1 Cataract and Anterior Segment

1.2 Assessment Techniques (22%)

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
1.2.1.5 Preoperative evaluation
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
1.2.2.3 Brightness acuity
1.2.2.4 Contrast sensitivity
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
1.2.2.9 Tests of macular function
1.2.2.10 Measure visual (and macular) function

1.2.3 Other Preoperative Tests/Measurements

1.2.3.1 Conduct preoperative tests/measurements for cataract surgery
1.2.3.2 Prevent errors in measurements for cataract surgery
1.2.3.3 Manage errors in measurements for cataract surgery
1.2.3.4 Biometry

1.2.3.4.1 Preprocedure/therapy evaluation
1.2.3.4.2 Techniques for biometry
1.2.3.4.3 Interpretation of biometry results
1.2.3.4.4 IOL formulas
1.2.3.5 Corneal pachymetry
1.2.3.6 Specular microscopy
1.2.3.7 Laser interferometry (For biometry)
1.2.4 Evaluation of Glare Disability
   1.2.4.1 Subjective
   1.2.4.2 Objective
   1.2.4.3 Evaluate glare disability: subjective and objective
1.2.5 Evaluation of Reduced Vision Not Fully Explained by Degree of Cataract
   1.2.5.1 Reduced vision not fully explained by cataract
   1.2.5.2 Evaluate reduced vision not fully explained by degree of cataract
1.2.6 Intraocular Lens Calculation Following Refractive Surgery
   1.2.6.1 Instruments and technique
   1.2.6.2 Calculate intraocular lens power following refractive surgery
   1.2.6.3 Complications, prevention, and management
   1.2.6.4 Considerations in interpretation
   1.2.6.5 Evaluate the ocular surface for disease
   1.2.6.6 Determine appropriate type of implant for the patient

1.3 Clinical Disease Conditions and Manifestations (20%)
1.3.1 Types of Cataract
   1.3.1.1 Identify types of cataracts
   1.3.1.2 Posterior polar cataracts
   1.3.1.3 Posterior subcapsular cataracts
   1.3.1.4 Anterior polar cataracts
   1.3.1.5 Ectopia Lentis
   1.3.1.6 Hypermature cataract
   1.3.1.7 Intumescent cortical cataract
   1.3.1.8 Morgagnian cataract
   1.3.1.9 Nuclear cataract
   1.3.1.10 Sutural cataract
   1.3.1.11 Agents associated with drug-induced lens changes
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
  1.3.2.5.1 Causes of trauma
  1.3.2.5.2 Manifestations of trauma
1.3.2.6 Cataract and skin disease
1.3.2.7 Assess special risks for cataract surgery e.g. zonular stability, pupil, cornea

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
  1.3.3.2.1 Congenital aphakia
  1.3.3.2.2 Lenticous and lenticilobus
  1.3.3.2.3 Lens coloboma
  1.3.3.2.4 Mittendorf dot
  1.3.3.2.5 Epicapsular star
  1.3.3.2.6 Peters anomaly
  1.3.3.2.7 Microspherophakia
  1.3.3.2.8 Aniridia
  1.3.3.2.9 Congenital and infantile cataract
1.3.3.3 Metabolic cataract
  1.3.3.3.1 Diabetes mellitus
  1.3.3.3.2 Galactosemia
  1.3.3.3.3 Hypocalcemia (tetanic cataract)
  1.3.3.3.4 Myotonic dystrophy
  1.3.3.4 Intrauterine infections and cataract (e.g., rubella, mumps, measles, toxoplasmosis, herpes virus)

1.4 Medical (and Other Nonsurgical) Therapies (2%)

1.4.1 Low Vision Aids for Cataract
  1.4.1.1 Spectacles
  1.4.1.2 Identify medical and other nonsurgical therapies
  1.4.1.3 Explain the medical/non-surgical therapies to patient
  1.4.1.4 Reduce risk factors for cataract progression (e.g. ultraviolet radiation exposure and smoking)

1.5 Laser and Incisional Cataract Surgery (56%)
1.5.1 General Principles
  1.5.1.1 Indications
  1.5.1.2 Contraindications
  1.5.1.3 Alternatives to cataract surgery
  1.5.1.4 Advantages/disadvantages for laser and incisional cataract surgery
  1.5.1.5 Infection prophylaxis

1.5.2 Surgical Techniques, and Instruments for Cataract Extraction
  1.5.2.1 Determine appropriate surgical technique
  1.5.2.2 Explain the surgical technique(s) to the patient
  1.5.2.3 Anterior capsulotomy - Capsulorrhexis and can opener
  1.5.2.4 Wound construction and closure
    1.5.2.4.1 Techniques
    1.5.2.4.2 Advantages
    1.5.2.4.3 Disadvantages
    1.5.2.4.4 Complications
  1.5.2.5 Astigmatic keratotomy - /peripheral corneal (limbal) relaxing incisions
  1.5.2.6 Capsule staining
  1.5.2.7 Capsular tension rings
  1.5.2.8 Hydrodissection and hydrodelineation
  1.5.2.9 Ophthalmic viscosurgical devices (OVDs)
    1.5.2.9.1 Rheologic and physical properties
    1.5.2.9.2 Functions during surgery
    1.5.2.9.3 Complications
    1.5.2.9.4 OVD substances
  1.5.2.10 Phacoemulsification fluidics
    1.5.2.10.1 Irrigation/infusion
    1.5.2.10.2 Pumps (venturi, peristaltic)
  1.5.2.11 Ultrasound - clinical principles
    1.5.2.11.1 Nuclear emulsification mechanism
    1.5.2.11.2 Power modulations
  1.5.2.12 Extracapsular cataract extraction
    1.5.2.12.1 Indications/contraindications
    1.5.2.12.2 Instrumentation, anesthesia, and technique
  1.5.2.13 Determine instruments for cataract extraction
1.5.2.14 Extract extracocular cataract
  1.5.2.14.1 Advantages/ disadvantages compared to phacoemulsification
  1.5.2.14.2 Complications of procedure and prevention and management
1.5.2.15 Phacoemulsification techniques - Nuclear removal
1.5.2.16 Perform phacoemulsification techniques - nuclear removal
  1.5.2.16.1 Pure sculpting
  1.5.2.16.2 Phaco flip
  1.5.2.16.3 Divide and conquer
  1.5.2.16.4 Phaco chop
1.5.2.17 Instrumentation for lens implantation
1.5.2.18 Implant anterior chamber intraocular lens
1.5.2.19 Implant posterior chamber intraocular lens
1.5.2.20 Intraocular lens material and design
1.5.2.21 Toric intraocular lenses
1.5.2.22 Neodymium Yttrium-Aluminum-Garnet (Nd:YAG) laser posterior capsulotomy
1.5.2.23 Perform Nd: YAG laser posterior capsulotomy
  1.5.2.23.1 Indications/contraindications
  1.5.2.23.2 Preprocedural evaluation
  1.5.2.23.3 Alternatives to procedure
  1.5.2.23.4 Instrumentation, anesthesia, and technique
  1.5.2.23.5 Complications of procedure and prevention and management
1.5.3 Anesthesia
  1.5.3.1 Identify appropriate anesthesia
  1.5.3.2 General
  1.5.3.3 Peribulbar
  1.5.3.4 Retrobulbar
  1.5.3.5 Sub-tenon
  1.5.3.6 Topical/intracameral
1.5.4 Complications of Cataract Surgery: Diagnosis, Prevention, Treatment
  1.5.4.1 Anterior capsule fibrosis and phimosis
  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
1.5.4.6 Errant continuous curvilinear capsulorhexis rescue and management
1.5.4.7 Hemorrhages (e.g., retrobulbar, suprachoroidal)
1.5.4.8 Incorrect intraocular lens power
1.5.4.9 Induced astigmatism
1.5.4.10 Recognize intraoperative complications
1.5.4.11 Intraocular decentration and dislocation
1.5.4.12 Intraoperative shallowing of the anterior chamber
1.5.4.13 Intraoperative signs of posterior capsular rupture
1.5.4.14 Iridodialysis
1.5.4.15 Microscope-induced light toxicity
1.5.4.16 Posterior capsule opacification
1.5.4.17 Postoperative concerns (e.g., elevated intraocular pressure, inflammation, shallow or flat anterior chamber)
1.5.4.18 Recognize postoperative complications
1.5.4.19 Retinal detachment
1.5.4.20 Surgical trauma - hyphema
1.5.4.21 Toxic anterior segment syndrome (TASS)
1.5.4.22 Undesired optical images associated with intraocular lens implants
1.5.4.23 Vitreous incarceration in wound
1.5.4.24 Wound leak or filtering bleb
1.5.4.25 Dropped nucleus
1.5.4.26 Iris prolapse
1.5.4.27 Intraoperative vitreous loss
1.5.4.28 Pupillary capture
1.5.4.29 Prevent complications
1.5.4.30 Manage complications (i.e., establish treatment plan)

1.5.5 Cataract Surgery in Special Situations

1.5.5.1 Assess special situations when performing cataract surgery
1.5.5.2 Cataract surgery combined with glaucoma filtering procedure
1.5.5.3 Cataract surgery following glaucoma filtering procedure
1.5.5.4 Cataract surgery following penetrating keratoplasty
1.5.5.5 Cataract surgery following refractive surgery
1.5.5.6 Clear lens extraction - refractive lensectomy
1.5.5.7 Endothelial dystrophy
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1.5.5.8 High myopia
1.5.5.9 (Primary) intraocular lens implantation in children
1.5.5.10 Keratoconus
1.5.5.11 Small pupil
1.5.5.12 Patients with anticoagulation therapy or bleeding diathesis
1.5.5.13 Intraoperative floppy iris syndrome
1.5.5.14 Patients with diabetes mellitus
1.5.5.15 Patients with retinal comorbidities
1.5.5.16 Patients with silicone oil
1.5.5.17 Presbyopia correcting intraocular lenses
1.5.5.18 Exfoliation syndrome
1.5.5.19 Surgical therapy for Pterygium
1.5.5.20 Small eyes
1.5.5.21 Ciliary sulcus fixation and capsulorhexis capture of posterior chamber intraocular lenses
1.5.5.22 Piggy-back lenses
   1.5.5.22.1 Primary
   1.5.5.22.2 Secondary
1.5.5.23 Secondary intraocular lens implantation
1.5.5.24 Sutured posterior chamber intraocular lens implantation
1.5.5.25 White cataract surgery
1.5.5.26 Dense nuclear cataract surgery
1.5.5.27 Triple procedure (cataract extraction, intraocular lens implantation, and penetrating keratoplasty)
1.5.5.28 Uveitis
1.5.5.29 Patients with prior vitrectomy
1.5.5.30 Eyes with zonular instability
1.5.5.31 Cataracts Secondary to Trauma

2 Cornea and External Disease

2.1 Basic Anatomical and Scientific Aspects (8%)

2.1.1 Anatomy
   2.1.1.1 Anatomy of the eye
   2.1.1.2 Biomechanics of the cornea
   2.1.1.3 Embryology of the anterior segment
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 (16%)

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
2.2.2.3 Indications and interpretations of anterior segment echography
2.2.2.4 Indications and interpretations of confocal microscopy
2.2.2.5 Anterior segment optical coherence tomography
2.2.2.6 Identify indications for anterior segment imaging
2.2.2.7 Interpret 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
2.2.3.2 Zones of the cornea
2.2.3.3 Shape, curvature, and power
2.2.3.4 Keratometry
2.2.3.5 Keratoscopy
2.2.3.6 Computerized corneal topography
2.2.3.7 Interpret corneal topography
2.2.3.8 Retinoscopy
2.2.3.9 Wavefront analysis
2.2.3.10 Identify contact lens therapeutic and cosmetic indications

2.3 Clinical Diseases/Condition and Manifestations (38%)

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
2.3.2.6 Manage corneal surgical therapies
2.3.2.7 Disease-related complications
2.3.2.8 Identify disease-related complications
2.3.2.9 Manage 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
      2.3.5.9.1 Thygeson superficial punctate 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
   2.3.6.2 Manage neoplastic disorders
   2.3.6.3 Tumor cell biology and diagnostic approaches to ocular surface neoplasia
   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
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2.3.7.2 Manage corneal dystrophies
2.3.7.3 Corneal epithelial basement membrane dystrophy/degeneration
2.3.7.4 Corneal dystrophy of Bowman layer I (CDB I; Reis-Bücklers dystrophy) and corneal dystrophy of Bowman
2.3.7.5 Meesmann corneal dystrophy
2.3.7.6 Granular and lattice corneal dystrophies
2.3.7.7 Macular corneal dystrophy
2.3.7.8 Fuchs endothelial dystrophy
2.3.7.9 Posterior polymorphous corneal 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
2.3.8.7 Pigmentation of the conjunctiva and cornea
2.3.8.8 Postinflammatory, post-traumatic, and postsurgical corneal opacity

2.3.9 Congenital Abnormalities of the Cornea and Sclera
2.3.9.1 Identify congenital corneal and anterior segment abnormalities
2.3.9.2 Basic concepts
2.3.9.2.1 Causes of congenital corneal abnormalities
2.3.9.2.2 Diagnostic approaches
2.3.9.3 Clinical aspects
2.3.9.3.1 Developmental anomalies of the globe and sclera
2.3.9.3.2 Developmental anomalies of the anterior segments
2.3.9.3.3 Secondary abnormalities affecting the fetal cornea

2.4 Toxic and Traumatic Injuries (16%)
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
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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 prophylaxis post injury

2.5 Procedures for the Cornea and Ocular Surface (22%)
2.5.1 Basic concepts
  2.5.1.1 Indications/contraindications
  2.5.1.2 Pre-procedure evaluation
  2.5.1.3 Treatment alternatives
  2.5.1.4 Instrumentation, anesthesia and technique
  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
2.5.1.9 Provide ongoing care to patients including management 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
2.5.2.5 Pterygium excision
2.5.2.6 Perform pterygium excision
2.5.2.7 Anterior stromal puncture
2.5.2.8 Perform anterior stromal puncture
2.5.2.9 Corneal epithelial debridement
2.5.2.10 Perform corneal epithelial debridement
2.5.2.11 Corneal biopsy
2.5.2.12 Superficial keratectomy
2.5.2.13 Amniotic membrane transplantation
2.5.2.14 Perform amniotic membrane transplantation
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
2.5.2.19 Descemetocele and corneal perforation by tissue adhesive
2.5.2.20 Treat descemetocele and corneal perforation by tissue adhesive
2.5.2.21 Descemetocele and corneal perforation by reconstructive graft
2.5.2.22 Donor selection criteria contraindicating donor cornea use for corneal transplantation
2.5.2.23 Keratoplasty techniques
   2.5.2.23.1 Penetrating keratoplasty
   2.5.2.23.2 Endothelial keratoplasty
   2.5.2.23.3 Anterior lamellar keratoplasty
2.5.2.24 Allograft rejection
2.5.2.25 Identify allograft rejection
2.5.2.26 Keratoprosthesis

2.6 Clinical Trials
2.6.1 Specific cornea Trials
  2.6.1.1 HEDS trial
  2.6.1.2 Corneal Donor Study (CDS)
  2.6.1.3 Collaborative Corneal Transplant Study (CCTS)

3 Glaucoma

3.1 Basic Anatomical and Scientific Aspects (6%)
  3.1.1 Intraocular Pressure and Aqueous Humor Dynamics
    3.1.1.1 Aqueous formation
    3.1.1.2 Aqueous outflow
    3.1.1.3 Episcleral venous pressure
    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 (14%)
  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
    3.2.1.4 Assessment alternatives
    3.2.1.5 Instruments and technique
    3.2.1.6 Interpretation considerations
    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
    3.2.2.2 Optic nerve head exam by direct ophthalmoscopy
    3.2.2.3 Optic nerve head photography and/or imaging
    3.2.2.4 Examine the optic nerve
  3.2.3 Examination of the Retinal Nerve Fiber Layer
3.2.3.1 Retinal nerve fiber layer by clinical exam
3.2.3.2 Retinal nerve fiber layer photography and/or Imaging
3.2.3.3 Examine the retinal nerve fiber layer clinically or with imaging

3.2.4 Examination of the Angle
3.2.4.1 Gonioscopy
3.2.4.2 Ultrasound biomicroscopy
3.2.4.3 Anterior Segment Optical Coherence Tomography (AS-OCT)
3.2.4.4 Examine the angle

3.2.5 Assessment of Central Corneal Thickness
3.2.5.1 Corneal pachymetry
3.2.5.2 Assess corneal thickness

3.2.6 Examination of Functional Status/Visual Field
3.2.6.1 Standard automated static perimetry
3.2.6.2 Short-wavelength automated perimetry (SWAP)
3.2.6.3 Frequency Doubling Technique (FDT)
3.2.6.4 Goldmann
3.2.6.5 Examine functional status with visual field

3.2.7 Assessment of Intraocular Pressure and Aqueous Humor Dynamics
3.2.7.1 Relationship episcleral venous pressure to IOP
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 (20%)
3.3.1 Disease Diagnosis and Subsequent Patient Management
3.3.1.1 Risk factors
3.3.1.2 Question patient regarding symptoms of subacute/acute angle closure
3.3.1.3 Differential diagnosis
3.3.1.4 Make appropriate diagnosis by performing careful anterior segment evaluation
3.3.1.5 Establish the diagnosis
3.3.1.6 Establish initial treatment
3.3.1.7 Prevention and management of complications of treatment
3.3.1.8 Disease-related complications
3.3.1.9 Patient instructions
3.3.1.10 Provide follow-up care
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)
   3.3.2.6 Angle-recession glaucoma (traumatic glaucoma)
   3.3.2.7 Corticosteroid-induced Glaucoma (steroid glaucoma)
   3.3.2.8 Elevated episcleral venous pressure
   3.3.2.9 Inflammatory glaucoma
   3.3.2.10 Juvenile OAG (JOAG)

3.3.3 Angle-Closure Glaucoma
   3.3.3.1 Acute primary angle-closure glaucoma
   3.3.3.2 Subacute angle-closure glaucoma
   3.3.3.3 Chronic angle-closure glaucoma
   3.3.3.4 Plateau iris
   3.3.3.5 Secondary angle-closure glaucoma
   3.3.3.6 Iridocorneal Endothelial (ICE) syndrome
   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
   3.3.4.2 Developmental glaucomas with associated anomalies--Axenfeld-Rieger Syndrome
   3.3.4.3 Developmental glaucomas with associated anomalies--Other developmental glaucomas with associated anomalies
   3.3.4.4 Aniridia

3.3.5 Other Glaucomas (and Related Conditions)
   3.3.5.1 Glaucoma and penetrating keratoplasty
   3.3.5.2 Glaucoma and posterior corneal transplantation
   3.3.5.3 Hyphema
   3.3.5.4 Lens-induced glaucoma
   3.3.5.5 Neovascular glaucoma
   3.3.5.6 Ocular hypotony
   3.3.5.7 Other (e.g., retinal injection related, viscoelastic, ghost-cell)

3.4 Medical Therapies For Glaucoma (16%)
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
3.4.1.10 Manage complications
3.4.1.11 Follow-up care
3.4.1.12 Perform 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
3.4.2.4 Hyperosmotic agents
3.4.2.5 Parasympathomimetic agents
3.4.2.6 Prostaglandin analogues (hypotensive lipids)

3.5 Laser And Incisional Surgeries For Glaucoma (14%)

3.5.1 General Principles

3.5.1.1 Surgical anatomy
3.5.1.2 Criteria for decision to operate
3.5.1.3 Decide on the appropriate surgical therapy
3.5.1.4 Perform preprocedural evaluation
3.5.1.5 Measure IOP
3.5.1.6 Review treatment options with the patient
3.5.1.7 Perform follow-up care
3.5.1.8 Examine prior records for prior laser and/or incisional surgeries
3.5.1.9 Decide on urgency of surgical intervention, considering IOP/optic nerve cupping/patient discomfort

3.6 Laser Surgeries For Glaucoma (12%)
3.6.1 Laser Trabeculoplasty
   3.6.1.1 Assess trabecular pigmentation
   3.6.1.2 Perform the laser surgery
   3.6.1.3 Check intraocular pressure after the laser surgery
   3.6.1.4 Consider pretreatment with argon/diode laser in thick, densely pigmented iris, blue iris with noncompact stroma, or iris prone to bleeding
   3.6.1.5 Consider constricting pupil to put iris on stretch
   3.6.1.6 Prevent complications
   3.6.1.7 Manage complications
   3.6.1.8 Perform follow-up care
   3.6.1.9 Indications, alternatives, and contraindications
   3.6.1.10 Gonioscopy
   3.6.1.11 Procedure
   3.6.1.12 Complications and their prevention/management
   3.6.1.13 Follow-up care

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
   3.6.2.4 Procedure
   3.6.2.5 Complications and their prevention/management
   3.6.2.6 Follow-up care

3.6.3 Laser Gonipoplasty or Peripheral Iridoplasty for Angle Closure
   3.6.3.1 Indications, alternatives, and contraindications
   3.6.3.2 Preprocedure evaluation
   3.6.3.3 Gonioscopy with and without indentation
   3.6.3.4 Procedure
   3.6.3.5 Complications and their prevention/management
   3.6.3.6 Follow-up care

3.6.4 Ciliary Body Ablation/Cyclodestructive Procedures
   3.6.4.1 Indications, alternatives, and contraindications
   3.6.4.2 Preprocedural evaluation A. patient counseling regarding other surgical options, benefits and risks
   3.6.4.3 Procedures
3.6.4.4 Complications and their prevention/management
3.6.4.5 Follow-up care

3.7 Incisional Surgeries For Glaucoma (18%)

3.7.1 Incisional Filtering Surgery for Open-Angle Glaucoma
   3.7.1.1 Indications, alternatives, and contraindications
   3.7.1.2 Preprocedural evaluation
   3.7.1.3 Procedure
   3.7.1.4 Perform the incisional surgery
   3.7.1.5 Internal and external anatomy of limbal area, and mechanism of filtration
   3.7.1.6 Anesthesia
   3.7.1.7 Use of antifibrotic agents
   3.7.1.8 Trabeculectomy techniques
   3.7.1.9 Complications and their prevention/management
   3.7.1.10 Prevent complications
   3.7.1.11 Manage complications
   3.7.1.12 Follow-up care
   3.7.1.13 Perform follow-up care

3.7.2 Combined Cataract And Filtering Surgery
   3.7.2.1 Indications, alternatives, and contraindications
   3.7.2.2 Preprocedural evaluation (including history)
   3.7.2.3 Procedure
   3.7.2.4 Complications
   3.7.2.5 Follow-up care

3.7.3 Aqueous Shunt Surgery (Glaucoma Drainage-Device Surgery)
   3.7.3.1 Indications, alternatives, and contraindications
   3.7.3.2 Preprocedural evaluation
   3.7.3.3 Procedure
   3.7.3.4 Hypotony with flat anterior chamber
   3.7.3.5 Other late tube/plate complications and their prevention/management
   3.7.3.6 Complications and their prevention/management
   3.7.3.7 Follow-up care

3.7.4 Incisional Surgery For Angle Closure
   3.7.4.1 Indications, alternatives, and contraindications
   3.7.4.2 Preprocedural evaluation
3.7.4.3 Procedure
3.7.4.4 Paracentesis
3.7.4.5 Surgical (peripheral) iridectomy
3.7.4.6 Goniosynechialysis
3.7.4.7 Cataract extraction
3.7.4.8 Procedures for aqueous misdirection (with edit)
3.7.4.9 Trabeculectomy
3.7.4.10 Drainage device
3.7.4.11 Complications and their prevention/management
3.7.4.12 Follow-up care

3.8 Clinical Trials In Glaucoma
3.8.1 Multicenter Randomized, Controlled Trials
  3.8.1.1 Ocular Hypertension Treatment Study (OHTS)
  3.8.1.2 Early Manifest Glaucoma Treatment (EMGT)
  3.8.1.3 Collaborative Initial Glaucoma Treatment Study (CIGTS)
  3.8.1.4 Advanced Glaucoma Intervention Study (AGIS)
  3.8.1.5 Collaborative Normal Tension Glaucoma Study (CNTGS)
  3.8.1.6 Glaucoma Laser Trial (GLT)
  3.8.1.7 Fluorouracil Filtering Surgery Study
  3.8.1.8 Tube Versus Trabeculectomy Study (TVT Study)

4 Neuro-Ophthalmology and Orbit

4.1 Basic Anatomical/Scientific Aspects (14%)
4.1.1 Anatomy
  4.1.1.1 Anatomy of the visual sensory system
  4.1.1.2 Facial nerve neuroanatomy
  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)
  4.1.1.6 Sensory and facial motor anatomy (e.g., trigeminal nerve [CNV], facial nerve [CNVII], eyelids)
  4.1.1.7 Ocular autonomic pathways (e.g., sympathetic pathways, parasympathetic pathways)

4.2 Neuro-Ophthalmic Examination Assessment Techniques (18%)
4.2.1 History
4.2.1.1 Take patient history
4.2.1.2 Symptoms of disordered motility
4.2.1.3 Pain
4.2.1.4 Assess characteristics of pain
4.2.1.5 Adnexal symptoms
4.2.1.6 Afferent visual symptoms

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
4.2.2.4 Contrast sensitivity
4.2.2.5 Assess contrast sensitivity
4.2.2.6 Color vision
4.2.2.7 Assess color vision
4.2.2.8 Amsler grid
4.2.2.9 Brightness comparison
4.2.2.10 Photostress test
4.2.2.11 Visual field testing
4.2.2.12 Assess visual field (e.g., confrontation, Amsler grid)
4.2.2.13 Visual evoked response
4.2.2.14 Electroretinogram
4.2.2.15 Spatial contrast sensitivity
4.2.2.16 Functional visual loss
4.2.2.17 Neutral density filter
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
4.2.3.9 Quantify relative afferent defect
4.2.3.10 Neutral density filter

4.2.4 Ocular Motility
4.2.4.1 Assess ocular motility
4.2.4.2 Range of eye movements
4.2.4.3 Stability of fixation
4.2.4.4 Assess stability of fixation
4.2.4.5 Versions
4.2.4.6 Assess versions
4.2.4.7 Ductions
4.2.4.8 Assess ductions
4.2.4.9 Vergence
4.2.4.10 Assess vergence
4.2.4.11 Alignment (e.g., cover-uncover; alternate cover, Maddox rod)
4.2.4.12 Assess alignment
4.2.4.13 Optokinetic nystagmus (OKN)
4.2.4.14 Oculocephalic maneuver
4.2.4.15 Passive forced ductions
4.2.4.16 Active force generation test
4.2.4.17 Pursuit
4.2.4.18 Assess pursuit
4.2.4.19 Saccades
4.2.4.20 Assess saccades
4.2.4.21 Nystagmus
4.2.4.22 Assess vestibular ocular reflex
4.2.4.23 Quantitative motility testing (Hess/BSV)

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
4.2.5.5 Apraxia of eyelid opening
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
4.2.6.2 Dystopia
4.2.6.3 Vascular abnormalities
4.2.6.4 Identify orbital and periocular abnormalities
4.2.6.5 Assess lacrimal system
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
4.2.7.7 Cranial Nerve VIII

4.3 Diagnostic Tests (16%)

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
4.3.2.3 Instrumentation and technique
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)
4.3.5.2 Visual evoked potential
4.3.5.3 Electrorretinography (multifocal and full field)
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 (32%)
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
4.4.2.4 Disease morbidity and mortality
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
  4.4.6.6 Hereditary optic neuropathy
  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)

4.4.8 Retro-chiasmal Disorders
  4.4.8.1 Disorders of the lateral geniculate and optic tract
  4.4.8.2 Disorders of the retrogeniculate pathway

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 Cranial nerve VI lesion
4.4.9.4 Multiple cranial nerve palsies (e.g., cavernous sinus syndrome)
4.4.9.5 Restrictive strabismus
4.4.9.6 Brain stem syndrome (e.g., internuclear ophthalmoplegia, one-and-one-half syndrome, gaze palsy)
4.4.9.7 Dorsal midbrain syndrome (Parinaud syndrome)

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
4.4.14.4 Miller Fisher variant of Guillain-Barré syndrome
4.4.14.5 Parkinsonism (e.g., progressive supranuclear palsy)
4.4.14.6 Chronic progressive external ophthalmoplegia
4.4.14.7 Disorders of higher cortical function
4.4.14.8 Thyroid eye disease
4.4.15 Miscellaneous
   4.4.15.1 Functional visual loss

4.5 Medical Therapy (10%)
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-ophtalmic indications for corticosteroids
      4.5.1.3.1 Giant cell arteritis
      4.5.1.3.2 Neuro-ophtalmic manifestations of other autoimmune diseases and vasculitides
      4.5.1.3.3 Selected cases of optic neuritis and other inflammatory/vasculitic optic neuropathies
      4.5.1.3.4 Idiopathic orbital inflammatory disease
      4.5.1.3.5 Compressive optic neuropathies
      4.5.1.3.6 Thyroid orbitopathy
      4.5.1.3.7 Isolated traumatic optic neuropathy (controversial)
      4.5.1.3.8 Neoplastic disease (e.g., use in therapy, danger of masking neoplastic disease)
      4.5.1.3.9 Inflammatory ophthalmoplegias
   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
   4.5.1.8 Follow-up care
   4.5.1.9 Provide or delegate follow-up care
   4.5.1.10 Monitor for complications of disease and therapy
   4.5.1.11 Patient instructions

4.6 Surgical Therapy (10%)
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
4.6.1.6 Optic nerve sheath fenestration versus CSF diversion
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
5.1 Anatomy and examination techniques: orbital, eyelid, lacrimal, facial (6%)
5.1.1 Anatomy
5.1.1.1 Dimensions
5.1.1.2 Bones
5.1.1.3 Topographic Relationships
5.1.1.4 Apertures
5.1.1.5 Soft tissues
5.1.1.6 Periorbital structures
5.1.1.7 Identify orbital structures
5.1.1.8 Examination of the orbit
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
5.1.2.3 Ultrasonography
5.1.2.4 Evaluate results from computed tomography and other imaging technology
5.1.3 Secondary Studies
5.1.3.1 Arteriography
5.1.3.2 Radionuclide scanning
5.1.3.3 CT and MR angiography
5.1.4 Laboratory Studies
5.1.4.1 Pathology
5.1.4.2 Vanillylmandelic acid and cystathionine
5.1.4.3 Thyroid function studies
5.1.4.4 Prostate specific antigen
5.1.4.5 Antineutrophil cytoplasmic antibodies
5.1.4.6 Order and evaluate different types of antigens and antibodies

5.1.5 Lacrimal Physiology
5.1.5.1 Secretory Apparatus
5.1.5.2 Excretory Apparatus
5.1.5.3 Evaluate the significance of the relationship of orbital anatomy to adjacent structures (e.g. nose and paranasal sinuses)

5.2 Orbital disorders and surgery: neoplasm, infection, inflammation (14%)
5.2.1 Basic Concepts in the Diagnosis of Orbital Disorders
5.2.1.1 Etiology
5.2.1.2 Epidemiology
5.2.1.3 Elements of History
5.2.1.4 Take patient history
5.2.1.5 Clinical features
5.2.1.6 Evaluation and diagnostic testing
5.2.1.7 Perform diagnostic testing
5.2.1.8 Evaluate results of diagnostic testing
5.2.1.9 Risk factors
5.2.1.10 Differential diagnosis
5.2.1.11 Diagnose orbital infections and disorders
5.2.1.12 Management
5.2.1.12.1 Medical
5.2.1.12.2 Surgical
5.2.1.12.3 Complications
5.2.1.13 Identify common medical and surgical therapies of the orbit
5.2.1.14 Perform surgical techniques in the orbit
5.2.1.15 Manage common medical and surgical therapies of the orbit
5.2.1.16 Participate in multi-disciplinary orbital procedures
5.2.1.17 Disease-Related complications
5.2.1.18 Identify disease-related complications
5.2.1.19 Manage disease-related complications
5.2.1.20 Patient instructions
5.2.1.21 Provide patient instructions

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
  5.2.2.4 Orbital abscess
  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 Zygomycosis
  5.2.2.10 Aspergillosis
  5.2.2.11 Vasculitis
  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
    5.2.3.1.3 Hemangiopericytoma
    5.2.3.1.4 Arteriovenous malformations
    5.2.3.1.5 Dural cavernous fistula and traumatic carotid cavernous fistula
    5.2.3.1.6 Orbital varices
    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
    5.2.3.3.2 Perform optic nerve sheath fenestration
    5.2.3.3.3 Sphenoid wing meningioma
    5.2.3.3.4 Optic nerve gliomas
    5.2.3.3.5 Neurofibromatosis 1
    5.2.3.3.6 Schwannoma
5.2.3.4 Mesenchymal Tumors
  5.2.3.4.1 Rhabdomyosarcoma
  5.2.3.4.2 Fibrous histiocytoma
  5.2.3.4.3 Liposarcoma
  5.2.3.4.4 Fibrosarcoma
  5.2.3.4.5 Osteogenic sarcoma
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
  5.2.3.6.1 Pleomorphic adenoma (benign mixed tumor) of the lacrimal gland
  5.2.3.6.2 Adenoid cystic carcinoma of the lacrimal gland
5.2.3.7 Histiocytic Tumors
  5.2.3.7.1 Letterer-Siwe
  5.2.3.7.2 Hand-Schüller-Christian
  5.2.3.7.3 Eosinophilic granuloma
  5.2.3.7.4 Juvenile xanthogranuloma
5.2.3.8 Fibro-osseous Tumors
  5.2.3.8.1 Fibrous dysplasia
  5.2.3.8.2 Osteomas
  5.2.3.8.3 Osteosarcoma
5.2.3.9 Secondary Tumors
  5.2.3.9.1 Globe
  5.2.3.9.2 Eyelid
  5.2.3.9.3 Sinus
  5.2.3.9.4 Brain
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
5.2.3.11 Identify signs and symptoms of orbital tumors and malformations
5.2.3.12 Manage (medical and surgical) different types of tumors and malformations
5.2.4 Basic concepts in the Treatment of Orbital Disorders and Tumors
  5.2.4.1 Indications
  5.2.4.2 Contraindications
  5.2.4.3 Identify indications and contraindications for a procedure
  5.2.4.4 Pre-procedure evaluation
  5.2.4.5 Alternatives to the procedure
  5.2.4.6 Identify alternatives to a procedure
  5.2.4.7 Instrumentation, Anesthesia and Techniques
  5.2.4.8 Complications of therapy
  5.2.4.9 Identify complications of surgery
  5.2.4.10 Manage complications of surgery
  5.2.4.11 Follow-up care
  5.2.4.12 Provide follow-up care
  5.2.4.13 Patient instructions
  5.2.4.14 Informed consent

5.2.5 Surgical approaches to orbital tumors
  5.2.5.1 Anterior
  5.2.5.2 Lateral
  5.2.5.3 Transcaruncular
  5.2.5.4 Transcranial

5.2.6 Special Surgical Techniques in the Orbit
  5.2.6.1 Endoscopy
  5.2.6.2 Fine needle aspiration biopsy

5.2.7 Complications of Orbital Surgery

5.3 Thyroid Eye Disease/Orbitopathy (8%)
  5.3.1 Thyroid Eye Disease
    5.3.1.1 Thyroid endocrine dysfunction
    5.3.1.2 Proptosis
    5.3.1.3 Manage (medical and surgical) T.E.D. related proptosis
    5.3.1.4 Compressive optic neuropathy
    5.3.1.5 Manage (medical and surgical) T.E.D. related 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
5.3.1.10 Lower lid retraction
5.3.1.11 Diagnose lower eyelid retraction
5.3.1.12 Orbital decompression
5.3.1.13 Upper eyelid retraction repair
5.3.1.14 Manage (medical and surgical) upper eyelid retraction
5.3.1.15 Lower lid retraction repair
5.3.1.16 Manage (medical and surgical) lower eyelid retraction

5.4 Anophthalmic socket: enucleation, evisceration, exenteration (8%)

5.4.1 Anophthalmic socket
  5.4.1.1 Enucleation
  5.4.1.2 Perform enucleation
  5.4.1.3 Evisceration
  5.4.1.4 Perform evisceration
  5.4.1.5 Exenteration
  5.4.1.6 Perform exenteration
  5.4.1.7 Manage complications of enucleation, evisceration
  5.4.1.8 Orbital Implant Options
  5.4.1.9 Perform secondary socket reconstruction
  5.4.1.10 Socket Contracture
  5.4.1.11 Congenital Socket Malformations

5.5 Eyelid and orbital trauma (10%)

5.5.1 Orbital Fractures
  5.5.1.1 Zygomatic fractures
  5.5.1.2 Medial wall fractures
  5.5.1.3 Orbital Floor Fractures
  5.5.1.4 Orbital Roof 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)
  5.5.1.7 Identify types of orbital fractures
  5.5.1.8 Manage (surgical) orbital fractures
  5.5.1.9 Manage (non-surgical) orbital fractures

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 (18%)
   5.6.1 Congenital Eyelid Anomalies
      5.6.1.1 Euryblepharon
      5.6.1.2 Ankyloblepharon
      5.6.1.3 Epicanthus
      5.6.1.4 Distichiasis
      5.6.1.5 Congenital coloboma

   5.6.2 Basic concepts in the diagnosis of Periocular Malpositions and Involutional Changes
      5.6.2.1 Etiology
      5.6.2.2 Epidemiology
      5.6.2.3 Elements of History
      5.6.2.4 Take patient history
      5.6.2.5 Clinical features
      5.6.2.6 Evaluation and diagnostic testing
      5.6.2.7 Perform diagnostic testing
      5.6.2.8 Evaluate results of diagnostic tests
      5.6.2.9 Biopsy periocular lesions
      5.6.2.10 Risk factors
      5.6.2.11 Differential diagnosis
      5.6.2.12 Diagnose periocular disorders
      5.6.2.13 Diagnose periocular malpositions and involutional changes
      5.6.2.14 Management
         5.6.2.14.1 Medical
         5.6.2.14.2 Surgical
         5.6.2.14.3 Complications
      5.6.2.15 Treat periocular disorders
      5.6.2.16 Identify common medical and surgical therapies
      5.6.2.17 Manage common medical and surgical therapies
5.6.2.18 Disease-Related complications
5.6.2.19 Identify disease-related sequelae
5.6.2.20 Manage disease-related sequelae complications
5.6.2.21 Patient instructions
5.6.2.22 Provide patient instructions

5.6.3 Ectropion
5.6.3.1 Involutional Ectropion
5.6.3.2 Paralytic Ectropion
5.6.3.3 Cicatricial ectropion
5.6.3.4 Congenital ectropion
5.6.3.5 Mechanical ectropion
5.6.3.6 Differentiate types of ectropion and entropion

5.6.4 Entropion
5.6.4.1 Involutional entropion
5.6.4.2 Cicatricial entropion
5.6.4.3 Trichiasis
5.6.4.4 Manage (medical and surgical) trichiasis
5.6.4.5 Congenital entropion
5.6.4.6 Symblepharon

5.6.5 Blepharoptosis
5.6.5.1 Congenital myogenic ptosis
5.6.5.2 Blepharophimosis syndrome
5.6.5.3 Synkinetic ptosis (Marcus Gunn syndrome)
5.6.5.4 Acquired myogenic ptosis
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
5.6.5.9 Pseudoptosis
5.6.5.10 Differentiate types of ptosis
5.6.5.11 Perform diagnostic testing of ptosis
5.6.5.12 Manage (medical and surgical) ptosis

5.6.6 Ptosis Surgery
5.6.6.1 Identify indications and contraindication of ptosis repair
5.6.6.2 Manage complications of ptosis repair
5.6.6.3 Frontalis suspension
5.6.6.4 Levator aponeurotic muscle surgery
5.6.6.5 Conjunctival-Müllerectomy
5.6.7 Floppy Eyelid Syndrome
5.6.7.1 Floppy eyelid syndrome
5.6.8 Lamellar Deficiencies
5.6.8.1 Anterior lamellar deficiency
5.6.8.2 Middle lamellar deficiency
5.6.8.3 Identify middle lamellar abnormalities
5.6.8.4 Posterior lamellar deficiency

5.7 Aesthetic and involutional eyelid and facial conditions and procedures (8%)
5.7.1 Involutional and gravitational changes of the face (diagnosis and management)
5.7.1.1 Identify age-related changes
5.7.1.2 Identify involutional changes of the upper face and eyelids
5.7.1.3 Identify involutional changes of the mid face and lower eyelids
5.7.1.4 Dermatochalasis
5.7.1.5 Manage (medical and surgical) upper dermatochalasis
5.7.1.6 Manage (medical and surgical) lower dermatochalasis
5.7.1.7 Brow Ptosis
5.7.1.8 Repair brow ptosis (direct brow lift)
5.7.1.9 Manage forehead ptosis (coronal, endoscopic, pretricheal surgery)
5.7.1.10 Identify and manage complications of forehead procedures
5.7.1.11 Upper eyelid blepharoplasty
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.)
5.7.1.13 Manage complications of upper blepharoplasty
5.7.1.14 Lower eyelid blepharoplasty
5.7.1.15 Identify indications and contraindication of lower blepharoplasty
5.7.1.16 Manage complications of lower blepharoplasty
5.7.1.17 Botulinum toxin use in oculoplastics
5.7.1.18 Perform aesthetic botulinum injections
5.7.1.19 Facial fillers used in oculoplastics
5.7.1.20 Perform facial or eyelid fillers
5.7.1.21 Skin resurfacing
5.7.1.22 Perform facial or eyelid chemical peel or laser resurfacing
5.7.1.23 Perform mid-facial (cheek) lifting
5.7.1.24 Perform facial flaps and grafts; harvest autologous tissues
5.7.1.25 Manage complications of aesthetic facial procedures

5.8 Eyelid, canthal, facial reconstruction (14%)

5.8.1 Eyelid neoplasms, lesions, inflammation
  5.8.1.1 Actinic keratosis
  5.8.1.2 Nevi
  5.8.1.3 Papilloma
  5.8.1.4 Molluscum contagiosum
  5.8.1.5 Xanthelasma
  5.8.1.6 Sebaceous gland tumors
  5.8.1.7 Tumors of sweat gland origin
  5.8.1.8 Tumors of hair follicle origin
  5.8.1.9 Basal cell carcinoma of the eyelid
    5.8.1.9.1 Basal cell nevus syndrome
  5.8.1.10 Squamous cell carcinoma of the eyelid
    5.8.1.10.1 Well differentiated squamous cell carcinoma (Keratoacanthoma)
  5.8.1.11 Malignant melanoma of the eyelid
  5.8.1.12 Lentigo maligna (Hutchinson melanotic freckle)
  5.8.1.13 Eccrine adenocarcinoma
  5.8.1.14 Blepharitis
  5.8.1.15 Epidermal inclusion cysts
  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
  5.8.1.21 Manage malignant eyelid tumors
  5.8.1.22 Mohs micrographic surgery
  5.8.1.23 Incisional biopsy
  5.8.1.24 Excisional biopsy
  5.8.1.25 Surgical resection
5.8.1.26 Cryotherapy
5.8.1.27 Radiation therapy
5.8.1.28 Chemotherapy
5.8.1.29 Recurrent tumor treatment
5.8.1.30 Metastatic tumor treatment

5.8.2 Eyelid and Canthal Reconstruction
  5.8.2.1 Eyelid defects not involving the eyelid margin
  5.8.2.2 Upper Eyelid Reconstruction
  5.8.2.3 Lower Eyelid Reconstruction
  5.8.2.4 Lateral Canthal Defects
  5.8.2.5 Medial Canthal Defects
  5.8.2.6 Full-Thickness Block Resection and Repair
  5.8.2.7 Perform eyelid and canthal reconstruction

5.9 Lacrimal outflow abnormalities and procedures (8%)
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
  5.9.1.5 Congenital Nasolacrimal Obstruction
  5.9.1.6 Manage congenital nasolacrimal duct obstruction
  5.9.1.7 Acquired nasolacrimal duct obstruction
  5.9.1.8 Manage (surgical) acquired nasolacrimal duct obstruction
  5.9.1.9 Manage (medical) nasolacrimal abnormalities
  5.9.1.10 Punctal Ectropion
  5.9.1.11 Punctal stenosis and atresia
  5.9.1.12 Canalicular Obstruction
  5.9.1.13 Canaliculitis
  5.9.1.14 Dacryocystitis
  5.9.1.15 Dacryoadenitis

5.9.2 Management of Lacrimal Outflow Disorders
  5.9.2.1 Nasal endoscopy
  5.9.2.2 Endonasal dacryocystorhinostomy for acquired nasolacrimal duct obstruction
  5.9.2.3 External dacryocystorhinostomy for acquired nasolacrimal duct obstruction
5.9.2.4 Silicone intubation of the nasolacral drainage system
5.9.2.5 Balloon catheter dilation
5.9.2.6 Punctoplasty
5.9.2.7 Jones tube insertion (conjunctival dacryocystorhinostomy)
5.9.2.8 Probe and irrigate the lacrimal system

5.10 Facial paralysis/dystonia (4%)
5.10.1 Facial Paralysis
  5.10.1.1 Facial nerve palsy
5.10.2 Dystonia
  5.10.2.1 Benign essential blepharospasm
  5.10.2.2 Diagnose blepharospasm
  5.10.2.3 Hemifacial spasm
  5.10.2.4 Diagnose hemifacial spasm
  5.10.2.5 Perform botulinum injections for eyelid dystonias

5.11 Miscellaneous oculoplastic procedures (2%)
5.11.1 Tarsorrhaphy
5.11.2 Temporal artery biopsy
5.11.3 Perform temporal artery biopsy

7 Pediatric Ophthalmology and Strabismus
7.1 Assessment Techniques (10%)
7.1.1 Tests and Measurements
  7.1.1.1 Cover tests
  7.1.1.2 Accommodative convergence/accommodation ratio
  7.1.1.3 Identify abnormal AC/A ratio
  7.1.1.4 Perform Worth four dot test
  7.1.1.5 Interpret Worth four dot test results
  7.1.1.6 Test stereoacuity
  7.1.1.7 Interpret stereoacuity results
  7.1.1.8 Test corneal light reflex
  7.1.1.9 Perform three-step test for cyclovertical muscle palsies
  7.1.1.10 Interpret three-step test results for cyclovertical muscle palsies
  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
   7.1.3.2 Manifest refraction
   7.1.3.3 Test visual acuity

7.2 Diagnosis of Pediatric Ophthalmology Disorders (2%)
   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
      7.2.1.5 Perform diagnostic testing
      7.2.1.6 Evaluate testing results
      7.2.1.7 Monitor for disease-related complications
      7.2.1.8 Provide patient instructions

7.3 Genetics (2%)
   7.3.1 Basic Concepts
      7.3.1.1 Mendelian inheritance
         7.3.1.1.1 autosomal dominant (AD) inheritance
         7.3.1.1.2 autosomal recessive (AR) inheritance
         7.3.1.1.3 X-linked inheritance
      7.3.1.2 Non-Mendelian inheritance
      7.3.1.3 Genetic counseling
      7.3.1.4 Gene therapy

7.4 Congenital-Genetic Disorders (2%)
   7.4.1 Congenital Disorders
      7.4.1.1 Aniridia
      7.4.1.2 Congenital/infantile glaucoma
      7.4.1.3 Congenital and acquired cataracts in children
      7.4.1.4 Congenital eyelid/ocular disorders: ocular colobomata
      7.4.1.5 Congenital infection syndrome
      7.4.1.6 Congenital corneal abnormalities
      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

7.4.2 Surgical Procedures for Cataract
   7.4.2.1 Lensectomy (for congenital and acquired cataracts)
   7.4.2.2 Intraocular lens implantation
   7.4.2.3 Perform surgical procedures for congenital cataract

7.4.3 Persistent Fetal Vasculature
   7.4.3.1 Persistent Fetal Vasculature

7.4.4 Craniosynostosis
   7.4.4.1 Craniosynostosis

7.5 Visual Development and Associated Abnormalities (4%)
   7.5.1 Normal milestones of ocular and visual development
     7.5.1.1 Normal milestones of ocular and visual development
   7.5.2 Role of ophthalmologist in learning disabilities
     7.5.2.1 Role of ophthalmologist in learning disabilities
   7.5.3 Poor vision in infants
     7.5.3.1 Cortical visual impairment in children
     7.5.3.2 Albinism
     7.5.3.3 Leber congenital amaurosis
     7.5.3.4 Achromatopsia
     7.5.3.5 Delayed visual maturation
   7.5.4 Functional Vision Loss
     7.5.4.1 Diagnostic techniques

7.6 Infectious and Allergic Diseases (8%)
   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 (4%)

7.7.1 Syndromes
  7.7.1.1 Tuberous sclerosis
  7.7.1.2 Retinal angiomatosis (von Hippel-Lindau)
  7.7.1.3 Ataxia telangiectasia
  7.7.1.4 Incontinentia pigmentii
  7.7.1.5 Neurofibromatosis
  7.7.1.6 Sturge-Weber syndrome
  7.7.1.7 Wyburn-Mason syndrome (racemose angioma)
  7.7.1.8 Klippel-Trenanau Weber syndrome
  7.7.1.9 Stevens-Johnson syndrome
  7.7.1.10 Kawasaki 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 (4%)

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
  7.8.1.6 Syphilis
  7.8.1.7 Lyme disease
  7.8.1.8 Toxoplasmosis
7.8.1.9 Sarcoidosis
7.8.1.10 Tubulointerstitial nephritis and uveitis syndrome

7.8.2 Posterior Uveitis
7.8.2.1 Toxoplasmosis
7.8.2.2 Ocular histoplasmosis
7.8.2.3 Toxocariasis
7.8.2.4 Diffuse unilateral subacute neuroretinitis
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
7.8.2.9 Syphilis

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

7.8.4 Masquerade Syndromes
7.8.4.1 Anterior segment
7.8.4.2 Posterior segment

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 (4%)

7.9.1 Genetic Disorders
7.9.1.1 Stargardt disease
7.9.1.2 Norrie disease
7.9.1.3 Aicardi syndrome
7.9.1.4 Stickler syndrome
7.9.1.5 Familial drusen
7.9.1.6 Familial exudative vitreoretinopathy
7.9.1.7 Familial juvenile retinoschisis
7.9.1.8 Best vitelliform dystrophy
7.9.1.9 Rod and cone dystrophy
  7.9.1.9.1 Retinitis pigmentosa
7.9.2 Other
  7.9.2.1 Retinopathy of prematurity
  7.9.2.2 Coats disease
  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 (6%)

7.10.1 Congenital Disorders
  7.10.1.1 Congenital ptosis
  7.10.1.2 Congenital ectropion
  7.10.1.3 Congenital entropion
  7.10.1.4 Epiblepharon
  7.10.1.5 Marcus-Gunn jaw-winking
  7.10.1.6 Anklyoblepharon
  7.10.1.7 Blepharophimosis
  7.10.1.8 Eyelid coloboma
  7.10.1.9 Epicanthus

7.10.2 Lacrimal Disorders
  7.10.2.1 Nasolacrimal duct obstruction
  7.10.2.2 Dacryocele
  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

7.10.3 Surgery for Nasolacrimal Obstruction
  7.10.3.1 Probing
  7.10.3.2 Silicone tube intubation
  7.10.3.3 Infracture of turbinate
  7.10.3.4 Balloon intubation
7.11 Optic Disc Disorders (4%)

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
- 7.11.1.9 Morning glory disc anomaly
- 7.11.1.10 Tilted disc syndrome
- 7.11.1.11 Optic pits

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 (4%)

7.12.1 Tumors
- 7.12.1.1 Rhabdomyosarcoma
- 7.12.1.2 Neuroblastoma
- 7.12.1.3 Capillary hemangioma
- 7.12.1.4 Choroidal hemangioma
- 7.12.1.5 Choroidal osteoma
- 7.12.1.6 Retinoblastoma
- 7.12.1.7 Lymphangioma
- 7.12.1.8 Retinal cavernous hemangioma
- 7.12.1.9 Metastatic disease

7.12.2 Diseases
- 7.12.2.1 Idiopathic orbital inflammatory disease (orbital pseudotumor)

7.12.3 Tissues
- 7.12.3.1 Tumors of bone origin
- 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 (2%)
7.13.1 Infantile Nystagmus Syndrome
   7.13.1.1 Idiopathic infantile nystagmus
7.13.2 Latent /Manifest Latent Nystagmus
   7.13.2.1 Latent/manifest latent nystagmus
7.13.3 Acquired Nystagmus in Children
   7.13.3.1 Acquired nystagmus
7.13.4 Other Acquired Eye Movement Disorders
   7.13.4.1 Spasmus nutans
   7.13.4.2 Opsoclonus

7.14 Amblyopia (14%)
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
   7.14.2.3 Optical degradation
   7.14.2.4 Pharmacological penalization
   7.14.2.5 Levodopa
   7.14.2.6 Treat amblyopia

7.15 Strabismus (24%)
7.15.1 Anatomy and Physiology
   7.15.1.1 Anatomy of extraocular muscles
   7.15.1.2 Sensory physiology and normal binocular functions
7.15.2 Pseudoesotropias
   7.15.2.1 Pseudoesotropias
7.15.3 Esodeviations
7.15.3.1 Infantile esotropia
7.15.3.2 Refractive accommodative esotropia
7.15.3.3 Nonrefractive accommodative esotropia (high AC/A ratio)
7.15.3.4 Partially accommodative esotropia
7.15.3.5 Basic (acquired) esotropia in childhood
7.15.3.6 Acute esotropia
7.15.3.7 Sensory esotropia
7.15.3.8 Nystagmus and esotropia
7.15.3.9 Incomitant esotropia

7.15.4 Pseudoesotropia
7.15.4.1 Positive angle kappa

7.15.5 Exodeviations
7.15.5.1 Exophoria
7.15.5.2 Infantile exotropia
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

7.15.6 A and V Patterns
7.15.6.1 A-pattern strabismus
7.15.6.2 V-pattern strabismus

7.15.7 Vertical Deviations
7.15.7.1 Inferior oblique muscle overaction/overelevation in adduction
7.15.7.2 Dissociated strabismus complex (vertical deviation)
7.15.7.3 Superior oblique palsy
7.15.7.3.1 unilateral superior oblique palsy
7.15.7.3.2 bilateral superior oblique palsy
7.15.7.4 Vertical deviations due to orbital floor fracture (blowout fracture)
7.15.7.5 Skew deviation

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
7.15.8.5 Duane syndrome
   7.15.8.5.1 esotropic Duane syndrome
   7.15.8.5.2 exotropic Duane syndrome
   7.15.8.5.3 vertical deviations due to Duane syndrome
7.15.8.6 Möbius syndrome
7.15.8.7 Brown syndrome/superior oblique tendon sheath syndrome
7.15.8.8 Monocular elevation deficit/double elevator palsy
7.15.8.9 Diagnose types of strabismus
7.15.8.10 Perform diagnosis specific follow-up care

7.15.9 Basic Concepts in Treatment of Pediatric Disorders/Strabismus
   7.15.9.1 Indications
   7.15.9.2 Contraindications
   7.15.9.3 Pre-procedure evaluation
   7.15.9.4 Alternatives to procedures
   7.15.9.5 Instrumentation, anesthesia and techniques
   7.15.9.6 Complications of therapy
   7.15.9.7 Informed consent

7.15.10 Treatment of Strabismus
   7.15.10.1 Eyeglasses, including bifocals and prisms
   7.15.10.2 Pharmacologic treatment
   7.15.10.3 Surgery of the extracocular muscles
      7.15.10.3.1 weakening procedures (including injectables)
      7.15.10.3.2 strengthening procedures (including injectables)
      7.15.10.3.3 adjustable suture techniques
   7.15.10.4 Anesthesia for strabismus surgery
   7.15.10.5 Ocular complications for strabismus surgery
      7.15.10.5.1 malignant hyperthermia
      7.15.10.5.2 other ocular complications
   7.15.10.6 Provide patient instructions
   7.15.10.7 Obtain informed consent
   7.15.10.8 Consider surgical and non-surgical treatments
7.15.10.9 Determine appropriate surgical approach
7.15.10.10 Explain the surgical technique(s) to the patient

7.16 Ocular Trauma (6%)
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

7.17 Clinical Trials
7.17.1 Retinopathy of Prematurity (ROP) Trials
   7.17.1.1 CRYO-ROP
   7.17.1.2 ETROP trial
7.17.2 Studies
   7.17.2.1 Amblyopia Treatment Studies

8 Refractive Management and Optics

8.1 Scientific Aspects of Optics (10%)
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
   8.1.1.4 Analyze corneal shape
   8.1.1.5 Wavefront theory and application
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 (18%)
8.2.1 Refraction
   8.2.1.1 Refractive stability
   8.2.1.2 Examine patient for refractive intervention
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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
  8.2.2.2 Wavefront testing
  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
  8.2.3.3 Power cross diagram notation and conversion

8.2.5 Basic Concepts
  8.2.5.1 Indications
  8.2.5.2 Contraindications
  8.2.5.3 Pre-test evaluation
  8.2.5.4 Take patient history
  8.2.5.5 Alternatives to the test
  8.2.5.6 Determine alternatives to the test
  8.2.5.7 Instrumentation and techniques
  8.2.5.8 Complications of the test
  8.2.5.9 Monitor complications
  8.2.5.10 Considerations in interpreting the test
  8.2.5.11 Interpret the test
  8.2.5.12 Provide patient instructions

8.3 Refractive Errors (16%)
  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
8.3.1.8 Pellucid marginal corneal degeneration
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
8.3.2.2 Epidemiology
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
8.3.2.11 Differential diagnosis

8.3.3 Patient Management
8.3.3.1 Medical therapy
8.3.3.2 Surgical therapy
8.3.3.3 Manage refractive errors with cataract surgery and incisional surgery
8.3.3.4 Manage refractive errors with laser keratorefractive surgery
8.3.3.5 Disease-related complications
8.3.3.6 Patient instructions
8.3.3.7 Give patient instructions (e.g., contact lenses use, post-operative care)

8.4 Refractive Management (28%)
8.4.1 Medical
8.4.1.1 Eyeglasses
8.4.1.2 Determine which type of glasses to prescribe
8.4.1.3 Contact lenses for refractive errors
8.4.1.4 Prescribe contact lenses for refractive errors
8.4.1.5 Orthokeratology (corneal refractive therapy)
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)
8.4.2.1 Multifocal lenses
8.4.2.2 Special purpose lenses
8.4.2.3 Therapeutic use of prisms
8.4.2.4 Prismatic effects
8.4.2.5 Indications
8.4.2.6 Contraindications
8.4.2.7 Patient suitability for lenses
8.4.2.8 Alternatives
8.4.2.9 Complications
8.4.2.10 Follow-up care
8.4.2.11 Patient instructions
8.4.2.12 Low vision (e.g., visual disability, visual impairment)

8.4.3 Laser Vision Correction
8.4.3.1 Excimer laser surface ablation
8.4.3.2 Excimer laser in situ keratomileusis
8.4.3.3 Intraoperative complications (e.g., incomplete flap, buttonhole flap)
8.4.3.4 Postoperative complications (e.g. DLK, dry eye, ectasia)

8.4.4 Lens-Based Correction
8.4.4.1 Phakic intraocular lens (IOL)
8.4.4.2 Refractive lensectomy / refractive lens exchange
8.4.4.3 Intraoperative complications (e.g., bleeding, wrong IOL power)
8.4.4.4 Postoperative complications (e.g., endophthalmitis, cataract)

8.4.5 Other Corneal Refractive Procedures
8.4.5.1 Conductive keratoplasty
8.4.5.2 Intraoperative complications (e.g., corneal perforations, bleeding)
8.4.5.3 Postoperative complications (e.g., irregular astigmatism)
8.4.5.4 Incisional (e.g., radial keratotomy, astigmatic keratotomy, limbal relaxing incisions)
8.4.5.5 Intrastromal corneal ring segments

8.5 Operative Evaluation, Testing and Complications (28%)
8.5.1 Basic Concepts of Surgical Management
  8.5.1.1 Advantages
  8.5.1.2 Disadvantages
  8.5.1.3 Indications
  8.5.1.4 Contraindications
  8.5.1.5 Identify which type of surgery is appropriate for disease/condition
  8.5.1.6 Pre-procedure evaluation
  8.5.1.7 Alternatives to the procedure
  8.5.1.8 Provide patient with alternatives to the surgical procedure
  8.5.1.9 Instrumentation, anesthesia and technique
  8.5.1.10 Complications of the procedure
  8.5.1.11 Describe possible complications of the surgical procedure
  8.5.1.12 Manage intraoperative complications of refractive surgery
  8.5.1.13 Follow-up care
  8.5.1.14 Patient instructions

8.5.2 Preoperative Evaluation and Testing
  8.5.2.1 Perform preoperative screening for refractive surgery
  8.5.2.2 Informed consent issues with refractive surgery
  8.5.2.3 Issues of unilateral vs. bilateral refractive surgery
  8.5.2.4 Pupil measurements
  8.5.2.5 Measure pupils prior to refractive surgery
  8.5.2.6 Ocular dominance testing
  8.5.2.7 Test ocular dominance
  8.5.2.8 Tonometry
  8.5.2.9 Issues of ablation diameter vs. depth
  8.5.2.10 Visual axis alignment and angle kappa issues
  8.5.2.11 Identify visual axis alignment and angle kappa issues

8.5.3 Post Surgical Considerations
  8.5.3.1 Corneal thickness effect on intraocular pressure measurements
  8.5.3.2 IOL power determination
  8.5.3.3 Enhancements
  8.5.3.4 Manage postoperative complications of refractive surgery
  8.5.3.5 Identify potential sources of error in delivering laser correction

9 Retina and Vitreous
9.1 Basic Anatomy (4%)

9.1.1 Anatomy
   9.1.1.1 Vitreous
   9.1.1.2 Neurosensory retina
   9.1.1.3 Retinal pigment epithelium
   9.1.1.4 Bruch membrane
   9.1.1.5 Choroid
   9.1.1.6 Sclera

9.2 Evaluation Techniques (24%)

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

9.2.2 Test Procedures
   9.2.2.1 Electrophysiologic
   9.2.2.2 Psychophysical

9.2.3 Clinical Indications for Electrophysiological 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
   9.2.3.3 Generalized degenerations
      9.2.3.3.1 Retinal
      9.2.3.3.2 Choroidal
   9.2.3.4 Disorders of night vision
   9.2.3.5 Visual problems in infants and children
   9.2.3.6 Use in retained intraocular foreign bodies

9.2.4 Fluorescein Angiography
   9.2.4.1 Indications
   9.2.4.2 Contraindications
   9.2.4.3 Pre-procedure evaluation
   9.2.4.4 Alternatives to this procedure
   9.2.4.5 Techniques/methods
   9.2.4.6 Complications
   9.2.4.7 Counsel patients on possible side effects and/or complications from angiography
   9.2.4.8 Monitor and manage any complications following angiography
9.2.4.9 Interpretation of this procedure
9.2.4.10 Interpret fundus angiography
9.2.4.11 Interpret iris angiography
9.2.4.12 Follow-up care
9.2.5 Optical coherence tomography
  9.2.5.1 Underlying physical principles
  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
  9.2.6.6 Conduct ocular ultrasound (echography)
  9.2.6.7 Interpretation of this procedure
9.2.7 Genetic testing
  9.2.7.1 Disorders that can be tested
  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 (48%)
9.3.1 Elements of Disease Diagnosis
  9.3.1.1 Etiology
  9.3.1.2 Epidemiology
  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
9.3.2.3 Manage pre- and post-operative care for surgical 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
  9.3.3.3 Angioid streaks
  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
  9.3.3.9 Other causes of subretinal neovascularization
  9.3.3.10 Solar retinopathy
  9.3.3.11 Photoretinopathy
  9.3.3.12 Choroidal folds
  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
  9.3.4.5 Radiation retinopathy
  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
  9.3.4.10 Macular telangiectasis
    9.3.4.10.1 Type 1 (exudative)
    9.3.4.10.2 Type 2 (non-exudative)
  9.3.4.11 Acquired retinal macroaneurysm
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9.3.4.12 Cystoid macular edema
9.3.4.13 Cilioretinal artery occlusion
9.3.4.14 Ophthalmic artery occlusion
9.3.4.15 Primary idiopathic vasculitis (Eales disease)
9.3.4.16 Primary retinal vascular anomalies
  9.3.4.16.1 Retinal telangiectasia (Coats disease)
  9.3.4.16.2 Angiomatosis retinae (von Hippel disease)
  9.3.4.16.3 Congenital retinal arteriovenous malformations, racemose hemangioma: Wyburn-Mason syndrome
  9.3.4.16.4 Retinal cavernous hemangioma
  9.3.4.16.5 Congenital preapillary vascular loop
  9.3.4.16.6 Congenital retinal macrovessels
9.3.4.17 Rheumatic diseases
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
9.3.4.21 Hyperlipoproteinemias
9.3.4.22 Treat or manage retinal vascular diseases
9.3.5 Chorioretinal Inflammations
  9.3.5.1 Multiple evanescent white dot syndrome
  9.3.5.2 Multifocal choroiditis with panuveitis
  9.3.5.3 Sarcoidosis
  9.3.5.4 Intermediate uveitis-pars planitis
  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
  9.3.5.6 Necrotizing herpetic retinitis
    9.3.5.6.1 Acute retinal necrosis (ARN)
    9.3.5.6.2 Progressive outer retinal necrosis (PORN)
9.3.5.7 Toxoplasmosis
9.3.5.8 Syphilitic panuveitis
9.3.5.9 Toxocariasis posterior uveitis
9.3.5.10 Cytomegalovirus retinitis
9.3.5.11 Tuberculosis
9.3.5.12 Vitiliginous chorioretinitis (birdshot retinochoroidopathy)
9.3.5.13 Punctate inner choroidopathy (PIC)
9.3.5.14 Epitheliopathy–Acute Multifocal Posterior Placoid Pigment Epitheliopathy (AMPPPE)
9.3.5.15 Serpiginous choroiditis (geographic helicoid peripapillary choroidopathy)
9.3.5.16 Acute macular neuroretinopathy
9.3.5.17 Vogt-Koyanagi-Harada Syndrome (VKH)
9.3.5.18 Viral Retinopathy
  9.3.5.18.1 Rubella
  9.3.5.18.2 Subacute Sclerosing Panencephalitis (SSPE)
9.3.5.19 Gastrointestinal disorders
  9.3.5.19.1 Whipple disease
  9.3.5.19.2 Inflammatory bowel disease
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)
  9.3.6.4 Cone and cone-rod dystrophies
  9.3.6.5 Retinal pigment epithelium dystrophies
    9.3.6.5.1 Dominant drusen (malattia leventinese)
    9.3.6.5.2 Sorsby
    9.3.6.5.3 Pattern dystrophies (including adult onset foveomacular dystrophy)
  9.3.6.6 Choroidal Dystrophies
    9.3.6.6.1 Choroideremia
    9.3.6.6.2 Gyrate atrophy
    9.3.6.6.3 Degenerative myopia
    9.3.6.6.4 Central areolar choroidal dystrophy
    9.3.6.6.5 Choroidal atrophy
  9.3.6.7 Vitreoretinal dystrophies
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9.3.6.7.1 Juvenile X-linked Retinoschisis (JXR)
9.3.6.7.2 Vitreoretinal dystrophy (Stickler and Wagner)
9.3.6.7.3 Goldman-Favre syndrome (enhanced S-cone syndrome)
9.3.6.7.4 Well-Marchesani
9.3.6.7.5 Familial Exudative Vitreoretinopathy (FEVR)
9.3.6.8 Differentiate between retinal, choroidal and macular dystrophies

9.3.7 Drug Toxicities
9.3.7.1 Chloroquine and its derivatives
9.3.7.2 Phenothiazines
9.3.7.3 Oral contraceptives
9.3.7.4 Nicotinic acid
9.3.7.5 Digoxin
9.3.7.6 Tamoxifen
9.3.7.7 Canthaxanthine
9.3.7.8 Methoxyflurane
9.3.7.9 Methanol
9.3.7.10 Carbon monoxide
9.3.7.11 Talc
9.3.7.12 Others (e.g., sildenafil, interferon, prostaglandin, quinine, rifabutin)

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
9.3.8.5 Cholesterolosis (synthesis scintillans)
9.3.8.6 Amyloidosis
9.3.8.7 Complications of vitreous loss during cataract surgery
9.3.8.8 Indications for surgery
9.3.8.9 Instrumentation
9.3.8.10 Operative techniques
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
  9.3.9.4 Degenerative retinoschisis
  9.3.9.5 Lesions that do not predispose to retinal detachment (e.g., pars plana cysts, paving stone degeneration, white with and without pressure
  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

9.3.11 Metabolic Diseases Affecting the Retina
  9.3.11.1 Systemic mucopolysaccharidoses
  9.3.11.2 Sphingolipidoses
  9.3.11.3 Mucolipidoses
  9.3.11.4 Cystinosis
  9.3.11.5 Diagnose metabolic diseases affecting the retina

9.3.12 Albinism
  9.3.12.1 Oculocutaneous albinism
  9.3.12.2 Ocular albinism
  9.3.12.3 Albinoidism
  9.3.12.4 Diagnose type of albinism

9.3.13 Posterior Segment Trauma
  9.3.13.1 Commotio retinae
  9.3.13.2 Choroidal rupture
  9.3.13.3 Scleretaria retinans
  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
  9.3.14.4 Melanocytoma or magnocellular nevus
  9.3.14.5 Choroidal osteoma
  9.3.14.6 Vascular tumors of the choroid and retina
    9.3.14.6.1 Choroid
    9.3.14.6.2 Retina
  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
  9.3.14.11 Differentiate less common types of tumors
  9.3.14.12 Determine treatment plan for tumors

9.4 Surgery (24%)
  9.4.1 Pertinent Elements of Indications/Contraindications
    9.4.1.1 Common indications
    9.4.1.2 Determine when surgery is appropriate for the disease/condition
9.4.1.3 Identify the type of surgery required
9.4.1.4 Pre-procedure/therapy evaluation
9.4.1.5 Provide pre and postoperative patient instructions
9.4.1.6 Explain the surgical options with the patient
9.4.1.7 Instrumentation, anesthesia and technique
9.4.1.8 Complications of the procedure/therapy, their prevention and management
9.4.1.9 Provide follow up care

9.4.2 Lasers
9.4.2.1 Lasers

9.4.3 Intravitreal Injections
9.4.3.1 Intravitreal Injections
9.4.3.2 Administer intravitreal injections

9.4.4 Vitrectomy
9.4.4.1 Pars plana vitrectomy
9.4.4.2 Perform pars plana vitrectomy
9.4.4.3 Vitrectomy for selected macular diseases
9.4.4.4 Vitrectomy for posterior segment complications of anterior segment surgery
9.4.4.5 Vitrectomy for complex retinal detachment

9.4.5 Pneumatic Retinopexy
9.4.5.1 Pneumatic Retinopexy

9.4.6 Scleral Buckle Surgery
9.4.6.1 Scleral Buckle Surgery
9.4.6.2 Perform scleral buckle surgery

9.4.7 Infectious Retinitis
9.4.7.1 Infectious Retinitis

9.4.8 Photocoagulation
9.4.8.1 Principles of technique
9.4.8.2 Mechanisms of action
9.4.8.3 General indications
9.4.8.4 Wavelengths employed
9.4.8.5 Complications
9.4.8.6 Perform photocoagulation

9.4.9 Photodynamic therapy
9.4.9.1 Indications
10 Uveitis

10.1 Basic Anatomical/Scientific Aspects (2%)

10.1.1 Principles of Immunology

10.1.1.1 Basic concepts in immunology (innate vs. adaptive immunity)

10.1.1.2 Components of the immune system

10.1.1.2.1 Cellular immunity

10.1.1.2.2 Cytokines and chemokines

10.1.1.2.3 Antibodies (immune response)

10.1.1.3 Identify components of the immune system

10.1.1.4 Immune response arc (local ocular vs. systemic immunological processes)

10.1.1.5 Mechanisms of immune effector reactivity

10.1.1.6 Immunoregulation of the adaptive immune system

10.1.1.7 Ocular immune responses

10.2 Evaluation Techniques (16%)

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

10.2.2 Physical Examination

10.2.2.1 Ocular signs

10.2.2.2 Systemic signs

10.2.2.3 Primary site of inflammation

10.2.2.3.1 Anterior

10.2.2.3.2 Intermediate

10.2.2.3.3 Posterior

10.2.2.3.4 Panuveitis

10.2.2.3.5 Endophthalmitis

10.2.2.3.6 Scleritis

10.2.2.4 Activity of uveitis
10.2.3 Medical and Surgical History
   10.2.3.1 Medication history
   10.2.3.2 Family history of autoimmune disorders
   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
   10.2.4.4 Nuclear medicine and positron emission
   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
   10.2.5.3 Posterior segment angiography: indocyanine green angiography (ICG)
   10.2.5.4 Autofluorescence
   10.2.5.5 Ultrasonography
   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
   10.2.6.1 Conjunctival biopsy/pathology
   10.2.6.2 Vitreous biopsy
   10.2.6.3 Anterior chamber aspiration
   10.2.6.4 Chorioretinal biopsy
   10.2.6.5 Scleral biopsy

10.2.7 Ocular specimen testing
   10.2.7.1 Microbiology study; culture and PCR
10.2.7.2 Cytology
10.2.7.3 Histology
10.2.7.4 Immunochemistry
10.2.7.5 Obtain intraocular specimens

10.3 Clinical Disease Conditions and Manifestations (4%)

10.3.1 Basic Concepts in Disease Diagnosis
   10.3.1.1 Diagnose intraocular inflammation and uveitis
   10.3.1.2 Etiology
   10.3.1.3 Epidemiology
   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
   10.3.1.9 Provide patient instructions (e.g., communicate to the patient: user drops, basic education)
   10.3.1.10 Medical therapies
   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 (20%)

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
   10.4.1.5 Glaucomatocyclitic crisis

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
   10.4.2.4 Fuchs uveitis syndrome
   10.4.2.5 Tubulointerstitial nephritis and uveitis syndrome
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

10.4.4 Posterior Uveitis
   10.4.4.1 Acute posterior multifocal placoid pigment epitheliopathy
   10.4.4.2 Birdshot retinochoroidopathy
   10.4.4.3 Multiple evanescent white dot syndrome (MEWDS)
   10.4.4.4 Multifocal choroiditis
   10.4.4.5 Serpiginous choroidopathy
   10.4.4.6 Punctate inner choroidopathy
   10.4.4.7 Acute zonal outer occult retinopathy (AZOOR)

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
      10.4.5.1.3 ANCA-associated vasculitis
   10.4.5.2 Idiopathic retinal vasculitis
   10.4.5.3 Antiphospholipid Antibody Syndrome

10.4.6 Panuveitis
   10.4.6.1 Sarcoidosis panuveitis
   10.4.6.2 Sympathetic ophthalmia
   10.4.6.3 Vogt-Koyanagi-Harada disease
   10.4.6.4 Multifocal choroiditis with panuveitis

10.4.7 Scleritis and Episcleritis
   10.4.7.1 Idiopathic
   10.4.7.2 Associated with systemic disease

10.4.8 Endophthalmitis
   10.4.8.1 Post injection therapy
   10.4.8.2 Related to systemic drugs (e.g., rifabutin-induced uveitis)

10.5 Infectious Uveitis (16%)

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
10.5.1.4 Determine appropriate method of treatment (surgical or medical)
10.5.1.5 Perform appropriate treatment for common 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
10.5.3.4 Associated with filtering blebs
10.5.3.5 Endogenous (subretinal abscess)
10.5.3.6 Prophylaxis
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
10.5.4.3 Rubella-associated anterior uveitis
10.5.4.4 Cytomegalovirus associated 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
10.5.4.9 HTLV-1 uveitis
10.5.4.10 Dengue fever
10.5.4.11 Epstein-Barr virus
10.5.4.12 West Nile virus retinitis
10.5.4.13 BK virus retinitis

10.5.5 Bacterial Uveitis
10.5.5.1 Syphilitic uveitis
10.5.5.2 Lyme disease
10.5.5.3 Leptospiral uveitis
10.5.5.4 Tuberculosis uveitis
10.5.5.5 Ocular bartonellosis
10.5.5.6 Brucellar uveitis
10.5.5.7 Tularemia
10.5.5.8 Leprosy

10.5.6 Fungal Uveitis
   10.5.6.1 Ocular histoplasmosis syndrome
   10.5.6.2 Cryptococcosis
   10.5.6.3 Coccidioidomycosis

10.5.7 Helminthic Uveitis
   10.5.7.1 Toxocariasis
   10.5.7.2 Diffuse unilateral subacute neuroretinitis (DUSN)
   10.5.7.3 Cysticercosis

10.5.8 Protozoal Uveitis
   10.5.8.1 Toxoplasmic retinochoroiditis
   10.5.8.2 Pneumocystis choroiditis

10.6 Masquerade Syndromes (6%)

10.6.1 Non-neoplastic Masquerade Syndromes
   10.6.1.1 Diagnose non-neoplastic masquerade syndromes
   10.6.1.2 Treat non-neoplastic masquerade syndromes
   10.6.1.3 Diagnose intraocular malignancies
   10.6.1.4 Retinitis pigmentosa (RP)
   10.6.1.5 Chronic retinal detachment
   10.6.1.6 Retained intraocular foreign body
   10.6.1.7 Pigment dispersion syndrome
   10.6.1.8 Ocular ischemic syndrome
   10.6.1.9 Juvenile xanthogranuloma

10.6.2 Neoplastic Masquerade Syndromes
   10.6.2.1 Primary central nervous system intraocular lymphoma
   10.6.2.2 Leukemia (as masquerade syndrome)
   10.6.2.3 Uveal melanoma (as a masquerade syndrome)
   10.6.2.4 Retinoblastoma (as masquerade syndrome)
10.6.2.5 Systemic lymphoma
10.6.2.6 Nonlymphoid malignancies
    10.6.2.6.1 metastatic tumors
    10.6.2.6.2 bilateral diffuse uveal melanocytic proliferation
10.6.2.7 Determine course of treatment for neoplastic masquerade syndromes
10.6.3 Other Masquerade Syndromes
    10.6.3.1 Cancer-associated retinopathy (CAR)
    10.6.3.2 Melanoma-associated retinopathy (MAR)

10.7 Ocular Manifestations of Immunodeficiency (4%)

10.7.1 Ocular Manifestations of AIDS
    10.7.1.1 Diagnose ocular manifestations of acquired immunodeficiency syndrome
    10.7.1.2 Treat 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
    10.7.1.7 Rapidly progressive necrotizing herpetic retinitis in immunocompromised patients
    10.7.1.8 Toxoplasma retinochoroiditis in acquired immune deficiency syndrome (AIDS)
    10.7.1.9 Syphilitic chorioretinitis in acquired immune deficiency syndrome (AIDS)
    10.7.1.10 Infectious multifocal choroiditis in acquired immune deficiency syndrome (AIDS)
    10.7.1.11 Immune recovery uveitis
    10.7.1.12 Impact of HAART
        10.7.1.12.1 incidence of ocular opportunistic infections
        10.7.1.12.2 Immune recovery uveitis
        10.7.1.12.3 Cessation of anti-CMV therapy
        10.7.1.13 Ocular complications of systemic therapy
    10.7.1.14 Primary HIV-associated uveitis
10.7.2 Iatrogenic immunosuppression
    10.7.2.1 Opportunistic infectious uveitis
10.7.3 Genetic uveitic syndromes
    10.7.3.1 Chronic granulomatous disease
    10.7.3.2 CINCA

10.8 Medical Treatment of Uveitis Patients (16%)
10.8.1 Principles
10.8.1.1 Pharmacology of specific agents
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
10.8.1.5 Alternatives to the procedure/therapy
10.8.1.6 Routes of administration
10.8.1.7 Dosage
10.8.1.8 Technique for administration of ocular medication
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
10.8.2.7 Administer periocular corticosteroid injections
10.8.2.8 Administer intravitreal corticosteroid injections
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
10.8.2.13 Intravitreal antiviral therapy
10.8.2.14 Intravitreal antifungal and antibacterial therapy
10.8.2.15 Injectable drug delivery device
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
10.8.3.5 Methotrexate
10.8.3.5.1 oral
10.8.3.5.2 injectable - intraocular and extraocular
10.8.3.6 Azathioprine
10.8.3.7 Mycophenolate
10.8.3.8 Cyclophosphamide and chlorambucil
10.8.3.9 Cyclosporine
10.8.3.10 Biologic response modifiers
10.8.3.11 Steroid-sparing agents
10.8.3.12 Identify indications for steroid-sparing therapy
10.8.3.13 Identify side effects and complications for steroid-sparing therapy
10.8.3.14 Monitor steroid-sparing therapy
10.8.3.15 Prescribe 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 (6%)

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
10.9.1.2 Glaucoma surgery for uveitis patients
  10.9.1.2.1 Surgical complications
  10.9.1.2.2 preoperative and postoperative medical management
10.9.1.3 Posterior segment surgery for uveitis patients
  10.9.1.3.1 Surgical complications
  10.9.1.3.2 preoperative and postoperative medical management
10.9.1.4 Implantation of drug delivery devices
  10.9.1.4.1 Surgical complications
  10.9.1.4.2 preoperative and postoperative medical management
10.9.1.5 Chelation or phototherapeutic keratectomy for band keratopathy
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%)

10.10.1 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
   10.10.2.1 Vitreous opacities
   10.10.2.2 Cystoid macular edema
   10.10.2.3 Retinal detachment
   10.10.2.4 Epiretinal membrane
   10.10.2.5 Identify potential complications
   10.10.2.6 Manage complications
   10.10.2.7 Retinal and choroidal neovascularization

10.10.3 Visual prognosis
   10.10.3.1 Causes of vision loss
   10.10.3.2 Visual rehabilitation