

# **SYLLABUS FOR Ph.D. IN OPHTHALMOLOGY**

## **Essential theoretical knowledge**

These are only broad guidelines and are illustrative; there may be overlap between sections.

### **a. The Basic Sciences:**

- i. Orbital and Ocular anatomy
  - a. Gross anatomy
  - b. Histology
- ii. Ocular Physiology
- iii. Pathology
  - a. General Pathology
  - b. Ocular pathology: Gross pathology, Histopathology.
- iv. Biochemistry: General biochemistry, Biochemistry applicable to ocular function.
- v. Microbiology
  - a. Specific microbiology applicable to the eye.
  - b. Immunology with particular reference to ocular immunology.
- vi. Geometric and ophthalmic optics.
  - a. Basic physical optics.
  - b. Ophthalmic optics
  - c. Applied optics including optical devices.

### **b. Clinical Ophthalmology**

- i. Disorders of Refraction

- ii. Disorders of the Lids
- iii. Disorders of the Lacrimal System
- iv. Disorders of Conjunctiva
- v. Disorders of the Sclera
- vi. Disorders of the Cornea
- vii. Disorders of Uveal Tract
- viii. Disorders of Lens
- ix. Disorders of Retina
- x. Disorders of the Optic Nerve & Visual Pathway
- xi. Disorders of Orbit
- xii. Glaucoma
- xiii. Neuro Ophthalmology
- xiv. Pediatric ophthalmology
- xv. Systemic Ophthalmology (Ocular involvement in systemic disease)
- xvi. Immune ocular disorders.
- xvii. Strabismus & Amblyopia

## **Essential diagnostic skills – instrumentation**

### **- Tonometry**

- i. Applanation
- ii. Indentation (commonly Schiøtz)

### **- Assessment of epiphora**

- i. Jone's dye test
- ii. Syringing – performance & interpretation

- **Dry eye evaluation**
  - i.Schirmer test
  - ii.Rose Bengal staining
  - iii.Tear film breakup time
  - iv.Tear meniscus evaluation
  
- **Corneal ulceration**
  - i.Taking a corneal scraping
  - ii.Inoculation into media
  - iii.Evaluation of Gram's stain
  - iv.Evaluation of KOH preparation
  - v.Corneal wedge biopsy
  
- **Direct ophthalmoscopy**
  - i.Distant direct
  - ii.Media assessment
  - iii.Use of filters provided
  
- **Indirect ophthalmoscopy**
  - i.Scleral depression
  - ii.Fundus drawing capability
  - iii.Use of filters provided
  
- **Slit Lamp Examination**
  - i. Diffuse examination
  - ii. Focal examination
  - iii. Retro illumination –direct & indirect
  - iv. Sclerotic scatter

- v. Specular reflection
- vi. Staining modalities and interpretation
  
- **Slit Lamp Accessories:**
  - i. Applanation Tonometry**
    - 1. Goldman's applanation
  - ii. Gonioscopy**
    - 1. Single mirror gonioscope
    - 2. Gonioprism
    - 3. Grading of the angle
    - 4. Testing for occludability
    - 5. Indentation gonioscopy
  - iii. 3- mirror examination of the fundus**
  - iv. 78-D/90-D/60-D examination**
  - v. Hruby lens examination**
  - vi. Optical pachymetry**
  - vii. Slit lamp photography**
  
- **Colour vision evaluation**
  - i. Ishihara pseudoisochromatic plates**
  - ii. Other tests including**
    - 1. Farnsworth –Munsell 100- hue or 15 – hue tests
    - 2. Holmgren's wools
    - 3. Edridge –Green lantern
  
- **Use of Amsler's charting**
  - 1. Instructing in the use of and interpreting the chart
  
- **Corneal topography and corneal mapping**
  - 1. Interpretation of corneal topography mapping
  
- **Specular microscopy of the corneal endothelium**

- **Keratometry**
  - i. Performance & interpretation of keratometry
  - ii. Diagnosis of situations such as keratoconus
  - iii. Keratometry
  
- **Fundus photography & fundus fluorescein angiography (FFA, FAG)**
  - i. Doing and evaluating stereoscopic fundus photographs
  - ii. Performance of and interpretation of FFA
  - iii. Performance of indirect fluorescein angiography
  
- **Refraction**
  - i. Retinoscopy
  - ii. Streak Retinoscopy
  - iii. Use of trial set
  - iv. Use of Jackson's cross – cylinder
  - v. Subjective and objective refraction
  
- **Autorefractometry**
  - i. Use of and interpretation of autorefractometer
  
- **Diagnosis & assessment of Squint**
  - i. Ocular position and motility examination
  - ii. Versions, ductions and vergences
  - iii. Convergence facility estimation
  - iv. Cover/Uncover/ alternate cover test
  - v. Use of prism bars or free prisms in assessment of squint
  - vi. Use of synaptophore/major amblyoscope
  - vii. Use of Bagolini's striated glasses/ red filters/Maddox rod

- viii. Use of Worth's four dot test
- ix. Use of minor amblyoscope
- x. Use of interpretation of the Hess chart/Lees' screen
- xi. Performance & interpretation of diplopia charting
- xii. Diagnosis of amblyopia

- **Exophthalmometry**

- i. USE of Hertel's exophthalmometer
- ii. Use of Luedde's exophthalmometer
- iii. Use of other exophthalmometers
- iv. Measurement of proptosis or exophthalmos

- **Use and evaluation of ophthalmic ultrasound**

- i. A - scan ultrasound with biometry
- ii. B - scan ultrasound: performance & interpretation

- **Interpretation of perimetry**

- i. Tangent screening
- ii. Goldman perimeter & interpretation
- iii. Static computerized perimetry
  - 1. Interpretation of commonly managed problems

- **Radiology**

**i. Interpretation of plain skull films**

- 1. PA -20 (Caldwell's view)
- 2. PNS (Water's view)
- 3. Lateral
- 4. Submentovertical
- 5. Optic canal views
- 6. Localization of intra ocular and intra orbital foreign body.

## **ii. Interpretations of contrast studies**

1. Performance & interpretation of dacryocystograms
2. Performance and interpretations of orbital venograms
3. Interpretation of carotid angiograms

## **iii. Interpretation of CT –Scans & MRI Scans**

1. Orbital CT interpretation & orbital MRI evaluation
2. Brain CT interpretation

## **SURGICAL PROCEDURES:**

- **Cataract surgery**
  - i. Standard ECCE with or without IOL implantation
  - ii. Small incision ECCE with or without IOL implantation
  - iii. Secondary AC or PC IOL implantation
  - iv. Vectis extraction
- **Sac surgery**
  - i. Dacryocystectomy
  - ii. Dacryocystorhinostomy
  - iii. Probing for congenital obstruction of nasolacrimal duct
- **Strabismus surgery**

Recession and resection procedures on the horizontal recti.
- **Orbit surgery**

Incision and drainage via anterior orbitotomy for abscess.

- **Cyclocryotherapy**

- **Vitreotomy**

# Intra vitreal and intra cameral (anterior chamber) injection techniques and dosages, particularly for endophthalmitis management.

# Needs to know the basics of open sky vitrectomy (anterior segment) as management of cataract surgery complication.

- **Surface ocular procedures**

Pterygium excision with modification

Conjunctival cyst excision /foreign body removal

Corneal foreign body removal

Conjunctival flap /peritomy

- **Corneal**

Repair of corneo – scleral perforations

Corneal suture removal

## **Other skills required**

### **1. Contact lenses**

- a. Assessment
- b. RGP fitting
- c. Soft lens fitting
- d. Troubleshooting

### **2. Subjective correction of refraction**

- i. Techniques of subjective correction
- ii. Knowledge of basic optical devices available and relative advantages and disadvantages of each.