Second Year Resident Curriculum

The second-year of ophthalmology training is designed to develop intermediate skills in history taking and examination of the eye and ocular adnexa. The second-year of training provides opportunities for advancing the residents’ skill and knowledge of anterior segment surgery, posterior segment surgery, glaucoma surgery, strabismus surgery, and oculoplastic surgery. Second-year residents are responsible for the preoperative, intraoperative, and postoperative management of patients undergoing anterior segment surgery, posterior segment surgery, glaucoma surgery, strabismus surgery, and oculoplastic surgery. Additionally, second-year residents attend specialty clinics in low vision /contact lens and receive special training in ophthalmic pathology. Specific guidelines for each rotation are outlined in this section.

Second Year Methodist Rotation

Second year residents spend 3 months at the Methodist Ophthalmology Clinic. Second year residents attend general ophthalmology clinics each day. Specialty clinics are held weekly. During this rotation, residents expand their ophthalmic experience with a diverse patient population with chronic and acute diseases. There is more patient care and clinical management responsibility assigned to second year residents, including the supervision and teaching of first year residents. This rotation provides residents with a broad experience in comprehensive ophthalmology as well as population-specific disorders, such as craniofacial trauma, AIDS, diabetes, and glaucoma. The residents will begin to perform cataract and glaucoma surgery, and continue to expand their surgical skills in orbit and oculoplastic surgery.

Goals

1. To gain further experience in the following areas:
   a. Techniques of the ophthalmic history and examination.
   b. Evaluation and management of comprehensive ophthalmology disorders in an adult population.
   c. Evaluation and management of patients with complex facial and ophthalmic trauma.

2. To expand and refine the resident’s experience performing consultations in an in-patient and out-patient setting.

3. To perform all or skill-level appropriate portions of cataract and glaucoma surgeries, and continue to expand their skill and surgical judgment in the area of orbit and oculoplastic surgery.
Learning Objectives

Patient Care

1. Perform a complete ophthalmic history and examination.

2. Perform refraction on patients with various refractive errors utilizing objective and subjective methods

3. Utilize specialized examination techniques including:
   a. Gonioscopy
   b. Three-mirror lens examination
   c. B-scan ultrasound

4. Interpret visual field examinations

5. Interpret fluorescein angiograms and other forms of retinal imaging

6. Perform basic surgical procedures including:
   a. Chalazion incision and drainage
   b. Tarsorrhaphy
   c. Eyelid margin laceration repair
   d. Bandage contact lens fitting
   e. Excision of eyelid lesions
   f. Orbital fracture repair
   g. Blepharoplasty

7. Evaluate glaucoma patients and determine based on stage of disease, response to treatment, and ability to tolerate treatment, which patients can use topical or systemic medications and which require surgery. Perform skill-appropriate portions of the surgery as follows.
   a. Retrobulbar block or local anesthetic injection
   b. Conjunctival incisions and dissection
   c. Paracentesis incision
   d. Suturing of the conjunctiva

8. Evaluate cataract patients pre-operatively for surgery, determine the optimal lens power and type and surgical approach (phacoemulsification or extracapsular), and perform the skill-appropriate portions of the surgery.
   a. Retrobulbar block or local anesthetic injection
   b. Paracentesis incisions
   c. Staining of capsule (if needed)
d. Injection of viscosurgical device

e. Main wound formation

f. Initiate capsulorhexis

g. Initial phacoemulsification

h. Intraocular lens insertion

Medical Knowledge

1. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following neuro-ophthalmologic disorders:
   a. Afferent pupillary defects
   b. Paradoxical pupillary phenomena
   c. Episodic pupillary phenomena
   d. Anisocoria
   e. Lesions of the parasympathetic system
   f. Lesions of the sympathetic system
   g. Ocular motor nerve palsies
      • Cranial nerve III (oculomotor)
      • Cranial nerve IV (trochlear)
      • Cranial nerve VI (abducens)
   h. Systemic Conditions with neuro-ophthalmic signs
      • Multiple sclerosis
      • Myasthenia gravis
      • Thyroid opthalmopathy
      • Neuro-ophthalmic disorders associated with pregnancy
      • Disorders of the cerebral circulation
      • Cerebrovascular disease
      • Cerebral aneurysms
      • Headache and facial pain
      • Acquired immunodeficiency syndrome (AIDS)
      • Lyme disease

2. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following orbital, eyelid, and lacrimal gland disorders:
   a. Orbital Trauma
   b. Midfacial fractures
   c. Orbital fractures
      • Medial orbital fractures
      • Orbital floor fractures
   d. Intraorbital foreign bodies
   e. Orbital hemorrhage
   f. Congenital anomalies
      • Blepharophimosis syndrome
- Congenital ptosis of the upper eyelid
- Congenital ectropion
- Euryblepharon
- Ankyloblepharon
- Epicanthus
- Epiblepharon
- Congenital entropion
- Congenital distichiasis
- Congenital coloboma
- Congenital eyelid lesions
- Cryptophthalmos

g. Eyelid inflammation
- Chalazion
- Hordeolum

h. Eyelid neoplasms
- Benign eyelid lesions
- Benign adnexal lesions
- Benign melanocytic lesions
- Premalignant epidermal lesions
- Premalignant melanocytic lesions
- Malignant eyelid tumors
- Masquerading neoplasms

i. Eyelid trauma
- Blunt trauma
- Penetrating trauma
- Dog and human bites
- Burns

j. Eyelid and canthal reconstruction
- Eyelid defects not involving the eyelid margin
- Eyelid defects involving the eyelid margin

k. Eyelid Malpositions and Involutional Changes
- Ectropion
- Entropion
- Symblepharon
- Trichiasis
- Blepharoptosis
- Ptosis
- Involutional periorbital changes
- Dermatochalasis
- Blepharochalasis

l. Lacrimal System
- Acquired tearing
- Congenital nasolacrimal duct obstructions
3. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following external disease and corneal disorders:

a. Dermatoses affecting the ocular surface
   - Meibomian gland dysfunction
   - Seborrheic blepharitis
   - Chalazion
   - Hordeolum
   - Rosacea

b. Tear deficiency states
   - Dry eye (keratoconjunctivitis sicca)
   - Aqueous tear deficiency
   - Mucin tear deficiency
   - Lipid tear deficiency

c. Structural and exogenous disorders
   - Exposure keratopathy
   - Floppy eyelid syndrome
   - Superior limbic keratoconjunctivitis (SLK)
   - Recurrent corneal erosion

d. Infectious Diseases of the Eyelid, Conjunctiva, Cornea, and Sclera
   - Basic Concepts of External Ocular Infection
   - Defense mechanisms of the outer eye
   - The normal ocular flora
   - Pathogenesis of ocular infections
   - Virulence factors
   - Host risk factors
   - Ocular microbiology
   - Diagnostic laboratory techniques

e. Viral infections
   - Adenovirus keratoconjunctivitis
   - Enterovirus and Coxsackie virus conjunctivitis
   - Herpes simplex virus blepharitis, conjunctivitis, epithelial keratitis, and stromal keratitis
   - Varicella-zoster virus dermatoblepharitis, conjunctivitis, epithelial keratitis, and stromal keratitis

f. Bacterial, fungal, and parasitic infections
   - Staphylococcal blepharitis
   - Fungal and parasitic infections of the eyelid margin
   - Bacterial conjunctivitis in children and adults
   - Bacterial conjunctivitis in neonates
   - Chlamydial conjunctivitis

g. Bacterial and fungal infections of the cornea
   - Bacterial keratitis
   - Fungal keratitis
   - Acanthamoeba keratitis

h. Congenital Anomalies of the Cornea and Sclera
- Cryptophthalmos
- Microphthalmos
- Nanophthalmos
- Blue sclera
- Microcornea
- Megalocornea
- Cornea plana

i. Secondary abnormalities affecting the fetal cornea
   - Intrauterine keratitis: bacterial and syphilitic
   - Congenital glaucoma
   - Birth trauma
   - Iridocorneal endothelial syndrome (ICE)

j. Depositions and Degenerations of the Conjunctiva, Cornea, and Sclera
   - Conjunctival degenerations:
     - Pinguecula
     - Pterygium
     - Conjunctival concretions
     - Corneal degenerations
     - Epithelial and subepithelial degenerations
     - Stromal degenerations: age-related (involutional) changes
     - Stromal degenerations: peripheral cornea
     - Stromal degenerations: postinflammatory changes
     - Endothelial degenerations
     - Drug-induced deposition and pigmentation
     - Corneal epithelial deposits
     - Pigmentation
     - Senile plaques

k. Wound Healing of the Conjunctiva, Cornea, and Sclera

l. Toxic and Traumatic Injuries of the Anterior Segment
   - Thermal burns
   - Ultraviolet (UV) radiation
   - Ionizing radiation
   - Chemical injuries
   - Alkali burns
   - Acid burns
   - Animal and plant substances
   - Toxic keratoconjunctivitis resulting from medications
   - Concussive trauma
   - Conjunctival hemorrhage
   - Traumatic mydriasis and miosis
   - Traumatic iritis
   - Iridodialysis and cyclodialysis
   - Traumatic hyphema
   - Nonperforating mechanical trauma
4. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of intraocular inflammatory and uveitis disorders:
   a. Symptoms and signs of uveitis
      • Anterior segment
      • Intermediate segment
      • Posterior segment
   b. Classification of uveitis
      • Anterior uveitis
      • Intermediate uveitis
      • Posterior uveitis
      • Panuveitis
   c. Review of the patient's health and other associated factors
   d. Differential diagnosis and prevalence of uveitic entities
   e. Laboratory and medical evaluation
   f. Medical management of uveitis
      • Cycloplegics
      • Corticosteroids
      • Immunomodulating and immunosuppressive agents
   g. Complications of uveitis
      • Cataracts
      • Glaucoma
      • Hypotony
      • Cystoid macular edema
      • Vitreous opacification and vitritis
      • Retinal detachment
   h. Anterior uveitis
      • Acute nongranulomatous iritis and iridocyclitis
      • Chronic iridocyclitis
   i. Intermediate uveitis
   j. Posterior uveitis
      • Infectious diseases
      • Collagen vascular diseases
   k. Panuveitis
      • Infectious diseases
      • Immunologic and granulomatous diseases
      • Masquerade syndromes
1. Endophthalmitis

m. Ocular Involvement in AIDS
   • Virology and transmission of HIV
   • Pathogenesis
   • Natural history
   • Ophthalmic complications
   • External eye manifestations

5. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following glaucoma disorders:
   a. Open-Angle Glaucoma
      • Primary open-angle glaucoma
      • The glaucoma suspect
      • Normal- (low-) tension glaucoma
   b. Angle-Closure Glaucoma
      • Primary angle-closure glaucoma with pupillary block
      • Acute primary angle-closure glaucoma
      • Subacute angle-closure glaucoma
      • Chronic angle-closure glaucoma
      • Primary angle-closure glaucoma without pupillary block
      • Secondary angle-closure glaucoma with pupillary block
      • Secondary angle-closure glaucoma without pupillary block
   c. Medical Management of Glaucoma
      • Beta-adrenergic antagonists (beta blockers)
      • Adrenergic agonists
      • Parasympathomimetic agents
      • Carbonic anhydrase inhibitors (CAIs)
      • Prostaglandin analogs
      • Hyperosmotic agents
   d. General approach to medical treatment
      • Open-angle glaucoma
      • Angle-closure glaucoma

6. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following lens and cataract disorders:
   a. Lens embryology and anatomy
      • Normal development
      • Lens anatomy
      • Capsule
      • Zonular fibers
      • Accommodation
      • Lens epithelium
      • Nucleus and cortex
   b. Lens biochemistry
• Molecular biology
• Intracellular membrane and cytoskeleton
• Carbohydrate metabolism
• Oxidative damage and protective mechanisms

c. Lens physiology
• Maintenance of lens water and cation balance
• Lens epithelium: site of active transport
• Pump-leak theory

d. Aging changes
• Nuclear cataracts
• Cortical cataracts
• Posterior subcapsular cataracts

e. Drug-induced lens changes
• Corticosteroids
• Phenothiazines
• Miotics
• Amiodarone

f. Metabolic cataract
• Diabetes mellitus
• Galactosemia
• Hypocalcemia (tetanic cataract)
• Wilson disease (hepatolenticular degeneration)
• Myotonic dystrophy

g. Exfoliation syndromes
• True exfoliation
• Exfoliation syndrome (pseudoexfoliation)

h. Evaluation and Management of Cataracts in Adults
• Clinical history: signs and symptoms
• Decreased visual acuity
• Glare
• Myopic shift
• Monocular diplopia

7. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following retina and vitreous disorders:

a. Anatomy
• Neurosensory retina
• Retinal pigment epithelium (RPE)
• Choroid

b. Diagnostic Approach to Retinal Disease
• Blood-ocular barriers and fluorescein angiography
• Side effects of fluorescein angiography
• Indocyanine green angiography
• Neovascularization
• Retinal neovascularization
• Choroidal neovascularization
• Techniques of examination

c. Retinal Physiology and Psychophysics
• Electrophysiologic testing
• Electroretinogram
• Electro-oculogram and RPE responses
• The electro-oculogram (EOG)
• Cortical evoked potentials
• Visually evoked potentials
• Electrically evoked potentials
• Psychophysical testing
• Dark adaptation
• Color vision
• Contrast sensitivity
d. Acquired Diseases Affecting the Macula
• Central serous chorioretinopathy
• Age-related macular degeneration (AMD)
• Ocular histoplasmosis syndrome (OHS)
• Idiopathic causes of CNV
• Angioid streaks
• Pathologic myopia
• Macular hole
e. Retinal Vascular Disease
• Systemic arterial hypertension
• Hypertensive retinopathy
• Hypertensive choroidopathy
• Hypertensive optic neuropathy
• Diabetic retinopathy
• Pathogenesis of diabetic retinopathy
• Epidemiology of diabetic retinopathy
• Classification
• The effect of systemic conditions on diabetic retinopathy
• Metabolic factors
• Clinical trials in diabetic retinopathy
• Photocoagulation for diabetic retinopathy
f. Peripheral retinal neovascularization
• Retinopathy of prematurity
g. Venous occlusive disease
• Branch retinal vein occlusion
• Central retinal vein occlusion
h. Arterial occlusive disease
• Precapillary retinal arteriole
• Branch retinal artery occlusion
- Central retinal artery occlusion
- Ocular ischemic syndrome

i. Phakomatoses
   - Von Hippel-Lindau disease (angiomatosis retinae)
   - Congenital retinal arteriovenous malformations (Wyburn-Mason syndrome)
   - Retinal cavernous hemangioma

j. Choroidal Disease
   - Choroidal hemangioma

k. Congenital and Stationary Retinal Disease
   - Color vision (cone system) abnormalities
   - Night vision (rod system) abnormalities

l. Hereditary Retinal and Choroidal Dystrophies
m. Retinal detachment
   - Rhegmatogenous retinal detachment
   - Tractional retinal detachment
   - Exudative retinal detachment

n. Diseases of the Vitreous
   - Developmental abnormalities
   - Tunica vasculosa lentis
   - Prepapillary vascular loops
   - Persistent hyperplastic primary vitreous, or persistent fetal vasculature
   - Familial exudative vitreoretinopathy
   - Asteroid hyalosis
   - Cholesterolosis

o. Posterior Segment Trauma
   - Blunt trauma
   - Vitreous hemorrhage
   - Commotio retinae
   - Choroidal rupture
   - Penetrating injuries
   - Perforating injuries
   - Intraocular foreign bodies
   - Posttraumatic endophthalmitis
   - Sympathetic ophthalmia
   - Shaken baby syndrome/child abuse
   - Avulsion of the optic disc
Practice-based Learning and Improvement

1. Teach medical students and first year residents.
2. Participate in all mandated conferences.
3. Evaluate patient care practices, discuss how they meet standards, and develop ways to improve these practices in an ethnically diverse and socioeconomically challenged patient population.
4. Demonstrate improvement in clinical management.
5. Implement preferred practice patterns into current patient care practices.
6. Obtain information from a variety of sources in ophthalmology and related fields.
7. Learn techniques/take responsibility for developing lifelong learning skills, including individual study to prepare for examinations, research for specific patient care issues, or attendance of Continuing Medical Education activities sponsored by the University and the Department of Ophthalmology.
8. Use information technology such as Up-To-Date, PubMed, or Ovid to enhance patient care.
9. Use patient care errors and near misses to teach residents and students.

Interpersonal and Communication Skills

1. Carefully listen to patients to assess the patient’s health problems including verbal and non-verbal communications.
2. Communicate and establish a therapeutic relationship with patients in an ethnically diverse and socioeconomically challenged patient population.
3. Develop respectful and considerate attitudes towards patients and their families, especially when delivering news of untreatable vision loss or poor outcomes.
4. Demonstrate effective communication skills with patients, families, and other health care personnel, especially in communications addressing decisions involving permanent loss of vision.
5. Present cases accurately and succinctly to faculty and peers in the clinical setting as well as in departmental patient care conferences.
6. Provide timely, legible, thorough, succinct medical record documentation - histories and physical examinations, admission notes, progress notes, procedure notes and discharge summaries.

7. Provide education and counseling to patients, and families using nontechnical and clear language.

8. Demonstrate skill in handling a variety of difficult patient care situations.

9. Clearly speak when addressing patient issues and management plans with patients, families, and health care colleagues.

10. Be willing to spend adequate time with patients addressing their questions and concerns.

11. Use both non-verbal and verbal communication skills to effectively deliver education and counseling to patients, families, and colleagues.

12. Work well within a team context relating to students, residents, attending physicians, nurses, and patients.

13. Function effectively as a consultant for specialty and subspecialty care.

14. Communicate effectively when discussing patient conditions and health care practices with fellow residents, attending physicians and other health care providers.

Professionalism

1. Interface with referring and consulting physicians and appropriate hospital staff in a professional and respectful manner, recognizing and instituting the core competencies.

2. Professionally interact with patients, attending physicians and allied health care personnel, including adherence to dress policy as outlined in the Residents’ Manual.

3. Establish trust with patients and staff by providing reliable and appropriate care to patients.

4. Demonstrate respect, compassion, integrity, punctuality, reliability, and honesty with regards to patients and colleagues.

5. Show regard for the opinions of others.

6. Display initiative and leadership.
7. Acknowledge errors, and alert patients and appropriate health care providers.

8. Create a plan of action to minimize errors.

9. Demonstrate concern for educational development of students and residents.

10. Volunteer for activities for the good of the institution and community.

11. Ask for help when needed, and seek and accept feedback.

12. Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.


14. Demonstrate understanding of the ethical concerns about pharmaceutical and patient gifts.

15. Compassionately respond to issues of culture, age, gender, ethnicity, and disability in patient care.

Systems-based Practice

1. Demonstrate ability to practice medicine in a county/inner city hospital setting.

2. Demonstrate knowledge of different types of medical practice and health delivery systems and know how this affects patient care.

3. Demonstrate knowledge of business aspects of medical practice including coding and insurance.

4. Work with ancillary team members (discharge planners, case managers, and social workers) to provide high quality cost-effective care.

5. Use systematic approaches to reduce errors.

6. Practice effective allocation of health care resources to avoid compromising quality of care.

7. Serve as a patient advocate in the outpatient and inpatient setting.

8. Direct care in inpatient and outpatient settings as a member of a multidisciplinary team.
9. Demonstrate knowledge of how the health care system including other physicians, nurses, and health care professionals affect their patient care practices.

10. Keep medical records review and signage up to date.

11. Record on call patients, procedures, and duty hours as required by the University, Regional Medical Center, and Department of Ophthalmology.

12. Attend University of Tennessee Graduate Medical Education’s System Based Lecture series, or view session online if unable to attend.

Resources

- BCSC (all sections)
- Basic Science and Board Review Course in Ophthalmology
  Essential Optics for the Ophthalmologist
  By Jack T. Holladay, M.D.
- Practical Ophthalmology: A Manual for Beginning Residents
- Refraction: A Programmed Text
  By Robert D. Reinecke and Robert J. Herm
- Departmental conferences and didactic lecture series

Evaluation

- Faculty evaluations of core competencies
- Faculty evaluations of Grand Rounds and Journal Club participation
- Peer evaluations
- Co-worker evaluations
- Patient evaluations
- Surgical/procedure logs
- Medical Records deficiency reports
- Duty hour and surgical log deficiency reports
- Evaluation portfolio documents (Grand Rounds presentations and others)
- Mid-year examinations/Mock Orals
- OKAP examination
Second Year VA Medical Center Rotation

Second year residents spend three months at the VA Medical Center. Second year residents attend general ophthalmology clinics each day and specialty clinics are held weekly, biweekly, or monthly. During this rotation, residents gain intermediate experience with a wide variety of adult patients with an emphasis on geriatric patients. This rotation provides residents with a broad experience in comprehensive ophthalmology as well as an introduction to intraocular and oculoplastics surgery in a largely male geriatric population with multi-system chronic diseases.

Goals

1. To acquire intermediate knowledge and skills in the evaluation and management of comprehensive ophthalmology disorders in adult and geriatric patients
2. To gain basic experience in intraocular and oculoplastics surgery
3. To develop intermediate and advanced knowledge and skills in the performance of systemic disease consultations

Learning Objectives

Patient Care

1. Perform a complete ophthalmic history and examination
2. Perform refraction on patients with various refractive errors utilizing objective and subjective methods
3. Perform consultations on patients with a variety of systemic diseases with ophthalmologic manifestations
4. Interpret visual field examinations
5. Interpret fluorescein and ICG angiograms and OCTs
6. Perform basic surgical procedures including:
   a. Chalazion incision and drainage
   b. Tarsorrhaphy
   c. Bandage contact lens fitting
   d. Excision of eyelid lesions
7. Perform extracapsular cataract extraction with intraocular lens implantation
8. Perform basic retinal interventions
   a. Pan Retinal Photocoagulation
   b. Focal photocoagulation
   c. Intravitreal anti-VEGF injections

9. Perform basic oculoplastics and orbital procedures including:
   a. Blepharoplasty
   b. Ectropion repair
   c. Entropion repair
   d. Enucleation
   e. Evisceration

Medical Knowledge

1. Describe in detail the pathophysiology, clinical manifestations, diagnostic work-up/evaluation, treatment, and prognosis of the following secondary tumors of the eye:
   a. Metastatic carcinoma
   b. Lymphomatous Tumors
   c. Malignant lymphoma
   d. Uveal lymphoid infiltration (reactive lymphoid hyperplasia)
   e. Leukemia

2. Explain in detail the neuroanatomic and physiologic basis of ocular motility including the following components
   a. Ocular motor nerves
      • Cranial nerve III (oculomotor)
      • Cranial nerve IV (trochlear)
      • Cranial nerve VI (abducens)
   b. Supranuclear control
      • Horizontal gaze center
      • Vertical gaze centers
      • Internuclear connections
      • Intranuclear input
      • Supranuclear input
   c. Cerebellar gain
   d. Saccadic system
   e. Smooth pursuit
   f. Vestibulo-ocular reflex
   g. Vergence system

3. Outline the approach to verifying functional visual loss
   a. "Bottom-up" acuity
   b. Deception of the eye tested
4. Discuss the selection of diagnostic imaging studies for various neuro-ophthalmologic disorders:
   a. MRI vs CT scanning
      • Orbit
      • Parasellar and cavernous sinus regions
      • Intracranial tumors
      • Vascular lesions
      • Multiple sclerosis
   b. Magnetic resonance angiography
   c. Arteriography
   d. Functional MRI
   e. Color flow Doppler imaging

5. Outline the evaluation of central abnormalities of the ocular motor system
   a. Ocular stability
   b. Vestibulo-ocular reflex (VOR)
   c. Optokinetic nystagmus
   d. Pursuit
   e. Saccades
   f. Convergence

6. Review in detail the pathophysiology, clinical manifestations, diagnostic work-up/evaluation and treatment of the following neuro-ophthalmologic disorders:
   a. Afferent pupillary defects
   b. Anisocoria
   c. Lesions of the parasympathetic system
   d. Lesions of the sympathetic system
   e. Ocular motility disorders:
      • Ocular motor system abnormalities without symptoms
      • Ocular instability: nystagmoid movements
      • Ocular instability: nystagmus
      • Ocular misalignment: diplopia
      • Myopathies
      • Myoneural junction disease
      • Internuclear ophthalmoplegia
      • Ophthalmoplegia
      • Sixth nerve palsy
      • Fourth nerve palsy
      • Third nerve palsy
      • Multiple cranial nerve palsies
   f. Systemic Conditions with Neuro-ophthalmic Signs
      • Multiple sclerosis
      • Myasthenia gravis
- Endocrinologic disorders
- Thyroid ophthalmopathy
- Neuro-ophthalmic disorders associated with pregnancy
- Disorders of the cerebral circulation
- Transient visual loss
- Cerebrovascular disease
  - Cerebral aneurysms
  - Arteriovenous malformations
  - Dissecting aneurysms
  - Cerebral venous and dural sinus thrombosis
- Headache and facial pain
  - Migraine and tension-type headache
  - Ice pick pains and idiopathic stabbing headache
  - Cluster headache
  - Facial pain
- Neuro-ophthalmic manifestations of infectious diseases
  - Acquired immunodeficiency syndrome (AIDs)
  - Lyme disease
  - Fungal infections
  - Cat-scratch disease

7. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following orbital, eyelid, and lacrimal gland disorders:
   a. Orbital Trauma
   b. Midfacial fractures
   c. Orbital fractures
      - Medial orbital fractures
      - Orbital floor fractures
   d. Intraorbital foreign bodies
   e. Orbital hemorrhage
   
g. Eyelid inflammation
      - Chalazion
      - Hordeolum
   h. Eyelid neoplasms
      - Benign eyelid lesions
      - Benign adnexal lesions
      - Benign melanocytic lesions
      - Premalignant epidermal lesions
      - Premalignant melanocytic lesions
      - Malignant eyelid tumors
      - Masquerading neoplasms
   i. Eyelid trauma
      - Blunt trauma
8. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following external disease and corneal disorders:

a. Ocular Surface Disorders
b. Dermatoses affecting the ocular surface
   • Meibomian gland dysfunction
   • Seborrheic blepharitis
   • Chalazion
   • Hordeolum
   • Rosacea
c. Tear deficiency states
   • Dry eye (keratoconjunctivitis sicca)
   • Aqueous tear deficiency
   • Mucin tear deficiency
   • Lipid tear deficiency
d. Structural and exogenous disorders
   • Exposure keratopathy
   • Floppy eyelid syndrome
   • Superior limbic keratoconjunctivitis (SLK)
   • Recurrent corneal erosion
e. Infectious Diseases of the Eyelid, Conjunctiva, Cornea, and Sclera
   • Basic Concepts of Ocular Infection
   • Defense mechanisms of the outer eye
   • The normal ocular flora
   • Pathogenesis of ocular infections
   • Virulence factors
   • Host risk factors
• Ocular microbiology
  • Diagnostic laboratory techniques

f. Viral infections
  • Adenovirus keratoconjunctivitis
  • Enterovirus and Coxsackie virus conjunctivitis
  • Herpes simplex virus blepharitis, conjunctivitis, epithelial keratitis, and stromal keratitis
  • Varicella-zoster virus dermatoblepharitis, conjunctivitis, epithelial keratitis, and stromal keratitis

ghi. Bacterial, fungal, and parasitic infections
  • Staphylococcal blepharitis
  • Fungal and parasitic infections of the eyelid margin
  • Bacterial conjunctivitis in children and adults
  • Bacterial conjunctivitis in neonates
  • Chlamydial conjunctivitis

h. Bacterial and fungal infections of the cornea
  • Bacterial keratitis
  • Fungal keratitis
  • Acanthamoeba keratitis

i. Depositions and Degenerations of the Conjunctiva, Cornea, and Sclera
  • Conjunctival degenerations:
    • Pinguecula
    • Pterygium
    • Conjunctival concretions
  • Corneal degenerations
    ➢ Epithelial and subepithelial degenerations
    ➢ Stromal degenerations: age-related (involutional) changes
    ➢ Stromal degenerations: peripheral cornea
    ➢ Stromal degenerations: postinflammatory changes
    ➢ Endothelial degenerations
  • Drug-induced deposition and pigmentation
  • Corneal epithelial deposits
  • Pigmentation
  • Senile plaques

j. Wound Healing of the Conjunctiva, Cornea, and Sclera

k. Toxic and Traumatic Injuries of the Anterior Segment
  • Thermal burns
  • Ultraviolet (UV) radiation
  • Ionizing radiation
  • Chemical injuries
  • Alkali burns
  • Acid burns
  • Animal and plant substances
  • Toxic keratoconjunctivitis resulting from medications
  • Concussive trauma
- Conjunctival hemorrhage
- Traumatic mydriasis and miosis
- Traumatic iritis
- Iridodialysis and cyclodialysis
- Traumatic hyphema
- Nonperforating mechanical trauma
- Conjunctival laceration
- Conjunctival foreign body
- Corneal foreign body
- Corneal abrasion
- Posttraumatic recurrent corneal erosion
- Perforating trauma

9. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following intraocular inflammatory and uveitis disorders:
   a. Symptoms and signs of uveitis
      - Anterior segment
      - Intermediate segment
      - Posterior segment
   b. Classification of uveitis
      - Anterior uveitis
      - Intermediate uveitis
      - Posterior uveitis
      - Panuveitis
   c. Review of the patient's health and other associated factors
   d. Differential diagnosis and prevalence of uveitic entities
   e. Laboratory and medical evaluation
   f. Medical management of uveitis
      - Cycloplegics
      - Corticosteroids
      - Immunomodulating and immunosuppressive agents
   g. Complications of uveitis
      - Cataracts
      - Glaucoma
      - Hypotony
      - Cystoid macular edema
      - Vitreous opacification and vitritis
      - Retinal detachment
   h. Anterior uveitis
      - Acute nongranulomatous iritis and iridocyclitis
      - Chronic iridocyclitis
   i. Intermediate uveitis
   j. Posterior uveitis
      - Infectious diseases
• Collagen vascular diseases

k. Panuveitis
  • Infectious diseases
  • Immunologic and granulomatous diseases
  • Masquerade syndromes

l. Endophthalmitis

m. Ocular Involvement in AIDS
  • Virology and transmission of HIV
  • Pathogenesis
  • Natural history
  • Ophthalmic complications
  • External eye manifestations

10. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following glaucoma disorders:
   a. Open-Angle Glaucoma
      • Primary open-angle glaucoma
      • The glaucoma suspect
      • Normal- (low-) tension glaucoma
   b. Angle-Closure Glaucoma
      • Primary angle-closure glaucoma with pupillary block
      • Acute primary angle-closure glaucoma
      • Subacute angle-closure glaucoma
      • Chronic angle-closure glaucoma
      • Primary angle-closure glaucoma without pupillary block
      • Secondary angle-closure glaucoma with pupillary block
      • Secondary angle-closure glaucoma without pupillary block
   c. Medical Management of Glaucoma
      • Beta-adrenergic antagonists (beta blockers)
      • Adrenergic agonists
      • Parasympathomimetic agents
      • Carbonic anhydrase inhibitors (CAIs)
      • Prostaglandin analogs
      • Hyperosmotic agents
   d. General approach to medical treatment
      • Open-angle glaucoma
      • Angle-closure glaucoma

11. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following lens and cataract disorders:
   a. Lens embryology and anatomy
      • Normal development
      • Lens anatomy
      ➢ Capsule
b. Lens biochemistry
   • Molecular biology
   • Intracellular membrane and cytoskeleton
   • Carbohydrate metabolism
   • Oxidative damage and protective mechanisms

c. Lens physiology
   • Maintenance of lens water and cation balance
   • Lens epithelium: site of active transport
   • Pump-leak theory

d. Aging changes
   • Nuclear cataracts
   • Cortical cataracts
   • Posterior subcapsular cataracts

e. Drug-induced lens changes
   • Corticosteroids
   • Phenothiazines
   • Miotics
   • Amiodarone

f. Metabolic cataract
   • Diabetes mellitus
   • Galactosemia
   • Hypocalcemia (tetanic cataract)
   • Wilson disease (hepatolenticular degeneration)
   • Myotonic dystrophy

g. Exfoliation syndromes
   • True exfoliation
   • Exfoliation syndrome (pseudoexfoliation)

h. Evaluation and Management of Cataracts in Adults
   • Clinical history: signs and symptoms
     ➢ Decreased visual acuity
     ➢ Glare
     ➢ Myopic shift
     ➢ Monocular diplopia

12. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following retina and vitreous disorders:
   a. Anatomy
      • Neurosensory retina
      • Retinal pigment epithelium (RPE)
      • Choroid
b. Diagnostic Approach to Retinal Disease
   - Blood-ocular barriers and fluorescein angiography
   - Side effects of fluorescein angiography
   - Indocyanine green angiography
   - Neovascularization
   - Retinal neovascularization
   - Choroidal neovascularization
   - Techniques of examination

c. Retinal Physiology and Psychophysics
   - Electrophysiologic testing
   - Electroretinogram
   - Electro-oculogram and RPE responses
   - The electro-oculogram (EOG)
   - Cortical evoked potentials
   - Visually evoked potentials
   - Electrically evoked potentials
   - Psychophysical testing
   - Dark adaptation
   - Color vision
   - Contrast sensitivity

d. Acquired Diseases Affecting the Macula
   - Central serous chorioretinopathy
   - Age-related macular degeneration (AMD)
   - Ocular histoplasmosis syndrome (OHS)
   - Idiopathic causes of CNV
   - Angioid streaks
   - Pathologic myopia
   - Macular hole

e. Retinal Vascular Disease
   - Systemic arterial hypertension
     - Hypertensive retinopathy
     - Hypertensive choroidopathy
     - Hypertensive optic neuropathy
   - Diabetic retinopathy
     - Pathogenesis of diabetic retinopathy
     - Epidemiology of diabetic retinopathy
     - Classification
     - The effect of systemic conditions on diabetic retinopathy
     - Metabolic factors
     - Clinical trials in diabetic retinopathy
     - Photocoagulation for diabetic retinopathy

f. Peripheral retinal neovascularization
   - Retinopathy of prematurity

g. Venous occlusive disease
   - Branch retinal vein occlusion
h. Arterial occlusive disease
   • Precapillary retinal arteriole
   • Branch retinal artery occlusion
   • Central retinal artery occlusion
   • Ocular ischemic syndrome

i. Phakomatoses
   • Von Hippel-Lindau disease (angiomatosis retinae)
   • Congenital retinal arteriovenous malformations (Wyburn-Mason syndrome)
   • Retinal cavernous hemangioma

j. Choroidal Disease
   • Choroidal hemangioma

k. Congenital and Stationary Retinal Disease
   • Color vision (cone system) abnormalities
   • Night vision (rod system) abnormalities

l. Hereditary Retinal and Choroidal Dystrophies

m. Retinal detachment
   • Rhegmatogenous retinal detachment
   • Tractional retinal detachment
   • Exudative retinal detachment

n. Diseases of the Vitreous
   • Developmental abnormalities
     ➢ Tunica vasculosa lentis
     ➢ Prepapillary vascular loops
     ➢ Persistent hyperplastic primary vitreous, or persistent fetal vasculature
   • Familial exudative vitreoretinopathy
   • Asteroid hyalosis
   • Cholesterolosis

Practice-based Learning and Improvement

1. Teach medical students and 1st year residents on service.

2. Participate in all mandated conferences, including presentation of assigned Journal Club articles, Grand Rounds patient presentations, and Morbidity/Mortality Conference.

3. Evaluate patient care practices, discuss how they meet standards, and develop ways to improve these practices.

4. Demonstrate improvement in clinical management.
5. Implement preferred practice patterns into current patient care practices.

6. Obtain information from a variety of sources in ophthalmology and related fields.

7. Learn techniques/take responsibility for developing lifelong learning skills, including individual study to prepare for examinations, research for specific patient care issues, or attendance of Continuing Medical Education activities sponsored by the University and the Department of Ophthalmology.

8. Use information technology such as Up-To-Date, PubMed or Ovid to enhance patient care.

9. Use patient care errors and near misses to teach residents and students.

Interpersonal and Communication Skills

1. Carefully listen to patients to assess the patient’s health problems including verbal and nonverbal communications.

2. Communicate and establish a therapeutic relationship with patients.

3. Develop respectful and considerate attitudes towards patients and their families, especially when delivering news of untreatable vision loss or poor outcomes.

4. Demonstrate effective communication skills with patients, families, and other health care personnel, especially in communications addressing decisions involving permanent loss of vision.

5. Present cases accurately and succinctly to faculty and peers in the clinical setting as well as in departmental patient care conferences.

6. Provide timely, legible, thorough, succinct medical record documentation - histories and physical examinations, admission notes, progress notes, procedure notes and discharge summaries.

7. Provide education and counseling to patients, and families using non-technical and clear language.

8. Demonstrate skill in handling a variety of difficult patient care situations.

9. Clearly speak when addressing patient issues and management plans with patients, families, and health care colleagues.

10. Be willing to spend adequate time with patients addressing their questions and concerns.
11. Use both non-verbal and verbal communication skills to effectively deliver education and counseling to patients, families, and colleagues.

12. Work well within a team context relating to students, residents, attending physicians, nurses/technicians, and patients.

13. Function effectively as a consultant for specialty and subspecialty care.

14. Communicate effectively when discussing patient conditions and health care practices with fellow residents, attending physicians and other health care providers.

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1. Interface with referring and consulting physicians and appropriate hospital staff in a professional and respectful manner, recognizing and instituting the core competencies.

2. Professionally interact with patients, attending physicians and allied health care personnel, including adherence to dress policy as outlined in the Residents’ Manual.

3. Establish trust with patients and staff by providing reliable and appropriate care to patients.

4. Demonstrate respect, compassion, integrity, punctuality, reliability, and honesty with regards to patients and colleagues.

5. Show regard for the opinions of others.

6. Display initiative and leadership.

7. Acknowledge errors, and alert patients and appropriate health care providers.

8. Create a plan of action to minimize errors.

9. Demonstrate concern for educational development of students and residents.

10. Volunteer for activities for the good of the institution and community.

11. Ask for help when needed, and seek and accept feedback.

12. Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

14. Demonstrate understanding of the ethical concerns about pharmaceutical and patient gifts.

15. Compassionately respond to issues of culture, age, gender, ethnicity, and disability in patient care.

Systems-based Practice

1. Demonstrate ability to practice medicine in a government hospital setting, including mastery of the Electronic Medical Record system at the VAMC.

2. Demonstrate knowledge of different types of medical practice and health delivery systems and know how this affects patient care.

3. Demonstrate knowledge of business aspects of medical practice including coding and VAMC service-related care issues.

4. Work with ancillary team members (discharge planners, case managers, and social workers) to provide high quality cost-effective care.

5. Use systematic approaches to reduce errors.

6. Practice effective allocation of health care resources to avoid compromising quality of care.

7. Serve as a patient advocate in the outpatient and inpatient setting.

8. Direct care in inpatient and outpatient settings as a member of a multidisciplinary team.

9. Demonstrate knowledge of how the health care system including other physicians, nurses, and health care professionals affect their patient care practices.

10. Keep medical records review and signage up to date.

11. Record on call patients, procedures, and duty hours as required by the University and Department of Ophthalmology.

12. Attend University of Tennessee Graduate Medical Education’s System Based Lecture series, or view session online if unable to attend.
Resources

- BCSC (all sections)
- Audio-Digest
- Library and on-line medical education services (such as OMIC’s modules on ophthalmic anesthesia)
- AAO, “The Ethical Ophthalmologist: A Primer.”
- Conference/lecture notes
- AUPO Conference on Clinical Research

Evaluation

- Faculty evaluations of core competencies
- Faculty evaluations of Grand Rounds and Journal Club participation
- Peer evaluations
- Co-worker evaluations
- Patient evaluations
- Surgical encounter evaluation forms
- Surgical/procedure logs
- Medical Records deficiency reports
- Duty hour and surgical log deficiency reports
- Evaluation Portfolio documents (Grand Rounds presentations and others)
- Mid-year examinations/Mock Orals
- OKAP examination
Second Year LeBonheur Pediatrics Rotation - Pediatric Ophthalmology & Strabismus

Second year residents spend four months on the Pediatric Ophthalmology Service. The resident attends clinic at Le Bonheur UTMG pediatric ophthalmology clinics at Hamilton Eye Institute and Germantown, and St. Jude Children's Research Hospital, providing the resident a broad experience in primary and tertiary care pediatric ophthalmology and strabismus with a diverse patient population. Residents perform a large number of strabismus procedures as assistant and primary surgeon during this rotation. Additionally, residents have the opportunity to evaluate neonates with Retinopathy of Prematurity, children with cancer (including retinoblastoma), and children with contact lenses during this rotation.

Goals

1. To gain intermediate and advanced experience in the diagnosis and management of ophthalmic diseases in pediatric patients.

2. To gain intermediate and advanced experience in the diagnosis and management of strabismus and motility disorders in children and adult patients.

Learning Objectives

Patient Care

1. Demonstrate the evaluation of the pediatric patient with ophthalmic disease and the adult with strabismus including:
   a. History and presenting complaint
   b. Assessment of visual acuity, particularly in the pre-verbal and pre-literate individual
   c. Assessment of ocular motility and alignment
      • Perform and interpret tests of ocular alignment
      • Identify pitfalls/potential sources of error in ocular alignment assessment
      • Interpret incomitant measurements in different positions of gaze
      • Measure convergence amplitudes
      • Assess fusional vergence
      • Perform and interpret tests of binocular sensory cooperation
      • Perform and interpret special motor tests
      • Perform and interpret three-step test
      • Perform cycloplegic retinoscopy/complete manifest refraction on age-appropriate basis
• Discuss the relevance of the prism adaptation test in children with acquired esotropia

2. Identify instruments used in strabismus surgery

3. Perform strabismus surgery of the horizontal and vertical extraocular muscles

4. Demonstrate the use of adjustable sutures in strabismus surgery

5. Perform nasolacrimal duct probing in infants

6. Fit diplopic adult patients with prism glasses

7. Prescribe appropriate spectacle correction for children with refractive errors and/or strabismus and/or amblyopia

8. Prescribe orthoptic treatment for appropriate patients

9. Evaluate the fit of a soft contact lens

Medical Knowledge

1. Contrast the components of normal binocular vision
   a. Correspondence
   b. Fusion
   c. Retinal rivalry

2. Distinguish abnormalities of binocular vision
   a. Diplopia and confusion
   b. Suppression
   c. Anomalous retinal correspondence
   d. Monofixation syndrome

3. Review the diagnosis, classification, and management of amblyopia
   a. Diagnosis
   b. Classification
      • Strabismic amblyopia
      • Anisometropic amblyopia
      • Isoametropic amblyopia
      • Deprivation amblyopia
   c. Treatment
      • Cataract removal
      • Refractive correction
      • Occlusion and optical degradation
4. Review the classification of strabismus
   a. Fusional status
   b. Variation of the deviation with gaze position or fixating eye
   c. Fixation
   d. Age of onset
   e. Type of deviation

5. Compare the various esodeviations and outline the management of each:
   a. Pseudoesotropia
   b. Infantile (congenital) esotropia
      • Classic congenital (essential infantile) esotropia
      • Nystagmus and esotropia
   c. Accommodative esotropia
      • Refractive accommodative esotropia
      • Nonrefractive accommodative esotropia
      • Partially accommodative esotropia
   d. Nonaccommodative acquired esotropia
      • Basic (acquired) esotropia
      • Acute esotropia
      • Cyclic esotropia
      • Sensory deprivation esodeviation
      • Divergence insufficiency
      • Divergence paralysis
      • Spasm of the near synkinetic reflex
      • Surgical (consecutive) esodeviation
   e. Incomitant esodeviation
      • Sixth nerve (abducens) palsy
      • Other forms of incomitant esodeviation

6. Compare the various exodeviations and outline the management of each:
   a. Pseudoexotropia
   b. Exophoria
   c. Intermittent exotropia
   d. Constant exotropia
   e. Congenital exotropia
   f. Sensory exotropia
   g. Consecutive exotropia
   h. Exotropic Duane (retraction) syndrome

7. Explain convergence insufficiency and convergence paralysis

8. Compare the various vertical deviations and outline the management of each:
   a. Dissociated vertical deviation (DVD)
b. Inferior oblique muscle overaction  
c. Superior oblique muscle overaction  
d. Superior oblique muscle paresis (fourth cranial nerve palsy)  
e. Monocular elevation deficiency (double elevator palsy)  
f. Brown syndrome (superior oblique tendon sheath syndrome)  
g. Inferior oblique muscle paresis  
h. Orbital floor fractures (blowout fractures)  
i. Inferior rectus muscle paresis  

9. Explain A and V Patterns  

10. Discuss the surgical considerations for patients with A and V pattern strabismus  
a. Principles of treatment  
b. Horizontal rectus muscle transpositions  
c. Treatment of V-pattern esotropia  
d. Treatment of V-pattern exotropia  
e. Treatment of A-pattern esotropia  
f. Treatment of A-pattern exotropia  

11. Review the diagnosis and management of special forms of strabismus including:  
a. Congenital sixth nerve (abducens) palsy  
b. Duane syndrome  
c. Mobius syndrome  
d. Third nerve (oculomotor) palsy  
e. Graves eye disease (thyroid ophthalmopathy)  
f. Chronic progressive external ophthalmoplegia (CPEO)  
g. Myasthenia gravis  
h. Congenital fibrosis syndrome  
i. Internuclear ophthalmoplegia  
j. Congenital ocular motor apraxia  

12. Describe the nomenclature of nystagmus and types of childhood nystagmus  

13. Outline the work-up of infantile nystagmus  

14. Describe the treatment of nystagmus  

15. Outline the indications for strabismus surgery  

16. Illustrate the surgical techniques for the muscles and tendons  
a. Weakening procedures  
b. Strengthening procedures  
c. Adjustable suture techniques  
d. Transposition procedures
17. Discuss the various considerations in planning surgery for strabismus
   a. Incomitance
   b. Prior surgery
   c. Cyclovertical strabismus
   d. Visual acuity

18. Discuss the choices of anesthesia for extraocular muscle surgery

19. Illustrate the different conjunctival incisions and discuss when to choose one over the other
   a. Fornix incision
   b. Limbal or peritomy incision

20. Review the complications of strabismus surgery and outline the management of each
   a. Unsatisfactory alignment
   b. Refractive changes
   c. Diplopia
   d. Perforation of the sclera
   e. Postoperative infections
   f. Foreign body granuloma and allergic reaction
   g. Conjunctival inclusion cyst
   h. Conjunctival scarring
   i. Adherence syndrome
   j. Dellen
   k. Anterior segment ischemia
   l. Change in eyelid position
   m. Lost muscle
   n. Slipped muscle
   o. Postoperative nausea and vomiting
   p. Oculocardiac reflex
   q. Malignant hyperthermia

21. Explain the use of chemodenervation for the treatment of strabismus and blepharospasm
   a. Botulinum toxin pharmacology and mechanism of action
   b. Indications, techniques, and results
   c. Strabismus correction
   d. Eyelid disorders
   e. Complications

22. Discuss the evaluation, differential diagnoses, work-up, and management of infectious and allergic ocular diseases affecting pediatric patients:
   a. Intrauterine and perinatal infections of the eye
      • Toxoplasmosis
      • Rubella
      • Cytomegalic inclusion disease
      • Herpes simplex virus

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• Syphilis
b. Ophthalmia neonatorum
c. Conjunctivitis
  • Bacterial conjunctivitis
  • Viral conjunctivitis
  • Other types of conjunctivitis
d. Cellulitis
  • Impetigo
  • Preseptal Cellulitis
  • Orbital cellulitis
e. Ocular allergy
  • Seasonal allergic conjunctivitis (SAC)
  • Vernal keratoconjunctivitis
  • Atopic keratoconjunctivitis
f. Stevens-Johnson syndrome (erythema multiforme)
g. Kawasaki syndrome

23. Describe disorders of the lacrimal drainage system affecting children
   a. Developmental anomalies
   b. Dacryocystocele
   c. Nasolacrimal duct obstruction
      • Nonsurgical management
      • Surgical management

24. Outline the embryologic development of the cornea and anterior segment

25. Recognize congenital corneal anomalies
   a. Abnormalities of corneal size and shape
   b. Anterior segment dysgenesis: peripheral developmental abnormalities
   c. Anterior segment dysgenesis: central developmental abnormalities
   d. Combinations of peripheral and central developmental abnormalities
   e. Infantile corneal opacities

26. Cite examples of systemic diseases with corneal manifestations in childhood

27. Identify iris abnormalities occurring in pediatric patients
   a. Aniridia
   b. Coloboma of the iris
   c. Iris nodules
      • Lisch nodules
      • Juvenile xanthogranuloma (JXG)
   d. Primary iris cysts
      • Cysts of iris pigment epithelium
      • Central (pupillary) cysts
- Cysts of iris stroma
- Brushfield spots (Wofflin nodules)
- Heterochromia iridis
- Persistent pupillary membranes
- Abnormalities in the size, shape, or location of the pupil
  - Congenital miosis
  - Congenital mydriasis
  - Dyscoria
  - Corectopia
  - Polycoria and pseudopolycoria
- Congenital iris ectropion
- Iris transillumination

28. Outline the glaucomas affecting pediatric patients
   a. Primary congenital glaucoma
      - Pathophysiology
      - Clinical manifestations and diagnosis
      - Natural history
   b. Primary developmental glaucomas
   c. Secondary glaucoma

29. Discuss the treatment of childhood glaucomas
   a. Surgical therapy
   b. Medical therapy

30. Review the evaluation and management of childhood cataracts and other pediatric lens disorders

31. Describe the evaluation and management of uveitis occurring in pediatric patients
   a. Anterior uveitis
      - Juvenile rheumatoid arthritis
      - Trauma
      - Sarcoidosis
      - Herpes zoster
      - Herpes simplex
      - Sympathetic ophthalmia
      - Syphilis
   b. Intermediate uveitis (pars planitis)
   c. Posterior uveitis
      - Toxoplasmosis
      - Ocular histoplasmosis
      - Toxocariasis
      - Other etiologies
   d. Masquerade syndromes
32. Discuss the epidemiology, pathophysiology, clinical manifestations, and treatment of the following vitreous and retinal diseases affecting children:
   a. Leukocoria
      • Persistent hyperplastic primary vitreous (PHPV)
      • Retinopathy of prematurity
      • Coats disease
   b. Hereditary retinal disease
      • Leber congenital amaurosis
      • Achromatopsia
      • Blue-cone monochromatism
      • Congenital stationary night blindness (CSNB)
      • Foveal hypoplasia
      • Aicardi syndrome
   c. Hereditary macular dystrophies
      • Stargardt disease (fundus flavimaculatus)
      • Best vitelliform dystrophy
      • Familial drusen
   d. Hereditary vitreoretinopathies
      • Juvenile retinoschisis
      • Stickler syndrome
      • Familial exudative vitreoretinopathy (FEVR)
      • Norrie disease
      • Goldmann-favre vitreoretinal dystrophy
   e. Systemic diseases and disorders with retinal manifestations
      • Diabetes mellitus
      • Leukemia
      • Albinism
      • Familial oculorenal syndromes
      • Gangliosidoses
   f. Retinopathy of prematurity

33. Outline the various optic nerve disorders affecting children:
   a. Developmental anomalies
   b. Optic atrophy
   c. Optic neuritis
   d. Papilledema
      • Pseudotumor cerebri
      • Pseudopapilledema/drusen

34. Review the diagnosis and management of ocular tumors in childhood
   a. Orbital tumors
      • Primary malignant neoplasms
      • Metastatic tumors
      • Benign tumors
      • Ectopic tissue masses
• Childhood orbital inflammations
b. Eyelid and epibulbar tumors
c. Intraocular tumors
  • Iris and ciliary body lesions
  • Choroidal and retinal pigment epithelial lesions
  • Retinoblastoma

35. Describe the clinical manifestations of the phakomatoses
   a. Neurofibromatosis
   b. Tuberous sclerosis (Bourne ville disease)
   c. Von Hippel-Lindau disease (retinal angiomatosis)
   d. Sturge-Weber syndrome (encephalofacial angiomatosis)
   e. Ataxia-telangiectasia (Louis-Bar syndrome)
   f. Incontinentia pigmenti (Bloch-Sulzberger syndrome)
   g. Wyburn-Mason syndrome (racemose angioma)

36. Evaluate craniofacial malformations
   a. Diagnostic approach
   b. Intrinsic ocular pathology
   c. Secondary ocular complications

37. Discuss selected craniofacial syndromes
   a. Craniosynostosis
   b. Other craniofacial anomalies
   c. Fetal alcohol syndrome
   d. Fetal hydantoin syndrome (FHS)

38. Recall the ocular findings in inborn errors of metabolism

39. Determine the etiology and recognize the manifestations of ocular trauma in childhood
   a. Child abuse
      • Retinal hemorrhages and associated vitreoretinal findings
      • Hyphema
      • Secondary glaucoma
      • Optic nerve injury
   b. Superficial injury
   c. Penetrating injury
   d. Blunt injury
      • Hyphema
      • Fractures

40. Outline the approach to the infant with decreased vision
   a. Visual inattention in infants
   b. Normal visual development
   c. Differential diagnosis
- Optic nerve hypoplasia
- Optic atrophy
- Leber congenital amaurosis
- Achromatopsia (rod monochromatism)
- Congenital infection syndrome/TORCH syndrome
- Congenital motor nystagmus
- Cortical visual impairment
- Delay in visual maturation
- Albinism

41. Provide appropriate evaluation and management for the child with learning disabilities (including dyslexia or vision problems)

42. Define contact lens parameters:
   a. Base curve
   b. Sagittal depth
   c. Diameter
   d. DK

43. Discuss the properties and use of various contact lens materials

44. Describe the optics of how a contact lens works

45. Review the essential components of the history for patients being fitted with contact lenses

46. List the steps in the pre-fitting examination

47. Describe the methods for classifying soft contact lenses

48. List the types of patients for whom soft contact lenses are appropriate

49. Discuss patient selection and complications of extended wear soft lenses

50. Outline the advantages/disadvantages of disposable or frequent replacement lenses

51. Describe the qualities of a good soft lens fit
   a. Centration
   b. Movement
   c. Vision

52. List the steps in the fitting of a soft contact lens
53. List the signs and symptoms of the following:
   a. Loose fit
   b. Tight fit

54. List the care systems for soft contact lenses

55. Discuss the selection of a lens care regimen
   a. Allergies
   b. Lens material
   c. Tear film
   d. Conventional versus planned replacement
   e. Cost
   f. Environment and personal habits
   g. Simplicity

56. Outline the management of contact lens complications:
   a. Red eye
   b. Corneal ulcer
   c. GPC
   d. Toxic reactions to contact lens solutions

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3. Demonstrate improvement in clinical management.

4. Implement preferred practice patterns into current patient care practices.

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2. Communicate and establish a therapeutic relationship with patients and their parents.

3. Develop respectful and considerate attitudes towards patients and their families, especially when delivering news of untreatable vision loss or poor outcomes.

4. Demonstrate understanding of the special issues regarding effective communication skills with children and their parents, especially in communications addressing decisions involving (potential) permanent loss of vision.

5. Present cases accurately and succinctly to faculty and peers in the clinical setting as well as in departmental patient care conferences.

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7. Provide education and counseling to patients, and families using non-technical and clear language.

8. Demonstrate skill in handling a variety of difficult patient care situations, including those made especially challenging by socioeconomic hardship or ethnic/religious diversity.

9. Clearly speak when addressing patient issues and management plans with patients, families, and health care colleagues.

10. Be willing to spend adequate time with patients addressing their questions and concerns.

11. Use both non-verbal and verbal communication skills to effectively deliver education and counseling to patients, families, and colleagues.

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10. Volunteer for activities for the good of the institution and community.

11. Ask for help when needed, and seek and accept feedback.

12. Demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.


14. Demonstrate understanding of the ethical concerns about pharmaceutical and patient gifts.

15. Compassionately respond to issues of culture, age, gender, ethnicity, and disability in patient care.
Systems-based Practice

1. Demonstrate ability to practice medicine in a private not-for-profit children’s regional medical center, including mastery of the Electronic Medical Record.

2. Demonstrate knowledge of different types of medical practice and health delivery systems and know how this affects patient care.

3. Demonstrate knowledge of business aspects of medical practice including coding and insurance, particularly related to TennCare/Medicaid involving the provision of health care for children.

4. Work with ancillary team members (discharge planners, case managers, and social workers) to provide high quality cost-effective care.

5. Use systematic approaches to reduce errors.

6. Practice effective allocation of health care resources to avoid compromising quality of care.

7. Serve as a patient advocate in the outpatient and inpatient setting, particularly in the situation where a child cannot act in his own best interest and abuse or neglect may be involved.

8. Direct care in inpatient and outpatient settings as a member of a multidisciplinary team.

9. Demonstrate knowledge of how the health care system including other physicians, nurses, and health care professionals affect their patient care practices.

10. Keep medical records review and signage up to date.

11. Record on call patients, procedures, and duty hours as required by the University and Department of Ophthalmology.

12. Attend University of Tennessee Graduate Medical Education’s System Based Lecture series, or view session online if unable to attend.
Resources

- BCSC (all sections)
- Audio-Digest
- Library and on-line medical education services (such as OMIC’s modules on ophthalmic anesthesia)
- AAO, “The Ethical Ophthalmologist: A Primer.”
- Conference/lecture notes
- AUPO Conference on Clinical Research
- Pediatric Ophthalmology Texts
  - Pediatric Ophthalmology, Kenneth Wright and Peter Spiegel, eds.
  - Taylor’s Pediatric Ophthalmology

Evaluation

- Faculty evaluations of core competencies
- Faculty evaluations of Grand Rounds and Journal Club participation
- Peer evaluations
- Co-worker evaluations
- Patient evaluations
- Surgical encounter evaluation forms
- Surgical/procedure logs
- Medical Records deficiency reports
- Duty hour and surgical log deficiency reports
- Evaluation Portfolio documents (Grand Rounds presentations and others)
- Mid-year examinations/Mock Orals
- End of rotation pediatric ophthalmology oral exam
- OKAP examination
Second Year Methodist Rotation -
Research, Pathology, Low Vision, Contact Lens Rotation and Call Float

Second year residents spend three months on the Research, Pathology, Low Vision, Contact Lens, Call Float rotation. During this rotation, residents expand their experience with a diverse patient population with chronic and acute diseases. There is more patient care and clinical management responsibility assigned to second year residents, including the supervision and teaching of first year residents. This rotation provides residents with a specialized experience in contact lens, research, wet lab, ophthalmic pathology and low vision clinic.

Goals

1. To provide an overview of the evaluation, treatment options, and functional implications of vision loss.
2. To gain experience in the evaluation and fitting of various contact lenses including rigid and keratoconus lenses.
3. To dedicate time to the required research project.
4. To increase the depth of knowledge of pathology of the eye.
5. To provide an introduction to the normal anatomy and histology of the eye and ocular adnexa.
6. To gain experience in the handling and processing of ocular pathology specimens.
7. To gain extensive experience in the evaluation and diagnosis of ophthalmic pathology specimens.

Learning Objectives

Patient Care

1. Perform a low vision evaluation and make recommendations for enhancing residual vision.
2. Demonstrate the evaluation and fitting of a rigid contact lens.
Medical Knowledge

1. Discuss the goals of low vision rehabilitation

2. Outline the evaluation techniques to determine visual capacity:
   a. Elements of the history
   b. Technique
   c. Phantom vision
   d. Documentation
   e. Visual acuity measurement
      - Distance
      - Near
      - Contrast sensitivity
   f. Visual field measurement
      - Central
      - Peripheral
      - Hemianopic
   g. Preferred retinal locus ability

3. Summarize various treatment options to enhance residual vision:
   a. Magnification
   b. Lighting and contrast enhancement
   c. Magnification devices
      - High-plus spectacles
      - Handheld magnifiers
      - Stand magnifiers
      - Telescopes
      - Video magnifiers

4. Organize guidelines for training patients with visual loss to develop compensatory skills:
   a. Instruction without devices
      - Fixation
      - Scotoma awareness
      - Scanning
      - Tracing
      - Spotting
      - Tracking
   b. Instruction with devices
      - Near work
      - Distance work
   c. Problems and solutions
      - Nausea or dizziness
      - Scotomas
      - Constricted fields
5. Evaluate the functional implications of vision loss and suggest modifications in daily activities affected by vision loss:
   a. Hazards of untreated visual loss
   b. Daily living activities
   c. Treatment to improve daily activities
   d. Professional rehabilitation personnel

6. Consider the unique needs of children, adolescents, and teenagers with impaired vision:
   a. Clinical assessment
   b. Needs and goals
   c. Examination and refraction at different ages
   d. Low vision devices
   e. Children with vision and hearing loss
   f. Children with multiple handicaps

7. Describe the information to be obtained when taking a history prior to contact lens fitting

8. List the steps in the pre-fitting evaluation

9. Relate the advantages and disadvantages of rigid versus non-rigid contact lenses

10. List the qualities of a good rigid contact lens fit

11. Discuss the way in which rigid lens parameters are chosen:
   a. Power
   b. Base curve
   c. Optic zone
   d. Peripheral and secondary curve radius
   e. Peripheral and secondary curve width
   f. Center thickness
   g. Lens diameter

12. Discuss patient instruction and follow-up
   a. Wearing schedules
   b. Follow-up
   c. When to discontinue wear
13. Describe in detail the pathophysiology, clinical manifestations, diagnostic work-up/evaluation, treatment, and prognosis of the following secondary tumors of the eye:
   c. Metastatic carcinoma
d. Lymphomatous Tumors
e. Malignant lymphoma
f. Uveal lymphoid infiltration (reactive lymphoid hyperplasia)
e. Leukemia

14. Describe in detail the pathophysiology, clinical manifestations, diagnostic work-up/evaluation, treatment, and prognosis of the following intraocular tumors:
   a. Melanocytic tumors
      • Iris nevus
      • Nevus of the ciliary body or choroid
      • Melanocytoma of the ciliary body or choroid
      • Iris melanoma
      • Melanoma of the ciliary body or choroid
      • Adenoma and adenocarcinoma
      • Acquired hyperplasia
      • Combined hamartoma
   b. Angiomatous tumors
      • Hemangiomas
         ➢ Choroidal hemangioma
         ➢ Capillary hemangioma (hemangioblastoma)
         ➢ Cavernous hemangioma
   c. Arteriovenous malformation

15. Discuss the proper methods used in the handling of ocular pathology specimens:
   a. Specimen Handling
   b. Communication with the pathologist
c. Identification of specimen
d. Transillumination of globe
e. Gross dissection
f. Processing/staining
   • Fixatives
   • Tissue processing
   • Tissue staining

16. Describe the histopathologic findings, formulate a differential diagnosis, and establish a final diagnosis for specimens from the following areas:
   a. Eyelid
   b. Conjunctiva
c. Sclera
d. Cornea
e. Anterior chamber and trabecular meshwork
f. Lens
g. Uveal tract - iris, ciliary body, choroid
h. Vitreous
i. Retina
j. Optic nerve
k. Orbit
l. Trauma

Skills

1. Demonstrate the proper techniques of specimen handling and processing
2. Perform gross dissection of ocular pathology specimens
3. Evaluate a histopathologic specimen and formulate a differential diagnosis
4. Establish a final diagnosis for ocular pathology specimens
5. Contact lens fitting, soft and hard lenses.

Resources

- BCSC Section 4
- Ophthalmic Pathology: Ophthalmic Pathology Study Set, Volumes 1 and 2 (CDROM)
- Low Vision Rehabilitation (AAO Monograph 12)

Evaluation

- Pathology unknowns
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