

OF Examinations Topic Index

Adapted from the American Academy of Ophthalmology's Basic and Clinical Sciences Course (BCSC)
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*BCSC Book 1 was not included as it includes mostly non-ophthalmic conditions (endocrine, cardiology, etc.)
Although important to have a good medical background, the exam must focus on ophthalmic knowledge.*

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- l) Internal Carotid Artery Dissection

- m) Giant Cell Arteritis
- n) Neoplastic Processes
- o) Trigeminal Neuralgia
- p) Occipital Neuralgia

13 Functional Neurological Symptom (Conversion) and Related Disorders

- a) Examination Techniques
- b) Afferent Visual Pathway
- c) Ocular Motility and Alignment
- d) Pupils and Accommodation
- e) Eyelid Position and Function
- f) Management of the Patient With Functional Neurological Symptom and Related Disorders
- g) Functional Neurological Symptom (Conversion) Disorder
- h) Somatic Symptom Disorder

14 Neuro-Ophthalmic Systemic Disease

- a) Giant Cell Arteritis
- b) Multiple Sclerosis
- c) Neuromyelitis Optica Spectrum Disorder
- d) Myelin Oligodendrocyte Glycoprotein Immunoglobulin
- e) Myasthenia Gravis
- f) Thyroid Eye Disease
- g) Sarcoidosis
- h) Myopathies
- i) Neurocutaneous Syndromes
- j) Posterior Reversible Encephalopathy Syndrome
- k) Lymphocytic Hypophysitis
- l) Cerebrovascular Disorders
- m) Transient Visual Loss
- n) Vertebrobasilar System Disease
- o) Cerebral Aneurysms
- p) Arterial Dissection
- q) Arteriovenous Malformations
- r) Cerebral Venous Thrombosis
- s) Reversible Cerebral Vasoconstriction Syndrome
- t) Human Immunodeficiency Virus Infection
- u) Herpesvirus
- v) Mycobacterium
- w) Syphilis
- x) Progressive Multifocal Leukoencephalopathy
- y) Lyme Disease
- z) Fungal Infections
- aa) Prion Diseases
- bb) Radiation Therapy

PART X Pediatric Ophthalmology

1 The Exam

- a) Vision Assessment
- b) Dynamic Retinoscopy
- c) Visual Field Testing
- d) Brückner Test
- e) Anterior Segment Examination
- f) Cycloplegic Refraction

2 Anatomy of the Extraocular Muscles

- a) Origin, Course, Insertion, and Innervation of the Extraocular Muscles
- b) Muscles
- c) Surgical Considerations
- d) Blood Supply of the Extraocular Muscles
- e) Structure of the Extraocular Muscles

3 Motor Physiology

- a) Extraocular Muscle Action
- b) Monocular Eye Movements
- c) Binocular Eye Movements
- d) Supranuclear Control Systems for Eye Movement

4 Sensory Physiology and Pathology

- a) The Physiology of Normal Binocular Vision
- b) Retinal Correspondence
- c) Fusion
- d) Visual Development
- e) Effects of Abnormal Visual Experience on the Retinogeniculocortical Pathway
- f) Abnormalities of Binocular Vision
- g) Sensory Adaptations in Strabismus

5 Amblyopia

- a) Pathophysiology
- b) Functional Considerations
- c) Classification
- d) Detection and Screening
- e) Complications and Challenges of Therapy

6 Diagnostic Evaluation of Strabismus and Torticollis

- a) Obtaining a History in Cases of Strabismus or Torticollis
- b) Assessment of Ocular Alignment
- c) Assessment of Eye Movements
- d) Tests of Sensory Adaptation and Binocular Function
- e) Stereoacuity Tests
- f) Assessment of the Field of Single Binocular Vision
- g) Torticollis: Differential Diagnosis and Evaluation

7 Esodeviations

- a) Pseudoesotropia
- b) Accommodative Esotropia
- c) Pathogenesis and Types of Accommodative Esotropia
- d) Infantile (Congenital) Esotropia
- e) Acquired Nonaccommodative Esotropia

8 Exodeviations

- a) Clinical Characteristics
- b) Evaluation
- c) Classification
- d) Treatment

9 Pattern Strabismus

- a) Etiology
- b) Clinical Features and Identification of Pattern Strabismus
- c) Management

10 Vertical Deviations

- a) A Clinical Approach to Vertical Deviations
- b) Superior Oblique Muscle Palsy
- c) Brown Syndrome
- d) Inferior Oblique Muscle Palsy
- e) Skew Deviation
- f) Monocular Elevation Deficiency
- g) Orbital Floor Fractures
- h) Dissociated Vertical Deviation

11 Special Motility Disorders

- a) Duane Syndrome
- b) Congenital Fibrosis of the Extraocular Muscles
- c) Mobius Syndrome
- d) Brown Syndrome
- e) Heavy Eye Syndrome
- f) Sagging Eye Syndrome
- g) Strabismus Associated With Other Ocular Surgery
- h) Ocular Motor Apraxia
- i) Superior Oblique Myokymia

12 Childhood Nystagmus

- a) Types of Childhood Nystagmus
- b) Acquired Nystagmus
- c) Induced Convergence-Retraction
- d) Saccadic Oscillations
- e) Treatment

13 Surgery of the Extraocular Muscles

- a) Indications for Surgery
- b) Surgical Techniques for the Extraocular Muscles and Tendons
- c) Anesthesia for Extraocular Muscle Surgery
- d) Complications of Strabismus Surgery
- e) Unsatisfactory Alignment
- f) Chemodenervation Using Botulinum Toxin

14 Growth and Development of the Eye

- a) Normal Growth and Development
- b) Abnormal Growth and Development

15 Decreased Vision in Infants

- a) Visual Development in Young Infants
- b) Classification of Visual Impairment in Infants and Children
- c) Pregeniculate Visual Impairment
- d) Cerebral Visual Impairment
- e) Delayed Visual Maturation

16 Eyelid Disorders

- a) Congenital Eyelid Disorders
- b) Infectious and Inflammatory Eyelid Disorders
- c) Vascular Eyelid Disorders
- d) Neoplasms and Other Noninflammatory Eyelid Lesions
- e) Pilomatrixoma
- f) Excessive Blinking

17 Orbital Disorders

- a) Abnormal Interocular Distance: Terminology and Associations
- b) Congenital and Developmental Disorders

- c) Infectious and Inflammatory Conditions
- d) Neoplasms

18 Lacrimal Drainage System Abnormalities

- a) Congenital and Developmental Anomalies
- b) Nonsurgical Management
- c) Surgical Management

19 External Diseases of the Eye

- a) Ophthalmia Neonatorum
- b) Conjunctivitis
- c) Dry Eye Disease
- d) Inflammatory Disease
- e) Stevens-Johnson
- f) Syndrome and Toxic Epidermal Necrolysis
- g) Papillomas
- h) Conjunctival Epithelial Inclusion Cysts
- i) Conjunctival Nevi
- j) Ocular Melanocytosis
- k) Ligneous Conjunctivitis

20 Disorders of the Anterior Segment

- a) Congenital Abnormalities of Corneal Size or Shape
- b) Congenital Abnormalities of Peripheral Corneal Transparency
- c) Congenital Abnormalities of Central and Diffuse Corneal Transparency
- d) Congenital or Primary Congenital Glaucoma
- e) Traumatic Breaks in Descemet Membrane
- f) Corneal Ulcers
- g) Congenital and Developmental Anomalies of the Globe
- h) Congenital and Developmental Anomalies of the Iris or Pupil
- i) Acquired Corneal Conditions
- j) Systemic Diseases Affecting the Cornea or Iris
- k) Metabolic Disorders Affecting the Cornea or Iris
- l) Other Systemic Diseases Affecting the Cornea or Iris
- m) Tumors of the Anterior Segment
- n) Pediatric Iris Heterochromia

21 Childhood Glaucomas

- a) Classification and Natural History
- b) Clinical Decisions in Childhood Glaucoma
- c) Surgical Decisions in Childhood Glaucoma .
- d) Prognosis and Long-Term Follow-Up

22 Childhood Cataracts and Other Pediatric Lens Disorders

- a) Pediatric Cataracts
- b) Cataract Surgery in Pediatric Patients
- c) Congenital Aphakia
- d) Spherophakia
- e) Isolated Ectopia Lentis
- f) Ectopia Lentis et Pupillae
- g) Marfan Syndrome
- h) Homocystinuria
- i) Weill-Marchesani Syndrome
- j) Sulfite Oxidase Deficiency

23 Optic Nerve Head Abnormalities

- a) Optic Nerve Hypoplasia
- b) Morning Glory Disc Anomaly
- c) Optic Nerve Coloboma
- d) Optic Nerve Pit
- e) Myelinated Retinal Nerve Fiber Layer
- f) Tilted Optic Nerve Head
- g) Bergmeister Papilla
- h) Megalopapilla
- i) Peripapillary Staphyloma
- j) Optic Nerve Aplasia
- k) Melanocytoma of the Optic Nerve Head
- l) Optic Atrophy
- m) Inherited Optic Atrophies
- n) Optic Neuritis
- o) Papilledema
- p) Idiopathic Intracranial Hypertension
- q) Pseudopapilledema
- r) Optic Nerve Head Drusen

24 Disorders of the Retina and Vitreous

- a) Vascular Disorders of the Retina
- b) Persistent Fetal Vasculature
- c) Coats Disease
- d) Retinopathy of Prematurity
- e) Inherited Retinal Vascular Disorders
- f) Retinopathy Associated With Hemoglobinopathies
- g) Leber Congenital Amaurosis
- h) Achromatopsia
- i) Congenital Stationary Night Blindness
- j) Hereditary Macular Dystrophies
- k) Inherited Vitreoretinopathies
- l) Toxic Retinopathies
- m) Infectious Diseases
- n) Tumors
- o) Choroidal and Retinal Pigment Epithelial Lesions
- p) Retinoblastoma
- q) Foveal Hypoplasia
- r) Aicardi Syndrome

25 Pediatric Uveitis

- a) Classification
- b) Evaluation of Pediatric Uveitis
- c) Ophthalmic Imaging and Functional Testing
- d) Ancillary Laboratory Testing and Imaging
- e) General Approach to Treatment of Pediatric Uveitis
- f) Anterior Uveitis
- g) Noninfectious Anterior Uveitis
- h) Infectious Anterior Uveitis
- i) Intermediate Uveitis
- j) Posterior Uveitis
- k) Toxoplasmosis
- l) Toxocariasis
- m) Panuveitis
- n) Sarcoidosis
- o) Familial Juvenile Systemic Granulomatosis

- p) Vogt-Koyanagi- Harada Syndrome
- q) Masquerade Syndromes
- r) Surgical Treatment of Complications of Uveitis

26 Ocular Trauma in Childhood

- a) Closed Globe Injury
- b) Open Globe Injury
- c) Adnexal and Orbital Trauma
- d) Orbital Fractures
- e) Traumatic Optic Neuropathy
- f) Nonaccidental Trauma

27 Ocular Manifestations of Systemic Disease

- a) Chromosomal Abnormalities
- b) Inborn Errors of Metabolism
- c) Familial Oculorenal Syndromes
- d) Alport Syndrome
- e) Ciliopathies
- f) Neurofibromatosis Type 1
- g) Neurofibromatosis Type 2
- h) Tuberous Sclerosis Complex
- i) Retinocerebral Angiomatosis
- j) Encephalofacial Angiomatosis
- k) Ataxia-Telangiectasia
- l) Incontinentia Pigmenti
- m) Racemose Angioma
- n) Klippel-Tr. naunay-Weber Syndrome
- o) Albinism
- p) Diabetes
- q) Intrauterine or Perinatal Infection
- r) Toxoplasmosis
- s) Rubella
- t) Cytomegalovirus
- u) Herpes Simplex Virus
- v) Syphilis
- w) Lymphocytic Choriomeningitis
- x) Zika Virus
- y) Malignant Disease
- z) Leukemia
- aa) Neuroblastoma

28 Pediatric Chronic Eye Care and Low Vision Rehabilitation

- a) Pediatric Chronic Eye Care
- b) Pediatric Low Vision Rehabilitation

PART XI Orbit

1 Evaluation of Orbital Disorders

- a) History
- b) Periorbital Changes
- c) Physical Examination
- d) Primary Studies
- e) Computed Tomography
- f) Magnetic Resonance Imaging
- g) Stereotactic Navigation

- h) Ultrasonography
- i) Venography
- j) Arteriography
- k) CT and MR Angiography
- l) Pathology
- m) Laboratory Studies

2 Congenital Orbital Anomalies

- a) Anophthalmia
- b) Microphthalmia
- c) Craniofacial Clefting and Syndromic Congenital Craniofacial Anomalies
- d) Congenital Orbital Tumors

3 Orbital Inflammatory and Infectious Disorders

- a) Cellulitis
- b) Necrotizing Fasciitis
- c) Mycobacterial Infection
- d) Mucormycosis
- e) Aspergillosis
- f) Parasitic Diseases
- g) Thyroid Eye Disease
- h) Vasculitis
- i) Sarcoidosis
- j) Immunoglobulin G4-Related Disease
- k) Nonspecific Orbital Inflammation

4 Orbital Neoplasms and Malformations

- a) Infantile (Capillary) Hemangioma
- b) Lymphatic Malformation
- c) Distensible Venous Malformation
- d) Cavernous Venous Malformation
- e) Arteriovenous Malformation
- f) Arteriovenous Fistula
- g) Orbital Hemorrhage
- h) Optic Nerve Glioma
- i) Neurofibroma
- j) Meningioma
- k) Schwannoma
- l) Mesenchymal Tumors
- m) Rhabdomyosarcoma
- n) Lymphoproliferative Disorders
- o) Lymphoid Hyperplasia and Lymphoma
- p) Plasma Cell Tumors
- q) Histiocytic Disorders
- r) Xanthogranuloma
- s) Lacrimal Gland Tumors
- t) Sinus Disease Affecting the Orbit
- u) Management of Orbital Metastases

5 Orbital Trauma

- a) Orbital Floor Fractures
- b) Midfacial (Le Fort) Fractures
- c) Intraorbital Foreign Bodies
- d) Orbital Compartment Syndrome
- e) Traumatic Vision Loss With Clear Media

6 Orbital Surgery

- a) Surgical Spaces
- b) Orbitotomy
- c) Orbital Decompression
- d) Postoperative Care for Orbital Surgery
- e) Special Surgical Techniques in the Orbit
- f) Complications of Orbital Surgery

7 The Anophthalmic Socket

- a) Evisceration
- b) Enucleation
- c) Intraoperative Complications of Enucleation and Evisceration
- d) Orbital Implants
- e) Prostheses
- f) Anophthalmic Socket Complications and Treatment
- g) Exenteration
- h) Types of Exenteration

8 Eyelid Disorders and Neoplasms

- a) Blepharophimosis–Ptosis–Epicanthus Inversus Syndrome
- b) Congenital Ptosis of the Upper Eyelid
- c) Congenital Ectropion
- d) Euryblepharon
- e) Ankyloblepharon
- f) Epiblepharon
- g) Epicanthus
- h) Congenital Entropion
- i) Congenital Distichiasis
- j) Congenital Coloboma
- k) Cryptophthalmos
- l) Congenital Eyelid Lesions: Infantile Hemangioma
- m) Chalazion
- n) Hordeolum
- o) Floppy Eyelid Syndrome
- p) Eyelid Imbrication Syndrome
- q) Trichotillomania
- r) Benign Eyelid Lesions
- s) Benign Adnexal Lesions
- t) Benign Melanocytic Lesions
- u) Premalignant Epidermal Lesions: Actinic Keratosis
- v) In Situ Epithelial Malignancies
- w) Premalignant Melanocytic Lesions: Lentigo Maligna
- x) Malignant Eyelid Tumors

9 Reconstructive Eyelid Surgery

- a) Blunt Trauma
- b) Penetrating Trauma
- c) Secondary Repair
- d) Dog and Human Bites
- e) Burns
- f) Eyelid and Canthal Reconstruction

10 Periocular Malpositions and Involutional Changes

- a) History and Examination
- b) Ectropion
- c) Entropion

- d) Symblepharon
- e) Trichiasis
- f) Blepharoptosis
- g) Eyelid Retraction
- h) Facial Paralysis
- i) Facial Dystonia
- j) Benign Essential Blepharospasm
- k) Hemifacial Spasm
- l) Involutional Periorbital Changes
- m) Dermatochalasis
- n) Blepharochalasis
- o) Blepharoplasty
- p) Brow Ptosis

11 Facial Rejuvenation

- a) Physical Examination of the Aging Face
- b) Nonsurgical Facial Rejuvenation
- c) Chemical Peels
- d) Laser Skin Resurfacing
- e) Cosmetic Uses of Botulinum Toxin
- f) Soft-Tissue Dermal Fillers
- g) Autologous Fat Grafting
- h) Surgical Facial Rejuvenation

12 Abnormalities of the Lacrimal Secretory and Drainage Systems

- a) Developmental Abnormalities
- b) Lacrimal Secretory System
- c) Lacrimal Drainage System
- d) Congenital Lacrimal Drainage Obstruction
- e) Punctal and Canalicular Agenesis and Dysgenesis
- f) Congenital Nasolacrimal Duct Obstruction
- g) Congenital Dacryocystocele
- h) Punctal Disorders
- i) Canalicular Obstruction
- j) Acquired Nasolacrimal Duct Obstruction
- k) Therapeutic Closure of the Lacrimal Drainage System
- l) Trauma
- m) Dacryoadenitis
- n) Canaliculitis
- o) Dacryocystitis
- p) Neoplasm

PART XII Cornea and External Disease

1 The Approach, Techniques, and Devices for Examination of the External Eye and Cornea

- a) External Eye Exam
- b) Ocular Surface Staining and Evaluation of Tear Function
- c) Ocular Surface Staining
- d) Evaluation of Tear Production
- e) Evaluation of Corneal Contour
- f) Corneal Biomechanics
- g) Specular Microscopy
- h) Pachymetry
- i) Confocal Microscopy
- j) Anterior Segment Optical Coherence Tomography

- k) Ultrasound Biomicroscopy

2 Clinical Approach to Ocular Surface Disease

- a) Conjunctival Signs of Inflammation
- b) Corneal Signs of Inflammation
- c) Clinical Approach to Dry Eye
- d) Treatment of Dry Eye
- e) Rosacea
- f) Seborrheic Blepharitis
- g) Staphylococcal Blepharitis
- h) Staphylococcal Blepharoconjunctivitis
- i) Marginal Keratitis
- j) Phlyctenular Keratoconjunctivitis (Phlyctenulosis)
- k) Hordeola and Chalazia

3 Eyelid, Conjunctival, and Corneal Conditions Associated with Ocular Surface Disorders

- a) Distichiasis and Trichiasis
- b) Conjunctival Disease
- c) Superior Limbic Keratoconjunctivitis
- d) Conjunctivochalasis
- e) Exposure Keratopathy
- f) Neurotrophic Keratopathy
- g) Recurrent Corneal Erosion
- h) Dellen
- i) Limbal Stem Cell Deficiency

4 Therapeutic Interventions for Ocular Surface Disorders

- a) Pterygium Excision
- b) Autologous Conjunctival Transplantation
- c) Conjunctival Flap for Corneal Disease
- d) Conjunctival Biopsy
- e) Treatment of Conjunctivochalasis
- f) Limbal Stem Cell Transplantation
- g) Mucous Membrane Grafts
- h) Superficial Keratectomy and Corneal Biopsy
- i) Surgical Management of Recurrent Corneal Erosion
- j) Management of Persistent Corneal Epithelial Defects, Thinning, and Perforation
- k) Tarsorrhaphy
- l) Corneal Tattooing

5 Congenital Anomalies of the Cornea and Sclera

- a) Anomalies of Size and Shape of the Cornea
- b) Corneal Dystrophies
- c) Developmental Anomalies of the Cornea and Associated Anterior Segment Structures
- d) Intrauterine Keratitis: Bacterial and Syphilitic
- e) Congenital Corneal Keloid
- f) Limbal Dermoid
- g) Congenital Corneal Anesthesia
- h) Congenital Glaucoma
- i) Birth Trauma
- j) Metabolic Disorders

6 Clinical Approach to Degenerations and Depositions of the Conjunctiva, Cornea, and Sclera

- a) Degenerations and Depositions of the Conjunctiva
- b) Pinguecula

- c) Pterygium
- d) Conjunctival Concretions
- e) Conjunctival Epithelial Inclusion Cysts
- f) Conjunctivochalasis
- g) Conjunctival Vascular Tortuosity and Hyperemia
- h) Epithelial and Subepithelial Degenerations and Depositions
- i) Mid-and Deep Stromal Degenerations and Depositions
- j) Endothelium
- k) Degenerations and Depositions in the Sclera
- l) Drug-Induced Depositions and Pigmentations
- m) Cornea Verticillata

7 Diagnosis and Management of Corneal Dystrophies

- a) Epithelial and Subepithelial Dystrophies
- b) Epithelial–Stromal TGFBI Dystrophies
- c) Stromal Dystrophies
- d) Endothelial Dystrophies

8 Clinical Approach to Corneal Ectatic Disease

- a) Keratoconus
- b) Pellucid Marginal Degeneration
- c) Keratoglobus
- d) Intrastromal Corneal Ring Segments for Treatment of Ectasia
- e) Corneal Crosslinking for Corneal Ectasia

9 Systemic Disorders With Corneal and Other Anterior Segment Manifestations

- a) Lysosomal Storage Diseases
- b) Disorders of Amino Acid, Nucleic Acid, Protein, and Mineral Metabolism
- c) Ehlers-Danlos Syndrome
- d) Marfan Syndrome
- e) Osteogenesis Imperfecta
- f) Goldenhar-Gorlin Syndrome
- g) Nutritional Disorder: Vitamin A Deficiency
- h) Hematologic Disorders
- i) Diabetes
- j) Multiple Endocrine Neoplasia
- k) Parathyroid Disease
- l) Ichthyosis
- m) Ectodermal Dysplasia
- n) Xeroderma Pigmentosum

10 Infectious Diseases of the Cornea and External Eye: Viral Infections

- a) Virology
- b) Herpes Simplex Virus Eye Diseases
- c) Varicella-Zoster Virus Dermato-blepharitis, Conjunctivitis, and Keratitis Epstein-Barr
- d) Virus Dacryoadenitis, Conjunctivitis, and Keratitis
- e) Cytomegalovirus Keratitis and Anterior Uveitis
- f) Adenoviruses
- g) Poxviruses
- h) Papillomaviruses
- i) RNA Viruses
- j) Coronaviruses
- k) Paramyxoviruses
- l) Picornaviruses
- m) Retroviruses
- n) Rhabdoviruses

11 Infectious Diseases of the Cornea and External Eye: Bacterial, Fungal, and Parasitic Infections

- a) Normal Ocular Flora
- b) Pathogenesis of Ocular Infections
- c) Diagnostic Laboratory Techniques
- d) Specimen Collection
- e) Staphylococcal Blepharitis
- f) Fungal and Parasitic Infections of the Eyelid Margin
- g) Bacterial Conjunctivitis in Children and Adults
- h) Parinaud Oculoglandular Syndrome
- i) Bacterial Keratitis
- j) Fungal Keratitis
- k) Corneal Stromal Inflammation Associated With Systemic Infection
- l) Loiasis
- m) Microbial Scleritis

12 Diagnosis and Management of Immune-Related Disorders of the Cornea and External Eye

- a) Contact Dermato-blepharitis
- b) Atopic Dermatitis
- c) Seasonal Allergic Conjunctivitis and Perennial Allergic Conjunctivitis
- d) Vernal Keratoconjunctivitis
- e) Atopic Keratoconjunctivitis
- f) Ligneous Conjunctivitis
- g) Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis
- h) Mucous Membrane Pemphigoid
- i) Ocular Graft-vs-Host Disease
- j) Conjunctivitis/Episcleritis Associated With Reactive Arthritis
- k) Thygeson Superficial Punctate Keratitis
- l) Interstitial Keratitis Associated With Infectious Diseases
- m) Cogan Syndrome
- n) Marginal Keratitis
- o) Mooren Ulcer
- p) Episcleritis
- q) Scleritis

13 Clinical Approach to Neoplastic Disorders of the Conjunctiva and Cornea

- a) Management of Patients With Ocular Surface Tumors
- b) Benign Epithelial Tumors
- c) Ocular Surface Squamous Neoplasia
- d) Oncocytoma
- e) Sebaceous Carcinoma
- f) Tumors of Neuroectodermal Origin
- g) Benign Pigmented Lesions
- h) Preinvasive Pigmented Lesions
- i) Malignant Pigmented Lesions
- j) Neurogenic and Smooth-Muscle Tumors
- k) Vascular and Mesenchymal Tumors
- l) Benign Tumors
- m) Malignant Tumors
- n) Lymphocytic Tumors
- o) Lymphoid Hyperplasia
- p) Lymphoma
- q) Metastatic Tumors

14 Clinical Aspects of Toxic and Traumatic Injuries of the Anterior Segment

- a) Chemical Injuries
- b) Alkali Burns
- c) Acid Burns
- d) Thermal Burns
- e) Ultraviolet Radiation
- f) Ionizing Radiation
- g) Insect and Arachnid Injuries
- h) Plant Injuries
- i) Blunt Trauma
- j) Subconjunctival Hemorrhage
- k) Corneal Involvement
- l) Traumatic Anterior Uveitis
- m) Traumatic Mydriasis and Miosis
- n) Iridodialysis and Cyclodialysis
- o) Traumatic Hyphema
- p) Conjunctival Laceration
- q) Conjunctival Foreign Bodies
- r) Corneal Foreign Bodies
- s) Evaluation and Management of Perforating Ocular Trauma

15 Clinical Approach to Corneal Transplantation

- a) Corneal Transplantation
- b) Keratoplasty and Eye Banking
- c) Donor-Cornea Selection
- d) Transplantation for the Treatment of Corneal Disease
- e) Preoperative Evaluation and Preparation of the Transplant Patient
- f) Penetrating Keratoplasty
- g) Control of Postoperative Corneal Astigmatism and Refractive Error
- h) Lamellar Keratoplasty
- i) Anterior Lamellar Keratoplasty and Deep Anterior Lamellar Keratoplasty
- j) Endothelial Keratoplasty
- k) Emerging Methods for Treatment of Endothelial Dysfunction
- l) Pediatric Corneal Transplantation
- m) Corneal Autograft Procedures
- n) Keratoprosthesis

PART XII Cornea and External Disease

1 Effector Cells and the Innate Immune Response

- a) Cellular Components of the Immune System
- b) Overview of the Innate Immune System
- c) Immunity Versus Inflammation
- d) Innate Immunity: Triggers and Mechanisms
- e) Innate Mechanisms for the Recruitment and Activation of Neutrophils
- f) Innate Mechanisms for the Recruitment and Activation of Macrophages
- g) Phagocyte Killing Mechanisms
- h) Mediator Systems That Amplify Immune Responses
- i) Plasma-Derived Enzyme Systems
- j) Histamine
- k) Lipid Mediators
- l) Cytokines
- m) Neutrophils and Their Products

2 Immunization and Adaptive Immunity: The Immune Response Arc and Immune Effectors

- a) Phases of the Immune Response Arc
- b) The Immune Response Arc and Primary or Secondary Immune Response
- c) Effector Responses and Mechanisms of Adaptive Immunity
- d) Combined Antibody and Cellular Effector Mechanisms

3 Ocular Immune Responses

- a) Regional Immunity and Immunologic Microenvironments
- b) Immune Responses of the Conjunctiva
- c) Immune Responses of the Cornea
- d) Immune Responses of the Anterior Chamber, Anterior Uvea, and Vitreous
- e) Immune Responses of the Retina, Retinal Pigment Epithelium, Choriocapillaris, and Choroid

4 Special Topics in Ocular Immunology

- a) Animal Models of Human Uveitis
- b) Human Leukocyte Antigen Associations and Disease
- c) Major Histocompatibility Complex and Human Leukocyte Antigen Molecules

5 Diagnostic Considerations in Uveitis

- a) Classification of Uveitis
- b) Anatomical Classification
- c) Classification by Clinical Features
- d) Symptoms of Uveitis
- e) Signs of Uveitis
- f) Differential Diagnosis of Uveitis
- g) Ancillary Testing
- h) Ophthalmic Imaging and Functional Tests
- i) Ocular Fluid and Tissue Sampling
- j) Cytology and Pathology

6 Therapy for Uveitis

- a) Medical Management of Uveitis
- b) Corticosteroids
- c) Systemic Immunomodulatory Therapy
- d) Other Therapeutic Agents
- e) Surgical Management of Uveitis

7 Scleritis

- a) Classification of Scleritis
- b) Pathophysiology
- c) Epidemiology
- d) Diffuse Anterior Scleritis
- e) Nodular Anterior Scleritis
- f) Necrotizing Scleritis
- g) Posterior Scleritis
- h) Infectious Scleritis

8 Noninfectious Anterior and Intermediate Uveitis

- a) Anterior Uveitis
- b) Acute Anterior Uveitis
- c) Chronic Anterior Uveitis
- d) Pars Planitis
- e) Multiple Sclerosis

9 Posterior Uveitis: The White Dot Syndromes

- a) Birdshot Chorioretinopathy

- b) Acute Posterior Multifocal Placoid Pigment Epitheliopathy
- c) Serpiginous Choroiditis
- d) Ampiginous Choroiditis, or Relentless Placoid Chorioretinitis
- e) Multifocal Choroiditis With Panuveitis, Punctate Inner Choroiditis, and Subretinal Fibrosis and Uveitis Syndrome
- f) Multiple Evanescent White Dot Syndrome
- g) Acute Retinal Pigment Epitheliitis
- h) Acute Zonal Occult Outer Retinopathy
- i) Acute Idiopathic Maculopathy
- j) Autoimmune Retinopathy

10 Posterior Uveitis and Panuveitis With Possible Systemic Manifestations

- a) Systemic Lupus Erythematosus
- b) Polyarteritis Nodosa
- c) Granulomatosis With Polyangiitis and Microscopic Polyangiitis
- d) Susac Syndrome
- e) Sarcoidosis
- f) Sympathetic Ophthalmia
- g) Vogt-Koyanagi-Harada Syndrome
- h) Behçet Disease

11 Infectious Uveitis: Bacterial Causes

- a) Syphilis
- b) Congenital Syphilis
- c) Acquired Syphilis
- d) Tuberculosis Ocular Involvement
- e) Lyme Disease
- f) Leptospirosis
- g) Nocardiosis
- h) Bartonellosis
- i) Whipple Disease

12 Infectious Uveitis: Nonbacterial Causes

- a) Herpesviridae Family
- b) Rubella
- c) Lymphocytic Choriomeningitis Virus
- d) Mumps
- e) Measles (Rubeola)
- f) West Nile Virus
- g) Rift Valley Fever
- h) Human T-cell Lymphotropic Virus Type 1
- i) Dengue Fever
- j) Chikungunya Fever
- k) Zika Virus
- l) Ebola Virus
- m) SARS-CoV-2 and COVID-19
- n) Fungal Uveitis
- o) Ocular Histoplasmosis Syndrome
- p) Coccidioidomycosis
- q) Protozoal Uveitis
- r) Toxoplasmosis
- s) Helminthic Uveitis
- t) Toxocariasis
- u) Cysticercosis
- v) Diffuse Unilateral Subacute Neuroretinitis

- w) Onchocerciasis

13 Ocular Involvement in HIV Infection and AIDS

- a) Ophthalmic Manifestations
- b) Cytomegalovirus Retinitis
- c) Necrotizing Herpetic Retinitis
- d) Toxoplasma Retinochoroiditis
- e) Ocular Syphilis
- f) Multifocal Choroiditis and Systemic Dissemination

14 Endophthalmitis

- a) Chronic Postoperative Endophthalmitis
- b) Endogenous Endophthalmitis
- c) Endogenous Bacterial Endophthalmitis
- d) Endogenous Fungal Endophthalmitis

15 Masquerade Syndromes

- a) Vitreoretinal Lymphoma
- b) Uveal Lymphoma
- c) Ocular Manifestations of Systemic Lymphoma
- d) Ocular Manifestations of Leukemia
- e) Nonlymphoid Tumors
- f) Metastatic Tumors
- g) Bilateral Diffuse Uveal Melanocytic Proliferation
- h) Retinitis Pigmentosa
- i) Ocular Ischemic Syndrome
- j) Chronic Peripheral Rhegmatogenous Retinal Detachment
- k) Intraocular Foreign Bodies
- l) Pigment Dispersion Syndrome
- m) Infectious Uveitis

16 Complications of Uveitis

- a) Calcific Band Keratopathy
- b) Cataracts
- c) Uveitic Ocular Hypertension
- d) Uveitic Glaucoma
- e) Corticosteroid-Induced Ocular Hypertension and Glaucoma
- f) Hypotony
- g) Uveitic Macular Edema
- h) Epiretinal Membrane and Macular Hole
- i) Vitreous Opacification and Vitritis
- j) Rhegmatogenous Retinal Detachment
- k) Choroidal and Retinal Neovascularization

PART XIII Glaucoma

1 Epidemiology, and Genetics

- a) Epidemiology
- b) Genetics

2 Intraocular Pressure and Aqueous Humor Dynamics

- a) Aqueous Humor Production and Outflow
- b) Aqueous Humor Dynamics
- c) Intraocular Pressure

3 History

- a) Relevant Factors
- b) Quality of Life

4 Clinical Evaluation and Imaging of the Anterior Segment

- a) Gonioscopy
- b) Ultrasound Biomicroscopy
- c) Anterior Segment Optical Coherence Tomography
- d) Specular Microscopy

5 Clinical Evaluation and Imaging of the Posterior Segment

- a) Glaucomatous Optic Neuropathy
- b) Clinical Examination of the Optic Nerve Head
- c) Optical Coherence Tomography
- d) Glaucoma Progression
- e) Imaging of the Lamina Cribrosa

6 Perimetry

- a) Basic Principles of Automated Perimetry
- b) Factors Affecting Perimetry Results
- c) Interpretation of a Single Visual Field
- d) Patterns of Visual Field Loss in Glaucoma
- e) Interpretation of a Series of Visual Fields and Detection of Visual Field Progression
- f) Frequency of Testing
- g) Structure and Function Relationship

7 Primary Open-Angle Glaucoma

- a) Clinical Features
- b) Atypical Findings
- c) Risk Factors
- d) Association with Systemic Conditions
- e) Prognosis and Therapy
- f) The Glaucoma Suspect
- g) Ocular Hypertension
- h) Normal-Tension Glaucoma

8 Secondary Open-Angle Glaucoma

- a) Pseudoexfoliation Syndrome
- b) Pigment Dispersion Syndrome
- c) Lens-Induced
- d) Glaucoma
- e) Intraocular Tumors
- f) Ocular Inflammation and Secondary Glaucoma
- g) Elevated Episcleral Venous Pressure
- h) Trauma and Surgery
- i) Schwartz Syndrome (Schwartz-Matsuo Syndrome)
- j) Drugs and Glaucoma

9 Primary Angle Closure

- a) Pathogenesis and Pathophysiology
- b) Pupillary Block
- c) Plateau Iris and Iris-Induced Angle Closure
- d) Role of Medications in Angle Closure
- e) Risk Factors
- f) The Primary Angle-Closure Spectrum
- g) Primary Angle-Closure Suspect
- h) Primary Angle-Closure Glaucoma Management

10 Secondary Angle Closure

- a) Secondary Angle Closure With Pupillary Block
- b) Lens-Induced Angle Closure
- c) Secondary Angle Closure Without Pupillary Block
- d) Conditions Associated With a Pulling Mechanism
- e) Conditions Associated With a Pushing Mechanism
- f) Conditions Associated With Combined Pushing and Pulling or Other Mechanisms

11 Glaucoma in Children and Adolescents

- a) Classification
- b) Genetics
- c) Primary Congenital Glaucoma
- d) Pediatric Glaucoma Without Anterior Segment Dysgenesis
- e) Pediatric Glaucoma With Anterior Segment Dysgenesis
- f) Juvenile Open-Angle Glaucoma
- g) Secondary Glaucomas due to Nonacquired Conditions
- h) Axenfeld-Rieger Syndrome
- i) Peters Anomaly
- j) Aniridia
- k) Sturge-Weber Syndrome
- l) Neurofibromatosis
- m) Glaucoma Following Cataract Surgery
- n) Evaluating the Pediatric Glaucoma Patient
- o) Treatment
- p) Prognosis and Follow-Up

12 Medical Management of Glaucoma and Ocular Hypertension

- a) Prostaglandin Analogues
- b) Adrenergic Drugs
- c) Carbonic Anhydrase Inhibitors
- d) Parasympathomimetic Agents
- e) Rho Kinase Inhibitors
- f) Combined Medications
- g) Hyperosmotic Agents
- h) General Approach to Medical Treatment
- i) Long-Term Therapy
- j) Therapy for Acute Intraocular Pressure Elevation
- k) Sustained-Release Bimatoprost Implant

13 Surgical Therapy for Glaucoma

- a) Laser Trabeculoplasty
- b) Cyclodestruction
- c) Peripheral Iridotomy
- d) Peripheral Iridoplasty
- e) Trabeculectomy
- f) Antifibrotic Agents in Trabeculectomy
- g) EX-PRESS Shunt
- h) Plate-Based Tube Shunt Surgery
- i) Cataract Surgery in the Glaucoma Patient
- j) Cataract Surgery in Conjunction With Trabeculectomy or Tube Shunt Surgery
- k) Minimally Invasive Glaucoma Surgeries
- l) Short Aqueous Stent to Subconjunctival Space
- m) Nonpenetrating Glaucoma Surgery

PART XIV Cataract

1 Epidemiology of Cataract

- a) Cataract Prevalence and Distribution of Subtypes
- b) Risk Factors for the Development of Cataract
- c) Cataract Surgery Rate and Outcomes

2 Anatomy

- a) Normal Crystalline Lens
- b) Capsule
- c) Zonular Fibers
- d) Lens Epithelium
- e) Nucleus and Cortex

3 Biochemistry and Physiology

- a) Molecular Biology
- b) Crystallin Proteins
- c) Membrane Structural Proteins and Cytoskeletal Proteins
- d) Increase of Water-Insoluble Proteins With Age
- e) Carbohydrate Metabolism
- f) Lens Physiology
- g) Maintenance of Lens Water and Cation Balance
- h) Accommodation and Presbyopia

4 Embryology and Developmental Defects

- a) Normal Development of the Lens
- b) Congenital Aphakia
- c) Lenticonus and Lentiglobus
- d) Lens Coloboma
- e) Mittendorf Dot
- f) Epicapsular Star
- g) Peters Anomaly
- h) Microspherophakia
- i) Aniridia
- j) Persistent Fetal Vasculature
- k) Congenital Cataract
- l) Developmental Defects
- m) Ectopia Lentis
- n) Genetic Contributions to Age-Related Cataracts
- o) Ectopia Lentis et Pupillae

5 Pathology

- a) Age-Related Lens Changes
- b) Nuclear Cataracts
- c) Cortical Cataracts
- d) Posterior Subcapsular Cataracts
- e) Cataract Grading and Classification
- f) Drug-Induced Lens Changes
- g) Trauma
- h) Intraocular Procedures
- i) Intralenticular Foreign Bodies
- j) Radiation
- k) Metallosis
- l) Electrical Injury
- m) Chemical Injuries
- n) Diabetes Mellitus

- o) Galactosemia
- p) Hypocalcemia
- q) Wilson Disease
- r) Myotonic Dystrophy
- s) Effects of Nutrition, Alcohol, and Smoking
- t) Cataract Associated With Uveitis
- u) Lens Changes With Hyperbaric Oxygen Therapy
- v) Pseudoexfoliation Syndrome
- w) Cataract and Atopic Dermatitis
- x) Phacoantigenic Uveitis
- y) Lens-Induced Glaucoma
- z) Phacolytic Glaucoma
- aa) Lens Particle Glaucoma
- bb) Phacomorphic Glaucoma
- cc) Glaukomflecken
- dd) Ischemia
- ee) Cataracts Associated With Degenerative Ocular Disorders

6 Evaluation and Management

- a) Clinical History: Signs and Symptoms
- b) Nonsurgical Management
- c) Indications for Surgery
- d) Limitations of Slit-Lamp Examination
- e) Fundus Evaluation With Opaque Media
- f) Potential Acuity Estimation
- g) Visual Field Testing
- h) Assessment of Corneal Endothelial Function
- i) Objective Tests of Macular Function

7 Preoperative Considerations for Cataract Surgery

- a) Preoperative Measurements
- b) Classic Regression Formula
- c) IOL Calculation
- d) Preventing Errors in IOL Calculation, Selection, and Insertion
- e) Patient Preparation and Informed Consent
- f) Anesthesia for Cataract Surgery
- g) Ophthalmic Viscosurgical Devices
- h) Surgical Checklist

8 Phacoemulsification

- a) Instrumentation
- b) Key Concepts and Advances in Phaco Power Delivery
- c) Phaco Tip
- d) Pulse and Burst Modes
- e) Torsional and Elliptical Phacoemulsification
- f) Irrigation
- g) Aspiration Pumps
- h) Outline of the Phacoemulsification Procedure
- i) Laser Photolysis
- j) Femtosecond Laser-Assisted Cataract Surgery
- k) Outcomes of Cataract Surgery

9 Optimizing Refractive Outcomes

- a) Intraocular Lens Characteristics
- b) Presbyopia Correction
- c) Pseudophakic Monovision

- d) Accommodating IOLs
- e) Multifocal IOLs
- f) Extended Depth of Focus IOLs
- g) Other Presbyopia-Correcting IOLs
- h) Postoperative Adjustment of Intraocular Lenses
- i) Corneal Relaxing Incisions
- j) Toric IOLs

10 Intraoperative Challenges

- a) Incision and Wound Complications
- b) Descemet Membrane Detachment
- c) Intraoperative Floppy Iris Syndrome
- d) Femtosecond Laser-Associated Miosis
- e) Lens-Iris Diaphragm Retropulsion Syndrome
- f) Cyclodialysis
- g) Intraoperative Shallow or Flat Anterior Chamber
- h) Anterior Capsule Tears
- i) Posterior Capsular Rupture
- j) IOL Placement with Posterior Capsule Rupture
- k) Retrobulbar Hemorrhage
- l) Intraoperative Hemorrhage
- m) Suprachoroidal Effusion or Hemorrhage
- n) Expulsive Suprachoroidal Hemorrhage

11 Postoperative Surgical Course and Complications

- a) Corneal Edema
- b) Corneal Melt
- c) Induced Astigmatism
- d) Epithelial or Fibrous Ingrowth
- e) Shallow or Flat Anterior Chamber
- f) Elevated IOP
- g) Hyphema
- h) Retained Lens Fragments
- i) Vitreous Prolapse in the Anterior Chamber
- j) Capsular Block Syndrome
- k) Uveitis-Glaucoma-Hyphema Syndrome
- l) Pseudophakic Bullous Keratopathy
- m) IOL Opacification
- n) IOL Glare and Dysphotopsia
- o) Unexpected Refractive Results
- p) Posterior Capsule Opacification
- q) Anterior Capsule Fibrosis and Phimosis
- r) Nd:YAG Laser Capsulotomy
- s) Diplopia
- t) Postoperative Uveitis
- u) Toxic Anterior Segment Syndrome
- v) Endophthalmitis
- w) Cystoid Macular Edema
- x) Hemorrhagic Occlusive Retinal
- y) Vasculitis
- z) Retinal
- aa) Light Toxicity
- bb) Delayed Suprachoroidal Hemorrhage
- cc) Retinal Detachment

12 Preparing for Cataract Surgery in Special Situations

- a) Psychosocial Considerations
- b) Patient Communication During Eye Surgery
- c) Medical Status
- d) Anticoagulation Therapy or Bleeding Disorders
- e) External Ocular Abnormalities
- f) Corneal Disease
- g) Cataract and Keratoplasty
- h) Cataract Following Refractive Surgery
- i) Small Pupil
- j) Poor Red Reflex
- k) Altered Lens and Zonular Anatomy
- l) Iris Coloboma and Corectopia
- m) Posterior Polar Cataract
- n) Zonular Dehiscence With Lens Subluxation or Dislocation
- o) Pseudoexfoliation Syndrome
- p) Cataract in Aniridia
- q) High Myopia
- r) High Hyperopia and Nanophthalmos
- s) Hypotony
- t) Cataract Surgery in an Eye With a Functioning Filter
- u) Combining Minimally Invasive Glaucoma Surgery With Cataract Surgery
- v) Uveitis
- w) Cataract Following Pars Plana Vitrectomy
- x) Cataract With Intraocular Silicone Oil
- y) Removal of Traumatic Cataract
- z) IOL Selection After Trauma
- aa) Appendix: Non-Phacoemulsification Cataract Surgery Techniques

PART XV Retina

1 Basic Anatomy

- a) Vitreous
- b) Neurosensory Retina
- c) Retinal
- d) Topography
- e) Retinal Layers and Neurosensory Elements
- f) Retinal Vasculature and Oxygen Supply
- g) Retinal Pigment Epithelium
- h) Bruch Membrane
- i) Choroid
- j) Sclera

2 Diagnostic Approach

- a) Examination With the Binocular Indirect Ophthalmoscope
- b) Indirect Ophthalmoscopy With the Slit Lamp
- c) Fundus Camera Imaging
- d) Scanning Laser
- e) Ophthalmoscopy
- f) Optical Coherence Tomography
- g) Optical Coherence Tomography Angiography
- h) Fundus Autofluorescence
- i) Adaptive Optics Imaging
- j) Retinal Angiographic Techniques

- k) Ultrasonography

3 Physiology and Psychophysics

- a) Electrophysiologic Testing
- b) Full-Field (Ganzfeld) Electroretinography
- c) Multifocal Electroretinography
- d) Pattern Electroretinography
- e) Electro-oculography
- f) Visual Evoked Potentials
- g) Microperimetry
- h) Psychophysical Testing
- i) Dark Adaptometry

4 Age-Related Macular Degeneration and Other Causes of Choroidal Neovascularization

- a) Genetics and AMD
- b) Nonneovascular AMD
- c) Neovascular AMD
- d) Ocular Histoplasmosis Syndrome
- e) Angioid Streaks
- f) Pathologic Myopia
- g) Idiopathic CNV and Miscellaneous Causes of CNV

5 Diabetic Retinopathy

- a) Diabetic Retinopathy Terminology
- b) Epidemiology of Diabetic Retinopathy
- c) Pathogenesis of Diabetic Retinopathy
- d) Recommended Diabetes Mellitus-Related
- e) Ophthalmic Examinations
- f) Systemic Medical Management of Diabetic Retinopathy
- g) Nonproliferative Diabetic Retinopathy
- h) Proliferative Diabetic Retinopathy
- i) Diabetic Macular Edema
- j) Cataract Surgery in Patients With Diabetes Mellitus

6 Retinal Vascular Diseases Associated With Cardiovascular Disease

- a) Hypertensive Retinopathy
- b) Hypertensive Choroidopathy
- c) Retinal Venous Occlusion
- d) Ocular Ischemic Syndrome and Retinopathy of Carotid Occlusive Disease
- e) Cotton-Wool Spots
- f) Branch Retinal Artery Occlusion
- g) Central Retinal Artery Occlusion
- h) Cilioretinal Artery Occlusion
- i) Paracentral Acute Middle Maculopathy
- j) Arterial Macroaneurysms

7 Other Retinal Vascular Diseases

- a) Sickle Cell Disease
- b) Other Ocular Abnormalities in Sickle Cell Hemoglobinopathies
- c) Management of Sickle Cell Retinopathy and Its Complications
- d) Vasculitis
- e) Cystoid Macular Edema
- f) Coats Disease
- g) Coats-like Reaction in Other Retinal Conditions
- h) Macular Telangiectasia Type 1
- i) Macular Telangiectasia Type 2

- j) Macular Telangiectasia Type 3
- k) Von Hippel–Lindau Syndrome
- l) Wyburn-Mason Syndrome
- m) Retinal Cavernous Hemangioma
- n) Radiation Retinopathy
- o) Valsalva Retinopathy
- p) Purtscher Retinopathy and Purtscher-like Retinopathy
- q) Terson Syndrome

8 Retinopathy of Prematurity

- a) Epidemiology
- b) Classification, Terminology, and Clinical Features
- c) Pathophysiology of ROP
- d) Natural Course
- e) Screening Recommendations
- f) Prevention and Risk Factors
- g) Laser and Cryoablation Surgery
- h) Anti-VEGF Drugs
- i) Vitrectomy and Scleral Buckling Surgery
- j) Associated Conditions and Late Sequelae of ROP
- k) Medicolegal Aspects of ROP

9 Choroidal Disease

- a) Central Serous Chorioretinopathy
- b) Choroidal Perfusion Abnormalities
- c) Age-Related Choroidal Atrophy
- d) Choroidal Folds
- e) Choroidal Hemangiomas
- f) Uveal Effusion Syndrome
- g) Bilateral Diffuse Uveal Melanocytic Proliferation

10 Myopia and Pathologic Myopia

- a) Definition, Prevalence, and Epidemiology
- b) Prevention of Pathologic Myopia
- c) The Retina
- d) Bruch Membrane
- e) Choroidal Neovascularization
- f) The Choroid
- g) The Sclera
- h) The Optic Nerve

11 Focal and Diffuse Retinal and Choroidal Inflammation

- a) White Dot Syndromes
- b) Chorioretinal Autoimmune Conditions
- c) Sympathetic Ophthalmia
- d) Uveitis Masquerade: Intraocular Lymphoma
- e) Cytomegalovirus Retinitis
- f) Non-CMV Necrotizing Herpetic Retinitis
- g) Endogenous Bacterial Endophthalmitis
- h) Fungal Endophthalmitis
- i) Ocular Tuberculosis
- j) Syphilitic Retinochoroiditis
- k) Ocular Bartonellosis
- l) Toxoplasmic Chorioretinitis
- m) Toxocariasis
- n) Ocular Lyme Borreliosis

- o) Diffuse Unilateral Subacute Neuroretinitis
- p) West Nile Virus Chorioretinitis
- q) Zika Virus Chorioretinitis
- r) Ebola Virus Panuveitis
- s) Chikungunya Virus Retinitis

12 Hereditary Retinal and Choroidal Disease

- a) Congenital Color Deficiency
- b) Congenital Night-Blinding Disorders With Normal Fundi
- c) Congenital Night-Blinding Disorders With Fundus Abnormality
- d) Retinal and Choroidal Dystrophies
- e) Diffuse Dystrophies: Photoreceptor Dystrophies
- f) Diffuse Dystrophies: Choroidal Dystrophies
- g) Macular Dystrophies
- h) Inner Retinal Dystrophies

13 Retinal Degenerations Associated With Systemic Disease

- a) Bardet-Biedl Syndrome
- b) Hearing Loss and Pigmentary Retinopathy: Usher Syndrome
- c) Neuromuscular Disorders
- d) Diseases Affecting Other Organ Systems
- e) Paraneoplastic and Autoimmune Retinopathies
- f) Metabolic Diseases
- g) Albinism
- h) Metabolic Diseases With Central Nervous System Abnormalities
- i) Amino Acid Disorders
- j) Mitochondrial Disorders

14 Systemic Drug–Induced Retinal Toxicity

- a) Chloroquine Derivatives
- b) Phenothiazines
- c) Miscellaneous Medications
- d) Drugs Causing Occlusive Retinopathy or Microvasculopathy
- e) Drugs Causing Ganglion Cell Damage and Optic Neuropathy
- f) Drugs Causing Macular Edema
- g) Drugs Causing Crystalline Retinopathy
- h) Drugs Causing Color Vision or ERG Abnormalities
- i) Drugs Causing Other Ocular Toxicities

15 Diseases of the Vitreous and Vitreoretinal Interface

- a) Posterior Vitreous Detachment
- b) Epiretinal Membranes
- c) Vitreomacular Traction Diseases
- d) Idiopathic Macular Holes
- e) Developmental Abnormalities
- f) Wagner and Stickler Syndromes
- g) Familial Exudative Vitreoretinopathy
- h) Vitreous Opacities
- i) Asteroid Hyalosis
- j) Vitreous Hemorrhage
- k) Pigment Granules
- l) Cholesterolosis
- m) Amyloidosis

16 Retinal Detachment and Predisposing Lesions

- a) Examination and Management of Posterior Vitreous Detachment

- b) Lattice Degeneration
- c) Vitreoretinal Tufts
- d) Meridional Folds, Enclosed Ora Bays, and Peripheral Retinal Excavations
- e) Paving-Stone Degeneration
- f) Retinal Pigment Epithelial Hyperplasia
- g) Retinal Pigment Epithelial Hypertrophy
- h) Peripheral Cystoid Degeneration
- i) Retinal Breaks
- j) Traumatic Breaks
- k) Trauma in Young Eyes
- l) Prophylactic Treatment of Retinal Breaks
- m) Lattice Degeneration
- n) Aphakia and Pseudophakia
- o) Subclinical Retinal Detachment
- p) Rhegmatogenous Retinal Detachment
- q) Traction Retinal Detachment
- r) Exudative Retinal Detachment
- s) Retinoschisis
- t) Optic Pit Maculopathy
- u) Macular Holes in High Myopia

17 Posterior Segment Manifestations of Trauma

- a) Classification of Ocular Globe Trauma
- b) Evaluation of the Patient After Ocular Trauma
- c) Blunt Trauma Without a Break in the Eye Wall
- d) Commotio Retinae
- e) Choroidal Rupture
- f) Posttraumatic Macular Hole
- g) Vitreous Hemorrhage
- h) Traumatic Chorioretinal Disruption
- i) Scleral Rupture
- j) Lacerating and Penetrating Injuries
- k) Perforating Injuries
- l) Surgical Management
- m) Intraocular Foreign Bodies
- n) Posttraumatic Endophthalmitis
- o) Prognostication of Globe Injuries
- p) Sympathetic Ophthalmia
- q) Avulsion of the Optic Nerve Head
- r) Abusive Head Trauma
- s) Photoc Damage
- t) Solar Retinopathy
- u) Phototoxicity From Ophthalmic Instrumentation
- v) Occupational Light Toxicity
- w) Laser-Pointer Injury

18 Laser Therapy and Cryotherapy for Posterior Segment Diseases

- a) Basic Principles of Photocoagulation
- b) Complications of Photocoagulation
- c) Transpupillary Thermotherapy
- d) Photodynamic Therapy
- e) Cryotherapy
- f) Cryopexy Technique

19 Vitreoretinal Surgery and Intravitreal Injections

- a) Pars Plana Vitrectomy
- b) Macular Epiretinal Membranes
- c) Vitreomacular Traction Diseases
- d) Submacular Hemorrhage
- e) Vitrectomy for Vitreous Opacities
- f) Vitrectomy for Complications of Diabetic Retinopathy
- g) Vitreous Hemorrhage
- h) Diabetic Traction Retinal Detachment
- i) Diabetic Macular Edema
- j) Vitrectomy for Posterior Segment Complications of Anterior Segment Surgery
- k) Postoperative Endophthalmitis
- l) Retained Lens Fragments After Phacoemulsification
- m) Posteriorly Dislocated Intraocular Lenses
- n) Cystoid Macular Edema
- o) Suprachoroidal Hemorrhage
- p) Needle Injury of the Globe
- q) Rhegmatogenous Retinal Detachment Surgery
- r) Techniques for Surgical Repair of Retinal Detachments
- s) Outcomes Following Retinal Reattachment Surgery
- t) Complications of Pars Plana Vitrectomy
- u) Intravitreal Injections

20 Gene Therapy

- a) Gene Augmentation Therapy
- b) Genome Editing
- c) Current Limitations

PART XVI Refractive Surgery

1 The Science of Refractive Surgery

- a) Corneal Optics
- b) Refractive Error: Optical Principles and Wavefront Analysis
- c) Measurement of Wavefront Aberrations and Graphical Representations
- d) Lower-Order Aberrations
- e) Higher-Order
- f) Aberrations
- g) Corneal Imaging for Keratorefractive Surgery
- h) Corneal Topography
- i) Corneal Tomography
- j) Indications for Corneal Imaging in Refractive Surgery
- k) Corneal Biomechanics
- l) Characteristics of the Stroma
- m) Evaluation Methods
- n) Changes in Corneal Biomechanics After Refractive Procedures
- o) Corneal Effects of Keratorefractive Surgery
- p) Incisional Techniques
- q) Tissue Addition or Subtraction Techniques .
- r) Alloplastic Material Addition Techniques
- s) Collagen Shrinkage Techniques
- t) Laser Biophysics
- u) Laser-Tissue Interactions
- v) Fundamentals of Excimer Laser Photoablation
- w) Types of Photoablative Lasers
- x) Corneal Wound Healing

- y) Selected Complications
- z) Drugs to Modulate Wound Healing
- aa) Emerging Technologies
- bb) Ocular Light Scatter Evaluation
- cc) Corneal Epithelial Mapping

2 Patient Evaluation

- a) Patient Expectations
- b) Social History
- c) Ocular History
- d) Patient Age, Presbyopia, and Monovision
- e) Refractive exam
- f) Corneal Topography
- g) Pachymetry
- h) Wavefront Analysis
- i) Patient Selection for Photoablation
- j) Special Considerations for Surface Ablation
- k) Special Considerations for LASIK
- l) Discussion of Findings and Informed Consent
- m) Emerging Technologies

3 Incisional Corneal Surgery

- a) Current Role of Incisional Procedures
- b) Radial Keratotomy for Myopia
- c) Ocular Surgery After Radial Keratotomy
- d) Arcuate Keratotomy and Limbal Relaxing Incisions for Astigmatism
- e) The Coupling Principle
- f) Surgical Considerations and Techniques
- g) Ocular Surgery and Arcuate Keratotomy or Limbal Relaxing Incisions

4 Photoablation: Techniques and Outcomes

- a) Excimer Laser
- b) LASIK
- c) Wavefront-Guided, Wavefront-Optimized, and Topography-Guided Ablations
- d) Surgical Techniques for Photoablation
- e) Laser Calibration, Preoperative Planning, and Laser Programming
- f) Preparation of the Bowman Layer or Stroma Bed for Ablation
- g) Application of Laser Treatment
- h) Immediate Postablation Measures
- i) Postoperative Care
- j) Outcomes for Myopia
- k) Outcomes for Hyperopia
- l) Wavefront-Guided, Wavefront-Optimized, and Topography-Guided Treatment Outcomes
- m) Re-treatment
- n) Emerging Technologies

5 Photoablation: Complications and Adverse Effects

- a) General Complications Related to Laser Ablation
- b) Overcorrection
- c) Undercorrection
- d) Dry Eye
- e) Optical Aberrations
- f) Central Islands
- g) Decentered Ablations
- h) Corticosteroid-Induced Complications
- i) Central Toxic Keratopathy

- j) Infectious Keratitis
- k) Complications Unique to Surface Ablation
- l) Persistent Epithelial Defects
- m) Sterile Infiltrates
- n) Corneal Haze
- o) Complications Unique to LASIK
- p) Microkeratome Complications
- q) Epithelial Sloughing or Defects .
- r) Flap Striae
- s) Traumatic Flap Dislocation
- t) LASIK Interface Complications
- u) Complications Related to Femtosecond Laser-Assisted LASIK Flaps
- v) Ectasia

6 Femtosecond Lenticule Extraction

- a) Refractive Lenticule Extraction
- b) Indications and Preoperative Evaluation
- c) Advantages of SMILE
- d) Disadvantages of SMILE
- e) Surgical Technique
- f) Outcomes
- g) Complications
- h) Re-treatment After SMILE
- i) Emerging Technologies

7 Refractive Surgery in Ocular and Systemic Disease

- a) Ocular Surface Disease
- b) Herpes Simplex and Herpes Zoster Virus Infection
- c) Keratoconus
- d) Corneal Dystrophies
- e) Post-Penetrating Keratoplasty
- f) Ocular Hypertension and Glaucoma
- g) Retinal Disease
- h) Amblyopia and Strabismus in Adults and Children
- i) Systemic Conditions
- j) Human Immunodeficiency Virus Infection
- k) Diabetes Mellitus
- l) Connective Tissue and Autoimmune Diseases

8 Considerations After Refractive Surgery

- a) Intraocular Lens Calculations After Refractive Surgery
- b) Eyes With Known Pre- and Post-Refractive Surgery Data
- c) Eyes Without Preoperative Information
- d) Detachment Repair After Laser Vision Correction
- e) Corneal Transplantation After Refractive Surgery
- f) Contact Lens Use After Refractive Surgery
- g) Glaucoma After Refractive Surgery

9 Intraocular Refractive Surgery

- a) Phakic Intraocular Lenses
- b) Refractive Lens Exchange
- c) Monofocal Intraocular Lenses
- d) Toric Intraocular Lenses
- e) Planning and Surgical Technique
- f) Complications Specific to Toric Intraocular Lenses
- g) Light-Adjustable Intraocular Lenses

- h) Accommodating Intraocular Lenses
- i) Multifocal and Extended Depth of Focus Intraocular Lenses
- j) Surgical Technique
- k) Adverse Effects, Complications, and Patient Dissatisfaction With Multifocal Intraocular Lenses
- l) Bioptics
- m) Emerging Technologies

10 Accommodative and Nonaccommodative Treatment of Presbyopia

- a) Theories of Accommodation
- b) Scleral Surgery
- c) Accommodating Intraocular Lenses
- d) Nonaccommodative Treatment of Presbyopia
- e) Monovision
- f) Conductive Keratoplasty
- g) Multifocal and Extended Depth of Focus Intraocular Lenses
- h) Multifocal Corneal Ablations
- i) Corneal Inlays
- j) Homoplastic Corneal Inlays
- k) Alloplastic Corneal Inlays
- l) Emerging Technologies
- m) Medical Treatment of Presbyopia
- n) Intraocular Lenses in Development