OPHTHALMOLOGY

Residency Training Program
Leading to the degree of

Master of Surgery (MS Ophthalmology)

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DEDICATION

Dedicated to all faculty Members of Curriculum Committee whose persistent efforts in the field of medical education will always be reminisced.

CURRICULUM

Master of Surgery (MS)

Ophthalmology

TABLE OF CONTENTS

ROAD MAP OF MS OPHTHALMOLOGY

Requirements of MS Ophthalmology to Enroll Graduate Students in the Program

- Fulfillment of University requirements for postgraduate study.
- Four (4) years of consecutive full-time advanced study and clinical training.
- Complete and approved master's thesis based on original research during the course of study in an area related to specialty, suitable for publication in a reputable medical & surgery journal.
- Must complete all didactic & clinical work in the required curriculum and satisfactorily pass all the University examinations.
- A minimum of 60% must be earned in all work/examinations attempted in the master's program. A grade below this will require re-examination.

A complete road map for postgraduate MS can be seen on University website at
http://www.szabmu.edu.pk/content/downloads/revised-road-map-for-postgraduate-residents.pdf

INTRODUCTION

Overview:

The following overall objectives are expected to be achieved by the end of four (4) years of MS Ophthalmology residential training program.

Clinical ophthalmology:

- Acquire scientific and rational approach to the diagnosis of ophthalmic cases
- Manage and treat all types of ophthalmic cases
- Competently handle and execute safely all routine surgical procedures on lens, glaucoma, lid, sac, adnexa, retina, and muscle anomalies
- Competently handle all ophthalmic medical and surgical emergencies
- Be familiar with microsurgery and special surgical techniques
- Demonstrate knowledge of the pharmacological (including toxic) aspects of the drugs used in ophthalmic practice and drugs commonly used in general diseases affecting the eyes.

Refraction:

- Acquire competence in the assessment of refractive errors and prescription of glasses
- Acquire basic knowledge of fitting of glasses and competence of judging the accuracy and defects of the dispensed glasses.

Ophthalmic pathological/microbiological/biochemical sciences:

- Be able to interpret the diagnosis in correlation with clinical data and routine materials received in such cases.

Community ophthalmology:

- The residents are given an opportunity to participate in surveys and eye camps, including school surveys and screening camps.

Research:

- Recognize a research problem
- State the objectives in terms of what is expected to be achieved in the end
- Plan a rational approach with appropriate controls with full awareness of the statistical validity of the size of the material
- Spell out the methodology and carry out most of the technical procedures required for the study

- Accurately and objectively record on systematic lines results and observation made
- Analyze the data with the aid of appropriate statistical analysis
- Interpret the observations in the light of existing knowledge and highlight in what ways the study has advanced existing knowledge on the subject and what further remains to be done
- Write a thesis in accordance with the prescribed instructions

ENTRY CRITERIA

ENTRY CRITERIA

Eligibility to apply for MS Ophthalmology

- Candidate must possess MBBS or equivalent degree and one-year house job from PMC recognized Institutions.
- Permanent valid registration with PMC.
- Declared successful in MS Part-I for University programs.
- In case of foreign candidate, valid registration with Medical Council of their country of origin must be produced.

Required Documents

Attested photo copies of the following documents must be attached with the application form:

- Computerized National Identity Card (CNIC)
- Domicile certificate
- Matric/O Level, FSc/A Level, Certificates or equivalent
- MBBS degree with detail marks certificates of all professional
- MBBS Attempts certificates of all professional
- NEB pass certificate (for foreign graduates)
- House Job certificates
- PMC valid permanent registration certificate
- MS Part-I passing certificate
- Experience Certificates (if any)
- Migration Certificate (To be produced at the time of admission)

Admission Procedure

- Details of admission procedure is available on university website at http://www.szabmu.edu.pk/admission/postgraduate-admission

CONTENT OF LEARNING

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Basic sciences

1. Orbital and ocular anatomy
    a) Gross anatomy
    b) Histology
    c) Embryology
2. Ocular physiology
3. Ocular pathology
4. Ocular biochemistry(General biochemistry, biochemistry applicable to ocular function)
5. Ocular microbiology (General microbiology, specific microbiology applicable to the eye)
6. Immunology with particular reference to ocular immunology
7. Genetics in ophthalmology.

Optics

1. Basic physics of optics
2. Applied ophthalmic optics
3. Applied optics including optical devices
4. Disorders of refraction.

Clinical ophthalmology

1. Disorders of the lids
2. Disorders of the lacrimal system
3. Disorders of the conjunctiva
4. Disorders of the sclera
5. Disorders of the cornea
6. Disorders of the uveal tract
7. Disorders of the lens
8. Disorders of the retina
9. Disorders of the optic nerve and visual pathway
10. Disorders of the orbit
11. Glaucoma
12. Neuro-ophthalmology
13. Pediatric ophthalmology
14. Ocular involvement in systemic disease

15. Immune ocular disorders
16. Strabismus and amblyopia.

Medical ethics and professionalism

1. Describe the fundamentals and principles of medical ethics in ophthalmology (e.g., patient care decision-making, informed consent, competency issues, ethics of intercollegial relations, risk management, and privacy issues)
2. Describe the basics of ophthalmic practice management (e.g., contractual negotiations, hiring and supervising employees, financial management, working with associates, and billing/collecting)
3. Describe the basics of the health-care system and reimbursement, as appropriate to the local, regional, and national market of the trainee (e.g.,

Research methodology

Following are the topics in Research Methodology to be covered in 1st year of residency in the workshop

1. Introduction to evidence-based medicine and research methodology
2. Ethics in research
3. Proper literature search
4. Framing a research question
5. Various study designs
6. Qualitative research/epidemiological studies/development of tools for quality of life and studies related to social issues
7. Concept of population, concept of sample, sample size calculation
8. Basics of statistics
    a) Types of data
    b) Central tendency and spread of data
    c) Understanding P value
    d) Standard error of mean (SEM) and confidence interval
9. Hypothesis testing
    a) Concept of null hypothesis and alternate hypothesis
    b) Type I error
    c) Type II error
    d) Power of study

e) Various statistical tests

10. Understanding various terminologies
    a) Risk ratio
    b) Odds ratio
    c) Sensitivity
    d) Specificity
    e) Positive predictive value
    f) Negative predictive value
    g) Receiver operator curve (ROC)
    h) Area under ROC
    i) Risk reduction
    j) Absolute risk reduction
    k) Number needed to treat
    l) Number needed to harm
11. Protocol writing
12. Scientific writing
13. How to read and review a paper (critical appraisal).

Examination techniques along with interpretation

1. Slit-lamp examination
    a) Diffuse examination
    b) Focal examination
    c) Retroillumination – Direct and indirect
    d) Sclerotic scatter
    e) Specular reflection
    f) Staining modalities and interpretation
2. Fundus evaluation
    a) Direct/indirect ophthalmoscopy
    b) Fundus drawing
    c) Three-mirror examination of the fundus
    d) 78-D/90-D/60-D examination
    e) Amsler charting.

Basic investigations along with their interpretation

1. Tonometry
    - Applanation /indentation /noncontact
2. Gonioscopy
    - Indentation gonioscopy grading of the anterior-chamber (AC) angle
3. Tear/lacrimal function tests
    - Staining – Fluorescein and Rose Bengal
    - Schirmer test/tear film breakup time
    - Syringing
    - Dacrocystography
4. Cornea
    - Corneal scraping and cauterization
    - Smear preparation and interpretation (Gram's stain /KOH
    - Media inoculation
    - Keratometry – Performance and interpretation
    - Pachymetry
    - Corneal topography – If available
5. Color vision evaluation
    - Ishihara pseudoisochromatic plates
    - Farnsworth-Munsell, if available
6. Refraction
    - Retinoscopy – Streak/Priestley Smith
    - Use of Jackson's cross-cylinder
    - Subjective and objective refraction
    - Prescription of glasses
7. Diagnosis and assessment of squint
    - Ocular position and motility examination
    - Synoptophore usage
    - Hess/Lees screen usage
    - Diplopia charting
    - Assessment of strabismus – Cover tests/prisms bars
    - Amblyopia diagnosis and treatment

- Assessment of convergence, accommodation, stereopsis, suppression

8. Exophthalmometry
    - Usage of Hertel exophthalmometer – Proptosis measurement
9. Contact lenses (CL)
    - Fitting and assessment of rigid gas permeable and soft lenses
    - Subjective verification of over-refraction
    - Complications arising of CL use
    - Educating the patient regarding CL usage and imparting relevant knowledge of the complications arising thereon
10. Low-vision aids
    - Knowledge of basic optical devices available and relative advantages and disadvantages of each
    - The basics of fitting with knowledge of availability and cost.

The resident must be well versed with the following investigative modalities although he/she may or may not perform it himself/herself. However, he/she should be able to interpret the following tests:

1. Fundus photography
2. Fluorescein angiography
3. Ophthalmic ultrasound A-scan/B-scan
4. Automated perimetry for glaucoma and neurological lesions
5. Radiological tests
    - X-rays – Anteroposterior/lateral view
    - Paranasal sinus (Water's view)/optic canal views
    - Localization of intraocular and intraorbital foreign bodies (FBs)
    - Interpretations of ultrasonography (USG)/computed tomography (CT)/magnetic resonance imaging (MRI) scans
6. Optical coherence tomography (OCT) and ultrasound biomicroscopy
7. Electroretinogram, electrooculogram, and visual-evoked potential
8. Corneal topography.

Minor surgical procedures

Must know and perform independently by the end of training

- Conjunctival and corneal FB removal on the slit lamp

- Chalazion incision and curettage
- Pterygium excision
- Biopsy of small lid tumors
- Suture removal – Skin/conjunctival/corneal/corneoscleral
- Tarsorrhaphy
- Subconjunctival injection
- Retrobulbar, parabulbar anesthesia
- Posterior subtenon's injections
- Artificial eye fitting
- Acute management of acid and alkali burns.

Major Surgical procedures

Must be able to independently perform and deal with complications arising from the following surgeries:

1. Ocular anesthesia:
   - Retrobulbar anesthesia
   - Peribulbar anesthesia
   - Facial blocks – O'Brien/Atkinson/Van Lint and modifications
   - Frontal blocks
   - Infraorbital blocks
   - Blocks for sac surgery
2. Lid surgery
   - Tarsorrhaphy
   - Ectropion and entropion
   - Lid repair following trauma
   - Epilation
3. Destructive procedures
   - Evisceration with or without implant
   - Enucleation with or without implant
4. Sac surgery
   - Dacryocystectomy
   - Dacryocystorhinostomy
   - Probing for congenital obstruction of nasolacrimal duct

5. Strabismus surgery
    - Recession and resection procedures on the horizontal recti
6. Orbit surgery
    - Incision and drainage via anterior orbitotomy for abscess
7. Cyclocryotherapy/cyclophotocoagulation
8. Cataract surgery
    - Standard extracapsular cataract extraction (ECCE) with or without intraocular lens (IOL) implantation
    - Small incision ECCE with or without IOL implantation and/or phacoemulsification with posterior-chamber (PC) IOL implantation
    - Secondary AC or PC IOL implantation
9. Vitrectomy/scleral buckling
    - Intravitreal and intracameral (AC) injection techniques and doses of drugs for the same
    - Need to know the basis of vitrectomy (anterior segment) as well as management of cataract surgery complications
    - Assist vitrectomy and scleral buckling procedures
10. Ocular surface procedures
    - Pterygium excision with modifications
    - Conjunctival cyst excision/FB removal
    - Corneal FB removal
    - Conjunctival flap/peritomy
11. Glaucoma – Trabeculectomy
12. Corneal
    - Repair of corneoscleral perforations
    - Corneal suture removal
    - Application of glue and bandage CL
13. laser procedures:
    - Yag capsulotomy
    - Laser iridotomy
    - Focal and panretinal photocoagulation

Should have observed/ assisted the following microscopic surgeries:

14. Keratoplasty
    - Therapeutic and optical
15. Glaucoma surgery
    - Pharmacological modulation of trabeculectomy
    - Trabeculotomy
    - Goniotomy
    - Glaucoma valve implant surgery
16. Keratorefractive procedures.

Surgery

The resident is provided with an opportunity to assist and then later perform both extraocular and intraocular surgical procedures with the assistance of the senior residents and/or senior faculty member and to be responsible for the postoperative care of these cases. It is essential that resident should perform at least 50 cataract surgeries, five glaucoma surgeries, five squint surgeries, five eyelid surgeries (entropion/ectropion/eyelid repair), five sac surgeries, and five eye repair procedures by the completion of the term. The surgical training is performed in stages. In the first stage, the resident is given training in the preparations of cases for operation, premedication, and regional anesthetic blocks. In the next stage, the resident assists the operating surgeon during the operations. In the third stage, the resident operates assisted by a senior resident or a faculty member. He/she is required to be proficient in some operations and shows familiarity with others.

Instructional Strategy: Teaching and Learning Methods

1. Group discussion: The junior residents may present the case to their senior PGs where it is fully discussed before finally being discussed in front of the faculty or senior eye specialists.
2. Bedside discussion on the rounds and outpatient teaching:
3. Clinical case discussions schedule at a fixed time every week, ranging from 1 to 2 hours, held at least once a week.
4. Case presentation at other in-hospital multidisciplinary forums
5. Journal clubs: Journals are reviewed in particular covering all articles in that subject over a 6-month period and are discussed by the resident under the following headings:
    a) Aim
    b) Methods

c) Observations
d) Discussions
e) Conclusions

The resident to whom the journal is allotted presents the journal summaries to the senior PGs. They are expected to show their understanding of the aspects covered in the article and clarify any of the points raised in the article, offer criticisms, and evaluate the article in the light of known literature

1. Participation in Continuing medical education (CME) programmes and symposia.
2. Outpatients: For the first 6 months of the training program, residents will be attached to as senior PGT to guide them in the methods of history taking and ocular examination in ophthalmic practice. After 6 months, the clinical resident may work independently, under the supervision of a senior resident or faculty member, whom they are to consult in case of any difficulty
3. Wards: Each resident will be allotted beds in the inpatient section depending upon the total bed capacity and the number of the PGs. Detailed history and case records are to be maintained by the resident.
4. Attend accredited scientific meetings (CME, symposia, and conferences)
5. Additional sessions on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, and medical ethics and legal issues related to ophthalmology (optional but recommended).
6. Active involvement in undergraduate teaching

Log Book -Record of Clinical Cases

Longitudinal evaluation (Logbook, Assignments, Assessments)

Throughout the length of the course the performance of the candidate will be recorded on the Log Book. Completed and duly certified logbook will form a part of the application for appearing in the final examination. The Log Book will reflect the performance of the candidate in the following parameters:

a. Entries in log book should be on regular basis, and signed by the supervisor, certifying the work.
b. Record of competence of technical skills.
c. Record of the assignments.
d. Record of affective and interpersonal behaviors.
e. Record of Journal clubs, conferences, lectures and workshops attended.

Table: Specimen from Log book

DATE	HOSPITAL No.	NAME, AGE, SEX	DIAGNOSIS	PROCEDURE PERFORMED	PERFORMANCE OF TRAINEE*	SIGNED BY IMMEDIATE SUPERVISOR

*Key 1) Observer Status 3) Performed under supervision
2) Assistant Status 4) Performed independently

Mandatory Workshops

During training candidate will attend the following mandatory workshops arranged by the University:

I. Communication skills

The aim is acquisition of the students with an art of communication for an effective doctor patient relationship, where the art of history taking and the skill of advice and instruction communication is pivotal. This with also enhance the interpersonal communication at the hospital amongst early colleges and those in various departments of the hospital setting. Furthermore, the appearance of our students in clinical meetings, workshops, conferences and seminars will be exceptionally didactic both as participants and as presenters. Furthermore, a better skill to communicate will empower the students to present better in their assessments for the very program, especially, OSPE, long case, short case and thesis defense.

II. Research methodology, Biostatics & Medical writing

As Research and recent advances are part and parcel of evidence-based practice, the university intends to endow in the students to raise intrigued healthcare professionals who intend to develop ease, both for the patient and the system by means of their queries and research. An elaborated session will provide a guideline as the first basic step towards thesis writing. Biostatistics will be introduced and statistics software introduction and basics workshop is carried out. Furthermore, the university provides the students with available Research and Biostatistics department as a continuum of guidance and help in their research works. Research Work is encouraged and a well-established ethical board and review committees for check of quality and virtues at all levels.

III. Computer and internet skills

Since literature review is the essence of research, an effective student must vest in him the recent updates in regards to the available search engines and gadgets, the software and platforms which lead to better understanding of topics. The aim of the workshop is to empower the students to better inquire for their research questions and to be able to avail the maximum out of the broad horizon of information available.

IV. Basic Life Support

Basic knowledge and skills for emergency situations in an unresponsive patient as per recent updates and protocols are delivered to the students, ensuring an up to the mark health care professional for the society at large. The workshops are well equipped and test the candidate both in knowledge and hands on.

V. Surgical skills

This workshop is the pivotal for the emerging surgeons and provides knowledge together with hands on practice. The students see, learn, perform and continue to implement well learnt basic practices over the course of the clinical training.

Candidate will be Certified of the above-mentioned workshops by the University.

ROTATIONS

The trainee has to undergo rotation in the following disciplines :

Dermatology 2 weeks
Pathology 2 weeks
Radiology 2 weeks
Radiotherapy 2 weeks
Neurology 1 month
Plastic Surgery 2 weeks
Community Ophthalmology 2 weeks

DERMATOLOGY 2 WEEKS

Competency to be attained Trainee can

1. Appreciate the relationship between skin and eye.
2. Can recognize common skin disorders.
3. Manage common skin lesions
4. Recognize and manage ocular complications of skin lesions.

* The trainee must see patients with the following disease for their ophthalmic manifestations.

Leprosy
Eczema (Atopic dermatitis)
Infection
- Bacterial
- Fungal
- Viral

Bullous Diseases
Psoriasis
Drug Eruptions
Auto immune diseases
Hereditary Disorders (Phacomatosis)
Contact Dermatitis
Impetigo
Erysipelas
Necrotizing fasciitis
Leprosy

PATHOLOGY 2 WEEKS

Competency to be attained Trainee can

1. Order the appropriate tests along with necessary Clinical Information.
2. Can take smear and inoculate in on culture media.
3. Can interpret from gram, Giemsa and Zeil Neilson stained slides.
4. Can study common Ocular histopathological slides.
5. Can correctly ananlyze and interpret data generated from pathological test.

The trainee should ensure that he/she sees the following.

Histopathology
Chalazion
Stye
Basal Cell Carcinoma
Squamous Cell Carcinoma
Sebaceous Cell Carcinoma
Sympathetic Uveitis
Retinoblastoma
Rhabdomyosarcoma
Choroidal Melanoma
Bowens diseases
Capillary Haemangioma
Cavernous Haemangioma
Dermoid Cyst
Lipodermoid
Lacrimal gland tumours
Metastatic Lesions in Eye
Lentigo Maligna
Malignant Melanoma of conjunctiva
Gliomas
Meningiomas
Pituitary Adenomas
Tuberculosis
Sarcoidosis
Microbiology
Growth on Agar
Growth on Blood Agar
Growth on Chocolate Agar
Growth on Sabourads Agar
Growth on Brain Heart Infusion Broth
Growth on McCopy Cell Culture Agar
Haematology
Identification of Blood Cells
Estimation of Haemoglobin
Chemical Pathology
Estimation of Blood and Urine Sugar

RADIOLOGY 2 WEEKS

Competency to be attained Trainee can

1. Order the appreciate investigation and provide necessary Clinical Information.
2. Can interpret X-rays, CT Scans and MRIs.
3. Can refer appropriate cases for Intervention radiology.

The trainee should see the X-ray/CT scan & MRIs related to the following.

1. Orbit: Fracture, Foreign Body, Erosion, Calcification, Space occupying lesions
2. Para nasal: Haziness, Blow Out Fractures, Foreign Body, Polyps, Erosions, Tumours
3. Sella Turcica: Dimensions, Shape, Calcification, Erosions, Double Floor
4. Skull and Brain: Space occupying lesions, Ventricular System, Foreign Body, Metastassis, Signs of increased ICP, Fracture, Angiograms
5. Optic Foramen: Dimensions, Erosion
6. Spine (Cervical &/or Sacroiliac): Scleroris, Oesteoporosis
7. Chest: Infections (TB, other), Tumours, Sarcoidosis,

MRI:

Brain: Plaques, Space occupying lesions, ULTRASOUND

Ocular:

Orbital

DOPPLER STUDY: Neck Vessels

RADIOTHERAPY 2 WEEKS

Competency to be attained, Trainee can:

1. Refer patients to Nuclear Medicine Department for appropriate investigations.
2. Refer patients for radiotherapy and chemotherapy.
3. Recognize the complications of radiotherapy and chemotherapy.
4. Manage Post Radiational Ocular complications.

The trainee should try to see patient suffering the following diseases.

Retinoblastoma

Thyroid Ophthalmopathy

Basal Cell Carcinoma

Kaposi Sarcoma

Capillary Haemangioma

Lacrimal Gland Tumours

Optic Nerve Gliomas

Meningiomas

Metastatic Lesions to eye and orbit

Uveal Tumours

NEUROSURGERY / NEUROLOGY 1 MONTH

Competency to be attained

The Trainee should be able to perform Neurological Examinations the following:

a. Cranial Nerve Examination
b. Visual Fields
c. Cerebellar Function
d. Signs of Meningial Irritation
e. Sensory and Motor Examination
f. Examination of Unconscious Patients

The Trainee should be able to interpret :

1. X-ray
2. CT scans
3. MRIs

The Trainee should understand the sequelae and complications of Neurological procedures.

Hydrocephalus - Shunts
Meningiomas
Gliomas
Pituitary Adenomas
Head Injuries
Craniopharyngioma
Unconscious Patients

PLASTIC SURGERY 2 WEEKS

Competency to be attained
The Trainee should :

1. understand the principles of wound construction and its repair.
2. be able to make flaps and grafts.
3. be well abreast with the suture material.

The trainee must try to see patient with the following.
Congenital defects
Acquired defects
Trauma

a. Repair (Adenexa)
b. Reconstruction
    i. Split Thickness Skin Graft
    ii. Full Thickness Skin Graft
    iii. Flaps
c. Tissue loss
    i. Excision
    ii. Reconstruction

Malignancy

a. Excision
b. Reconstruction

Post burn Contractures

a. Reconstruction

COMMUNITY OPHTHALMOLOGY 2 WEEKS

Competency to be attained
The Trainee should:

1. understand the principles of Ophthalmic Epidemiology.
2. understand the principles of Planning and Managing Comprehensive health Care.
3. be able to organize Safe, Effective, Scientifically Sound, Outreach programme.

4. understand the principles and importance of Monitoring and Evaluation of Eye Care programme.

The trainee must ensure adequate understanding of the following:
(relevant to ophthalmology)

Epidemiology
General Principles of Health Planning and eye care planning
Demography and Population Dynamics
Health / Hospital Administration and Public Health Practices
Material and child health and care of the elderly
Food and Nutrition
Communicable Eye Disease
Chronic Non-Communicable Eye Diseases
Occupational Health and Eye Diseases

Thesis

One of the training requirements for the Degree is to undertake a research and write a Thesis on a topic related to the field of specialization. Firstly, the student shall prepare a synopsis under guidance of his supervisor. The synopsis should be in accordance with the guidelines to Synopsis written recommended by the University. Synopsis of the research must be approved from the Ethical Review Board (ERB) and the Advanced study & research board (AS&RB) before starting the research work. During process of Research the resident has to submit study data/result of project on quarterly basis to the Department of Medical Education (DME) and Biostatistician. Once the research is commenced, an elaborative document of the guided structure, the Thesis, is then submitted for approval. The thesis must be submitted for approval during the beginning of fourth year of training program. After review by three external examiners, approval of thesis from AS&RB, the Resident can appear in the final examination. The Thesis is then to be subjected to a seminar of thesis defence. A candidate shall be eligible for defence of thesis examination whether he/she shall be declared pass or fail in the theory examination. Defence of thesis examination comprising of a presentation and question/Answer session with a panel of examination. A score of 70% or above will fulfill the passing criteria.

The guideline for synopsis and thesis writing is available on University website at

http://www.szabmu.edu.pk/content/downloads/guidelines-for-synopsis-writing.pdf
http://www.szabmu.edu.pk/content/downloads/guidelines-for-thesis-writing.pdf

The thesis submitted by all post graduate residents shall comply with the instructions and guidelines for Thesis writing issued by the University. It shall form a distinct contribution to knowledge and afford evidence of originality, shown by the discovery of new facts, by the exercise of independent critical judgment and / or by the invention of new methods of investigation. It shall not include research work for which a degree has already been conferred in this or any other university/college. In the wake of fundamental improvements being introduced in the system of Higher Education in Pakistan, the credit, respect, recognition of research and scholarly publications, career development and financial gains are now linked with such original works accomplished without replicating the efforts of other researchers. Students are guided to work in light of HEC Plagiarism policy and put original effort to light.

I. Thesis Evaluation

There shall be a standing list of External Examiners for each discipline consisting of persons of eminence in the respective field of research. The list shall be suggested from time to time by the Board of Studies of the Department/ Institute, Board of Faculty concerned and approved by the Research Board. The External Examiners will be requested to critically examine the thesis for its suitability for acceptance.

The candidate shall in the first instance submit four unbound copies of his/her complete thesis along with an application on prescribed form for the evaluation of his/ her thesis, duly forwarded by his/her supervisor and the Head of Ophthalmology Department. The Vice Chancellor shall appoint

three External Examiners from the approved list of External Examiners.

The reports of the examiners shall be placed before the Research Board for consideration. If two of the three Examiners find that the thesis is wholly inadequate it may be rejected by the Research Board.

If any of the examiners suggests modification/ revision of the thesis, the candidate shall be required to resubmit a revised version of the thesis duly certified by the supervisor, within one year (in case of Major Correction). The revised version of the thesis shall be approved by the same examiners (s) who suggested modification/ revision of the thesis (in case of Major Correction).

If any examiner finds the thesis adequate but suggests minor modification/ revision, this may be incorporated without referring again to the examiners. However, supervisor will recommend the correction.

The candidate will submit the research thesis in the final year of training, six months before completion of the training.

II. Thesis Evaluation Criteria for AS & RB

In pursuance of recommendations of Academic Council, decisions were taken about thesis evaluation of MS Ophthalmology thesis. Three (03) copies of thesis will be sent to three (03) external examiners for evaluation (28th February for Aug/Sep exam & 31st August for Mar/Apr Exam). In consideration of thesis evaluation reports, the Board's decision for thesis evaluation is as follows:

- If three examiners have accepted thesis with minor correction in present/accepted form thesis should be sent to the Advanced Studies & Research Boards (AS & RB) for further necessary action.
- In case two external examiners accepted thesis as minor in present/accepted form and third examiner reject the thesis, all thesis report will be rejected, and student must rewrite thesis.
- In case of two minor and one major corrections student will resubmit the thesis after three months.
- Time required for Thesis evaluation is within one year.

ASSESSMENT

ASSESSMENT

Assessment of trainees will cover the cognitive, psychomotor and affective domains. It will take two forms:

- Formative Assessment
- Summative Assessment

Formative Assessment

It is the continuous assessment of progress and competence. It will be conducted through workplace-based assessment throughout the training. Assessment will be undertaken by a range of assessors and will cover a range of procedures appropriate to the stage of training. Formative assessment will include:

- Directly observed practical skills (DOPS)
- Case based discussion (CbD)
- Mini clinical examination exercises (Mini-CEX)
- Multiple source feedback (MSF)

Residents will be evaluated by Supervisor quarterly throughout the Residency according to the syllabus/curriculum and report will be submitted to the Registrar office. A specified template form is used to submit the report (Annexure).

Summative Assessment

Summative assessment will be held twice:

1. Mid Term Assessment (MTA) Examination (At the end of 2nd year)
2. Final/Exit Examination (At the end of Final Year)

The level of performance required for passing the exam will depend on the knowledge and skills necessary for acceptable performance and will not be adjusted to regulate the number or proportion of persons passing the examination. The pass point will be determined by careful analysis and judgment of acceptable performance.

STANDARD ASSESSMENT PROTOCOLS / FORMAT OF EXAMINATIONS

Mid Term Assessment (MTA)

The Mid Term Assessment (MTA) examination is mandatory eligibility requirement for all Postgraduate Final examinations. Candidates are required to have passed MS Part-I, complete two years training in Ophthalmology, get approval of their Synopsis from AS&RB and take the MTA Examination. In case of failure in the MTA examination, the trainees are permitted to continue their training but must pass the MTA examination prior to appear in the final examination.

Format of Examination

MTA Examination consists of the following components:

ASSESSMENT		
Written	Paper:100 One Best MCQs (100 Marks) **Part-A:** 50% MCQs from General Principles **Part-B:** 50% MCQs from Specialty Oriented	Pass Marks 60% Aggregate and Not Less than 55% in any Part (A Or B)
Assessment of Clinical & Technical Skills (ACTS/OSCE)	100 Marks 8-12 Stations	Pass Marks 60%
Total Marks		**200**

Format of Mid Term Assessment (MTA)

1. **Multiple Choice Questions (MCQs)**

   The MTA comprises of two parts; A and B. Each MCQ carries 2 marks. There is no negative marking. MCQs are choose the best one type. Time available is minutes for each paper with a gap of minutes in between both A and B papers.

   - Paper A comprises of 50 MCQs from Surgery in General.
   - Paper B comprises of 50 MCQs from Allied specialties.

2. Assessment of Clinical & Technical Skills (ACTS/OSCE)

- **Eligibility**

A candidate shall be eligible for the ACTS/OSCE after passing MTA examination. He can avail three consecutive clinical examinations after passing the exam.

A candidate availing/missed all the three consecutive chances of clinical examination after passing an MTA examination, he shall appear again in the theory examination.

- **Format**

ACTS/ OSCE will comprise of 12-18 stations of 5 to 8 minutes each with a change time of one minute for the candidate to move from one station to the other. The stations would have an examiner, a patient or both. Structured clinical tasks will be set at each station. The examiners using a global rating scale will assess the performance of each candidate. On stations where no examiner is present the candidates will have to submit written responses to short answer questions on a response sheet. There will be two types of stations: static and interactive. On static stations the candidate will be presented with patient data, a clinical problem or a research study and will be asked to give written responses to questions asked. In the interactive stations the candidate will have to perform a procedure, for example, taking history, performing clinical examination, counseling, assembling an instrument etc. One examiner will be present at each interactive station and will either rate the performance of the candidate or ask questions testing reasoning and problem-solving skills.

Final Postgraduate Examination

Final Postgraduate examination of MS Ophthalmology is comprising of following three (03) main components:

1. Theory Examination
2. OSCE & Clinical Examination
3. Defence of Thesis

1. Theory Examination

- **Format & Passing Criteria**

Paper	Type	Marks	Duration	Passing Criteria
Paper – I	One Best Type MCQ Paper	100	03 Hours	75 % in Aggregate and Not Less than 70% in any Paper
Paper – II	One Best Type MCQ Paper	100	03 Hours	

2. OSCE & Clinical Examinations

- **Eligibility**

A candidate shall be eligible for the OSCE & Clinical Examination after passing theory examination. He can avail three consecutive clinical examinations after passing a final theory examination.

A candidate availing/missed all the three consecutive chances of clinical examination after passing a theory examination, he shall appear again in the theory examination

- **Format & Passing Criteria**

OSCE & Clinical Examination is comprising of three components

i. OSCE
ii. Long Case
iii. Short Case

i. Format of OSCE

Observed Structured Clinical Examination (OSCE) will comprise of 12-18 stations of 5 to 8 minutes each with a change time of one minute for the candidate to move from one station to the other. The stations would have an examiner, a patient or both. Structured clinical tasks will be set at each station. The examiners using a global rating scale will assess the performance of each candidate. On stations where no examiner is present the candidates will have to submit written responses to short answer questions on a response sheet. There will be two types of stations: static and interactive. On static stations the candidate will be presented with patient data, a clinical problem or a research study and will be asked to give written responses to questions asked. In the interactive stations the candidate will have to perform a procedure, for example, taking history, performing clinical examination, counseling, assembling an instrument etc. One examiner will be present at each interactive station and will either rate the performance of the candidate or ask questions testing reasoning and problem-solving skills.

ii. Format of long case

For assessment of the holistic approach of the candidate regarding patient management, each candidate will be allotted one long case and allowed 30 minutes for history taking and clinical examination. Candidates should take a careful history from the patient (or relative) and after a thorough physical examination identify the problems which the patient presents with. During the period a pair of examiners will observe the candidate. In this section the candidates will be assessed on the following areas:

- **Interviewing skills**
  - Introduces one self. Listens patiently and is polite with the patient.
  - Is able to extract relevant information.
- **Clinical examination skills**
  - Takes informed consent
  - Uses correct clinical methods systematically (including appropriate exposure and re-draping).
- **Case presentation/ discussion**
  - Presents skillfully
  - Gives correct findings.
  - Gives logical interpretations of findings and discusses differential diagnosis.
  - Enumerates and justifies relevant investigations.
  - Outlines and justifies treatment plan (including rehabilitation).
  - Discusses prevention and prognosis.
  - Has knowledge of recent advances relevant to the case.
  - During case discussion the candidate may ask the examiners for laboratory investigations which shall be provided, if available. Even if they are not available and are relevant, candidates will receive credit for the suggestion.

iii. Format of short cases

Candidates will be examined in at least four short cases for a total of 40 minutes jointly by a pair of examiners. Candidates will be given a specific task to perform on patients, one case at a time. During this part of the examination, the candidate will be assessed in:

- **Clinical examination skills**
  - Takes informed consent.
  - Uses correct clinical methods including appropriate exposure and re-draping.
  - Examines systematically.

- **Discussion**
  - Gives correct findings.
  - Gives logical interpretations of findings.
  - Justifies diagnosis/es.
  - As the time for this section is short, the answers given by the candidates should be precise, succinct and relevant to the patient under discussion.

Component	Protocol Description	Marks	Duration	Passing Criteria
OSCE	8-12 Stations 60% Interactive 40% Static	100	5 to 6 minutes per stations	60% in Aggregate and Not Less than 55% in any Paper
Long Case	One (01) Case	100	50 Minutes	
Short Case	Four (04) Case	100	40 Minutes (10 Minutes for each case)	

If a candidate securing 60% or more marks in OSCE component He/She shall be exempted from this component in the next clinical examination until & unless he reappears in the theory examination.

3. Defence of Thesis

- **Eligibility**

  A candidate shall be eligible for defence of thesis examination whether he/she shall be declared pass or fail in the theory examination

- **Format of Examination**

  Defence of thesis examination comprising of a presentation and question/Answer session with a panel of examination.

- **Passing criteria**

  A score of 70% or above marks is required to pass.

  If a candidate shall be declared pass in the Defence of thesis examination, he/she shall be exempted from this component forever. Provisional Certificate, Transcript and Degree will be awarded only after passing all the components of the final MS Ophthalmology examination.

ANNEXURE

Supervisor Evaluation Form

SUPERVISOR'S INTERNAL ASSESMENT/EVALUATION PROFORMA FOR MS

PGR Name: _____ Session: _____ Specialty: _____

University Registration No: _____

Period: From_____ To _____

1.	Generic Competencies			
	(Please score from 1 - 100. 75% shall be the pass marks)		Component Score	Score achieved
		Patient Care	20	
		Medical Knowledge and Research	20	
	i	Practice and System Based Learning • Journal Clubs	04	
	• Audit Projects • Medical Error Investigation and Root Cause Analysis • Morbidity / Mortality / Review meetings • Awareness of Health Care Facilities		04 04 04 04	
	iv. Communication Skills • Informed Consent • End of life decisions		10 10	
	v. Professionalism • Punctuality and time keeping • Patient doctor relationship • Relationship with colleagues • Awareness of ethical issues • Honesty and integrity		04 04 04 04 04	
2.	Specialty specific competencies			
	Please score from 1 - 100. 75% shall be the pass marks			Score achieved
	Operative Skills / Procedural Skills			
3.	**Multisource Feedback Evaluation**(Please score from 1 - 100. 75% shall be the pass marks)			
4.	**Candidates Training Portfolio** (Please score from 1 - 100.75% shall be the pass marks)			

	(Please score from 1 -100. 75% shall be the pass marks)	Component Score	Score achieved
	I. Log book of operations and procedures	**25**	
	II. Record of participation and presentation in academic activities	**25**	
	III. Record of publications	**25**	
	IV. Record of results of assessments and examinations	**25**	

Total marks obtained _____ Signature of Supervisor _____

Name & Stamp _____