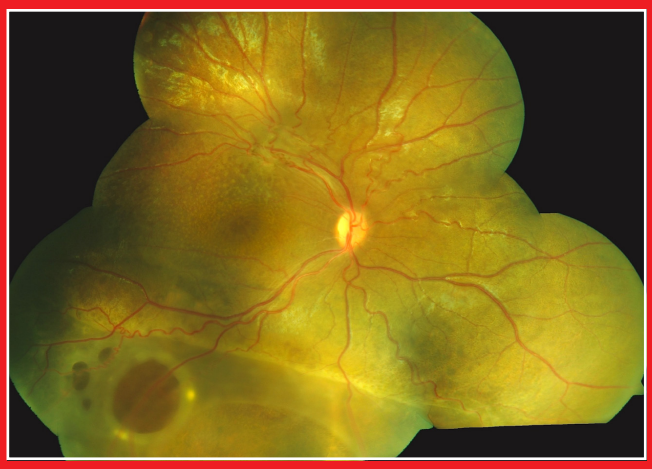
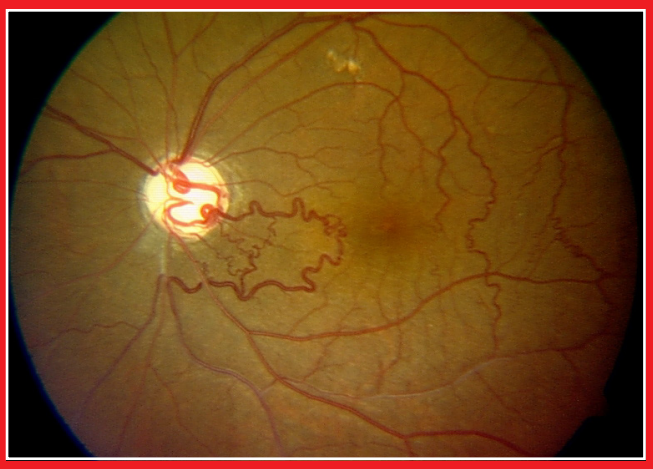
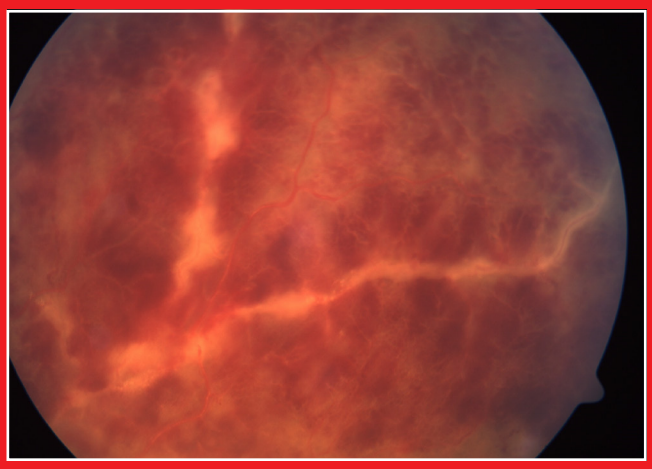




Vitreoretinal Diseases



Vitreoretinal Diseases

Basic Level Goals:

A. Cognitive Skills

1. Describe basic principles of retinal anatomy and physiology (ie, basic retinal and choroidal anatomy, retinal and choroidal physiology), with emphasis on macular anatomy and physiology.**
2. Describe fundamentals of ancillary testing and demonstrate basic understanding of fluorescein angiography (angiographic phases), optical coherence tomography (OCT) (eg, macular anatomy, determine pathophysiology behind structural alterations).
3. Describe pathological anatomy, physiopathology, and clinical pictures of the most common vascular diseases:**
   a. Diabetic retinopathy**
   b. Central vein occlusion**
   c. Branch vein occlusion**
   d. Arterial occlusion**
   e. Hypertensive retinopathy**
4. Describe features of different types of retinal detachment (ie, rhegmatogenous, tractional, exudative).**
5. Describe typical features of common macular diseases (eg, age-related macular degeneration [AMD], macular hole, macular pucker, central serous chorioretinopathy, chloroquine maculopathy, pseudophakic cystoid macular edema).**
6. Describe and recognize features of traumatic pathologies, including:
   a. Commotio retinae
   b. Traumatic choroidal rupture
   c: Purtscher retinopathy
7. Describe typical features of retinitis pigmentosa, main macular dystrophies (eg, Stargardt, Best, cone dystrophy), and other hereditary pathologies.
8. Describe basic principles of laser photocoagulation (eg, laser response to change in power, duration, and spot size) and photodynamic therapy for retinal treatment.
9. Describe basic principles, techniques, and safety of intravitreal injections.
10. Diagnose, evaluate, and treat (or refer) postoperative/posttraumatic endophthalmitis.

B. Technical/Surgical Skills

1. Perform direct ophthalmoscopy.**
2. Perform indirect ophthalmoscopy.**
3. Perform slit-lamp biomicroscopy with precorneal lenses, 3-mirror contact lenses, or other wide-field contact lenses.**
4. Diagnose the presence of common retinal disorders such as exudative AMD, diabetic retinopathy, cystoid macular edema, central serous retinopathy, based on results of fundus examination, fundus photographs, OCT, and fluorescein angiography.

Standard Level Goals:

A. Cognitive Skills

1. Describe more advanced retinal anatomy and physiology.**
2. Describe more advanced ancillary testing concepts of fluorescein and indocyanine green (ICG) angiography as applied to retinal vascular and other diseases (eg, indications, basic differential diagnosis based on angiographic patterns).**
3. Describe the fundamentals of retinal electrophysiology and basic ophthalmic echography.
4. Diagnose, evaluate, treat (or refer) the following retinal vascular diseases:**
   a. Macular telangiectasia**
   b. Coats disease**
   c. Acquired retinal macroaneurysms**
   d. Ocular ischemic syndrome**
   e. Sickle cell retinopathy**
   f. Eales Disease**
5. Describe the findings of major studies in vascular retinal diseases, including the following:**
   a. Diabetic retinopathy**
      i. Early Treatment Diabetic Retinopathy Study (ETDRS)
      ii. Diabetes Control and Complications Trial (DCCT)
      iii. United Kingdom Prospective Diabetes Study (UKPDS)
      iv. Diabetic Retinopathy Clinical Research Network (DRCRnet) Trials
   b. Central vein occlusion**
      i. Central Vein Occlusion Study (CVOS)
      ii. Standard Care vs. Corticosteroid for Retinal Vein Occlusion (SCORE)
      iii. Global Evaluation of implaNtable dExamethasone in retinal Vein occlusion with macular edemA (GENEVA) Study Group
      iv. Central Retinal Vein Occlusion (CRUISE) Study
   c. Branch vein occlusion**

i. Branch Vein Occlusion Study (BVOS)
ii. Standard Care vs. Corticosteroid for Retinal Vein Occlusion (SCORE)
iii. GENEVA Study Group
iv. BRAnch Retinal Vein Occlusion (BRAVO) Trial

d. Retinopathy of prematurity**
i. Cryotherapy for Retinopathy of Prematurity (CRYO-ROP)
ii. Early Treatment for Retinopathy of Prematurity (ETROP)

6. Describe the fundamentals of, evaluate, and treat (or refer) peripheral retinal diseases and vitreous pathologies (eg, vitreous hemorrhage, posterior vitreous detachment, retinal tears, giant retinal tears, lattice degeneration with atrophic holes).**

7. Describe the techniques for retinal detachment repair, including indications, mechanics, instruments, basic techniques, and surgical adjuvants, including heavy liquids, expandable gases, and silicone oil for the following:
a. Pneumatic retinopexy**
b. Scleral buckling**
c. Vitrectomy**

8. Describe and recognize typical features of less common macular diseases:
a. Myopic maculopathy**
b. Serous retinal detachment secondary to optic disc pit**
c. Ocular histoplasmosis syndrome**
d. Phenothiazine/tamoxifen toxicity**

9. Diagnose, evaluate, treat, and classify open and closed globe trauma (eg, Birmingham Eye Trauma Terminology System).**

10. Describe, evaluate, and treat (or refer) postoperative/posttraumatic choroidal detachments and sympathetic ophthalmia.**

11. Describe, recognize, and evaluate hereditary pathologies, such as juvenile retinoschisis and choroidal dystrophies (eg, choroideremia, gyrate atrophy).**

12. Describe the indications/complications for and perform basic laser treatment for diabetic retinopathy (eg, panretinal photocoagulation, macular grid).

B. Technical/Surgical Skills

1. Perform indirect ophthalmoscopy with scleral indentation.

2. Perform ophthalmoscopic examination with contact lenses, including panfunduscopic lenses.

3. Interpret fluorescein and indocyanine green (ICG) angiography and correlate findings with differential diagnosis.**

4. Diagnose the presence of pigment granules in the anterior vitreous (ie, Shafer sign) during a retinal detachment or retinal break.

5. Describe the indications for and interpret retinal imaging technology (eg, OCT, retinal thickness analysis).**

6. Perform posterior segment photocoagulation.**

7. Perform diabetic focal/grid macular laser treatment.

8. Perform peripheral scatter photocoagulation (panretinal).

9. Perform laser retinopexy (demarcation) for isolated retinal breaks.

10. Describe the indications for and interpret basic electrophysiological tests (eg, electroretinogram [ERG], electrooculogram [EOG], visual evoked potential [VEP], dark adaptation).

11. Interpret basic echographic patterns (eg, rhegmatogenous retinal detachment, tractional retinal detachment, posterior vitreous detachment, choroidal detachment, intraocular foreign body).**

12. Perform fundus drawings of the retina, showing vitreoretinal relationships and findings.

13. Perform (or assist during) cryotherapy of retinal holes and other pathology.

14. Describe indications, techniques, and complications of pars plana vitrectomy and scleral buckling.

15. Perform (or assist during) vitreous tap and intravitreal antibiotic injections for the treatment of endophthalmitis.

16. Perform subtenon injections of triamcinolone acetonide for the treatment of macular edema.

17. Perform intravitreal injection of anti-vascular endothelial growth factor (VEGF) drugs for the treatment of AMD.

Advanced Level Goals:

A. Cognitive Skills

1. Apply into clinical practice the most advanced knowledge of retinal anatomy and physiology (eg, surgical anatomy).**

2. Apply into clinical practice the most advanced ancillary testing concepts of fluorescein/ICG angiography in complex retinal vascular disease and other vascular diseases.

3. Describe and apply retinal electrophysiology.

4. Evaluate, treat, or refer the most complex forms of retinal vascular diseases:
a. Combined arterial and venous obstructions
b. Advanced diabetic retinopathy

c. Advanced hypertensive retinopathy
d. Peripheral retinal vascular occlusive disease

5. Describe the findings of major studies in age-related macular degeneration:**
   a. Treatment of Age-Related Macular Degeneration with Photodynamic Therapy Study (TAP)**
   b. Verteporfin in Photodynamic Therapy Study (VIP)**
   c. Minimally Classic/Occult Trial of the Anti-Vascular Endothelial Growth Factor (VEGF) Antibody Ranibizumab in the Treatment of Neovascular AMD (MARINA)**
   d. Anti-VEGF Antibody for the Treatment of Predominantly Classic Choroidal Neovascularisation in AMD (ANCHOR)**
   e. The Comparisons of Age-Related Macular Degeneration Treatments Trials (CATT)**
6. Evaluate and diagnose complex cases of retinal detachment (eg, acute retinal necrosis, proliferative vitreoretinopathy).
7. Diagnose and classify retinopathy of prematurity.
8. Diagnose and manage (or refer) complex trauma cases (eg, chorioretinitis sclopetaria, intraocular foreign body, shaken baby syndrome).
9. Diagnose hereditary vitreoretinal degenerations (eg, Stickler syndrome, Wagner syndrome, Goldmann-Favre degeneration).
10. Describe the treatment algorithm for each specific retinal condition, with special emphasis on pros and cons.**

B. Technical/Surgical Skills

1. Perform indirect ophthalmoscopy with scleral indentation in complex retinal cases (eg, multiple holes, documented with detailed retinal drawing).
2. Perform ophthalmoscopic examination with panfunduscopic or other lenses in complex retinal conditions (eg, giant retinal tears, proliferative vitreoretinopathy).
3. Interpret and apply in clinical practice the results of fluorescein and ICG angiography and OCT in complex retinal or choroidal pathology.
4. Perform posterior segment photocoagulation in more complicated retinal cases:**
   a. Diabetic focal/grid macular treatment (eg, monocular patient, repeat treatment)**
   b. Repeat peripheral scatter photocoagulation (panretinal)**
   c. Laser retinopexy (demarcation) of large or multiple breaks; cryotherapy**
5. Interpret and apply in clinical practice electrophysiology (eg, ERG, EOG, VEP, dark adaptation) in more complicated retinal pathology.
6. Interpret and apply in clinical practice ocular imaging techniques (eg, B-scan echography) in more complex cases (eg, choroidal osteoma).
7. Perform detailed fundus drawings of the retina with vitreoretinal relationships in the most complex retinal cases (eg, recurrent retinal detachment, retinoschisis with and without retinal detachment).
8. Perform laser therapy or cryotherapy of retinal holes and other more complex retinal pathologies.**
9. Participate during scleral buckling and pars plana vitrectomy surgeries.**

Very Advanced Level Goals: Subspecialist

Subspecialty training level should require a greater understanding of the cognitive skills outlined in the previous levels. It should include an intensive hands-on training covering both laser and surgical treatment of the retina.

The trainee should be able to independently manage current medical treatment for vitreoretinal diseases and to discuss recent discoveries and possible future treatments for these disorders.**

A. Cognitive Skills

1. Diagnose, evaluate, treat (or refer) the most complex forms of retinal vascular diseases and diagnose/manage risk factors (eg, blood dyscrasia) and systemic complications.
2. Diagnose, evaluate, and treat inherited, congenital, and acquired macular diseases.
3. Compare the current therapeutic retinal treatment strategies and be able to discuss the future improvements of the therapeutic armamentarium.
4. Evaluate and treat traumatic injuries to the retina, including complex cases such as intraocular foreign body with rhegmatogenous retinal detachment and traumatic macular holes, and be able to manage complications to the other ocular structures.
5. Diagnose, evaluate, and understand the genetic alterations and the possible applications of gene therapy for hereditary diseases.
6. Develop surgical proficiency in different surgical techniques for management of retinal detachment, including complex cases (eg, combined rhegmatogenous/tractional retinal detachments).

B. Technical/Surgical Skills

1. Perform posterior photocoagulation in complicated retinal cases:

a. Retinal breaks with vitreous hemorrhage

b. Cases with intraocular tamponade (ie, gas, silicone oil)

2. Interpret and apply electrophysiology in clinical practice.

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

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

5. Perform laser therapy or cryotherapy of retinal holes and other more complex retinal pathology.

6. Perform scleral buckling in complex retinal detachment.

7. Perform advanced pars plana vitrectomy.