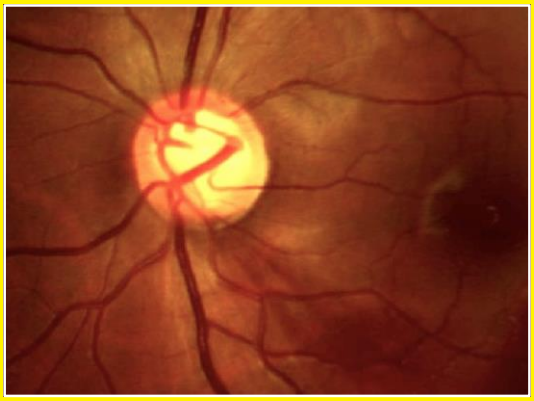
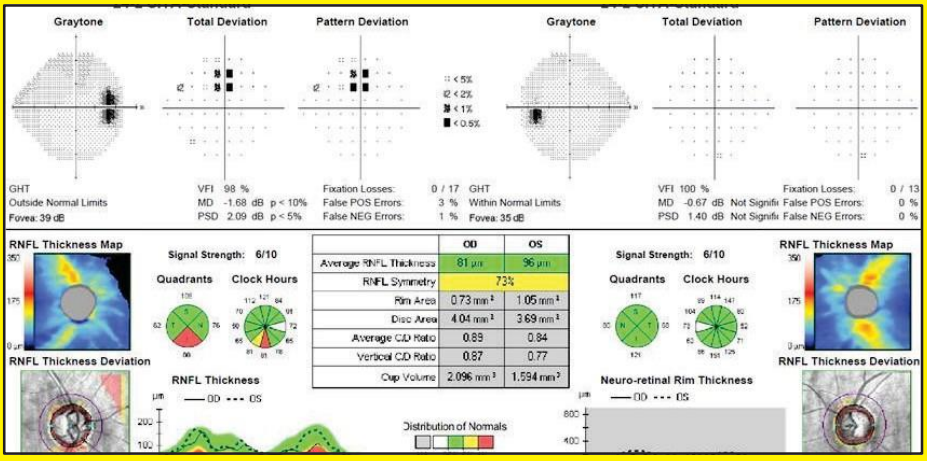


Glaucoma


Graytone
Total Deviation
Pattern Deviation
Graytone
Total Deviation
Pattern Deviation
GHT
Outside Normal Limits
Fovea: 39 dB
VFI 98 %
MD -1.68 dB p < 10%
PSD 2.09 dB p < 5%
Fixation Losses: 0 / 17
False POS Errors: 3 %
False NEG Errors: 1 %
GHT
Within Normal Limits
Fovea: 35 dB
VFI 100 %
MD -0.67 dB Not Signifi
PSD 1.40 dB Not Signifi
Fixation Losses: 0 / 13
False POS Errors: 0 %
False NEG Errors: 0 %
RNFL Thickness Map
RNFL Thickness Deviation
Signal Strength: 6/10
Quadrants
Clock Hours
RNFL Thickness
OD
OS
Average RNFL Thickness 81 µm 96 µm
RNFL Symmetry 73%
Rim Area 0.73 mm² 1.05 mm²
Disc Area 4.04 mm² 3.69 mm²
Average C/D Ratio 0.89 0.84
Vertical C/D Ratio 0.87 0.77
Cup Volume 2.096 mm³ 1.594 mm³
Distribution of Normals
Signal Strength: 6/10
Quadrants
Clock Hours
Neuro-retinal Rim Thickness
RNFL Thickness Map
RNFL Thickness Deviation

Qualifications : MBBS, MS/MD/DNB/DO/DOMS

Observership – One to three months duration.

Basic Level Goals:

A. Cognitive Skills

Basic Science

1. Describe the anatomy of the anterior chamber, angle, and ciliary body.**
2. Describe the anatomy of the retinal nerve fiber layer, optic nerve head, and visual pathway from the retina to the visual cortex.**
3. Describe the mechanisms and dynamics of aqueous humor inflow and outflow.**
4. Describe the microscopic anatomy of the retina from inner to outer portions, with attention to the retinal ganglion cell layer and nerve fiber layer.**
5. Describe the blood supply of the optic nerve and ciliary body.**
6. Describe the apoptotic mechanism of retinal ganglion cell death.**
7. Know the physiology underlying visual-field examination and its interpretation.**
8. Describe the fundamentals of Goldmann static, kinetic perimetry, and standard automated perimetry.**
9. Know basic principles of tonometry and aqueous outflow, and applications of tonometric data (eg, diurnal curve, peak and trough values).**

Clinical Science

1. Describe the major features of primary open-angle glaucoma (high and low tension), angle-closure glaucoma, glaucoma suspects, and ocular hypertension.**
2. Describe the major risk factors for primary open-angle glaucoma and angle-closure glaucoma.**
3. Describe the steps in evaluating primary open-angle glaucoma and angle-closure glaucoma.**
4. Define glaucoma as a progressive neural degeneration of retinal ganglion cells, their axons and their connections to central visual centers.**
5. Describe the features of glaucomatous optic neuropathy.**
6. Describe the basic features of the major glaucomas: primary open-angle glaucoma, angle-closure glaucoma, exfoliative glaucoma, and pigmentary glaucoma.**
7. Know the role of intraocular pressure (IOP) in the development and progression of glaucoma.**
8. Understand the factors that influence IOP.**
9. Describe and understand basic principles of Goldmann applanation tonometry.**
10. Describe tonometers (eg, Schiøtz, Tono-Pen) and recognize artifacts of testing.**
11. Describe principles and basic techniques of gonioscopy (3 or 4 mirror lenses) to evaluate angle structures.**
12. Describe normal and abnormal angle findings.**
13. Know risk factors other than IOP for primary open-angle glaucoma.**
14. Know subtypes of angle-closure glaucoma (eg, pupillary block, plateau iris, lens-related angle-closure, and malignant glaucoma).**
15. Describe corneal pachymetry and how biomechanics and measurements of corneal thickness affect IOP interpretations.**
16. Understand the principles of indirect ophthalmoscopy to evaluate the optic nerve and retinal nerve fiber layer.**
17. Describe the most common types of visual field defects in glaucoma.**
18. Describe principles and mechanisms of medical management of glaucoma.**
19. Describe major classes of glaucoma medications,their mechanisms of action, indications, contraindications, and side effects (topical and systemic).**
20. Know drug interactions between systemic drugs and glaucoma drugs.
21. Know basic medical statistics to interpret major glaucoma studies.
22. Describe the major results of large prospective clinical trials in addition to those appropriate to the practice region.
    a. The Glaucoma Laser Trial (GLT)
    b. The Ocular Hypertension Treatment Study (OHTS)
    c. The Collaborative Initial Glaucoma Treatment Study (CIGTS)

d. The Fluorouracil Filtering Surgery Study (FFSS)
e. The Normal Tension Glaucoma Study (NTGS)
f. The Advanced Glaucoma Intervention Study (AGIS)
g. The European Glaucoma Prevention Study (EGPS)
h. The Early Manifest Glaucoma Trial (EMGT)

Standard Level Goals:

A. Cognitive Skills

Know epidemiology of congenital glaucoma, primary open-angle glaucoma, exfoliation syndrome and exfoliative glaucoma, and angle-closure glaucoma.

1. Know the genetics of:
   a. Primary congenital glaucoma (CYP1B1)
2. Syndromes associated with congenital/ developmental Describe basic principles of tools to analyze optic nerve and retinal nerve fiber layer such as OCT, Heidelberg Retina Tomograph (HRT), and GDx.**
3. Interpret HRT, OCT, and GDx scans.**
4. Describe and interpret more advanced forms of perimetry (kinetic and automated static), including various perimetry strategies such as threshold testing, suprathreshold testing, and special algorithms.**
5. Describe the principles involved in determining glaucomatous progression both clinically and perimetrically.**
6. Describe the principles, and more advanced anatomic gonioscopic features of primary and secondary glaucomas (eg, plateau iris, appositional closure).**
7. Describe target IOP and its use in glaucoma management.**
8. Describe the principles of medical management of more advanced glaucomas (eg, advanced primary open-angle glaucoma, secondary open and closed angle glaucomas, normal tension glaucoma).**
9. Describe pitfalls of medical treatment, in particular poor compliance and adherence.**
10. Describe and recognize the features of angle-closure glaucomas and aqueous misdirection.**
11. Describe the most common clinical features and etiologies of ocular hypotony.**
12. Describe differential diagnosis and management of hypotony.**
13. Describe and know how to apply the results of major clinical trials in glaucoma to clinical practice (eg, GLT, OHTS, CIGTS, FFSS, NTGS, AGIS, EGPS, EMGT).
14. Describe and apply specific medical treatments in more advanced glaucoma.**
15. Describe the principles, indications, and techniques of various types of laser energy, spot size, and laser wavelengths.
16. Describe the principles, indications, and techniques of trabeculectomy (with or without cataract surgery, with or without antimetabolites), glaucoma drainage devices, and cyclodestructive procedures.**
17. Describe the major etiologies of dislocated or subluxated lens associated with glaucoma (eg, trauma, Marfan syndrome, homocystinuria, Weill- Marchesani syndrome, syphilis).
18. Describe the less common causes of lens abnormalities associated with glaucoma (eg, spherophakia, lenticonus, ectopia lentis).
19. Define the relationships of glaucoma and uveitis.**
20. Describe diagnostic accuracy, false positive and false negative diagnoses and their significance at individual and societal levels, differences between case-based and community-based screening, including an understanding of sensitivity and specificity, numberglaucomatous cupping (eg, rim pallor) and when to order additional tests to rule out other pathologies (eg, magnetic resonance imaging, computerized tomography scan, carotid Doppler).**

1. Know how to diagnose progression using special software available with optic nerve and retinal measurement technologies and know the errors and limitations of the instruments.**
2. Describe, interpret, and apply the results of the most complex and advanced forms of perimetry, including special kinetic and automated static perimetry strategies (eg, special algorithms) in atypical or multifactorial glaucoma.
3. Describe visual field damage, progression, rate of progression, caveats, and their use in glaucoma management.**
4. Describe medical management of the most advanced and complex glaucoma (eg, advanced primary open- angle glaucoma previously treated with medicine, laser, or surgery; secondary glaucomas).**
5. Describe, recognize, and know how to treat the most advanced cases of primary open-angle glaucoma (eg, monocular patients, repeat surgical cases), normal tension

glaucoma, and secondary glaucomas (eg, inflammatory glaucoma, angle recession).**

6. Describe, recognize, and know how to treat primary angle-closure glaucoma and complex glaucomas (eg, postoperative cases, secondary angle closure, aqueous misdirection).**

Describe the clinical features of ocular hypotony, recognize and know how to treat common and uncommon etiologies (eg, choroidal detachment, leaking trabeculectomy bleb).**

7. Describe the results, apply the conclusions, and critically analyze the major clinical trials in glaucoma (eg, GLT, OHTS, CIGTS, FFSS, NTGS, AGIS, EGPS, EMGT), as well as describe and use other publications in the management of glaucoma patients.**
8. Describe the features of and know how to evaluate and treat or when to refer the primary infantile, developmental (eg, aniridia, Axenfeld-Rieger), and juvenile glaucomas.**
9. Describe and know how to apply specific medical treatments in advanced glaucoma cases.**
10. Describe the principles,indications,and complications of laser treatment of more advanced or complex glaucoma (eg, repeat procedures).**
    Describe the more advanced surgical treatment of glaucoma: (eg, trabeculectomy, combined cataract and trabeculectomy, glaucoma drainage devices, and cyclodestructive procedures), including indications, techniques, and complications.**
11. Describe use of antimetabolites and antiangiogenic agents and potential complications from their use.**
12. Recognize glaucoma surgical complications, their etiologies, and options for treatment.**
13. Describe and treat intraocular infections resulting from filtering blebs or other glaucoma procedures.**
14. Describe new nonpenetrating glaucoma surgery techniques: principles, techniques, advantages, limitations, and complications.**
15. Describe new microsurgical devices (eg, EX-PRESS, iStent, gold shunt, Trabectome) used in glaucoma surgery.

Very Advanced Level Goals:

Subspecialist equivalent: a glaucoma subspecialist must be able to perform flawless gonioscopy; interpret the most difficult discs; diagnose and treat unusual and rare glaucomas; devise management algorithms throughout care, foreseeing alternatives and potential complications; perform surgery and manage complications of surgery in high-risk glaucoma cases; prepare a thorough consultation letter with instructions for management and future potential difficulties; and teach these skills to residents and general ophthalmologists.**

A. Cognitive Skills

1. List the main population-based studies in glaucoma prevalence, incidence, and risk factors (eg, Baltimore Eye Survey, Blue Mountains Eye Study, Barbados Eye Study, Rotterdam Eye Study, Thessaloniki Eye Study, Latinos Eye Study, Singapore Malay Eye Study).
2. Describe and critically discuss results of the above-mentioned studies on glaucoma prevalence, incidence, and risk factors.
3. Describe rate of progression and use of special algorithms (eg, value function iteration, PROGRESSOR, Garway-Heath map).**
4. Describe and critically discuss literature on structure-function correlation.**
6. Describe use of other tonometers (eg, ocular response analyzer, dynamic contour tonometry, pneumotonometer).**
7. Describe mechanisms of ganglion cell damage and potential pathways for neuroprotection.**
8. Describe and know specific medical and surgical treatments in the most complex and most advanced glaucoma cases (eg, refractory glaucoma, monocular patients, noncompliant patients).**

Describe and know the specific management of complications related to the surgical intervention of the most complex and most advanced glaucomas.**