P.G. Curriculum
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P.G. Curriculum
MS Ophthalmology

The infrastructure and faculty of the Department of Ophthalmology will be as per the MCI guidelines.

1. Goal

The goal of MS course in Ophthalmology is to produce a competent ophthalmologist who:

- Recognizes the health needs of and carries out professional obligations in keeping with principles of National Health Policy and professional ethics;
- Has acquired the competencies pertaining to Ophthalmology that are required to be practiced in the community and at all levels of health care system;
- Has acquired skills in effectively communicating with the patient, family and the community;
- Is aware of the contemporary advances and developments in medical sciences as related to eye care;
- Is oriented to principles of research methodology
- Has acquired skills in educating medical and paramedical professionals.

2. Objectives

At the end of the MS course in Ophthalmology, the student should be able to

- Recognize the key importance of ocular health in the context of the health priority of the country;
- Practice the speciality of Opthalmology in keeping with the principles of professional ethics;
- Identify social, economic, environmental, biological and emotional determinants of patients and institute diagnostic, therapeutic, rehabilitative, preventive and promotive measures to provide holistic care to the patients;
- Recognize the importance of growth and development as the foundation of Ophthalmolgy; and help each patient realize her/his optimal potential in this regard;
- Take detailed history, perform full ocular examination including anterior and posterior segment of eye and neuro ophthalmology and make clinical diagnosis;
- Perform relevant investigative and therapeutic procedures for the patient;
- Interpret important imaging and laboratory results;
- Diagnose ocular ailment on the analysis of history, ocular examination and investigative work up;
- Plan and advise measures for the prevention of eye diseases and visual disability.
- Carryout common surgical procedures independently.
- Plan rehabilitation of patients suffering from ocular illness and handicap, and those with special needs;
- Manage ocular emergencies efficiently;
- Recognize the emotional and behavioral characteristics of visually disabled patient and keep these fundamental attributes in focus while dealing with them;

- Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities;
- Develop skills as a self-directed learner, recognize continuing educational needs; use appropriate learning resources, and critically analyze relevant published literature in order to practice evidence-based ophthalmology;
- Demonstrate competence in basic concepts of research methodology and epidemiology;
- Facilitate learning of medical/nursing students, practicing physicians, para-medical health workers and other providers as a teacher-trainer;
- Play the assigned role in the implementation of National Programs For Control of Blindness, effectively and responsibly;
- Function as a productive member of a team engaged in eye care, research and education.

3. Syllabus

3.1. Theory

During the training period effort should always be made that adequate time is spent in discussing ocular health problems of public health importance in the country.

- **Section I: Anatomy and Physiology**
  - Embryology and Anatomy
  - Physiology of the Eye
  - The Physiology of Vision
  - The Neurology of Vision
- **Section II: Ophthalmic Optics**
  - Elementary Optics
  - Elementary Physiological Optics
  - Refraction
  - Refractive Errors of the Eye
- **Section III: Ocular Examination Techniques and Ocular Therapeutics**
  - Ocular Symptomatology
  - Assessment of Visual Function
  - Examination of the Anterior Segment
  - Examination of the Posterior Segment and Orbit
  - Ocular Therapeutics
  - Ocular Microbiology
- **Section IV: Diseases of the Eye**
  - Diseases of the Conjunctiva
  - Diseases of the Cornea
  - Diseases of the Sclera
  - Diseases of the Uveal Tract
  - The Lens
  - The Glaucomas
  - Diseases of the Retina
  - Diseases of the Vitreous
  - Diseases of the Optic Nerve
  - Intraocular Tumours
  - Injuries to the Eye

- **Section V: Disorders of Motility**
  - Anatomy and Physiology of the Motor Mechanism
  - Comitant strabismus
  - Incomitant Strabismus
- **Section VI: Diseases of the Adnexa**
  - Diseases of the Lids
  - Diseases of the Lacrimal Apparatus
  - Diseases of the Orbit
- **Section VII: Systemic Ophthalmology**
  - Diseases of the Nervous System with Ocular Manifestations
  - Ocular Manifestatioins of Systemic Disorders
  - Systemic drugs – Effects on eye
- **Section VIII: Preventive Ophthalmology**
  - Genetic Ophthalmology
  - The Causes and Prevention of Blindness
  - Eye Banking
  - Eye Camps
- **Section IX: Surgical Instruments in Ophthalmology**
  - Surgical Instruments in Ophthalmology
  - Local Anaesthesia in Ophthalmology
  - Lasers in Ophthalmology

3.2 Practical

During the training period, PG students should learn various clinical and skilled work. PG's should be encouraged to perform the procedures (both minor & major including) given below:

- **Minor Procedures**
  - Thorough ocular examination.
  - Pediatric ocular examination.
  - Removal of Corneal/ forniceal foreign body.
  - Syringing and probing
  - Pterygium excision
  - Chalazion excision
  - I & D for Adnexal infections(stye)
  - Posterior/Anterior sub tenon injection
  - Intravitreal injection
  - Tarsorraphy
  - Epilation
  - Corneal Scrapping
  - Conjuctival swab
  - Anterior chamber tap
  - Subconjuctival injection
- **Major Procedures**
  - Cataract Surgery with IOL implantation
  - Glaucoma surgery
  - Lid surgeries including entropion, ectropion & ptosis
  - Ocular trauma management
  - Enucleation, Evisceration (and Exenteration)
  - Corneal transplant

- Basic Squint Surgery

❖ **Surgical Training**

It may be helpful to expose all PG students to artificial eye for various surgical steps and to hone surgical skills.

❖ **Surgical Skills**

- Thoroughly examine the eye
- Treat medical conditions
- Perform all minor and at least Cataract and Glaucoma surgery

4.0 Teaching Program

4.1. General Principles

Acquisition of practical competencies being the keystone of postgraduate medical education, postgraduate training is skill oriented. Learning in postgraduate program should essentially be self-directed and primarily emanating from clinical and academic work. The formal sessions should merely be meant to supplement this core effort.

4.2 Teaching Sessions

❖ Seminar presentations including detailed topics covering all aspects of ophthalmology shall be taken up by the residents

❖ Journal clubs shall be held for having wider view of the subject and latest research work and papers discussed in routine.

❖ Case discussions should be mandatory for PG students so as to be expert in clinical examination, reach a diagnosis and then plan for appropriate and required management.

4.3. Teaching Schedule

In addition to bedside teaching rounds, in the department there should be daily hourly sessions of formal teaching per week. The suggested departmental teaching schedule is as follows:

1. Seminar Presentation	Once a week
2. Journal Club	Once a week
3. PG Case Discussion	Once a week
4. Seminar Presentation	Once a week
5. Journal Club	Once a week
6. PG Case Discussion / Central Session	Once a week

Note:

❖ All sessions shall be attended by all the faculty members except for those on emergency duties. All Junior and Senior Residents are supposed to attend the session.

❖ All teaching sessions should be assessed by all consultants at the end of session and log books signed.

- Attendance of the Residents at various sessions has to be at least 75%.

- research paper.

5. Posting

- All PG students shall be posted in Eye OPD and ward on rotation.
- OT duties shall be mandatory for all PG students and has to be taken up as per monthly roster.
- PG students should be posted in emergency to deal with any ocular emergency in casualty.
- All PG students should be posted in various basic Departments (Anatomy, Pathology and microbiology) for a period of minimum 2 weeks each.
- Effort should be made to expose PG students to the latest techniques even though they may have to be sent for sometime to the centers performing and using latest instruments or surgeries.

6. Thesis

- Every candidate shall carry out work on an assigned research project under the guidance of a recognized Postgraduate Teacher, the project shall be written and submitted in the form of Thesis.
- Every candidate shall submit thesis plan to the University within six months from the date of admission.
- Thesis shall be submitted to the University six months before the commencement of theory examination i.e. for examination May/June session, 30th November of the preceding year of examination and for November/December session 31st May of the year of examination.
- Identify a relevant research question;(II) conduct a critical review of literature;(iii)formulate a hypothesis;(iv) determine the most suitable study design;(v) state the objectives of the study;(vi) prepare a study protocol; (vii) analyze and interpret research data, and draw conclusions ;(ix) write a research paper.

7. Assessment

All the PG residents should be assessed daily for their academic activities and also periodically.

7.1. General Principles

- The assessment is valid, objective and reliable.
- It covers cognitive, psychomotor and affective domains.
- Formative, continuing and summative (final) assessment is also conducted in theory as well as practical/clinicals. In addition, thesis is also assessed separately.

7.2. Formative Assessment

The formative assessment is continuous as well as end-of-term. The former is to be based on the feedback from the senior residents and the consultants concerned. End-of-term assessment is held at the end of each semester(upto the 5th semester).

Fomative assessment will not count towards pass/fail at the end of the program, but will provide feedback to the candidate.

7.3. Internal assessment

The performance of the Postgraduate student during the training period should be monitored throughout the course and duly recorded in the log books as evidence of the ability and daily work of the student. Marks should be allotted out of 100 as followed.

Sr. No.	Items	Marks
1.	Personal Attributes	20
2.	Clinical Work	20
3.	Academic activities	20
4.	End of term theory examination	20
5.	End of term practical examination	20

1. Personal attributes:

- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations, shows positive approach.
- **Motivation and Initiative:** Takes on responsibility, innovative, enterprising, does not shirk duties or leave any work pending.
- **Honesty and Integrity:** Truthful, admits mistakes, does not cook up information, has ethical conduct, exhibits good moral values, loyal to the institution.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.

2. Clinical Work:

- **Availability:** Punctual, available continuously on duty, responds promptly on calls and takes proper permission for leave.
- **Diligence:** Dedicated, hardworking, does not shirk duties, leaves no work pending, does not sit idle, competent in clinical case work up and management.
- **Academic ability:** Intelligent, shows sound knowledge and skills, participates adequately in academic activities, and performs well in oral presentation and departmental tests.
- **Clinical Performance:** Proficient in clinical presentations and case discussion during rounds and OPD work up. Preparing Documents of the case history/examination and progress notes in the file (daily notes, round discussion, investigations and management) Skill of performing bed side procedures and handling emergencies.

3. **Academic Activity:** Performance during presentation at Journal club/ Seminar/ Case discussion/Stat meeting and other academic sessions. Proficiency in skills as mentioned in job responsibilities.

4. **End of term theory examination** conducted at end of 1st, 2nd year and after 2 years 9 months

5. **End of term practical/oral examinations** after 2 years 9 months.

Marks for **personal attributes** and **clinical work** should be given annually by all the consultants under whom the resident was posted during the year. Average of the three years should be put as the final marks out of 20.

Marks for **academic activity** should be given by the all consultants who have attended the session presented by the resident.

The Internal assessment should be presented to the Board of examiners for due consideration at the time of Final Examinations.

7.4. Summative Assessment

- Ratio of marks in theory and practicals will be equal.
- The pass percentage will be 50%.
- Candidates will have to pass theory and practical examinations separately.

A. Theory examination (Total = 400 marks)

Paper	Title	Marks
Paper 1:	Basic Ophthalmology	100
Paper 2:	Clinical Ophthalmology	100
Paper 3:	Principle and practices of surgery and related topics.	100
Paper 4:	Recent Advances in Ophthalmology	100

B. Practical & Viva voce examination (Total = 400 marks)

Format of Practicals

Type of case	Marks
1 Long Case	70
2 Short Cases (20 each)	40
2 Fundus Cases (20 each)	40
Spotting-(10 each) Any 5 of them.	50
Fundus Photograph	
FFA	

USG(A&B Scan)	
X-rays	
Perimetry	
CT/MRI	
OCT	
Corneal Topography	
HRT/GDx	
Surgical Instruments/steps	50
Dark Room examination/Refraction	50
Oral (Grand Viva)	100

8. Job Responsibilities

- During first year the resident will work under direct supervision of the 2nd/3rd year resident/senior resident and consultant on call. She/he will be responsible for taking detailed history, examination of patients as per the file record and send appropriate investigations as advised by seniors. Initially all procedures are to be observed and then done under supervision of seniors and during 2nd/3rd year can do procedures independently.
- In 2nd year, resident is posted in special clinics like Cornea clinic, Uveitis Clinic and Glaucoma Clinic also and making of discharge cards including referrals.
- In 3 rd year, resident is also encourged to make independet decisions in management of cases. She/he is also involved in teaching of undergraduate students.
- In 2nd and 3rd year Junior Residents should be performing surgeries stepwise and then independently under the guidance of Senior Residents/ Consultants.

9. Suggested Books

- **Core books**

Parson's Diseases of the Eye	Sihota & TandonClinical
Ophthalmology	Kanski.J.J

- **Reference Books**

Ophthalmology	Yanoff Duker
Retina	Stephen. J. Ryan
Systems of Ophthalmology	Duke Elder
Principles and Practices of Ophthalmology	Peyman, Sander & Goldberg
Diagnosis and Therapy of Glaucoma	Becker Shaffer

➢ Glaucoma	Chandler & Grant
➢ Refraction	Duke Elder
➢ Practical Orthoptics in treatment of Squint	Keith Lyall
➢ Mastering Phacoemulsification	Paul. S.Koch
➢ Anatomy and Physiology of the Eye	A.K.Khurana
➢ Glaucoma	Shields
➢ Cataract Surgery and its complications	Jaffe
➢ Stallard's Eye Surgery	Stallards
➢ Automated Static Perimetry	Anderson and Patela
➢ Cornea	Smolin

❖ **Journals**

- American Journal of Ophthalmology
- British Journal of Ophthalmology
- Archives in Ophthalmology
- Ophthalmology
- Indian Journal of Ophthalmology
- International Ophthalmology Clinics

10. Model Test Papers

MODEL QUESTION PAPER

MS (Ophthalmology)
Paper-I
Basic Ophthalmology

Max. Marks:100 *Time: 3 hrs*

- ***Attempt ALL questions***
- ***Answer each question & its parts in SEQUENTIAL ORDER***
- ***ALL questions carry equal marks***
- ***Illustrate your answer with SUITABLE DIAGRAMS***

I Which structures of eye have ectodermal origin. Describe diagrammatically the development of crystalline lens.

II List techniques to examine fundus of eye. Diagrammatically show the optics of direct ophthalmoscopy.

III Define Accomodation. How it is affected by age and what do you understand by progressive glasses.

IV Briefly write about Histology of ciliary body(pars plicata). What is the role of ciliary epithelium in aqueous formation.

V Shortly write about iris histology. Describe blood supply of choroid.

VI What is subjective correction of astigmatism. Describe two methods of subjective detection of astigmatism.

VII Role of systemic steroids in eye diseases especially uveitis. Discuss various side effects of its long term use.

VIII Discuss biochemical and anatomical features of vitreous. How its degeneration affects the health of retina.

IX What do you understand by tear drainage pathways. Write in detail about the lacrimal pump.

X Briefly discuss one most important theory of colour vision. Briefly write about colour vision tests.

MODEL QUESTION PAPER

MS (Ophthalmology)
Paper-II
Clinical Ophthalmology

Max. Marks:100 *Time: 3 hrs*

- ***Attempt ALL questions***
- ***Answer each question & its parts in SEQUENTIAL ORDER***
- ***ALL questions carry equal marks***
- ***Illustrate your answer with SUITABLE DIAGRAMS***

I Discuss pathological features of Retinoblastoma with diagram and effect of pathological presentation and management.

II Discuss etiology and management of VIth nerve palsy.

III Discuss the management of Delayed post operative endophthalmitis.

IV Discuss pathology and management of congenital glaucoma.

V Write about the pathology and its clinical implications in a patient with Chronic Simple Glaucoma.

VI Write about pathology of ARMD and illustrate its clinical significance in management of ARMD.

VII How will you investigate a case of ulcerative keratitis of 7 days origin with reference to basic microbiological investigations.

VIII Aeitiopathogenesis of blunt trauma to orbit and surgical management of fracture roof of maxillary sinus.

IX Enumerate Biochemical and Pathological changes in Endocrine Exophthalmos with their significance.

X Write about the pathology of senile cataract. How these changes affect the Cataract management with phacoemulsification.

MODEL QUESTION PAPER

MS (Ophthalmology)
Paper-III
Principle and Practices of Surgery and Related Topics

Max. Marks:100 *Time: 3 hrs*

- ***Attempt ALL questions***
- ***Answer each question & its parts in SEQUENTIAL ORDER***
- ***ALL questions carry equal marks***
- ***Illustrate your answer with SUITABLE DIAGRAMS***

I Discuss the role of Newer Antifungal drugs in Ophthalmology.

II Enumerate various drug delivery routes which can be used in a case of post-operative endophthalmitis.

III Write clinical features of PDR and how you will manage a patient of PDR.

IV Name various dyes used in eye. What is the significance of investigative dyes in Ophthalmology.

V Define LASER. How lasers are helpful in posterior segment eye diseases.

VI Discuss various mydriatics and cycloplegics drugs along with their mechanism of action.

VII Enumerate various filteration procedures. How antimetabolites affect success rate of surgical management of Glaucoma.

VIII What are the age changes seen at fovea. How will a diagnosed case of wet ARMD managed.

IX What is conventional phacoemulsification. Also write about the modern variations in emulsification of cataractous lens.

X Define and enumerate causes of entropion. Discuss treatment of cicatritial entropion.

MODEL QUESTION PAPER

MS (Ophthalmology)
Paper-IV
Recent advances in Ophthalmology

Max. Marks:100 *Time: 3 hrs*

- ***Attempt ALL questions***
- ***Answer each question & its parts in SEQUENTIAL ORDER***
- ***ALL questions carry equal marks***
- ***Illustrate your answer with SUITABLE DIAGRAMS***

I What are the causes of Dry eye. Discuss changing trends in diagnosis and management of Dry eye.

II How will you diagnose and manage a case of Keratoconus in 2009.

III Write briefly imaging techniques for anterior segment of eye.

IV What is Plus disease of ROP. Discuss role of LIO in Retinopathy of prematurity.

V What is aetiopathogenesis of wet ARMD. Write about the recent advances in medical management of CNVM.

VI Enumerate causes of Blindness in India. What steps have been taken at National level to eradicate it.

VII Compare merits and demerits of cold phaco and conventional phaco.

VIII What is LASIK. Discuss its demerits.

IX What is accommodation group doing for a patient of cataract.

X Draw conclusive comparison between Laser Iridotomy and Surgical Peripheral Iridectomy.