MS OPHTHALMOLOGY CURRICULUM

AIIMS KALYANI

JANUARY 8, 2024

ACADEMIC SECTION
AIIMS Kalyani

OPHTHALMOLOGY PG CURRICULUM

AIIMS KALYANI

COURSE NAME MS in Ophthalmology

DURATION OF COURSE 3 years

ELIGIBILITY MBBS

OBJECTIVES

1. **BROAD OBJECTIVE**

The Clinical postgraduate training programmes are intended at developing in a student a blend of qualities of a clinical specialist, a teacher and a researcher. They are organised such that a postgraduate should acquire adequate knowledge and skills to handle all ocular cases.

Basic Sciences

He/she should possess basic knowledge of the structure, function and development of the human body, and the pathophysiology of certain systemic diseases which affect the vision.

Clinical Knowledge

He/she should be able to practice and handle most day to day problems independently in ophthalmology.

He/she should understand the effect of the environment on health and be familiar with the epidemiology of at least the more common diseases in the field of ophthalmology.

He/she should be able to integrate the preventive and promotive methods with the curative and rehabilitative measures in the treatment of disease.

Community Ophthalmology

He/she should practice ophthalmology at the doorstep of community. He should be familiar with common eye problems occurring in rural areas and be able to deal with them effectively. He should also be made aware of mobile ophthalmic Unit and its working & components.

Current Developments

He/she should be familiar with the current development and recent advances in Ophthalmic Sciences.

Teaching

He/she should be able to plan educational programmes in ophthalmology in association with his senior colleagues and be familiar with the modern methods of teaching and evaluation.

Research

He/she should be able to identify a problem for research of a clinical or experimental nature involving epidemiological studies, clearly state his objectives, plan a rational approach to its solution and execute it and critically evaluate his data in the light of existing knowledge.

1. **INTERMEDIATE OBJECTIVES**

The following overall objectives are expected to be achieved by the end of 3 years of instructions and residential training programme. The details are listed subject and clinical assignment wise. At the end of this training programme the students should be able to:

Basic Medical Sciences

. Attain understanding of the structure and function of the eye and the diseases associated with it.

. Attain understanding and application of knowledge of the structure and function of the parts of Central Nervous System and other parts of the body which influence of control the structure and function of the eye.

. Attain an understanding of and develop competence in executing common general laboratory procedures employed in diagnosis and research in ophthalmology.

Clinical Skills

. Acquire a scientific and rational approach to the diagnosis of ophthalmic cases presented.
. Acquire an understanding of and develop inquisitiveness to investigate, to establish cause and effect of the disease.
. To perform all routine and special ophthalmic investigations

(e.g. Slit-lamp examination, Gonioscopy, Ophthalmoscopy, perimetry, scotometry, intraocular pressure measurement by applanation tonometer, ERG, EOG, EMG, etc., Dark adaptometry, Darkroom procedures, Funds photography, Fluorescein angiography, Hess & Less screen, Synoptophore) and other procedures, of these investigations in the light of clinical presentation.

. To manage and treat all types of ophthalmic cases.
. Acquire competence in assessment of refractive errors (Static and dynamic) and prescription of glasses for all types of refraction problem.
. Acquire basic knowledge of manufacture and fittings of glass and competence of judging the accuracy and defects of the dispensed glasses.
. To demonstrate the knowledge of the pharmacological (including toxic) aspects of drugs used in ophthalmic practice and drug commonly used in general diseases affecting the eyes.
. To exhibit competence in the medical management of ophthalmic cases.
. To have knowledge on all routine surgical procedures on lens, glaucoma, lid, sac, adnexa, retina and muscle anomalies.
. To competently handle all ophthalmic medical and surgical emergencies.
. To be familiar with micro-surgery and special surgical techniques.
. Ophthalmic Specialists: Given an opportunity to work on a rotational basis in various especial clinics of Sub-specialties of ophthalmology.
. Community Ophthalmology :

- Given an opportunity to participate in surveys, eye camps and rehabilitation work.

- The students should be able to:

o Organize and conduct ocular examinations in rural, urban and industrial communities and in specialized groups of the population.

o Organize and conduct comprehensive eye camps covering promotive, rehabilitative and curative aspects of ophthalmic problems.
o Guide rehabilitation workers in the organization and training of the blinds.
o Write at least one scientific paper as expected of International Standards from the material of his thesis.

SYLLABUS CONTENT

THEORY

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

Basic Sciences: Orbital and ocular anatomy

i. Gross anatomy

ii. Histology

iii. Embryology

. Ocular Physiology
. Ocular Pathology
. Ocular Biochemistry: General biochemistry, biochemistry applicable to the ocular function
. Ocular Microbiology: General Microbiology, specific microbiology applicable to the eye
. Immunology with particular reference to ocular immunology
. Genetics in ophthalmology
. Community Eye Health

. **Optics** Basic physics of optics
. Applied ophthalmic optics
. Applied optics including optical devices
. Disorders of Refraction
.
. **Clinical Ophthalmology** Disorders of the lids
. Disorders of the lacrimal system
. Disorders of the Conjunctiva
. Disorders of the Sclera
. Disorders of the Cornea
. Disorders of the Uveal Tract
. Disorders of the Lens
. Disorders of the Retina
. Disorders of the Optic Nerve and Visual Pathway
. Disorders of the orbit
. Glaucoma
. Neuro-ophthalmology
. Paediatric ophthalmology
. Ocular involvement in systemic disease
. Immune ocular disorders
. Strabismus and Amblyopia
. Ocular oncology
.

PRACTICAL

Essential diagnostic skills: (MUST KNOW)

. Examination techniques along with interpretation Slit-lamp Examination i. Diffuse examination ii. Focal examination iii. Retroillumination – direct and indirect iv. Sclerotic scatter v. Specular reflection vi. Staining modalities and interpretation
. Fundus evaluation Direct/Indirect ophthalmoscopy• Fundus drawing• 3-mirror examination of the fundus• 78-D/90-D/60-D examination•Amsler's charting•
.
. Basic investigations along with their interpretation Tonometry - Applanation/Indentation/Non-contact
. Gonioscopy -Gonioscopy grading of the anterior chamber angle
. Tear/ Lacrimal function tests i. Staining-fluorescein and Rose Bengal
. ii. Schirmer test/tear film break up time
. iii. Syringing
. iv. Dacrocystography
.
. Corneal
.

Corneal scraping and cauterization

i. Smear preparation and interpretation (Gram's stain /KOH)
ii. Media inoculation
iii. Keratometry - performance and interpretation
iv. Pachymetry
v. Corneal topography

The postgraduate must be well versed with the following investigative modalities although the student may or may not perform it individually. But, she/he should be able to interpret results of the following tests: Fundus photography
Fluorescein angiography
Ophthalmic ultrasound A-scan/B scan
Automated perimetry for glaucoma and neurological lesions
Radiological tests –

X rays - Anteroposterior/ Lateral view

PNS (Water's view) / Optic canal views

The localisation of intra-ocular and intra-orbital FBs

Interpretations of -USG/ CT/ MRI Scans

. OCT and UBM
. ERG, EOG, and VEP

Surgical Skills(Must have performed)

. Lids Entropion
. Ectropion (uncomplicated)
. Lid repair
. Electrolysis
. Tarsorrhapy
. Chalazion
.
. Sac Dacryocystectomy
. Dacryocystorhinostomy
.
. Muscle- Recession/Resection
. Conjunctiva cyst removal
. pterygium
. Paracentesis
.
. Cataract- ECCE, SICS and Phacoemulsification
. Glaucoma Yag laser Iridotomies
. Trabeculectomy
. Cyclodestructive procedures
. Optical iridectomy
.
. Intravitreal injections
. Peritomy
. Repair of wounds

TEACHING AND LEARNING METHODS

The residents will be imparted training in teaching in several ways.

. Group Discussions -The residents are divided into small groups. Each group is composed of a resident from each semester.
. Symposia -The residents present the Symposium to the group where it is fully discussed. A free and fair discussion is encouraged. These discussions enable the residents to prepare for a general discussion in the class.
. Journal Clubs- The resident to whom the journal is allotted present the journal summaries (as cyclostyled and distributed) to the group where each article is fully discussed. These discussions enable the residents to prepare for a general discussion in the class.
. Case discussion conference- The residents present the case allotted to the group and discussion the case in the group and in the class.

Teaching Methodology:

The theoretical knowledge is imparted to the postgraduate student through distinct courses of lecture-demonstrations, seminars, symposia and inter- and intradepartmental meetings. The students are exposed to recent advances through discussions in journal clubs and participation in CMEs, and symposia. The postgraduate students are imparted clinical training in several ways: such as case discussion, demonstration and lectures.

Maintenance of **log book**: Logbooks shall be checked and assessed periodically by the faculty members imparting the training.

LIST OF THE SYMPOSIA AND SEMINARS

SECTION-I- RETINA and UVEA

1. a) Anatomy and Physiology of Retina.

   b) Anatomy and Physiology of Vitreous.

1. Retinal detachment surgery
2. Endophthalmitis
3. Vitreous Substitutes
4. Lasers & posterior segment diseases.
5. Fluorescein Angiography.
6. Hypertensive Retinopathy
7. Diabetic Retinopathy
8. Retinal Degeneration

UVEA

1. Anterior Uveitis
2. Posterior Uveitis
3. Posterior Segment Trauma
4. Intraocular foreign bodies.

SECTION-II -CORNEA and CONJUNCTIVA

1. Anatomy and physiology of Cornea
2. Donor Corneal Tissue
3. Penetrating Keratoplasty
4. Corneal Graft Rejection
5. Conjunctivitis
6. Tear Film-Abnormalities and Management
7. Dry Eye &Keratomalacia
8. Bacterial Keratitis and Fungal Keratitis

SECTION-III-CATARACT

1. Cataract (a) Anatomy & Embryology (b) Physio Pathology. (c) Pathogenesis of age-related cataract.
2. Congenital Cataract
3. Traumatic Cataract
4. IOLS (a) History, Physical and Chemical Properties & Types (b) Techniques of IOL Implantation. (c) Complications related to IOL
5. Phacoemulsification Surgery
6. Contact Lens and Low vision aids
7. Refractive Errors

SECTION-I V-GLAUCOMA

1. Diagnosis of Glaucoma
2. Basics of Permietry
3. Medical management of glaucoma

SECTION-V- Pediatric Ophthalmology, Strabismus and Oculoplasty

1. Pediatric Ophthalmology
2. Neurophthalmology: Papilloedema
3. Oculoplasty: Ptosis evaluation and management
4. Strabismus: Convergence insufficiency & intermittent divergent squint (c) Secondary deviations. 13. A-V Patterns (a) Etiology, classification (b) Clinical features, investigations (c) Management 14. Special forms of strabismus (a) Duane's retraction syndrome (b) Other restrictive squints (c) Myasthenia and Myopathies
5. Orbital Fractures

DEPARTMENTAL TRAINING SCHEDULE & POSTING OFRESIDENTS

Courses

The training programmes in the Centre are divided into theoretical, clinical and practical into all aspects of the delivery of the Ophthalmic medical and health care.

They provide training in the methodology of research and teaching. At the end of the prescribed period the students may submit a thesis on a research problem.

THEORETICAL

The theoretical knowledge is imparted to the candidate through distinct courses of lecture-demonstration and symposia. The students are exposed to recent advances through discussions in journal clubs Symposia

DIDACTIC TEACHING IN CLINICAL APPLIED BASIS AND PARA-CLINICAL SCIENCES

1. Knowledge in applied, basic and para-clinical and clinical science is imparted by the member of the staff of the Centre in respective disciplines or by clinicians themselves by conducting didactic courses-(Lecture & Demonstration)
2. Symposia: In each section which has two or more specialities the residents of 3rd and 4th semester are exposed to 14 symposia in each speciality over a 1 year period to cover the entire speciality.
3. Journal Clubs -Journals are reviewed in a particular speciality covering all articles in that subject over a 6 months period and 10 major articles presented and discussed by the resident. About 2 journal reviews per section are done every 3 months. 1) Aim 2) Methods 3) Observations 4) Discussions and 5) Conclusions

CLINICAL OPHTHALMOLOGY

For the purpose of clinical training, the Centre is divided into clinical sections, Proportionate number of residents are attached to each section. The training is given in wards out-patient department, speciality clinics and operation theatres. Each Resident shall rotated through all the clinical sections & work in each section for proportionate period of his/her stay in the Centre.

1. Out-Patients

   For the first six months of the training programme Residents are attached to a faculty member to be able to pick up methods of history taking and ocular examination in ophthalmic practice. After 6 months, the clinical resident is allotted a cubicle, where he receives new and old cases including refractions and prescribes for them. The residents are attached to a Senior Resident and faculty member whom they can consult in case of difficulty.

1. Wards

   Each resident is allotted 3 to 5 beds in the in-patient sections of the Centre. The beds of each resident are approximately divided into two halves-general ophthalmic cases and speciality cases. The whole concept is to provide the resident increasing opportunity to work increasing responsibility according to seniority. A detailed history and case record is to be maintained by the resident and he is made familiar with coding and punch card system the Centre.

1. Speciality Clinics

   The residents are provided with an opportunity to work in speciality clinics of the section he is working in at the time of his postings. The resident is provided with an opportunity to learn by actuality doing all investigative procedures, methods of diagnosis and principles of management of cases in the clinics. These clinics also provide him with an opportunity of learning and sifting proper referrals, fellow up cases over a long period and evaluate results.

1. Operations

   The resident is provided with an opportunity to perform operations both extra-ocular & Intraocular with the assistance of the Senior Residents and/or under the direct supervision of a faculty member. He is provided with an opportunity to learn special and complicated operations by assisting the Senior Resident or the Senior Surgeon in operations of cases of the speciality and be responsible for the post-operative care of these cases besides their earlier work up & pre-operative preparations.

   A phased programme is gone through.

   In the first phase, the resident is given training in regional anaesthetic block preparations of cases for operation and premeditation.

   In the next phase, the resident assists the operating surgeon operates independently assisted by the senior resident or faculty member. He is required to be proficient in some operation and show familiarity with others. Some of the operative procedures are learnt by the residents by practising the same on

artificial eyeballs or Goat's eye.

1. Case Discussions

Detailed ward rounds are conducted by each section where the work if the residents are scrutinized and cases are discussed. Case discussions are also held in the O.P.D. and the speciality clinics. Besides the above, a special case conference is held once a week. One case from each section is selected for discussion which is worked up discussed in the group and then presented in the case conference where the faculty of the Centre, resident, discuss the problem of diagnosis and management.

CAMPS

Eye camps are conducted where residents are posted for imparting training to the clinical residents according to a set methodology. The community and school surveys are conducted by residents.

RESEARCH

The methodology of research is given in the initial phase of training.

ASSESSMENT

The evaluation of the candidates at the end of the course may be under the following headings:

1. The resident shall be required to demonstrate comprehension of basic knowledge of the subject by being able to answer essay type or multiple choice type question in four papers of 3 hours each to the satisfaction of the board of examiners.
2. That the resident shall be evaluated in all fields of the instruction areas of work and demonstrate skills to elicit history, examine, diagnose and treat (medically or surgically or both) cases in the outpatient department and admitted cases including the relevance of investigative procedures in the case under discussion. The residents will be required to see and interpret X-ray charts and laboratory reports of special investigations pertaining to these case.
3. The resident may be required to demonstrate the use of appliances and specialized diagnostic techniques including their utility and limitations.
4. The resident will be required to report on specimens and slides of Pathology and give a pathological diagnosis from the clinicians understanding given relevant clinical data and history.
5. The resident will be required to answer oral questions on any aspect of the Specialty.
6. The evaluation shall be done by a board of examiners for adequate time. The number of days on which examinations to be conducted in 3 days.
7. The external examiners may be invited to deliver extension lectures and participate in a discussion on those delivered by other during their stay as examiners so that the faculty and students of this Centre can derive the advantage of their scientific knowledge and expertise.

RESIDENTS FORMAL ASSESSMENT FORM

1. Credibility & Reliability (3)
2. Punctuality & Regularity (3)
3. Ability to get along with peers (3)
4. Inter-personal relationship (3)
5. Humane & compassionate behaviour with patients & their families. Concern for the welfare of the patients & social obligations to the community (3)

Total = 15 marks.

Examination on Research Methodology & Biostatistics

Timing: End of 2nd Semester

Total marks: 100

Will be considered as an internal examination

Candidate should pass to appear in Final examination

No marks will be added to final/summative examination

Will be conducted by Examination Cell in the month of June & December

INTERNAL EXAMINATIONS

Timeline: End of the 3rd, 4th and 5th semester, pre-final (2 months before final examination).

Marks distribution: Theory 100 marks, and practical with viva and logbook will carry 100 marks (Practical – 70, viva – 20, logbook – 10).

The marks of the 4 internal examinations will be averaged to 100 each for theory and practical.

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

Quarterly assessment during the MD training should be based on the following

educational activities:

1. Journal based / recent advances learning
2. Patient-based /Laboratory or Skill-based learning
3. Self-directed learning and teaching

4. Departmental and interdepartmental learning activity
1. External and Outreach Activities / CMEs

SUMMATIVE ASSESSMENT

The Post Graduate examination shall be in three parts:

1. Thesis:

Every postgraduate student shall carry out work on an assigned research project under the guidance of a recognised postgraduate teacher, the result of which shall be written in form of a thesis.

1. Theory Examination

The examinations shall be organised on the basis of 'Marking system' to evaluate and to certify postgraduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year.

There shall be four theory papers.

Paper I: Basic Sciences related to Ophthalmology, Refraction & Optics

Paper II: Clinical Ophthalmology

Paper III: Systemic Diseases in Relation to Ophthalmology

Paper IV: Recent Advances in Ophthalmology and Community Ophthalmology

Summative/Final Examinations:

Theory question paper format:

One Long question – 20 marks

Eight Short question/notes – 10 x 8 = 80 marks

Total marks in theory: 500 marks

- 4 papers in the final examination – 400 marks
- Average of 4 internal examination – 100 marks

Practical examination Practical examination: Total marks: 500 (Practical and viva in the final examination – 400 marks and an average of 4 internals- 100 marks).
The format of the practical examination (400 marks)

Part	Components	Marks allotted
Part A* 200 marks	Longcase (1 no.)	100
	Short cases (2 nos.)	50
	OSCE/OSPE (5-10 stations)	50

Part B 200 marks	Operative procedure/Pedagogy/ Department specific activity	50
	Critical appraisal of a scientific paper	25
	Thesis presentation and evaluation	50
	Viva	75