NATIONAL POSTGRADUATE MEDICAL COLLEGE OF NIGERIA

CURRICULUM FOR SUBSPECIALTY OF

COMPREHENSIVE OPHTHALMOLOGY

FACULTY OF OPHTHALMOLOGY

APPROVED BY THE SENATE ON 1ST DECEMBER, 2022

DR F. A. AROGUNDADE, MD FMCP

COLLEGE REGISTRAR

NATIONAL POSTGRADUATE MEDICAL COLLEGE OF NIGERIA

FACULTY OF OPHTHALMOLOGY

TRAINING CURRICULUM

FOR

COMPREHENSIVE OPHTHALMOLOGY SUB-SPECIALTY

TABLE OF CONTENTS

1. Chapter 1: Preamble…… 3
2. Chapter 2: Year 1: General Ophthalmology …….. 9
3. Chapter 3: Doctor Of Medicine (MD) Degree In Ophthalmology (Optional) 10
4. Chapter 4: Years 2 And 3 (Comprehensive Ophthalmology Subspecialty) 11
5. Chapter 5: Certifying Examination of the College…….. 20
6. Chapter 6: Accreditation Of Training Institutions Guidelines…… 23
7. Appendix: Literature and Studies for Review…… 26

CHAPTER 1

PREAMBLE

1.1 Introduction and Philosophy:

Blindness and reduced vision affect hundreds of millions of people throughout the world, and the causes vary widely from one region or locality to the other. The provision of appropriate care to individuals and population groups suffering from disorders of the eye, orbit, the visual system, and vision requires not only core competencies but also a set of specialized cognitive capabilities and an array of technical skills. Despite the introduction of subspecialty ophthalmic training, the issue of numbers and distribution of general ophthalmologists (human resource crunch) remains central to promoting eye health globally, and in Nigeria particularly. There is still a need to have a cadre of ophthalmologists who can provide ophthalmic care at a level which is almost at par with that of subspecialists, regardless of the specialty of interest. To produce safe, independent, and competent ophthalmologists who are capable of practicing effectively at an advanced level in all the major aspects of ophthalmology, a subspecialist training in comprehensive ophthalmology is required. Thus, a structured program of learning that facilitates the acquisition of such advanced knowledge, understanding, skills, and attitudes within the context of global best practices will be established.
This 36-month subspecialist fellowship is intended to prepare candidates for a career as a comprehensive ophthalmologist with a strong emphasis on cataract, glaucoma, refractive errors/low vision, paediatric eye diseases, external eye/lid diseases, medical retinal conditions, neuro-ophthalmic conditions, uveitis/ocular inflammation ,ocular tumours, trauma, health care management, ethics/professionalism, research methods; and for ophthalmologists who envision a career as a full-time specialized general ophthalmologist in an academic, community or private care setting .This fellowship is designed to promote subspecialty competence, confidence, and efficiency in managing the full range of common and rare medical and surgical cases in ophthalmology.
Admission requirements:

a) Completion of a minimum of 24 months rotations in general ophthalmology at the Part I level of the National Postgraduate Medical College of Nigeria (NPMCN) or its equivalents,
b) A pass at the Part I examinations of the NPMCN in Ophthalmology or its equivalent.

1.2 Training duration:

3 years after passing Part I Fellowship examination. General Ophthalmology rotations in the first year followed by 2 years clinical rotations in choice areas relevant to the subspecialty.

1.3 Competencies to be acquired:
The program aims to train ophthalmologists in the diagnosis and management of common diseases of the eye in the areas of clinical evaluation, use of various investigative procedures, medical treatment, surgical intervention and research. The clinical training involves fellows working in rotation through all the 7 different subspecialties **(i.e. Cornea and anterior segment; Paediatric Ophthalmology & strabismus; Glaucoma; Vitreo-retinal diseases with emphasis on Medical Retina; Ophthalmic plastic surgery; Neuro-ophthalmology; and Public and community eye health)** in the out-patient and in-patient sections. They will also be encouraged to evaluate patients' problems in detail, using logic and clinical data to arrive at an accurate diagnosis. The trainee will be expected to provide triage services for the full spectrum of ophthalmologic disorders and diseases presenting to the department, including trauma and other emergencies. The subspecialty training prepares candidates for a professional career in comprehensive ophthalmology with the ability to manage an eye care centre independently.
Clinical exposure will combine outpatient, inpatient and surgical experience. The trainee assumes increasing responsibility for patient care, under the supervision of faculty members responsible for the

cases in the respective subspecialties. They learn to perform common surgeries independently and follow up these surgical cases. In addition to receiving clinical training from faculty, the fellow is required to participate actively in research, presentations, publications and in training of other ophthalmic residents and medical students in the institution.

Research exposure will require these trainees to engage in basic, clinical, epidemiological or clinical research and/or clinical trials and descriptive retrospective studies and develop an in-depth working knowledge of the current scientific literature of medical and surgical advances. They are expected to participate in relevant meetings/courses within and outside the National College, as well as those hosted by community, national or international Ophthalmology societies. Trainees are also expected to participate in any on-going research projects within their training institution in a basic or clinical field related to their area of interest. Time is allotted appropriately for this experience, and its value is enhanced by careful supervision, availability of laboratory facilities, and access to technical assistance.

Teaching exposure ensures that teaching is an integral part of the fellowship experience. The trainee is expected to be an instructor for other resident ophthalmologists, optometrists,medical students and other allied ophthalmic personnel in the training institution. The trainees are expected to present cases at Grand Rounds and participate as instructors or lecturer at educational activities in the training institutions through practical and didactic presentations, and improve their techniques of examinations and interpretation of ancillary tests.

Community ophthalmology/ eye care management exposure will be facilitated by involvement in the community eye health/Public health activities of the training institution. Trainees will be expected to be involved in the organisation, conduct and management of the community eye health programs of the institution,including but not limited to satellite eye care facilities, outreach programs, eye camps and community eye health educational campaigns.

1.4 General education objectives:

i) To build on the knowledge, skills, and competencies of the junior residency years and develop into an all-round competent Ophthalmologist with special capabilities in one sub-specialty area:
ii) Exhibit a high level of confidence in all aspects of general ophthalmic care and management
iii) Confidently diagnose, develop management plans, and manage complex ophthalmic conditions
iv) Develop confidence in the basics of several Ophthalmology sub-specialties, with the confidence and knowledge to know where their skill and experience lies and refer to subspecialists as necessary
v) Develop special capacity in one preferred subspecialty, having spent at least months in that specific sub-specialty. The Resident will be able to take care of more common and less complex ophthalmic sub-specialty medical and surgical services in the chosen field, thereby improving overall access to specialist eye health care
vi) Exhibit confidence as a trainer and health care manager and be confidently able to establish and develop tertiary level health care and training programmes for all eye health care cadres
vii) Develop the generic core competencies common to the Fellowship level, including administrative, and medical education skills.

1.5 Expected outcome:

At the end of the subspecialist training in comprehensive ophthalmology, the trainee must be in a position---

i). Effectively triage consultations in Paediatric ophthalmology ;evaluate, diagnose, and manage the following listed common conditions; and understand the indications for surgery (when applicable), create a surgical plan, anticipate surgical complications, and perform surgery safely and independently; and know indications for referral of cases:

-Refractive errors/low vision, Congenital eye abnormalities, Retinopathy of prematurity, pediatric cataracts and glaucoma, Retinoblastoma and other ocular tumours, squints, nystagmus , hyphema, ocular trauma, allergic eye diseases and other external eye diseases, orbital cellulitis, red eyes and uveitis, Amblyopia, Strabismus, and neuro-ophthalmic conditions

ii) Effectively triage consultations in adult ophthalmology; and evaluate, diagnose and manage the following listed common conditions; and understand the indications for surgery (when applicable), create a surgical plan, anticipate surgical complications, and perform surgery safely and independently; and know indications for referral of cases:
-Refractive errors/presbyopia/low vision, Cataracts, pterygium, glaucoma, red eyes, uveitis, lid pathologies, watering eye diseases, dry eyes and external eye disease, allergic eye disease, age related macular degeneration and other common medical retina conditions, trauma, tumours, squints/paediatric eye disorders, and neuro-ophthalmic conditions

iii) Competently and responsibly initiate and conduct basic, clinical, epidemiological and translational research either independently or as a research team member. .The trainee will have be expected to develop an appreciation for pursuit of knowledge and advancement of ophthalmology through scientific enquiry, including clinical research project design and completion, along with publications and presentations at learned society activities.
iv) Effectively teach and train resident doctors, optometrists, medical students and other allied eye health workers, as well as have the capacity and ability to provide the required mentoring and leadership in an eye care team setting.

v) Effectively function as a communicator, collaborator, partner, advocate and manager in the discharge of his duties and obligations, including community eye health obligations and responsibilities.

vi) Consistently exhibit and demonstrate the highest levels of ethics and professionalism in their relationships with patients and their families, colleagues, allied eye health workers, other stakeholders in the health sector, and the society. The trainee will be expected to have imbibed the skills for maximizing personal growth and career/ life aspirations, and also incorporating volunteerism/altruism into their life plans.

Table 1: Disposition and duration of postings in Comprehensive Ophthalmology Training Programme

S/No	**Postings**	**For Post-Part I residents (36months)**	**Credit units**
1.	OPH 926- Cornea and anterior segment senior posting	3 months	12.5
2.	OPH 927- Glaucoma senior posting	3 months	12.5

3.	OPH 930- Paediatric Ophthalmology and strabismus senior posting	3 months	12.5
4.	OPH 932- Vitreo-retina senior posting	3 months	12.5
2	Sub-specialty postings	18 months rotation in 6 Sub-specialties (including Public and Community Eye health) and excluding preferred specialty for final clinical rotation.	75
3.	Preferred Subspecialty posting(excluding Public health)	Final 6 months	25
	TOTAL		150

MANDATORY COURSES:

(a) College-based courses:

Course code	Course	Duration (months)	Contact academic time in hours	-	Credit units
PMC 951	Research Methodology in Medicine Course	1 week	30	-	2
PMC 952	Health Resources management Course	1 week	30	-	2
PMC 953	Ethics in Clinical Practice	1 week	30		2
PMC 901	Advanced Trauma Life Support (ATLS)	1 week	30		2
	TOTAL				8

(b) Faculty-based courses:

OPH 933	Clinical ophthalmology Revision course	2 week +3 days hands-on	30(45)	18 hours	2
OPH 934	Advanced Community ophthalmology course	1 week +4 days hands- on	30	24 hours	3
	TOTAL				5

- **PMC 998 Seminars 6 credit units**
- **PMC 999 Thesis/ Dissertation 12 credit units**

All Senior Residents in Comprehensive Subspecialty are to rotate 3-monthly through OPH 927, 929, 930 and 931 making 48 credit units. The subspecialty core posting of 24 months account for additional 100 credit units. The mandatory College courses account for 24 credit units and Faculty ones account for additional 5 units as shown in the table above. **So, the total credit units for this senior Residency is 50 + 100 + 8+5 +18 = 181 credit units.**

1.6 Methods and opportunities for Training/Mode of delivery

At the commencement of the subspecialist programme, the trainee will be handed a procedure and surgical performance logbook in which he/she will be expected to make verifiable entries on the procedures/surgeries performed. The activities of teaching, training and evaluation should follow a well-structured plan using all recognised and accepted conventional methods. These include and are not limited to the following: Tutorials/seminars, Grand Rounds, Journal clubs, Low vision/Refraction clinics, Case presentations with exploration of the professional, medico-legal and ethical implications where applicable. Clinical meetings/Audits, Investigation/work-up days, Hands-on surgical training (as evidenced by Surgical and Procedures logbook), Hands-on clinical training, Wet-lab practice to precede all surgical procedures on human subjects, simulation training, virtual/E-learning methods, Video-conferencing, personal study/research days, monthly assessment of logbooks, end- of -rotation assessments ,end-of-specialty examination(as found necessary).
Formal performance evaluations may be done at the completion of any rotation, and the format for such evaluations may be left to the discretion of the supervising consultant and the training institution. Informal feedback will be provided on a weekly basis to the trainee by his trainers. Evaluations will be based on performance in clinics, wards, operating theatres, teaching sessions and rounds, community activities, academic/literary output, and from feedback from other members of the health care team. Assessment of the resident's procedure and surgical log book, multiple Choice questions format, Orals, Objective structured clinical and practical examination methods may be used in evaluating these candidates at the completion of the sub-specialisation training.
The overall supervision of the Resident lies with the Residency Training Co-ordinator. Trainees will work to a level of clinical supervision commensurate with their clinical experience and level of competence. This will be the responsibility of the relevant clinical supervisor or trainer. Centres are also encouraged to allocate personal tutors/mentors to each resident in addition to the clinical supervisor/trainer and Residency training co-ordinator. There should also be provisions for the evaluation of trainers by their trainees at the end of each rotation.
For emphasis, the educational methods include but are not limited to the following:

- Ward rounds; ward consultation and outpatient clinics
- Bedside teachings
- Didactic Lectures
- Essay writing
- Procedure sessions including surgical exposures: recorded in log book
- Seminars and tutorials in relevant topics in the Subspecialty at least 3? seminars
- Grand rounds and teaching practices
- Unit-led research, dissertation writing
- Workshops and Conferences focusing on the subspecialty

- Community outreaches including relevant declared world days.
- Mandatory courses of the NPMCN including Research methodology, Management, Ethics in clinical practice/research and health resources management courses and any other course that may be prescribed by the College/Faculty from time to time.

CHAPTER 2

YEAR 1: **GENERAL OPHTHALMOLOGY**

This will cover the following 3-monthly senior postings in **Cornea and anterior segment(OPH 926), Glaucoma (OPH 927), Paediatric ophthalmology and strabismus (OPH 930) and Vitreo-retina (OPH 932)**

2.1 Syllabus/Themes

i) Perform complex refractions competently including higher order aberrations as well as post-surgery refractions.

ii) Competently and confidently assess low vision patients and prescribe appropriate aids to them.

iii) Perform and interpret in more details clinical exam findings including corneal topographic map; retinal drawing for detachment and other lesions; A and B Scans; gonioscopy, etc.

iv) Supervise and guide competently junior residents in the management of ocular emergencies.

v) Hold tutorials for junior residents, medical students and other paramedical personnel in the eye care team.

vi) Identify key examination techniques and management of complex though common medical and surgical problems in the subspecialty areas of glaucoma, cornea, ophthalmic plastic surgery, medical retina, neuro-ophthalmology; interprets plain x-rays, ultrasound, CT, MRI, OCT, etc of the eye and orbit.

vii) Perform and treat complications of cataract and glaucoma surgeries.

viii) Acquire competencies in the efficient organization of eye care services and leadership of the eye care team. Candidates should attend the College-organized Research Methodology course, health resources management course, and Medical education course.

ix) Acquire competence in epidemiologic and clinical ophthalmic research and publication. Candidates are encouraged to co-author at least 2 journal articles.

x) Master common anterior segment surgical procedures – cataract and glaucoma surgeries as well as manage complications.

xi) Recognize microbial, hematologic and histopathologic features of ophthalmic disorders.

CHAPTER 3

DOCTOR OF MEDICINE (MD) DEGREE IN OPHTHALMOLOGY (OPTIONAL)

Admission into this MD degree programme is only for medical doctors with MBBS or MBChB degree and are already admitted into residency training programme in Ophthalmology and registered as an associate fellow of the National Postgraduate Medical College of Nigeria and is strictly by:

i. Having passed Primary FMCOph Fellowship Examination or Exemption from Primary Examination of NPMCN

ii. Having passed Part I FMCOph Fellowship Examination of NPMCN

iii. The duration of the MD is minimum of 6 semesters post Part I in an accredited training Institution.

iv. Defense for MD thesis will be conducted by examiners in the Faculty of Ophthalmology as appointed by the National Postgraduate Medical College of Nigeria (NPMCN)

Philosophy

This postgraduate MD programme will be administered by the NPMCN in accredited training institutions. Candidates will focus on the creation of new and innovative knowledge. The MD degree is primarily for individuals with goals in ophthalmology **Research or Teaching**.

The NPMCN Senate oversees the MD degree programmes and its requirements, which entail coursework and independent research. Generally, the programme is for resident doctors undergoing residency training in the Faculty of Ophthalmology, NPMCN and other sister Colleges as approved by the Senate of NPMCN. It consists of course work during residency training in accredited residency training institutions during junior residency training period and first 2 years of senior residency training period in ophthalmology and independent research during the senior residency training period in ophthalmology.

The NPMCN MD degree programme ensures that Residents have a breadth and depth of knowledge in a particular discipline or area and candidate's ability to conduct research is assessed by the preparation of a written thesis.

CHAPTER 4

YEARS 2 AND 3 (COMPREHENSIVE OPHTHALMOLOGY SUBSPECIALTY)

The approved clinical rotations will be in all the specified subspecialties as stipulated:
A) Cornea /external diseases/anterior segment and refractive surgery
B) Glaucoma
C) Vitreo-retinal diseases with emphasis on Medical Retina
D) Ophthalmic plastic surgery and oncology
E) Neuro-ophthalmology
F) Paediatric Ophthalmology & strabismus
G) Public and community eye health

The duration of the rotations will be equally distributed among 6 specialties (3 months in duration, one of which must be Public and eye health, while a greater proportion of time(the remaining 6 months) will be assigned to the trainee's preferred clinical subspecialty of interest(excluding Public Health Ophthalmology). The requirements and expectations in the respective subspecialty posting areas are described as cognitive, clinical, technical and surgical skills.

A) **Cornea and anterior segment senior posting – OPH 926**

Cognitive Skills:

i.To describe the fundamentals of applied anatomy, embryology, biochemistry, physiology, microbiology ,pharmacology, genetics ,immunology, pathology, and optics with respect to the ocular surface, external eye ,anterior segment (including lens).

ii. To describe, recognize and manage all common conditions affecting the ocular surface ,external eye, anterior segment(including lens) .

iii.To understand the indications, preoperative assessment, patient selection, and techniques in pterygium surgery, cataract surgery such as ECCE,SICS & Phacoemulsification, corneal transplant and refractive surgery, and the management of the associated intraoperative and postoperative complications .

iv.To demonstrate a detailed understanding of all the basic and advanced diagnostic procedures applicable to the management of conditions of the cornea, external eye, anterior segment, and lens.

v. Demonstrate a detailed understanding of design and choice of IOLs, and calculation of IOL power

vi. Knowledge of cornea cross linking and intra-corneal rings

Clinical/Technical/surgical Skills:

i. Mastering examination techniques, including biomicroscopy, vital stains of the ocular surface, and special diagnostic testing (e.g., specular microscopy, corneal topography/tomography, biometry,keratometry, high-resolution ultrasonography, anterior-segment OCT, confocal microscopy, and corneal pachymetry).

ii. To perform uncomplicated contact lens fitting

iii. To perform thin conjunctival flaps (e.g. Gunderson flap) and autografts, and basic non-laser refractive surgery techniques (e.g. relaxing keratotomy).

ix. -Demonstrate proficiency in corneal repairs and management of multiple anterior segment trauma as well as the medical/surgical management of corneal thinning and perforation, including techniques of pharmacological manipulation; and office procedures such as application of tissue glue and therapeutic contact lenses.

iv. Demonstrate proficiency in all types of pterygium /cataract surgery and management of all common intraoperative/postoperative complications, including doing laser capsulotomies.

v.Conduct research relevant to cornea, external diseases,anterior segment and refractive surgeries

B) **Glaucoma senior posting- OPH 927**

Cognitive Skills:

i. To describe the features and management of all forms and types of glaucoma, including the relevant genetics.

ii. To describe the mechanics of aqueous humor dynamics in the etiologies of glaucoma (e.g., angle recession, combined or multifactorial glaucoma, traumatic or inflammatory glaucoma, pigmentary dispersion glaucoma) and apply the most advanced knowledge of optic nerve and nerve fiber layer anatomy to describe techniques, methods, and tools for analyzing the nerve fiber layer.

iii. To describe, interpret, and apply the results of perimetry, including, special kinetic and automated static perimetry strategies (e.g., special algorithms)

iv. To describe the principles, indications and clinical relevance of the findings in gonioscopy
v. To describe the clinical features and management of ocular hypotony.

vi. To describe the results, apply the conclusions, and critically analyze the major clinical trials in glaucoma (e.g., Glaucoma Laser Trial, Normal Tension Glaucoma Study, and Advanced Glaucoma Intervention Study), as well as describe and use other publications in the management of glaucoma patients
vii. To describe the principles, indications, and complications of laser treatment in glaucoma.

Clinical/Technical/surgical Skills:

i. To perform a comprehensive evaluation of a patient in order to confirm or rule out a diagnosis of any type of glaucoma.This may involve performing and interpreting tonometry, gonioscopy, pachymetry and perimetry etc.
ii. To manage all common types and forms of glaucoma especially in juvenilles and adults,including open angle glaucoma and angle closure glaucoma.
iii. To perform trabeculectomy,trabeculotomy,trabeculoplasty, surgical iridectomy,combined trabeculectomy and cataract procedures and other simple laser procedures required for the management of glaucoma i.e laser peripheral iridotomy
iv. To recognise and manage glaucoma surgery bleb and flat anterior chamber complications
v. To conduct research relevant to glaucoma

C) Neuro-ophthalmology senior posting- OPH 928

Cognitive Skills:

i. Knowledge of the applied neuroanatomy, neurophysiology and genetics of the visual pathway, pupillary and accommodative pathway and relating them to neuro-ophthalmic disorders or conditions with neuro-ophthalmic significance.
ii. To describe typical and atypical features, evaluation(including ocular imaging and neuro-imaging techniques), and management of all the common optic neuropathies, optic disc anomalies,ocular motor neuropathies/myaethenia gravis ,nystagmus , pupillary abnormalities, double vision,visual field defects; abnormalities involving the 3^{rd},4^{th} and 6^{th} cranial nerves; intracranial SOLs affecting the eyes;as well as sudden/transient loss of vision.
iii. To describe the most aspects of visual field indications, selection, and interpretation (e.g., variability in automated perimetry, application of specific testing and thresholding strategies for different patient populations with different neuro-ophthalmic conditions, different testing abilities (e.g., young or old age, mental status, hand-eye coordination, reaction time).
iv. To describe the evaluation and management of the neuro-ophthalmic aspects of systemic diseases (e.g., malignant hypertension, diabetic papillopathy, toxicity of systemic medications, pseudotumor cerebri).
v. To describe the evaluation and management of the neuro-ophthalmologic manifestations of trauma (e.g., corticosteroid or surgical therapy in traumatic optic neuropathy).
vi. To describe appropriate genetic counseling for neuro-ophthalmologic diseases (Leber's hereditary optic neuropathy, chronic progressive external ophthalmoplegia, von Hippel-Lindau syndrome).

Technical Skills:

i. To perform and interpret the complete cranial nerve evaluation (eg., testing of and facial nerve function) and basic neurologic exam in the context of neuro-ophthalmic localization and disease.

ii. To interpret neuro-radiologic images in neuro-ophthalmology (eg., interpretation of orbital imaging for orbital pseudotumor and tumors, thyroid eye disease, intracranial imaging modalities and strategies for tumors, aneurysms, infection, inflammation, and ischemia), and to appropriately discuss, in advance of testing, the localizing clinico-radiologic features, with the neuroradiologist in order to obtain the best study and interpretation of the results.

iii. To perform and interpret the results of the intravenous edrophonium (Tension) and prostigmine tests for myasthenia gravis, and to recognize and treat the complications of the procedures.

iv. To recognize patients with "functional" visual loss (non-organic visual loss) and provide appropriate counseling and follow-up.

v. To conduct research relevant to neuro-ophthalmic conditions.

D) Ophthalmic plastic surgery – OPH 929

Cognitive

i. Applied knowledge of anatomy,physiology,biochemistry,embryology,pathology,genetics,immunology,pharmacology relevant to the eyelids, lacrimal apparatus, globe/adnexae and orbit .

ii. Knowledge of etiology, evaluation and management of all the common pathologies(including chalazion, entropion, ectropion, ptosis, blepharospasm, dermatochalasia, dacrocystitis, orbital cellulitis, proptosis, thyroid eye diseases, inflammatory conditions, trauma, benign/malignant growths, congenital anomalies) involving the eyelids, lacrimal apparatus, globe/ adnexae and orbit

iii. Knowledge of pre-operative and post-operative assessment and coordination of care of patients with oculoplastic or oncological disorders (eg., systemically ill patient, multi-disciplinary procedures),including understanding and interpreting all relevant ocular and orbital imaging investigations.

iv) Knowledge of clinically relevant data from international and local research in oculoplatics, orbital reconstructive surgery and ocular oncology.i.e Collaborative ocular melanoma study,

Technical/surgical Skills:

i. To perform all the examination techniques for the diagnosis of oculoplastic and orbital abnormalities. To recognize typical and atypical features and to describe the differential diagnosis, clinical features, and treatment of all common oculoplastic, oncological and orbital diseases, as well as the complications following treatment.

ii. To perform all the relevant preoperative and intraoperative assessment/measurements of the eyelids, eyebrows, lacrimal apparatus, globe/ adnexae and orbit (eg., intraoperative adjustments).
iii. To provide comprehensive management for all commonly presenting oculo-plastic and oncological conditions i.e trauma, entropion, ectropion, ptosis, proptosis, lacrimal duct obstructions and epiphora, tumours, anophthalmic sockets
iv. To identify orbital pathology (eg., complex orbital fractures, orbital tumors) on imaging studies and confidently make appropriate interpretations (eg, magnetic resonance imaging, computed tomography, ultrasound).
v. To administer botulinum toxin injections.
vi. To perform all commonly done oculoplastic and orbital surgical procedures.These may include but are not limited to the following: eyeball wound repairs,eyelid and facial wound repairs, Tarsorrhaphy, blepharoplasty, canthoplasty, excision biopsies, chalazion surgery, ptosis sugery, entropion/ectropion surgery,simple lid reconstructive procedures,Dacryocystorhinostomy,enucleation,evisceration,exenteration,debulking,anterior orbitotomy and repair of orbital floor fracture.
vii. To be able to conduct research and generate data on oculoplastic and oncological conditions.

E) Paediatric Ophthalmology and strabismus – OPH 930

Cognitive Skills:

i. To demonstrate a comprehensive understanding of the history taking, examination methods and techniques in paediatric eye patients, including those with strabismus (eg.visual function tests, refraction/low vision assessment in children, complicated prism cover testing in multiple cranial neuropathy & patients with nystagmus, dissociated vertical deviation & double Maddox rod testing; techniques for assessment of visual development in complicated or non-cooperative pediatric ophthalmology patients (eg., less common objective measures of visual acuity, electrophysiologic testing).
ii. To describe clinical application of the most advanced sensory adaptations (eg., anomalous head position, anomalous retinal correspondence).
iii. To describe the etiologies /clinical features of amblyopia ,strabismus, nystagmus(eg., refraction non-compliance, patching failures, pharmacologic penalization) and their management.
v. To describe the aetiologies, clinical features and management of common paediatric eye conditions I .e allergic eye diseases, red eyes, refractive errors, eye trauma, cataracts, glaucoma, corneal diseases, inflammatory conditions/uveitis, lacrimal duct obstructions, congenital and hereditary diseases, retinopathy of prematurity and other causes of leucocoria, and other causes of vision loss.

Technical/surgical Skills:

i. To perform a comprehensive evaluation in a paediatric eye patient ,including history taking, examination, investigations and refraction/low vision assessment
ii. To recognise and manage common paediatric eye conditions (and refer complex cases to the paediatric ophthalmologist) such as refractive errors/low vision, allergic eye disease,

corneal diseases, red eyes,cataract,glaucoma,strabismus,amblyopia,nystagmus,trauma,tumours such as retinoblastoma,, congenital eyelid and eye anomalies, inherited eye disease, retinopathy of prematurity & other causes of leucocoria, sickle cell retinopathy, hyphaema, retinal detachment.

iii. To perform the pre-operative assessment, intraoperative techniques and to manage postoperative complications for commonly done paediatric ophthalmic surgeries (eg cataracts, glaucoma, strabismus, ptosis, tumours, wound repairs, examination under anaesthesia).

iv. Conduct research among a paediatric patient population group, and develop appropriate excellent communication/counselling and teaching skills with parents/guardians, medical and non-medical staff.

v. Promote community diagnosis and effective referral system for Childhood Eye Diseases

F) Public and Community eye health senior posting -OPH 931

Cognitive, clinical and technical

Knowledge, understanding and application of the following

i. The Principles and applications of community eye health.
ii. Epidemiology of blindness, visual impairment, eye diseases, including tropical eye diseases.
iii. Principles of screening for eye conditions.
iv. Planning and managing eye care programs.
v. Fundamentals of medical, research and public health ethics; and professionalism in eye care.
vi. Research methodologies in public health and designing/conducting research projects.
vii. Community engagement\community rehabilitation.
viii. Communication in eye care.
ix. Mentoring and leadership in eye care

G) Vitreo-retina senior posting (with emphasis on medical retina) – OPH 932

Cognitive Skills

i. Knowledge of applied anatomy, biochemistry, physiology, embryology, pharmacology, immunology, genetics and pathology relevant to the retina and vitreous.
ii. Knowledge of retinal examination methods /ancillary investigations and interpretation of findings i.e. Fluorescein/ Indocyanine Green angiography ,optical coherence tomography, fundus autofluorescence, ultrasonography, electrophysiological tests
iii. Knowledge of pathologic processes that affect the choroid, retina or vitreous
iv. Describe the principles of medical and surgical management of vitreoretinal disorders as well as intermediate, posterior and panuveitis. This will include knowledge of the principles, methods and complications of intravitreal injections, laser photocoagulation, photodynamic therapy.
v. Knowledge of data from all the major international and local clinical trials in the management of vitreoretinal disorders such as the Early Treatment of Diabetic Retinopathy Study(ETDRS)and Central Vein Occlusion Study(CVOS)

Clinical/Technical/Surgical skills

i) To comprehensively evaluate,recognise, and medically manage all common vitreo-retinal conditions(ie central serous chorioretinpathy, ARMD, diabetic retinopathy, cystoid macular oedema, branch and central vein occlusions, hypertensive retinopathy, sickle cell retinopathy , and refer complex surgical cases such as retinal detachments. Competence in using all the retinal examination methods and techniques (but not limited to indirect ophthalmoscopy with scleral indentation)must be clearly demonstrated.

ii) To evaluate and treat or refer the etiologically more complex or uncommon cases of posterior uveitis (eg., sympathetic ophthalmia) and endophthalmitis (eg., endogenous).

iii) Competence in intravitreal injection administrations.

iv) Application of findings from all the examination and diagnostic procedures(including imaging/electrophysiological procedures) in clinical practice.

v) To perform basic laser therapy,cryotherapy, pars plana vitrectomy and scleral buckling, where there is no available retinal specialist.

vi) To conduct research relevant to vitreo-retinal diseases

Subspecialty Competencies:

S/N	Course code	Courses	Duration (months)	Contact academic time (hrs/wk = Total hrs)	Contact Clinical/ Surgical time (hrs/wk = Total hrs)	Credit units
1	OPH 928	Neuro-ophthalmology senior posting	4	4(54)	35(560)	16
2	OPH 929	Ophthalmic plastic surgery senior posting	4	4(54)	35(560)	16
3	OPH 931	Public and community eye health	4	4(54)	35(560)	16
4		Comprehensive 6 months postings in each of OPH 926, OPH 927, OPH 930 and OPH 932	24	4(324)	35(3,360)	100
		TOTAL				**48+ 100 =148**

MANDATORY COURSES:

(c) College-based courses:

PMC 951	Research Methodology in Medicine Course	1 week	30	-	2
PMC 952	Health Resources management Course	1 week	30	-	2
PMC 953	Ethics in Clinical Practice	1 week	30		2
PMC 901	Advanced Trauma Life Support (ATLS)	1 week	30		2
	TOTAL				8

(d) Faculty-based courses:

OPH 933	Clinical ophthalmology Revision course	1 week	30	-	2
OPH 934	Advanced Community ophthalmology course	1 week +4 days hands-on	30	24hours	3

PMC 998 Seminars 6 credit units
PMC 999 Thesis/ Dissertation 12 credit units

All Senior Residents in Comprehensive Ophthalmology are to rotate through OPH 928, 929 and 931 (together =48 credit units) in the first 12 months of training. The rotations will be arranged as convenient for the department. The following 24 months will be devoted to rotations in the remaining 4 subspecialties for 6 months each, ie: OPH 926, 927, 930 and 932 giving 100 credit units. There should also be 5 College compulsory courses (26 credit units) and 2 Faculty compulsory courses (5 credit units) to achieve **48+100+8+5 + 18=179 Credit units.**

Research Training

Residents are encouraged to learn the wholesome habit of systematic clinical problem solving, featuring observation, interpretation, deductive reasoning, decision-making, and intervention followed by further observation. This habit which resident doctors are encouraged to acquire during training is itself the basic requirement for competence in research.
Besides, training institutions are obliged to institute a research committee and an ethics review committee; part of the function of which is to screen research proposals within the department for appropriateness and scientific content as well as for compliance with ethical requirements.

A monthly departmental research seminar is expected to be the forum in which young researchers present their projects for discussion and receive the criticism and guidance of their teachers and peers.

Teaching Skills

True to the hierarchical organization in medicine, resident doctors have the opportunity of acquiring teaching skills during training through the practice whereby every doctor teaches those junior to him, other members of the health team, as well as counsel his patients and relatives in order to achieve an effective therapeutic alliance and good clinical practice.
In addition, resident doctors have the opportunity to attend educational methodology workshops and management and computer courses conducted by the college. Training institutions are encouraged to avail their residents of this opportunity.

Management Training
The secretariat of the College conducts management courses twice a year, which is mandatory for senior residents. Also, second/third year senior residents should be appointed as chief residents and given the opportunity to serve in a managerial post.

Communication Skills

It is important that ophthalmologists should be effective communicators, not only in the ordinary running of clinical practice involving medical record documentation, case presentation, case referral and discharge summary writing, but also in the context of scientific journal publication, conference presentations and answering examination questions.
Therefore, the training programme must provide opportunities for the acquisition and evaluation of various levels of communication skills.

Continuing Education (courses, workshops, conferences, etc.)

The need for continuing medical education especially in the field of ophthalmology and other medical specialties is just as vital as the period of fellowship training. Fellows of the Faculty of Ophthalmology are actively encouraged to continue their ophthalmological training throughout their active practice life. Among other means to achieve this, Fellows and Associate Fellows are encouraged to take active interest in activities of the Faculty and the College. They should be encouraged to take advantage of modern information technology (internet) facilities as well as attend both local and international conferences, association meetings where they communicate freely with colleagues, other groups or schools of thought. A resident (Associate Fellow) should attend at least a conference (local or international) each year.

A resident should show evidence of having attended at least one Ophthalmological Society of Nigeria (OSN) conference to qualify to sit for the Part I examination and one additional OSN national conference to qualify to sit for the Part II examination.

-Credit Units: The Senior Residency phase is therefore 179 CREDIT UNITS as indicated in the rotation of postings above.

Assessments And Examinations

-Formative Assessment: In order to effectively prepare the resident for the various parts of the FMCOph examinations, it is advisable for the trainers to assess their residents by regular formative assessment exercises.
-Log book: Procedures which are mandatory for each clinical posting are addressed in the resident's logbook. Once adjudged satisfactory, such procedures are credited to the resident. To be signed off at

the end of each posting, the resident must be judged to have satisfactorily performed all the mandatory procedures for that posting.

-An **end of posting** test is highly recommended.

-Annual Report: Each year an annual report on the progress of each resident is required to be sent to the Faculty Secretariat.

CHAPTER 5

CERTIFYING EXAMINATION OF THE COLLEGE

5.1 Application for College Certifying Examinations

The Fellowship Examinations are held twice a year in March/April/May and September/October/November. A call for application is published in at least one of the National Daily newspapers and College website in December and June for the March/May and September/November examinations respectively.

Candidates are advised to watch out for and comply with the examination application requirements as outlined in these advertisements.

5.2 Assessment methods for MD Degree

These will include practical exercises, assignments and tests, Formative assessment, Summative assessment, Thesis presentation and thesis defence examination will be administered at the end of the course.

This thesis defence will take place at least 6 months before the Part II Final for FMCOph.

5.3 Part II Fellowship Examination

The Part II Examinations is designed to complete the assessment of professional competence in ophthalmology before the award of the Fellowship in Ophthalmology (FMCOph). Candidates are eligible to write the examination at least by the 36th month of senior residency training.

5.3.1 Dissertation Proposal Preparation and approval: The dissertation proposal should have at least 2 supervisors one of whom must be a Fellow of the Faculty and agree to critically supervise the design, collection of data, analysis of data and general write up of the dissertation. Submit written attestations by the supervisors indicating their willingness to supervise the project for the dissertation The criteria to qualify as a supervisor is as the prevailing approval by the Faculty and the College. The proposal should be considered in a departmental seminar and approved by the department before sending to the ethical review board.

Approval from the relevant institutional review board or ethical approval for the study should be obtained before registration of the dissertation proposal with the College.

Exams shall be done not earlier than 12 months after proposal for dissertation has been approved by the College.

The format for the Proposal and the Dissertation book is as in the main Faculty Curriculum and as approved by the College.

5.3.2 Components of the Part II Fellowship Examinations

The Part II Fellowship Examinations shall consist of:

a) A comprehensive oral examination on the candidate's dissertation. The **"Dissertation orals"** shall focus on the candidate's accomplishment of those objectives of the dissertation earlier stated in this handbook.

b) An oral examination (VIVA VOCE) consisting of two sections:

i) General Ophthalmology where the candidate is expected to meet a set of at least two examiners to answer THREE questions in general ophthalmology postings done in the first year of senior Residency over a 30-minute period

ii) Comprehensive ophthalmology: where the candidate is expected to meet a set of at least two sub-specialists to answer SIX questions in the sub specialties covered in the last 2 years of training over a 60-minute period.

The ORALS (VIVA VOCE) will cover the following components:

Principles of Ophthalmology- 10

Medical, Tropical and Surgical Ophthalmology including pathology in candidates Subspecialty area (cornea and anterior segment) -70

Community Ophthalmology -10

Management and other soft Skills- 10

Oral (Viva Voce)

The purpose of Viva Voce is to cover as wide a field as possible with the candidate. Each candidate is subjected to 60-90 minutes oral examinations dealing with principles of surgery, pre-and post-operative management, surgical pathology, diagnostic modalities and operative surgery mostly directed at the subspecialty of interest.

The Standard setting method for Orals - Borderline group method should be used to obtain the pass score.

5.3.3 Examination Results

To pass the examination, a candidate must:

i) Have his/her dissertation accepted at *P* or *P+* level. **OR Passed MD Thesis defense at least 6 months earlier.**

ii) Pass the Orals which is the Viva Voce

Conditions for Provisional Pass, Referral in Orals, Referral in Dissertation and Fail follows:

iii) A candidate whose dissertation needs some significant corrections, i.e. *P-* level pass, but who had passed Orals shall have a Provisional Pass.

iv) The corrections of the dissertation shall be made within three months and must be satisfactorily vetted by one of the examiners before it can be accepted. Once accepted, the provisional pass is converted to a full pass by the College.

v) A candidate who has his/her dissertation accepted as *P* or *P+* level but fails in Orals shall be referred in the Orals only.

vi) A candidate who scores a P-level pass in the Dissertation and fails the Orals shall be deemed referred in Orals with Provisional Pass in Dissertation.

vii) The candidate would be required to make the corrections in the book within 3 months after the exams and if satisfactory to the examiners, will be expected to repeat only the Orals. However, if the dissertation remains unacceptable to the examiners, the candidate would be required to sit both the dissertation and the Orals.

viii) A candidate, having passed the Orals but whose dissertation needs major restructuring, i.e. *P-1* level, shall be referred in the Dissertation only.

ix) A candidate whose dissertation needs major restructuring, i.e. *P-1* level and also failed the Orals is deemed to have failed the entire exam.

Pass: means a pass or provisional pass in dissertation and a pass in Oral examinations

5.3.5 Publication of the Results

The results of the Fellowship examinations in Ophthalmology are published by the College Registrar on approval by the Senate

5.3.6 Correspondence

The National Postgraduate Medical College of Nigeria or the Faculty of Ophthalmology does not normally enter into correspondence or discussion in respect of the details of a candidate's performance in the examination.

CHAPTER 6

ACCREDITATION OF TRAINING INSTITUTIONS GUIDELINES

6.1 Training institution eligibility criteria

The training institution shall meet the training requirements of the Faculty of Ophthalmology of NPMCN in Comprehensive Ophthalmology, namely:
-Be fully accredited in the Subspecialty of comprehensive ophthalmology
-Have the appropriate manpower; at least TWO Subspecialists with a minimum of 10 years post fellowship in Ophthalmology and minimum 5 years practising in comprehensive ophthalmology
-Have the appropriate infrastructures, facility and equipment, as well as the in-hospital support services with the requisite manpower, as specified in the faculty accreditation guidelines eg. radiology, pharmacy, laboratory, medical records.
- Demonstrable evidence of appropriate volume of clinical procedures and surgeries:

- Minimum of surgical load and mixture relevant to comprehensive ophthalmology
- Minimum volume of outpatient and in-patient cases per week

6.2 UNIFORM CRITERIA/GUIDE FOR ACCREDITATION

This will be as approved by the College Senate.

TABLE 7: ACCREDITATION TABLE OF REQUIREMENTS AND GRADING

No	Requirement	Inadequate 0	Partially Adequate 7.5	Full Adequate 15
1.	Qualified and experienced personnel a. Prescribed number (full time/Part time b. prescribed trainers: trainees ratio c. support personnel **(15 Points)**			
2.	Appropriate infrastructure a. basic: water, light, sewage etc b. core departments presents c. support departments presents **(10 Points)**			
3	Equipment a. core equipment b. support equipment **(20 Points)**			
4	Well-structured training programme a. seen by all b. content (lectures, tutorial , bedside sessions) **(15 Points)**			
5	Opportunities/ Evidence of skill acquisition a. Procedure Register b. Theater List c. Log Book **(15 Points)**			
6	Access to new information(15 point) a. library b. Internet **(15 Points)**			
7	Regular feedback and evaluation **(10 Point)**			

8	**TOTAL**			

< 0=49 (Scores less than 50%) - Accreditation Denied

≥50-74 (Scores equals to 50% and Less than 75%) - Partial Accreditation for 2 years

>75-100 (Scores equals or greater than 75% and above) - Full Accreditation for 5 years

2. **Effectiveness/function/role of visiting Consultants**

i. A visiting Consultant should have a minimum of 5 years post Fellowship experience.

ii. No training should take place in any institution without permanent consultants on ground.

iii. There must be documented evidence of activities of a visiting Consultant that residents are being supervised by him/her.

iv. For the purpose of accreditation the full time equivalent should be as follows:

2 visiting Consultants to 1 Full time Consultant.

3**. Period of Accreditation**

i. Partial accreditation should last for 2 years. Within the period of the Partial accreditation, one monitoring visit should be made to the institution.

ii. Full accreditation should last for 5 years. Within the period of the Full accreditation, two monitoring visits should be made to the institution.

4. **Effective Date of Accreditation**

The effective date for existing accreditation should be with effect from the date of visitation, irrespective of the time the Senate approves the report.

The effective date for new accreditation should be from the date of Senate approval.

5**. Trainers/trainee ratio**

The ratio of Residents to consultants should be minimum of 3:1 or Maximum 4:1. That is, One (1) Senior Registrar and Two (2) Registrars OR Two (2) Senior Registrars and Two (2) Registrars to one Consultant.

6. The number of Consultants is not the sole determinant for accreditation status, either as partial or full.

Every other criteria are taken into account to arrive at the verdict of either Partial or Full accreditation.

1. For any re-accreditation visit, the report of the previous accreditation visit should be made available to the current nominated panel member, to enable them to compare notes and ensure that progress is being made.

6.3 SUMMARY OF ACCREDITATION VISIT:

Should accompany the accreditation report and in formats approved by the College and the Faculty and contained in the main Faculty Curriculum

APPENDIX

LITERATURE AND STUDIES FOR REVIEW INCLUDING GENERAL REFERENCES (BOOKS):

The Herpetic Eye Disease Study (HEDS)

The Fluorouracil Filtering Surgery Study (FFSS)

The Normal Tension Glaucoma Study

The Ocular Hypertension Study (OHTS)

The Glaucoma Laser Trial (GLT)

The Optic Neuritis Treatment Trial (ONTT)

The Ischemic Optic Neuropathy Decompression Trial (IONDT)

Studies of the Ocular Complications of AIDS (SOCA)

Branch Vein Occlusion Studies (BVOS)

Macular Photocoagulation Study (MPS)

Age-Related Eye Disease Study (AREDS)

Verteporfin in Photodynamic Therapy (VIP) Study

Treatment of Age-Related Macular Degeneration with Photodynamic Therapy (TAP)

Silicone (oil) Study

The Submacular Surgery Trials (SST)

The Multicenter Trial of Cryotherapy for Retinopathy of

Prematurity (CRYO-ROP)

Central Vein Occlusion Studies (CVOS)

Diabetes Control and Complications Trial (DCCT)

Diabetic Retinopathy Study (DRS)

Early Treatment Diabetic Retinopathy Study (ETDRS)

Randomized Trial of Acetazolamide for Uveitis-Associated Cystoid Macular Edema

Collaborative Ocular Melanoma Study (COMS)

Selected Review Articles.

This list is by no means exhaustive.