C M S A
The Colleges of Medicine of South Africa NPC
Nonprofit Company (Reg No.1955/000003/08)
Nonprofit Organisation (Reg. No. 009-874 NPO)
Vat No. 4210273191
27 Rhodes Avenue, PARKTOWN WEST, 2193
Tel: +27 11 726 7037;
Fax: +27 11 726 4036
www.cmsa.co.za
Academic.Registrar@cmsa.co.za

JOHANNESBURG OFFICE
EXAMINATIONS & CREDENTIALS

June 2023

R E G U L A T I O N S

FOR ADMISSION TO THE FELLOWSHIP OF

THE COLLEGE OF OPHTHALMOLOGISTS OF SOUTH AFRICA

FC Ophth(SA)

The examination comprises Part I and Part II: Part II must be passed within eight (8) years of passing the Part I or 6 years of passing Part IB (for candidates who successfully wrote Part 1B prior to first semester 2022).

PART I EXAMINATION

1.0 ADMISSION TO THE PRIMARY (PART I) EXAMINATION

(To be read in conjunction with the instructions)

1.1 The candidate must hold a post-internship qualification to practise medicine, which has been registered or is registrable with the Health Professions Council of South Africa

1.2 The CMSA Senate, through its Examinations and Credentials Committee, will review all applications for admission to the examination and may also review the professional and ethical standing of candidates.

2.0 SYLLABUS FOR THE PART I EXAMINATION

See Appendix A for guidelines.

3.0 CONDUCT OF THE PART I EXAMINATION

3.1 **Content**

3.1.1 Anatomy and embryology of the head and neck to include CNS.

3.1.2 Ocular and Visual Physiology: General principles of physiology, genetics, basic statistics, biochemistry, molecular biology, pharmacology, immunology, and microbiology

3.1.3 Clinical Optics, Refraction, and Ophthalmic Pathology

3.2…/

3.2 **Format of the Examination**

3.2.1 Three Written papers (Subjects):

- Paper 1: Anatomy and Embryology
- Paper 2: Ocular and Visual Physiology
- Paper 3: Clinical Optics & Refraction, and Ophthalmic Pathology

Subminimum of 50% for each paper. All the three papers must be written in the same sitting (same semester examination): A candidate who passes all three papers will have passed the primary examination (FCOPHTH Part 1). A candidate who passes any paper/s, must attempt the failed paper/s at the next two consecutive examinations of the CMSA. All three papers must be completed within **THREE consecutive semester examinations.** A candidate who fails any paper following these three consecutive examinations will be deemed to have failed the FCOphth (SA) Part I examination. Such a candidate will need to repeat **ALL THREE** Part I papers in the same sitting (same semester examination).

NB: Candidates who passed Part IA (prior to First Semester 2022) but NOT PASSED the Intermediate exams (Part IB: prior to First Semester 2022) will need to write paper 3 of Part I (Clinical Optics &Refraction, and Ophthalmic Pathology), which paper shall be written for a maximum of 3 consecutive semesters, after which time the candidate will be required to write all three papers of Part I exam (Papers 1, 2 and 3) in the same sitting (same semester examination).

4.0 RE-EXAMINATION PROCEDURE

There will be no limit on the number of attempts a candidate will be permitted to re-sit the part I examination.

PART II (FINAL) EXAMINATION

5.0 ADMISSION TO THE PART II EXAMINATION
(To be read in conjunction with the Instructions)

A candidate may be admitted to the Final examination having:

5.1 **Passed the Part I** FCOPHTH examination.

5.2 In possession of a **Refraction Competency** certificate: completed by each candidate at their institution. Candidates who would have passed the Part IB (previously called intermediates) will be exempted from producing the refraction certificate.

5.3 Produced evidence indicating that:

5.3.1 They are qualified to practice medicine for a period of not less than four years, including the year of internship.

5.3.2 They have Completed a period of not less than three years (36 months) training in ophthalmology in a fulltime post-internship HPCSA-numbered registrar post approved by the CMSA.

5.4 Noting that internship period has been extended to two years plus one year for community service, the training as a registrar can therefore only commence following full registration with the HPCSA, i.e., following completion of community service.

5.5 Submitted a **Portfolio of learning in Ophthalmology**.

5.6 Submitted **Workplace-Based Assessments (WBA).**

6.0 SYLLABUS FOR THE FINAL EXAMINATION
See Appendix C for guidelines.

7.0 Examination Content
Candidates will be examined on their in-depth knowledge and understanding of the medical and surgical ophthalmology.

8.0…/

8.0 Format of the Examination

The examination will comprise three components: A written, clinical/OSCE and structured oral components
(in chronological order)

- **Written Component:**
  Comprising 2 written papers each covering Clinical Ophthalmology. Invitation to the clinical and oral examinations will depend upon successfully passing the written papers. The written papers will be viewed as a single component, and a pass mark of 50% (aggregate) will apply to this component of the examination. A subminimum of 40% in each paper is required.
- **Clinical/OSCE Component:**
  The Clinical/OSCE examination will consist of a series of short cases.
- **Structured Oral Component:**
  The Oral examination will be preceded by the written and clinical/OSCE examination.

Subminimum of 50% for each component is required. The weighting of the components will be as follow:

- Written Component:
  - Papers 1 and 2 – Single Best Answers (SBA). (40%)
- Clinical/OSCE Component (Short cases). (40%)
- Structured Oral Component. (20%)

9.0 Re-examination Procedure

There will be no limit on the number of times a candidate will be permitted to re-sit the examination, provided it is within 8 years of passing FC Ophth(SA) Part I

10.0 Results

Results will be released on the day which will be specified by the CMSA.

11.0 ADMISSION AS A FELLOW

11.1 Only candidates who have completed training in a CMSA recognised registrar post may be awarded a fellowship if successful in the examination.

11.2 **Candidates who have written the examination as a prerequisite from the HPCSA for inclusion on the specialist register are not eligible to be awarded a Fellowship but will be sent a letter confirming their success in the examinations.**

All other candidates will be asked to sing a declaration as below:

I, the undersigned, …… do solemnly and sincerely declare.

that while a member of the CMSA I will at all times do all within my power to promote the objects of the CMSA and uphold the dignity of the CMSA and its members.

that I will observe the provisions of the Memorandum and Articles of Association, By-laws, Regulations and Code of Ethics of the CMSA as in force from time to time.

that I will obey every lawful summons issued by order of the Senate of the said CMSA, having no reasonable excuse to the contrary

and I make this solemn declaration faithfully promising to adhere to its terms.

Signed at …..……. this …… day of

…….. 20 ……..

Signature ….……..……

Witness ……
(Who must be a Founder, Associate Founder, Fellow, Member, Diplomate or Commissioner of Oaths)

11.3 A two-thirds majority of members of the CMSA Senate present at the relevant meeting shall be necessary for the award to any candidate of a Fellowship.

11.4 A Fellow shall be entitled to the appropriate form of certificate under the seal of the CMSA.

11.5 In the event of a candidate not being awarded the Fellowship (after having passed the examination) the examination fee shall be refunded in full.

11.6 The first annual subscription is due one year after registration (statements are rendered annually)

A P P E N D I X A

Syllabus for the Part I examination

1.0 ANATOMY

Trainees must understand and apply knowledge of the anatomy of the eye and the head and neck structures including the brain that are relevant to the practice of ophthalmology. Later in their ophthalmology training they will be required to be able to relate this knowledge to the interpretation of special investigations such as x-rays, ultrasound and scans in addition to applying the knowledge for ophthalmic surgery.

1.1 **Embryology**

General embryology of relevance and detailed knowledge of the embryology of the eye, orbit, adnexae and visual pathways, with particular emphasis on the understanding of embryology relevant to the understanding of congenital anomalies of the eye.

1.2 **The Orbit and adnexae**

- Osteology, orbital foramina
- Eyelids
- Conjunctiva
- Lacrimal gland and lacrimal drainage system
- Extraocular muscles
- Intraorbital nerves, vessels, ganglia
- Orbital fascia

1.3 **Ocular anatomy**

- Conjunctiva
- Cornea
- Sclera
- Limbus and anterior chamber angle
- Iris and pupil
- Lens and zonule
- Ciliary body
- Choroid
- Retina and retinal pigment epithelium
- Vitreous
- Optic nerve

1.4 **The Cranial Cavity**

- Osteology of the skull
- Meninges, blood supply, nerve supply
- Venous sinuses
- Foramina and their contents
- Cranial fossae
- Pituitary gland and its relations

1.5 **Central Nervous System**

- Cerebral Hemispheres and cerebellum including – surface appearance, cortical areas, ventricles, formation and circulation of cerebrospinal fluid, blood supply and venous drainage, microscopic anatomy of the visual cortex
- Brain stem, cranial nerve nuclei, ganglia
- Cranial nerves
- Spinal cord
- Visual pathways
- Control of eye movements
- Autonomic nervous system and the eye

1.6…/

1.6 **Head and neck**

- Nose, mouth and paranasal sinuses
- The face and scalp, muscles, nerves and vessels
- Salivary glands
- Temperomandibular joint
- Inferotemporal fossa and pterygopalatine fossa
- Carotid arteries and jugular veins, microscopic anatomy of arteries, veins and capillaries
- Respiratory system: anatomy of the mouth, pharynx, soft palate
- Lymphatic drainage of the head and neck

1.7 **Recommended basic textbooks (latest editions):**

- Clinical Anatomy of the Eye. Snell RS, Lemp MA. Blackwell Scientific Publications.
- Basic and Clinical Science Course. Fundamentals and principles of Ophthalmology. Section 2. American Academy of Ophthalmology.

1.8 **Additional reading:**

- Wolff's Anatomy of the Eye and Orbit: Comparative Anatomy of the Visual Apparatus, Bron AJ, Tripathi R, Warwick R, Marshall J. Chapman and Hall.
- Basic Sciences in Ophthalmology: A self assessment text. John Ferris. BMJ books. ISBN 0-7279-1377-8
- The Eye: Basic Sciences and Practice. Forrester JV, Dick AD, McMenamin P, Lee WR, WB Saunders Ltd, London.
- Duane's Foundations of Clinical Ophthalmology. JB Lippincott Co, Philadelphia.

2.0 PHYSIOLOGY

Trainees should understand and apply knowledge of the physiology of the eye and the head and neck structures including the brain that are relevant to the practice of ophthalmology. This knowledge will later be applied to the interpretation of clinical symptoms and signs as well as investigations in the practice of ophthalmology.

Knowledge of general physiology is required as it is applicable to ocular physiology

2.1 **MOLECULAR AND CELL BIOLOGY**

- Cells and cell membranes
- Cytoskeleton
- Cell motility and contractility
- Nucleus
- Cell-cell communication
- Protein synthesis
- Receptor physiology - secondary messenger systems and intracellular signalling

2.1.1 **Understanding molecular biological techniques including**

- Polymerase chain reaction
- Northern and Southern blotting
- In situ hybridisation
- Extracellular matrix with particular respect to ocular structures (see biochemistry)

2.2…/

2.2 GENERAL PHYSIOLOGY

2.2.1 General principles including:

2.2.1.1 Maintenance of homeostasis

- Characteristics of control systems - nervous and hormonal
- Body fluids - volume, osmolarity, osmotic and oncotic pressure, and electrolyte (including H+) concentrations.

2.2.2 Excitable tissues - nerve and muscle

- structure and function of nerve cell
- membrane potential
- action potential
- nerve conduction
- synapse
- the motor unit, neuromuscular junction, motor end-plate muscle

2.2.3 Blood

- plasma composition and functions
- immune mechanism
- blood groups
- haemoglobin and red and white cell formation and destruction
- anaemias
- clotting and fibrinolysis

2.2.4 Cardiovascular system

- pressure resistance and flow in blood vessels
- blood pressure and blood flow
- the activity of the heart and its control
- cardiac output
- control mechanisms within the CVS
- transcapillary exchange, tissue fluid formation

2.2.5 Respiratory system

- structure
- lung volumes
- composition of respiratory gases
- lung mechanics
- gas exchange in the lung
- carriage of O_2 and CO_2 in blood
- ventilation-perfusion relationships
- chemical and neural control of ventilation

2.2.6 Nervous system and special senses

- receptors
- synapses
- afferent pathways
- efferent pathways
- cerebral cortex
- control of movement
- hearing
- pain and its control
- autonomic nervous system
- cholinergic transmission
- adrenergic transmission

2.2.7 Endocrinology

- hormonal control
- hypothalamus
- pituitary
- thyroid / parathyroid
- adrenals
- pancreas

2.2.8 **Nutrition**

- dietary requirements
- absorption
- vitamins

2.2.9 **Kidney and adrenal cortex**

- glomerular and tubular function
- osmolality and pH of body fluids

2.3 OCULAR PHYSIOLOGY

2.3.1 **Physiology of vision including:**

- Biochemistry of tears, lacrimal system, eyelids
  - Physiology of aqueous production and drainage including principles of intraocular pressure including measurement
- Physiology and biochemistry of the cornea
- Lens metabolism
- Biochemistry of the vitreous
- Retinal physiology including phototransduction.
- Retinal pigment epithelium
- Choroid
- Blood ocular barrier
- Visual acuity
- Accommodation
- Pupillary reflexes
- Light detection
- Dark adaptation
- Colour vision
- Electrophysiology of the visual system
- Visual fields
- Contrast sensitivity
- Eye movements, extraocular muscles
- Binocular vision, stereopsis
- Motion detection
- Visual perception
- Magnocellular and parvocellular pathways
- Entoptic phenomena

2.4 RECOMMENDED BOOKS:

- The Eye: Basic Sciences and Practice. Forrester JV, Dick AD, McMenamin P, Lee WR, WB Saunders Ltd, London.
- Basic and Clinical Science Course. Fundamentals and principles of Ophthalmology. Section 2. American Academy of Ophthalmology.

Additional reading:

- Adler's Physiology of the Eye. Ed Levin LA. 11th Edition. ISBN: 978-0-323-05714-1
- Basic Sciences in Ophthalmology: A self-assessment text. John Ferris. BMJ books. ISBN 0-7279-1377-8
- Duane's Foundations of Clinical Ophthalmology. JB Lippincott Co, Philadelphia.

2.5…/

2.5 **BIOCHEMISTRY**

General principles including:

2.5.1 **Cellular biochemistry**

- Organisation of the cell organelles, plasma membrane, cytoskeleton, nucleus, cell-cell communication, ion and solute transport
- Protein and nucleic acid synthesis
- Transport processes in systems and tissues
- Molecular biology

2.5.2 **Connective tissue and extracellular matrix**

- Collagen, synthesis/degradation
- Basal lamina type 4 collagen, laminin, fibronectin, proteoglycans, glycoproteins

2.5.3 **Receptors, signal-transduction and second messengers**

- Adenylate cyclase, hormone receptors, G-proteins
- Phosphoinositide system (P1)
- Atrial natriuretic factor

2.5.4 **Retinal neurochemistry and photochemistry**

2.5.5 **Active oxygen species**

- Free radicals and H_2O, scavengers, lipid peroxidation, phospholipase **A**

2.5.6 **Eicosanoids**

- Prostaglandins, leukotrienes

2.5.7 **Aerobic and anaerobic metabolism**

2.5.8 **Role of calcium in regulating cell processes**

2.5.9 **Drug metabolising enzymes**
(Cytochromes and mixed function oxidases)

2.6 **RECOMMENDED BOOKS:**

- The Eye: Basic Sciences and Practice. Forrester JV, Dick AD, McMenamin P, Lee WR, WB Saunders Ltd, London.
- Basic and Clinical Science Course. Fundamentals and principles of Ophthalmology. Section 2. American Academy of Ophthalmology.

2.7 **PHARMACOLOGY**

General principles including:

- Mechanisms of drug actions (including receptor pharmacology and biochemical pharmacology)
- Mechanisms of drug toxicity
- Pharmacokinetics and pharmacodynamics- absorption, distribution, metabolism and excretion of drugs
- Catecholaminergic pharmacology - Adrenergic, non-adrenergic, peptonergic, cholinergic
- Cholinergic pharmacology
- Serotonergic pharmacology
- Histaminergic pharmacology
- Pharmacology of drugs used in inflammation
- Pharmacology of drugs used in glaucoma
- Local anaesthetics
- Analgesics

These principles apply to the drugs commonly used in ophthalmology both systemic and local.

2.8 **Recommended books:**

- Basic and Clinical Science Course. Fundamentals and principles of Ophthalmology. Section 2. American Academy of Ophthalmology.
- The Eye: Basic Sciences and Practice. Forrester JV, Dick AD, McMenamin P, Lee WR, WB Saunders Ltd, London.

2.9…/

2.9 **MICROBIOLOGY**

General principles including:

- The biological and clinical behaviour of the micro-organisms responsible for infection
- Elementary principles of microbial pathogenesis eg concepts of colonisation, invasion, endotoxins, exotoxins, virulence and pathogenicity etc.
- Bacteria: Classification, staining, including commensal organism
- Viruses including classification, structure and replication, antiviral agents, and laboratory methods of viral detection. Viral infections of the eye.
- Microbiology of HIV and AIDS
- Fungi, classification, factors which predelict to fungal infection, antifungal agents.
- Toxoplasmosis, Chlamydia, Acanthamoeba, helminthic infections
- Principles of sterilisation, disinfection and asepsis, and the application of these to current practice and practical procedures
- Spectrum of activity, mode of action, and pharmacokinetics and of the principal antimicrobials, bacterial resistance

2.10 **RECOMMENDED BOOKS:**

- Basic and Clinical Science Course. Fundamentals and principles of Ophthalmology. Section 2. American Academy of Ophthalmology.
- The Eye: Basic Sciences and Practice. Forrester JV, Dick AD, McMenamin P, Lee WR, WB Saunders Ltd, London.

2.11 **IMMUNOLOGY**

- Principles of immunology eg non-specific resistance, genetic basis of immunity, cellular and humoral mechanisms
- Host defence mechanisms with particular reference to the eye
- Mechanisms of immunologically-induced tissue damage with special reference to the eye
- MHC antigens, antigen presenting cells and antigen processing.
- Immunodeficiency and immunosuppression
- Transplantation immunology

2.12 **RECOMMENDED BOOKS:**

- Basic and Clinical Science Course. Fundamentals and principles of Ophthalmology. Section 2. American Academy of Ophthalmology.
- The Eye: Basic Sciences and Practice. Forrester JV, Dick AD, McMenamin P, Lee WR, WB Saunders Ltd, London.

2.13 **GENETICS**

- Chromosomes and cell division
- Methods of genetic analysis
- Mendelian, X-linked, Mitochondrial inheritance
- Linkage analysis, disequilibrium, population genetics
- Chromosome mapping
- Gene mutations
- Oncogenes, and genetics of malignancy (including retinoblastoma)
- Principles of gene therapy

2.14 **RECOMMENDED BOOKS:**

- Basic and Clinical Science Course. Fundamentals and principles of Ophthalmology. Section 2. American Academy of Ophthalmology.
- The Eye: Basic Sciences and Practice. Forrester JV, Dick AD, McMenamin P, Lee WR, WB Saunders Ltd, London.

2.15…/

2.15 BASIC EPIDEMIOLOGY AND BIOSTATISTICS

All trainees should understand the statistics relevant to ophthalmic practice. They must be able to use this knowledge in the interpretation and later in their training, publication of research.

Basic descriptive and inferential statistics

Statistical tests: Choice of test, parametric vs nonparametric, sensitivity, specificity, predictive values, odds ratio, likelihood ratio, correlation and regression.

Clinical study design: Types, stages of clinical studies, bias, errors, randomisation, power, sample size calculation, confidence intervals, P-values, reliability and validity

2.16 RECOMMENDED BOOKS:

- Basic Epidemiology Robert Beaglehole & Tord Kjellstrom Ruth Bonita. 2nd edition. World Health Organisation, Geneva.
- This WHO book can be downloaded free from the internet: http://whqlibdoc.who.int/publications/2006/9241547073_eng.pdf
- All syllabuses are indicative of the areas of knowledge expected of candidates. The syllabuses, however, are not intended to be exhaustive or to exclude other items of knowledge which are of similar relevance.

3.0 READING LIST:

- The Eye: Basic Sciences and Practice. Forrester JV, Dick AD, McMenamin P, Lee WR. WB Saunders 2003. ISBN: 0-7020-2541-0
- MCQ companion to the Eye. Basic Sciences in Practice. Galloway PH, Forrester JV, Dick AD, Lee WR. WB Saunders 2001. ISBN: 0702025666
- American Academy of Ophthalmologists. Basic and Clinical Science Course. ISBN: 1-56055-570-X
- Volume 1. Update on general medicine.
- Volume 2. Fundamentals and principles of ophthalmology
- Adler's Physiology of the Eye. Ed. Levin LA. 11th Edition ISBN:978-02-323-05714-1
- Clinical Anatomy of the Eye. Snell RS, Lemp MA. Blackwell Scientific Publications 1998. ISBN: 063204344X
- Clinically orientated anatomy. Moore KL, Dalley AF. Lippincott Williams and Wilkins 2005. ISBN: 0781736390.
- Medical Microbiology. Greenwood D, Slack R, Peutherer J. Churchill Livingstone 2002. ISBN 0443070776
- Medical pharmacology at a glance. Neal MJ. Blackwell Publishing 2002. ISBN: 0632052449
- Clinical Ocular Pharmacology. Jaanus SD, Barlett JD. Butterworth-Heinemann 2001. ISBN: 0750670398
- Neuro-Ophthalmology. Glaser JS, 3rd edition, 1999. JB Lippincott Co, Philadelphia 1999. ISBN: 0781717299.
- Genetics for Ophthalmologists: The molecular genetic basis of ophthalmic disorders. Black GCM. Remedica Publishing 2002. ISBN: 190134620X
- Biochemistry of the eye. Whikehart R. Butterworth-Heinemann 2003. ISBN: 0750671521
- Wolff's Anatomy of the Eye and Orbit. 8th Edition. ED Bron. Tripathi and Tripathi. ISBN 0 412 41010 9 (HB)

OPTICS

1.1 PHYSICAL OPTICS

1.1.1 Properties of light.

- Visible light, electromagnetic spectrum, wavelength and frequency
- Propagation of light, wave and particle theory
- Fluorescence and pseudofluorescence
- Absorption and transmission of electromagnetic radiation by the eye
- Ophthalmic hazards of different electromagnetic radiations

1.1.2 Diffraction, Interference, Polarisation, Transmission and Absorption.

1.1.3 **Laser Theory.**

- Properties of laser light - Coherence
- Solid crystal, pulsed and continuous wave lasers
- Gas discharge tube lasers
- Argon, Diode, Excimer, YAG, Femtosecond laser
- Laser hazards and safety.

1.2 **GEOMETRIC OPTICS**

1.2.1 **Basics**

- Reflection at plane and curved surfaces, the images produced and their character, including ray diagrams
- Refraction, Snell's law
- Refractive index
- Critical angle
- Total internal reflection
- Prisms

1.2.2 **Lenses**

- Spherical lenses
- Cardinal points, axes and principal ray diagrams
- Character of images produced
- Power, notation and transposition of lenses
- Magnification
- Thin and thick lenses and their formulae
- Prismatic effect of decentring lenses (Prentice's rule)
- Principles of the pin hole
- Aspheric lenses and their use in ophthalmology
- Cylindrical lenses and their focal characteristics
- Maddox rod
- Jackson's cross cylinder
- Astigmatic lenses
- Conoid of Stürm
- Circle of least confusion
- Confocal optics

1.2.3 **Clinical Optics**

- Optics of the normal eye including accommodation
- The schematic and reduced eye
- Refractive indices of ophthalmic media including the tear film
- The effect of pupil diameter

1.2.4 **Visual Acuity**

- Snellen and Log MAR theory
- Contrast sensitivity testing

1.2.5 **Refractive error and its correction**

- Emmetropia
- Myopia, hypermetropia, astigmatism and principles of correction
- Pin hole, stenopaeic slit
- Keratoscopic patterns in regular and irregular astigmatism
- Presbyopia
- Aphakia, pseudophakia

1.2.6 **Clinical refraction**

- Retinoscopy in adults and children
- Cycloplegic refraction
- Subjective refraction
- Duochrome test
- Interpupillary distance and back vertex distance
- Decentring of lenses
- Anisometropia and aniseikonia and the practical limits for spectacles
- Muscle balance tests

1.2.7.../

1.2.7 **Spectacle lenses**

- Spectacle lenses and their notation, transposition, spherical equivalent
- Recognition of unknown lenses and prisms clinically
- Neutralisation and focimetry
- Lens Aberrations
- Bifocal, multifocal and varifocal lenses

1.2.8 **Contact lenses -** Classification, indications, materials, advantages
Correction of high ametropia - optical advantages and disadvantages of different methods

1.2.9 **The candidate should have a detailed knowledge of**

- Direct and indirect ophthalmoscope
- Diagnostic and therapeutic fundus lenses eg 90D, 78D, 30D, 20D
- Gonioscope
- Retinoscope
- Slit-lamp biomicroscope
- Applanation tonometer
- Focimeter
- A-scan ultrasonograph
- Keratometer

1.2.10 **The candidate should be familiar with the optical principles of**

- Simple magnifiers
- Operating microscope
- Low vision aids including telescopes
- Autorefractors
- Endothelial specular microscope and confocal microscopy
- Placido's disc and keratoscope
- Pachymetry
- Optical anterior chamber depth
- Corneal topographic analysers
- Fundus and slit-lamp cameras
- Scanning laser ophthalmoscope
- Optical Coherence Tomography

1.2.11 **Recommended books:**

- Clinical optics. Elkington AR, Frank HJ, Greaney MJ. 3rd Ed. Blackwell. ISBN 0-632-04989-8
- Basic and Clinical Science Course. Optics and refraction. Section 3. American Academy of Ophthalmology.
- The Fine Art of Prescribing Glasses without making a spectacle of yourself. Milder B, Rubin ML. 3rd Ed.Triad Publishing Co. ISBN 0-937404-66-7

2.0 PATHOLOGY CURRICULUM

2.1 **Basic Principles of Pathology**

- Inflammation
- Immunobiology
- Cellular and tissue reactions

2.2 **Congenital Anomalies**

- Phakomatoses (Disseminated Hereditary Hamartomas)
- Chromosomal aberrations
- Infectious embryopathy
- Drug embryopathy
- Other congenital anomalies

2.3 **Nongranulomatous inflammation: uveitis, endophthalmitis, panophthalmitis and sequelae**

- Definition
- Classification
- Suppurative endophthalmitis and panophthalmitis
- Nonsuppurative, chronic nongranulomatous uveitis and endophthalmitis
- Sequelae of uveitis, endophthalmitis, and panophthalmitis
- End stage of diffuse ocular diseases

2.4 **Granulomatous inflammation**

- Introduction
- Post-traumatic
- Nontraumatic infectious
- Nontraumatic noninfectious

2.5 **Skin and lacrimal drainage system**

2.5.1 **Skin**

- Terminology
- Congenital abnormalities
- Aging
- Inflammation
- Lid manifestations of systemic dermatoses or disease
- Cysts, pseudoneoplasms and neoplasms

2.5.2 **Lacrimal drainage system**

- Congenital abnormalities
- Inflammation – dacryocystitis
- Tumours

2.6 **Conjunctiva**

- Congenital anomalies
- Epitarsus
- Vascular disorders
- Inflammation
- Injuries
- Conjunctival manifestations of systemic disease
- Degenerations
- Cysts, pseudoneoplasms and neoplasms

2.7 **Cornea and sclera**

2.7.1 **Cornea**

- Congenital defects
- Inflammations – nonulcerative
- Inflammations – ulcerative
- Inflammations – corneal sequelae
- Injuries
- Degenerations
- Dystrophies
- Pigmentations

2.7.2 **Sclera**

- Congenital anomalies
- Inflammations
- Tumours

2.8…/

2.8 **Uvea**

- Congenital and developmental defects
- Congenital and developmental defects of the pigment epithelium
- Inflammations
- Injuries
- Systemic diseases
- Atrophies and degenerations
- Dystrophies
- Tumours
- Uveal oedema (uveal detachment: uveal hydrops)

2.9 **Lens**

- General information
- Congenital anomalies
- Capsule (Epithelial basement membrane)
- Epithelium
- Cortex and nucleus (lens cells or “fibres”)
- Secondary cataracts
- Complications of cataracts
- Ectopic lens

2.10 **Neural (Sensory) retina**

- Congenital anomalies
- Vascular diseases
- Inflammations
- Injuries
- Degenerations
- Hereditary primary retinal dystrophies
- Hereditary secondary retinal dystrophies
- Systemic diseases involving the retina
- Tumours
- Neural retinal detachment

2.11 **Vitreous**

- Congenital anomalies
- Inflammation
- Vitreous adhesions
- Vitreous opacities
- Vitreous haemorrhage

2.12 **Optic Nerve**

- Congenital defects and anatomic variations
- Optic disc oedema
- Optic neuritis
- Optic atrophy
- Injuries
- Tumours

2.13 **Orbit**

- Exophthalmos
- Developmental abnormalities
- Orbital inflammation
- Injuries
- Vascular disease
- Ocular muscle involvement in systemic disease
- Neoplasms and other Tumours

2.14.../

2.14 **Diabetes Mellitus**

- Natural history
- Conjunctiva and cornea
- Lens
- Iris
- Ciliary body and choroid
- Neurosensory retina
- Vitreous
- Optic nerve

2.15 **Glaucoma**

- Introduction
- Normal outflow
- Impaired outflow
- Tissue changes caused by elevated intraocular pressure

2.16 **Ocular melanotic tumours**

- Melanotic tumours of eyelids
- Melanotic tumours of conjunctiva
- Melanotic tumours of pigment epithelium or iris, ciliary body and retina
- Melanotic tumours of the uvea
- Melanotic tumours of the optic disc and optic nerve
- Melanotic tumours of the orbit

2.17 **Retinoblastoma and pseudoglioma**

2.17.1 **Retinoblastoma**:

- General information
- Heredity
- Clinical features
- Histology
- prognosis

2.17.2 **Pseudoglioma:**

- General information
- Leukokoria
- Discrete retinal or chorioretinal lesions

2.18 **HIV-AIDS**

- Pathological manifestations of HIV-AIDS in the eye and ocular adnexae
- Patho-physiology of AIDS

2.20 **Suggested reading:**

- Myron Yanoff and Ben S Fine, Ocular Pathology, Mosby, 5th Edition, ISBN 0-323-01403-8
- Section 4, Basic and Clinical Science Course. American Academy of Ophthalmology. "Ophthalmic Pathology and Intraocular tumors"

JOHANNESBURG
June 2023

A P P E N D I X C

CURRICULUM OF SPECIALIST TRAINING IN OPHTHALMOLOGY

1.0 Introduction

This curriculum document establishes the training aims together with the objectives against which training programmes and progress of individual Registrars should be assessed. The College intends to review the curriculum regularly in response to changes in surgical (or other) practice so that Registrar training evolves and improves continually.

Specialist Training is a structured programme of learning which facilitates the acquisition of knowledge, understanding, skills and attitudes to a level appropriate to an ophthalmic specialist who has been fully prepared to begin his/her career as an independent practitioner (Consultant) in this specialty.

Evidence of attainment of the above aims, in a recognised (HPCSA) training programme will be evaluated through:

Ongoing departmental assessments.

The Registrar will be required to submit an adequate standard of portfolio documenting their experience as follows:

Structured education and training

The portfolio must demonstrate the depth, breadth and balance of surgical and non-surgical education and training gained under supervision by attendance at general and, where possible, special clinics, operating sessions and appropriate educational events.

Research

Trainees must also demonstrate their involvement in research, by providing evidence of their capability to critically review new developments and research findings in science and medicine as they apply to ophthalmology. It is essential that they also make their own contribution to the advancement of scientific knowledge through presentations for example, at regional, national or international congresses and/or through publications in peer-reviewed journals.

Clinical Audit

Expertise in, and an ongoing commitment to clinical audit.
Note: A final review by the College of Ophthalmologists of the Registrar's portfolio will be linked to acceptance of training time completed.

Successful completion of the FC Ophth Part II examination.

2.0. Aims of the Curriculum

To enable Registrars to acquire the necessary attributes to practice as a Specialist Ophthalmologist.

- To specify a programme of attainment of the knowledge, understanding, skills and attitudes required to practice as a Specialist Ophthalmologist.
- To ensure that the intended learning outcomes are achievable and measurable.
- To meet the need for consistency in judging competence and performance in the completion of training.
- To reflect not only the reasonable career aspirations of the Registrar but also the needs for comprehensive service provision.
- To promote an appreciation among Registrars of the importance of continuing self-learning, knowledge reinforcement, audit and research in order to provide expert and effective service to their patients.

3.0 …/

3.0 General Specialty Objectives

3.1 Knowledge Base/Syllabus:

Through participation in the training programme, Registrars will have consolidated and extended their knowledge in the following areas:

3.2 Clinical Science

Embracing all aspects of the medicine and surgery of the eye, adnexae and visual pathways, and including interactions with systemic disease and in the context of relevant general aspects of surgery and medicine. There is emphasis on multi-system disease and visual impairment in the context of other co-morbidities. For specific diseases, knowledge is expected concerning aetiology (including pathogenesis, genetics, and interactions with patients' physical and social environment), clinical manifestations, investigation, diagnosis, management and prevention, and including management of visual impairment generally. The depth of knowledge in the various subspecialty areas should reflect the epidemiology of the condition (the 'burden of disease' to society and its significance to the patient).

3.3 Health Service Management

Including the political and economic context of patient care, the role of constituent and associated agencies and relevant senior personnel roles in the organisation.

3.4 Data Management

Including the reliable recording of clinical, research and audit data using paper-based and digital filing systems, and an appreciation of the appropriate application of information technology in this context.

3.5 Understanding:

Through their management of patients during Specialist Training, through discussions and through their presentations, trainees will:

- 3.5.1 Interpret investigations appropriately.
- 3.5.2 Demonstrate a capacity to formulate a relevant differential diagnosis and choose an appropriate management strategy from the options available and to plan and implement that strategy.
- 3.5.3 Shown an understanding of the value of clinical audit in improving practice, including the culture of personal audit.
- 3.5.4 Demonstrate and appreciate the importance of basic and clinical research in advancing knowledge and contributing to the evidence-based management.
- 3.5.5 Understand the principles of good medical practice, and informed consent.
- 3.5.6 Recognise the limits of their own knowledge and skills and to have insight into their own difficulty in understanding complex interactions.

3.6 Professional Skills:

Registrars should be able to:

- 3.6.1 Consolidate and enhance their clinical skills, including history taking and carrying out an appropriately targeted clinical examination, developing investigative strategies through an appropriate choice of tests, analysing the evidence in order to formulate a provisional diagnosis, and outlining an approach to therapeutic interventions (including indications and contraindications, advice and support, pharmacological treatment, anaesthesia, laser and surgical treatment, and rehabilitation).
- 3.6.2 Demonstrate a capability to recognise and appropriately manage complications of treatment.
- 3.6.3 Maintain their skills in cardiopulmonary resuscitation.
- 3.6.4 Demonstrate their information technology and communication skills (e.g. letter and report writing, teaching presentations, etc).
- 3.6.5 Show an ability to work as part of a team.
- 3.6.6 Demonstrate their management skills (e.g. unit administration, understanding budgets, organising meetings etc.).
- 3.6.7 Develop an understanding of the principles of Clinical Governance, Appraisal and Revalidation.

3.7…/

3.7 **Professional Attitudes and Conduct:**

Registrars must have developed a style of care which is:

3.7.1 Humane (reflects compassion in 'breaking bad news' and in the management of the visually impaired, and recognition of the impact of visual impairment on the patient and society.)

3.7.2 Reflective (including recognition of the limits of his/her knowledge, skills and understanding.)

3.7.3 Ethical (e.g. in relation to rationing issues, truth-telling and disclosure of patient information.)

3.7.4 Integrative (especially involvement in the inter-disciplinary team in the eye care of children, the handicapped and the elderly.)

3.7.5 Scientific (e.g. critical appraisal of the scientific literature, evidence-based practice and use of information technology and statistics.)

4.0 Specific Objectives by Subspecialty Section

The details of the curriculum are classified by subspecialty sections: Each has four subsections:

4.1 **Objective**

A summary of the fundamental aims of the training in that section.

4.2 **Essential Clinical Experience**

This section specifies the minimum clinical experience which should be achieved by each Registrar during training, e.g. the minimum number of procedures which must have been personally performed by the Registrar (under supervision until competence is established) the target number of Consultant-supervised clinics to have been attended and educational experiences acquired.

These mandatory attainments must have been recorded in the relevant part of the trainee's logbook.

4.3 **Mandatory Competence**

Competence is defined as '*the extent of acquisition of knowledge/understanding and skills/attitudes that allows appropriate delegation of consultant responsibility to the Registrar in an unsupervised clinical or surgical setting*'. A Consultant's professional responsibility towards any of his/her patients has always included a requirement to establish the competence of trainees before delegating clinical care. Competence-based assessment of a Registrar by a Consultant Trainer is thus a (continuous) review of clinical performance in specified areas; in each of these areas, the Registrar must demonstrate his/her capability '*to do the right thing right at the right time and in the right spirit*'. In judging competence, trainers should extend their consideration of a Registrar's merit beyond the subspecialty-based areas of knowledge, understanding and skills towards issues of attitude, professional values, team-working, communication skills, empathising with patients etc.; this is what is meant by '*in the right spirit*'.

The range of attainment of Registrar competence should be certified for the relevant subspecialty sections by regular assessment. Re-certification of the range of Registrar competence in each subspecialty section should be undertaken by succeeding trainers wherever appropriate.

4.4 **Desirable Clinical Experience**

The list identifies those aspects of competence and experience which, although desirable, are not essential 'core' attainments during training.

5.0 Section 1: Oculoplastic, Orbital, Adnexal and Lacrimal Surgery

5.1 **Objective**

To acquire demonstrable proficiency in the assessment and contemporary management of disorders of the eyelids and adnexae.

5.2 **Essential clinical experience**

5.2.1 To manage the following:
Abnormal lid position, abnormal lid swelling, the watery eye, proptosis and their causative conditions, HIV related eyelid and orbital conditions

5.2.2 To have undertaken a minimum of 40 oculoplastic and/or adnexal operations.

5.2.3 Actively to have participated in, or assisted at:
A minimum of 3 major ptosis repairs

5.2.4 The interpretation of a minimum of 10 relevant radiographs (e.g. CT, MRI).

5.2.5 The management of 5 patients with thyroid eye disease.

5.2.6 Appropriate liaison with associated services, including ENT, maxillofacial, dermatology, neurology, neurosurgical, plastic surgical and endocrinology departments.

5.3 **Mandatory competence**

Competence in the following is specifically required:

5.3.1 Oculoplastic management of lid disease, including incision and curettage for chalazion, entropion, ectropion, trichiasis, dermatochalasis, lagophthalmos and small tumours, in particular using the techniques of biopsy, blepharoplasty, wedge resection, lateral canthal sling and lateral tarsorrhaphy.

5.3.2 Primary repair of lid lacerations, including canalicular repair.

5.3.3 Assessment of cases of orbital and facial trauma, including recognition of fractures.

5.3.4 Management of epiphora and dacryocystitis, including dacryocystorhinostomy.

5.3.5 Enucleation, evisceration, orbital implantation and socket care.

5.3.6 Recognition of compressive optic neuropathy in dysthyroid disease and management of the milder dysthyroid problems including lid retraction.

5.3.7 Appropriate use and interpretation of relevant special investigations, including CT, MRI and ultrasound scans.

5.3.8 Assessment and management of proptosis and use of the exophthalmometer.

5.4 **Desirable clinical experience**

5.4.1 Major lid reconstruction, Mohs' micrographic surgery, rehabilitative blepharoplasty, mucous membrane grafting, socket reconstruction.

5.4.2 Correction of ptosis

5.4.3 Lacrimal surgery, nasal endoscopy and endonasal DCR.

5.4.4 Management of severe dysthyroid orbitopathy, including use of orbital decompression, radiotherapy and immune suppression.

5.4.5 Orbital floor implants in management of orbital floor fracture.

5.4.6 Removal of orbital tumours, including the technique of exenteration.

5.4.7 Orbital cellulitis – management by sinus drainage.

5.4.8 The uses of botulinum toxin A in the periocular area including levator weakening, temporary entropion correction, management of blepharospasm and other disorders of facial movement.

5.4.9 Use of an ocular prosthetics service.

5.4.10 Histopathological examination of skin and orbital biopsy specimens.

6.0 Section 2: Cornea and External Diseases

6.1 **Objective**

To acquire demonstrable proficiency in the assessment and contemporary management of disorders of corneal and external eye diseases.

6.2 **Essential clinical experience**

To have become familiar with the following:

6.2.1 Infectious external disease, the dry eye, allergic and atopic eye disease, corneal ulceration, complications of contact lens wear, corneal oedema, opacity and ectasia, episcleritis.

6.2.2 Actively to have participated in, or assisted at, a minimum of 6 corneal transplant operations.

6.2.3 Actively to have participated in the management of the complications of corneal transplantation, including rejection and refractive problems.

6.3 **Mandatory competence**

6.3.1 To have undertaken the following:

6.3.1.1 Conjunctival sampling and corneal scraping for microbiological investigation.

6.3.1.2 Pachymetry.

6.3.1.3 Keratometry and Placido’s disc.

6.3.1.4 Removal of corneal sutures.

6.3.2 Investigation and management of acute and chronic conjunctivitis, including appropriate use of laboratory investigations.

6.3.3 Management of infective keratitis, including biopsy/sampling (for cytology, histology, microbiology) and the development of an appropriate antimicrobial strategy, and in particular the management of herpetic keratitis.

6.3.4 Management and primary repair of penetrating eye injury, including those affecting the anterior segment.

6.3.5 Management of inflammatory diseases of the cornea, particularly corneal melt.

6.3.6 Management of tear film insufficiency, including punctal plugs and cautery.

6.3.7 Management of atopic eye disease.

6.3.8 Acute management of severe chemical burns involving the anterior segment.
6.3.9 Pterygium excision, including conjunctival autografting and antimetabolites.
6.3.10 Clinical evaluation of the patient undergoing corneal transplantation leading to the development, after discussion with the patient, of a suitable management plan.
6.3.11 Liaison: with microbiology, immunology.
6.3.12 Conjunctival tumours especially squamous cell carcinoma.

6.4 **Desirable clinical experience**
6.4.1 Combined corneal transplantation, cataract extraction and lens implantation.
6.4.2 Management of acute corneal perforation by transplantation or tissue glues.
6.4.3 Fitting of contact lenses.
6.4.4 Endothelial specular microscopy.
6.4.5 Corneal topography.
6.4.6 Management of the complications of severe chemical injuries to the anterior segment.
6.4.7 Production of protective ptosis by the injection of Botulinum toxin.
6.4.8 Limbal cell transplantation and conjunctival autografting.
6.4.9 Amniotic membrane grafting.
6.4.10 Techniques and organisation of eye-banking.

7.0 Section 3: Cataract & Refractive Surgery

7.1 **Objective**
To acquire demonstrable proficiency in assessment and contemporary management of (adult) cataract, and to develop an understanding of the principles of refractive surgery.

7.2 **Essential clinical experience**
7.2.1 To have become familiar with the following:
Lens opacification, pseudoexfoliation of the lens capsule, calculation of intraocular lens power.
7.2.2 To have undertaken a minimum of 300 complete surgical cataract cases (of which at least 50 must be phacoemulcification) as a Registrar.
7.2.3 To show documented evidence of having undertaken a personal assessment by audit of at least 50 consecutive cataract cases performed in the latter part of training.
7.2.4 Observe the treatment of 5 cases with refractive surgery, including excimer laser techniques.

7.3 **Mandatory competence**
7.3.1 To have undertaken (under supervision until proficient) the following:
7.3.1.1 Retinoscopy with trial lenses and subjective refraction.
7.3.1.2 Correction of refractive error by spherical, cylindrical and multi-focal lenses.
7.3.1.3 Lens neutralisation and use of focimeter.
7.3.2 To draw up a management plan leading to a target post op refraction after discussion with the patient; this should include at least a theoretical knowledge of astigmatic management during cataract surgery.
7.3.3 Biometry (keratometry & axial length determination) to indicate IOL power leading to target post op refraction.
7.3.4 Routine phacoemulsification, to include capsulorhexis and placement of PC IOL (including foldable lenses), using a variety of contemporary forms of anaesthesia.
7.3.5 Management of difficult cataract cases. This should include cases with hard nuclei (by phacoemulsification and/or ECCE), small pupils, previous vitrectomy and/or trauma, high myopia, pseudoexfoliation, and mature and hypermature lenses.
7.3.6 Management of intraoperative complications (including vitreous loss by anterior vitrectomy and wound leak by suturing).
7.3.7 Management of post op complications, including raised pressure, endophthalmitis, macular oedema and posterior capsular opacification (by YAG laser capsulotomy).
7.3.8 Management of cataract in the presence of glaucoma (e.g. phacotrabeculectomy).
7.3.9 Management of cataract in the presence of retinal disease (e.g. ARMD; and especially in the presence of diabetic retinopathy).
7.3.10 Management of adverse refractive outcomes of cataract surgery.
7.3.11 Liaison with contact lens service.
7.3.12 Understanding of Intraocular lens (IOL) design and biomaterials.

7.4.../

7.4. **Desirable clinical experience**

7.4.1 Implantation of other IOL types (e.g. AC in complicated cases, secondary AC and PC IOLs).
7.4.2 Management of the dislocated lens.
7.4.3 Anterior segment revision (including use of anterior vitrector).
7.4.4 Intracapsular cataract surgery, small incision ECCE.
7.4.5 Attendance at refractive surgery clinics, including exposure to excimer laser techniques to provide understanding of the common complications and their acute management.

8.0 Section 4: Glaucoma

8.1 **Objective**

To acquire demonstrable proficiency in the assessment and contemporary management of ocular hypertension and primary and secondary glaucoma in adults.

8.2 **Essential clinical experience**

8.2.1 To have become familiar with the following:
Glaucomatous optic neuropathy, glaucoma suspects, rubeotic glaucoma, hypotony.
8.2.2 To have undertaken a minimum of 30 procedures (surgical or laser) for glaucoma of which at least 10 were trabeculectomies.

8.3 **Mandatory competence**

8.3.1 To have undertaken the following:
8.3.1.1 Applanation tonometry and other forms of tonometry.
8.3.1.2 Visual field testing and the appropriate selection and interpretation of visual fields.
8.3.1.3 Assessment of peripheral and central anterior chamber depth including pachymetry.
8.3.1.4 Assessment of iridocorneal angle structures by gonioscopy.
8.3.1.5 Methods of optic disc cup measurement.
8.3.2 The clinical evaluation of the retinal nerve fibre layer by slit-lamp biomicroscopy.
8.3.3 The drawing up of an individual management plan leading to a target IOP.
8.3.4 Pharmacological lowering of IOP.
8.3.5 Trabeculectomy and all aspects of bleb management
8.3.6 Use of antimetabolites in trabeculectomy.
8.3.7 Management of the complications of trabeculectomy, including flat anterior chamber.
8.3.8 Management of glaucoma in the presence of cataract.
8.3.9 Cycloablation for refractory glaucoma.
8.3.10 Laser trabeculoplasty.
8.3.11 Management of acute angle closure glaucoma, including medical and laser treatment (eg PI, peripheral iridoplasty, paracentesis)
8.3.12 Management of aqueous misdirection glaucoma
8.3.13 Use of drainage tubes/stents in complex glaucoma surgery with or without antimetabolites
8.3.14 Management of chronic closed angle glaucoma.
8.3.15 Risk factors for primary open-angle and normal-tension glaucoma.
8.3.16 Other secondary glaucomas, including phacolytic, pigmentary, erythroclastic, pseudoexfoliative and silicone-oil glaucomas.

8.4 **Desirable clinical experience**

8.4.1 Cyclodiode laser for refractory glaucoma.
8.4.2 Non-penetrating glaucoma surgery.
8.4.3 Scanning Laser Ophthalmoscope and nerve fibre layer analysis.

9.0 Section 5: Retina and Vitreous

9.1 **Objective**

To acquire demonstrable proficiency in the assessment and contemporary management of disorders of the retina and vitreous.

9.2 **Essential clinical experience**

9.2.1 To have undertaken a minimum of 40 posterior segment laser treatments.
9.2.2 Performed or assisted at a minimum of 20 retinal operations.
9.2.3 To have performed, under supervision, a minimum of 20 B scan ultrasound examinations of cases with echographic features of posterior segment disease.

9.3 **Mandatory competence**

9.3.1 Management of diabetic retinopathy, hypertensive and arteriosclerotic retinopathy, retinal vascular occlusions, macular diseases and performing fluorescein angiography.

9.3.2 Clinical evaluation of rhegmatogenous retinal detachment, including retinal drawing, scleral indentation and indirect ophthalmoscopy. The development of a suitable management plan which may include pneumoretinopexy and laser (via slit-lamp and indirect ophthalmoscope delivery systems) and/or vitreoretinal surgery.

9.3.3 Clinical evaluation of medical retinal disease (including diabetic retinopathy and retinal vein occlusion) leading to the development, in discussion with the patient, of a suitable management plan.

9.3.4 Clinical evaluation of macular disease, and the development of a suitable management plan.

9.3.5 Appropriate use and interpretation of fluorescein angiography.

9.3.6 Appropriate use and interpretation of investigations for ocular inflammation and retinal vascular disease.

9.3.7 Appropriate use and interpretation of electrodiagnostic studies in the context of retinal disease.

9.3.8 Management of ischaemic retinopathies by scatter laser photocoagulation, by slit-lamp and indirect ophthalmoscope delivery systems.

9.3.9 Management of maculopathies by focal and grid laser photocoagulation.

9.3.10 Management of retinal breaks by laser photocoagulation and cryotherapy.

9.3.11 Management of endophthalmitis by intraocular fluid biopsy, planning an appropriate pharmacological therapeutic strategy, and the administration of intraocular drug therapy.

9.3.12 Recognition of retinal problems associated with inflammatory eye disease, ocular malignancy, genetic disease, telangiectasia and retinal phacomatoses.

9.3.13 Recognition of HIV-related opportunistic infections and knowledge of anti-retroviral treatment.

9.4 **Desirable clinical experience**

To have a sound working knowledge, by exposure to:

9.4.1 Management of IOFB

9.4.2 Treatment modalities of SRNVM eg PDT, anti-VEGF drugs.

9.4.3 Specialist clinics dealing with the systemic problems associated with diabetes, rheumatological disease, genetic disease or other relevant general medical disorders.

9.4.4 Low vision appliances and the social implications of blind and partial sight registration.

9.4.5 Liaison: with diabetologists, vascular surgeons, low vision services.

9.4.6 Organisation of appropriate screening for diabetic retinopathy.

10.0 Section 6: Neuro-Ophthalmology

10.1 **Objective**

To acquire demonstrable proficiency in the assessment and contemporary management of neuro-ophthalmic disorders.

10.2 **Essential clinical experience**

To have attended a minimum of 20 neuro-ophthalmology clinics or have otherwise been exposed to the investigation and management of an equivalent number of patients covering the full range of neuro-ophthalmic disease.

10.3 **Mandatory competence**

10.3.1 Management of patients with swollen optic disc, the atrophic optic disc and visual pathway disorders.

10.3.2 The clinical assessment and investigation of optic nerve and optic chiasmal disease.

10.3.3 The clinical assessment and investigation of pupil abnormalities.

10.3.4 The performance of confrontation visual field testing and the selection and interpretation of perimetry in the assessment of the visual pathways.

10.3.5 The clinical assessment and interpretation of eye movement disorders, including cranial nerve palsies, supranuclear eye movement disorders, and nystagmus.

10.3.6 Appropriate use and interpretation of electrodiagnostic studies in the context of neuro-ophthalmology.

10.3.7 Indications for and interpretation of neuroimaging, neurophysiological, and carotid ultrasound studies.

10.3.8 The management of paralytic strabismus, including the indications for extra-ocular muscle surgery.

10.3.9 The management of giant cell arteritis, including temporal artery biopsy.
10.3.10 The management of facial nerve palsy, blepharospasm and hemifacial spasm.
10.3.11 Liaison with neurologists, neurosurgeons, neuroradiologists and vascular surgeons.
10.3.12 Recognition of higher cortical dysfunction, including the visual agnosias.
10.3.13 The management of HIV related neuro-ophthalmic conditions like optic neuritis, disc swelling, cranial nerve palsies.

10.4 **Desirable clinical experience**

Exposure to

10.4.1 The performance of Goldmann, tangent screen perimetry and automated perimetry.
10.4.2 The performance of electrodiagnostic studies.
10.4.3 Recording of eye movement abnormalities.
10.4.4 4 Optic nerve sheath decompression.
10.4.5 The rehabilitation of patients with multiple neurological handicaps.
10.4.6 The use of botulinum toxin in management of paralytic strabismus and disorders of ocular and facial movements.

11.0 Section 7: Paediatric Ophthalmology and Adult Strabismus

11.1. **Objective**

To acquire demonstrable proficiency in the assessment and contemporary management of paediatric eye disease and adult strabismus.

11.2. **Essential clinical experience**

11.2.1 To have attended 20 paediatric ophthalmology clinics, and participation in the investigation and management of an appropriate number (±200) of patients covering the full range of paediatric ophthalmology and strabismus disease.
11.2.2 To have undertaken a minimum of 20 extraocular muscle surgery cases.
11.2.3 Actively to have participated in the ophthalmoscopic screening for ROP.
11.2.4 To have managed patients with concomitant strabismus, amblyopia, incomitant strabismus.
11.2.5 To have become familiar with ophthalmia neonatorum, congenital nasolacrimal obstruction, ametropia in children and the apparently blind infant.

11.3. **Mandatory competence**

11.3.1 The assessment of the normal growth and development of vision, and of abnormal or delayed visual maturation including amblyopia.
11.3.2 The determination of the refractive state and visual acuity in infants, children and adults.
11.3.3 The assessment of ocular movement and binocularity, and the selection and interpretation of investigations and appropriate tests (e.g. cover tests, stereo tests, cycloplegia, refraction, etc.)
11.3.4 Assessment of paediatric neurological diseases affecting vision.
11.3.5 Appropriate use and interpretation of electrodiagnostic studies.
11.3.6 The management of amblyopia and of disorders of binocular function.
11.3.7 Strabismus surgery as applied to concomitant and incomitant strabismus.
11.3.8 Relevant paediatric therapeutics.
11.3.9 Assessment of suspected cases of non-accidental injury and liaison with the appropriate authorities.
11.3.10 Clinical approaches to, and communication with, visually impaired children and their parents.
11.3.11 Liaison with paediatricians, geneticists, neurologists and orthoptists.
11.3.12 Fundoscopy in children.
11.3.12 Management of childhood blindness.

11.4. **Desirable clinical experience**

To have a sound working knowledge, by exposure to

11.4.1 The management of congenital cataract, congenital glaucoma and ROP.
11.4.2 The management of retinoblastoma.
11.4.3 The management of nystagmus.
11.4.4 Clinical genetics and genetic counselling.
11.4.5 The performance of electrodiagnostic tests in children.
11.4.6 The interdisciplinary assessment of children with multiple handicaps.
11.4.7 Services for and rehabilitation of the visually disabled child.
11.4.8 Competency in counselling the child and parents with HIV/AIDS.

12.0…/

12.0 Section 8: Uveitis

12.1 **Objective**

To acquire demonstrable proficiency in the assessment and contemporary management of disorders of the uvea.

12.2 **Essential clinical experience**

12.2.1 Managing patients with the different types of uveitis (eg, acute and chronic uveitis, granulomatous and non-granulomatous uveitis, anterior, intermediate, and posterior uveitis).

12.2.2 The typical features and differential diagnosis of anterior uveitis, including infectious (e.g., bacterial, viral, protozoal, parasite), inflammatory (eg, sarcoid, HLA-B27-associated, Behçet's disease, collagen vascular disease), neoplastic (masquerade syndromes), post-surgical, post-traumatic, Fuchs' heterochromic uveitis, juvenile rheumatoid arthritis.

12.2.3 The typical features and differential diagnosis of the following posterior segment uveitis:

- 12.2.3.1 Toxoplasmosis
- 12.2.3.2 Sarcoidosis
- 12.2.3.3 Pars planitis
- 12.2.3.4 Acute retinal necrosis (necrotising herpetic retinitis) and PORN
- 12.2.3.5 Vogt-Koyanagi-Harada syndrome
- 12.2.3.6 Large cell lymphoma
- 12.2.3.7 Post-operative uveitis
- 12.2.3.8 Endophthalmitis (eg, post-operative, traumatic, endogenous, fungal, phacoanaphylactic, sympathetic ophthalmia)
- 12.2.3.9 Unusual infectious aetiologies for uveitis (eg human immunodeficiency virus, herpes simplex virus, herpes zoster virus, pneumocystis carinii)
- 12.2.3.10 Acquired and congenital ocular syphilis
- 12.2.3.11 Cytomegalovirus retinitis
- 12.2.3.12 Multiple sclerosis
- 12.2.3.13 Behçet's disease

12.2.4 A minimum of 10 uveitis treatments (including the use of systemic immunosuppressive drugs).

12.3. **Mandatory competence**

12.3.1 To perform an examination of the anterior and posterior segment for uveitis (eg, slit-lamp biomicroscopy of the anterior chamber evaluation for flare cells, keratic precipitates iris nodules, scleral depression, magnified posterior segment exam, vitreous evaluation for cells, retinal, choroidal, and pars plana evaluations).

12.3.2 The appropriate use of ancillary testing in the evaluation of uveitis (eg, fluorescein angiography, ultrasound, laboratory testing, radiologic testing).

12.3.3 To evaluate and treat common causes of anterior and posterior uveitis.

12.3.4 To administer steroids in the treatment of uveitis by various routes and understand the indications and contraindications for corticosteroid treatment of uveitis (eg, topical, local, systemic), including risks and benefits of therapy.

12.3.5 To administer intra-vitreal agents

12.4**.** **Desirable clinical experience**

12.4.1 To biopsy, when indicated, the vitreous or uveal tract.

12.4.2 To insert intra-vitreal implants containing antiviral or corticosteroid medications.

12.4.3 To describe indications and contraindications for immunosuppressive therapy in uveitis; use of antimetabolites, cyclosporine, alkylating agents and biologic agents e.g. anti-TNF drugs

13.0 Section 9: Ocular Oncology

13.1 **Objective**

To acquire demonstrable proficiency in the assessment and contemporary management of ocular oncology.

13.2 **Essential clinical experience**

To have become familiar with:

13.2.1 The basic classification of common extra- and intraocular tumours.

13.2.2 The management of leucocoria (eg, inflammatory, infectious, neoplastic, congenital, persistent fetal vasculature, cataract, Coats' disease, vitreous hemorrhage, retinal detachment).

13.2.3…/

13.2.3 The important major diagnostic features of major intraocular and extraocular tumour types (eg retinoblastoma, choroidal melanoma, metastatic lesions) and the differentiating features of similar lesions.

13.3. **Mandatory competence**

13.3.1 Perform slit-lamp, ophthalmoscopic and ocular transillumination examination of patients with intraocular tumours (eg, choroidal melanoma).

13.3.2 Management options for different intraocular and extraocular Tumours, including knowledge of the classification of retinoblastoma, malignant melanoma, CIN/squamous carcinoma, lacrimal gland tumours, eyelid tumours, Kaposi's sarcoma and rhabdomyosarcoma and their treatment.

13.3.3 Knowledge of the basic histopathology of intraocular and extraocular tumours.

13.3.4 The selection and interpretation of diagnostic techniques for common intraocular tumours (eg, physical examination, imaging, laboratory, oncology referral).

13.3.5 To be able to guide evaluation for systemic involvement with the knowledge of the prognostic significance of different types of ocular tumours.

13.3.6 Appropriate use of A- and B-scan echography and fluorescein angiography of intraocular mass lesions.

13.3.7 Management of conjunctival, corneal and intraocular tumours by destruction (including cryotherapy and laser) or excision.

13.3.8 Understand the indications for surgical or other therapeutic procedures and their complications, and for referral, if necessary, for:

13.3.8.1 Plaque or other radiotherapy

13.3.8.2 Iridectomy and iridocyclectomy

13.3.8.3 Resection of conjunctival tumours

13.3.9 Perform an enucleation for malignancy.

13.3.10 To discuss various treatment options with patients and their families in a detailed, ethical, and compassionate manner.

13.4 **Desirable clinical experience**

13.4.1 Indications for and techniques of transpupillary thermal therapy for intraocular tumours.

13.4.2 Management options for unusual intraocular tumours (eg choroidal metastasis, choroidal osteoma).

13.4.3 Surgical Technique to perform an exenteration

13.4.4 The findings of the Collaborative Ocular Melanoma Study (COMS).

14.0 Section10: Community Eye Health

14.1 **Objective**

To acquire a demonstrable understanding of the principles of community eye health.

14.2 **Essential knowledge:**

To know and understand –

14.2.1 The definitions of normal vision, low vision, and blindness.

14.2.2 The prevalence and incidence of blindness (global, sub Saharan Africa, South Africa).

14.2.3 The aetiology of blindness (global, sub Saharan Africa, South Africa).

14.2.4 The epidemiology and community eye health aspects of cataract.

14.2.5 The epidemiology and community eye health aspects of refractive error.

14.2.6 The epidemiology and community eye health aspects of glaucoma.

14.2.7 The epidemiology and community eye health aspects of diabetic retinopathy.

14.2.8 The epidemiology and community eye health aspects of childhood blindness.

14.2.9 The epidemiology and community eye health aspects of HIV/AIDS.

14.2.10 The principles of the Vision 2020 programme.

14.3 **Desirable knowledge:**

14.3.1. The planning and management of a district Vision 2020 programme.