.1 Toxoplasmic retinochoroiditis

10.6 Masquerade Syndromes
  10.6.1 Non-neoplastic Masquerade Syndromes
    10.6.1.1 Diagnose non-neoplastic masquerade syndromes
10.6.1.6 Retained intraocular foreign body
10.6.2 Neoplastic Masquerade Syndromes
  10.6.2.1 Primary central nervous system intraocular lymphoma
10.7 Ocular Manifestations of Immunodeficiency
  10.7.1 Ocular Manifestations of AIDS
    10.7.1.1 Diagnose ocular manifestations of acquired immunodeficiency syndrome
    10.7.1.3 Explain course of treatment to patient
    10.7.1.4 Human immunodeficiency virus (HIV) retinopathy
    10.7.1.5 Cytomegalovirus (CMV) retinitis
    10.7.1.6 Herpes zoster ophthalmicus (HZO) in patients with human immunodeficiency virus (HIV) infection
  10.7.2 Iatrogenic immunosuppression
    10.7.2.1 Opportunistic infectious uveitis
10.8 Medical Treatment of Uveitis Patients
  10.8.1 Principles
    10.8.1.2 Indications/contraindications for specific treatments
    10.8.1.3 Goals and endpoints of treatment
    10.8.1.4 Pre-procedure/therapy evaluation
    10.8.1.6 Routes of administration
    10.8.1.9 Complications of procedure/therapy
    10.8.1.10 Treatment principles for non-infectious ocular inflammatory disease
  10.8.2 Topical and regional injection therapy
    10.8.2.1 Cycloplegics
    10.8.2.2 Nonsteroidal anti-inflammatory drugs
    10.8.2.3 Topical corticosteroids
    10.8.2.4 Prescribe topical corticosteroids
    10.8.2.5 Monitor for side effects and complications with topical corticosteroids
    10.8.2.6 Injectable - intraocular and extraocular corticosteroids
    10.8.2.9 Monitor for side effects and complications with periocular corticosteroids
    10.8.2.10 Monitor for side effects and complications with intravitreal corticosteroids
    10.8.2.11 Recognize contraindications for periocular corticosteroids
    10.8.2.12 Recognize contraindications for intravitreal corticosteroids
    10.8.2.14 Intravitreal antifungal and antibacterial therapy
    10.8.2.16 Contraindications for regional injection therapy
10.8.3 Systemic Medical Therapy
   10.8.3.1 Oral corticosteroids
   10.8.3.2 Prescribe systemic corticosteroids
   10.8.3.3 Intravenous corticosteroids
   10.8.3.4 Monitor for side effects and complications with systemic corticosteroids
   10.8.3.11 Steroid-sparing agents
   10.8.3.12 Identify indications for steroid-sparing therapy
   10.8.3.16 Comanage medical therapy of appropriate patients with other medical specialists
   10.8.3.17 Formulate treatment plan based on anatomical localization of uveitis
   10.8.3.18 Formulate treatment plan based on severity of uveitis
   10.8.3.19 Formulate treatment plan based on time course of uveitis (e.g. acute vs. persistent)

10.9 Surgical Treatment of Uveitis Patients
   10.9.1 Surgical Techniques
      10.9.1.1 Cataract extraction for uveitis patients
         10.9.1.1.1 Surgical complications
         10.9.1.1.2 Preoperative and postoperative medical management
         10.9.1.6 Perform pre-procedure evaluation and medical therapy
         10.9.1.7 Provide alternatives to a procedure/therapy
         10.9.1.8 Provide follow-up care
         10.9.1.9 Coordinate care with other medical specialists
         10.9.1.10 Give patient instructions
   10.10 Complications of Uveitis
      10.10.1 Anterior segment complications
         10.10.1.1 Band keratopathy
         10.10.1.2 Posterior synechiae
         10.10.1.3 Glaucoma
            10.10.1.3.1 Open angle
            10.10.1.3.2 Closed angle
            10.10.1.3.3 Iris bombe
         10.10.1.4 Hypotony
         10.10.1.4.1 Ciliary body atrophy
         10.10.1.4.2 Cyclitic membrane
         10.10.1.5 Cataract
         10.10.2 Posterior segment complications
10.10.2.2 Cystoid macular edema
10.10.2.5 Identify potential complications
10.10.2.6 Manage complications