



*In the name of God, the Most Gracious, the Most Merciful*

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## **INTRODUCTION**

The objective of the Postgraduate Medical Institute, Quetta is to promote the Postgraduate Medical Education amongst the doctors by designing postgraduate medical studies programs keeping in view the provincial, national and international needs.

To achieve this objective the Postgraduate Medical Institute has developed structured training programs for specialist to be utilized in the health care facilities of tertiary and secondary levels. Beside clinical sciences the institute is also running Postgraduate training programs in Basic Medical Sciences.

The Postgraduate Medical Institute, Quetta possesses all the relevant learning facilities like qualified and well trained faculty, teaching hospitals, libraries, lecture halls, clinocopathological conference halls, laboratories, audiovisual aids, internet access, etc.

The Postgraduate Medical Institute is affiliated with University of Balochistan. The format of the examination has been improved with more valid

objectives and reliable methods of assessment. To ensure the fairness and transparency the institute has introduced the use of assessment forms for scoring of all components of clinical and oral examination.

This booklet contains the information for the candidate of Diploma in Ophthalmology (DOMS) regarding eligibility criteria for admission to the course details of training program, Syllabus, Objective of the training program and format of examination.

## **ELIGIBILITY CRITERIA FOR DOMS COURSE:**

Requirements for Admission in Diploma in Ophthalmology (DOMS) course session 2013-15

- MBBS or equivalent qualification registered with the PMDC.
- One year House job in a teaching hospital six months of which should preferably be in the specialty of Ophthalmology.
- Only those doctors are eligible who are in the active service of Government of Balochistan for a minimum period of two years.
- Selection through entry test and selection committee approval.

## **TRAINING PROGRAM.**

The duration of program for Diploma in Ophthalmology (DOMS) is two years in this duration the trainees are suppose to attend the formal lectures in the relevant basic sciences but simultaneously trainees start their clinical programme, which is specially designed for acquisition of knowledge, attitude and skills in the relevant field.

Following teaching modalities will be employed:

- Lectures
- Seminar Presentation and Journal Club Presentations
- Group Discussions
- Grand Rounds
- Clinico-pathological Conferences
- SEQ as assignments on the content areas
- Skill teaching in Operation theatres, emergency and ward settings
- Attend genetic clinics and rounds for at least one month.
- Self study, assignments and use of internet
- Bedside teaching rounds in ward
- OPD & Follow up clinics
- Long and short case presentations

## **AIMS AND OBJECTIVES OF THE COURSE**

The aim of 02 years diploma programme in ophthalmology is to equip trainees with relevant professional knowledge, skills and ethical values to enable them to apply their acquired expertise at primary & secondary health care organizations as non-academic consultants.

### **OBJECTIVES**

At the end of training in DOMS, a trainee doctor should be able to:

- Take a comprehensive and pertinent history of a patient presenting with Eye related complaints
- Perform detailed physical examination in a rational sequence that is both technically correct as well as methodical
- Elicit physical signs without discomfort to the patient.
- Evaluate patients in the setting of outpatients department, hospital wards and emergency.
- Order a set of relevant investigations considering availability, diagnostic yield, cost-effectiveness, side effects, and implications for management
- Comprehend Community Indicators related to individual's health.

- Aware of and can apply national and international guidelines for treatment and assessment
- Counsel patients and relatives in patient's preferred language in elective and emergency situations in keeping principles of good communication skills, empathy and empowerment of patients.
- Exhibit emotional maturity and stability, integrity, ethical values and professional approach, sense of responsibility in day-to-day professional activities
- Take proper informed consent for physical examination and ensure confidentiality and appropriate environment for intimate physical examination.
- Act as an independent specialist at community/ Tehsil and District Headquarter Hospital
- Show initiative and become lifelong self-directed learners tapping on resources including clinical material, faculty, internet and on-line learning programmes and library.



## **SYLLABUS.**

### **PART-I SYLLABUS**

A list of topics given in this syllabus is considered to be important for the trainee to know as a minimum requirement for his/her training programme.

### **ANATOMY**

- Applied Embryology of Eye
- Orbit bones
- Soft parts
- Cranial nerves, autonomic nervous system
- Eye ball + Adnexa
- Pathways + Cortex
- Extra ocular muscles
- Eye ball with its coats
- Cranial Nerves, 2nd, 3rd, 4th, 5th, 6th, 7th,
- Autonomic supply of the orbit and its contents
- Blood supply of the orbit and its contents
- Lacrimal system
- Visual pathway and visual cortex

### **THE EYE AND THE ORBIT**

Embryology, anatomy including histology, blood supply, nerve supply and lymphatic drainage of the:

- Eye Lid & Adnexa.
- Eye ball.
- Anterior Segment
- Conjunctiva, Cornea, Sclera, Iris and Pupil
- Limbus and Angle of anterior chamber
- Lens and Zonule

- Posterior Segment
- Ciliary Body, Choroid, Vitreous
- Retina, Optic Nerve
- Orbit and its contents.
- Visual pathway.
- Lacrimal Secreting & Drainage System.

### **PHYSIOLOGY**

The candidate should be able to understand functions of the eye ball and adnexa and structures as applied to or affected by a disease process.

- Transparency of Cornea
- Aqueous humour dynamics
- Pupil, its functions and controls
- Accommodation
- Functions of retinal pigment epithelial cells – retina and its physiology
- Rods and cones, formation of nerve signal and vitamin A metabolism
- Lens transparency
- Functions of extra ocular muscles (ocular motility)
- Binocular vision
- Lacrimal apparatus: tear film, its production, composition, circulation and drainage of tears.
- Dynamics of aqueous humor and maintenance of intraocular pressure.

- Eyelids, cornea, lens, retina, vitreous, accommodation, convergence, -Pupillary reflexes, -binocular vision and control of eye movements.
- Physiology of vision: visual activity, visual fields and visual adaptation.
- Electrophysiology of vision.

## **BIOCHEMISTRY**

### **A. NUTRITION AND DIETETICS**

- **Balanced diet** Requisites of an adequate diet. Role of carbohydrates, fats, proteins, minerals, vitamins and water in diet. Principles of nutrition as applied to surgical problems.
- **Vitamins** A, B, C, D, E and K. Classification, components, sources, absorption and functions (physiological and biochemical role). Daily requirements, effects of deficiency and hyper vitaminosis. Salient morphologic features of diseases related to deficiency or excess of vitamins.

### **B. Carbohydrate Metabolism**

## PHARMACOLOGY

The student should be able to choose appropriate drug for a given situation and select the proper route for the best possible delivery

- Introduction to ophthalmic pharmacology
- Diagnostic
- Therapeutic
- Cycloplegics & mydriatics (mechanism of action, pharmacodynamics, pharmacokinetics)
- Uses of cycloplegics & mydriatics, Adverse effects.
- Antibiotics (Types, Uses, Adverse reactions and Side Effects)
- Antiviral
- Anti-fungals
- Anti-glaucoma drugs
- Adverse Reactions of other Ophthalmic Drugs
- Anti-histamines
- Topical anesthetics
- Steroids
- Anti-inflammatory drugs
- Non-steroidal anti inflammatory drugs
- Lubricants
- Diagnostic Stains: Fluorescein, Rose Bengal
- Mode of action, penetration and classification of drugs related to Ophthalmology.
- Autonomic drugs.
- Antibiotics, antifungal, antiviral and chemotherapeutic agents.

- Carbonic anhydrase inhibitors and osmotic drugs.
- Tear supplements
- Anesthetic drugs (topical and infiltrative)
- Analgesics drugs
- Corticosteroids drugs
- Non steroidal anti inflammatory drugs
- Anti allergic and anti collagenase drugs.

## **PATHOLOGY**

### **1. General Pathology**

- Cell Injury and adaptation
- Cell Injury
- Reversible and Irreversible Injury
- Fatty change, Pigmentation, Pathologic calcification
- Necrosis and Gangrene
- Cellular adaptation
- Atrophy, Hypertrophy,
- Hyperplasia, Metaplasia, Aplasia
- Inflammation
- Acute inflammation --- Vascular changes, Chemotaxis, Opsonization and Phagocytosis
- Enlist the cellular components and chemical mediators of acute inflammation
- Differentiate between exudates and transudate
- Chronic inflammation
- Etiological factors, Granuloma
- Cell repair and wound healing

- Regeneration and Repair
- Healing--- steps of wound healing by first and second intention
- Factors affecting healing
- Enlist the complications of wound healing
- Haemodynamic disorders
- Define and classify the terms Edema, Haemorrhage, Thrombosis, Embolism, Infarction & Hyperaemia
- Define and classify Shock with causes of each.
- Describe the compensatory mechanisms involved in shock
- Describe the pathogenesis and possible consequences of thrombosis
- Describe the difference between arterial and Venous emboli
- Neoplasia
- Dysplasia and Neoplasia
- Differences between benign and malignant neoplasms
- Enlist the common etiological factors for neoplasia
- Define and discuss the different modes of metastasis
- TNM staging system and tumor grade
- Immunity and Hypersensitivity

## **2. Special Pathology**

- Ocular Tumors

### **3. Microbiology**

- History and introduction to Microbiology
- Microbiology, Physiology, Life Cycle and Classification and parasites.
- Role of Microbes In Various Human Diseases
- Infection source
- A brief account of the classification of microorganisms .
- Morphology: Identification of various shapes of bacteria and viruses under the microscope.
- Distribution, size, motility, reproduction and functions of bacteria and viruses.
- Effects of environment upon bacteria and viruses.
- Sterilization and disinfection. Definition, use of physical and chemical disinfectants.
- Infection and immunity pathogenicity, pathology of infection, resistance and natural immunity, antigens and antibodies.
- Common Bacterial and viral diseases of man.
- Spores, Yeast and moulds.
- Nosocomial Infections
- Bacterial Growth and Death
- Important Viruses
- Important Parasites
- Sterilization and disinfection
- Immunization
- Use Of Investigation And Procedures In Laboratory
- Interpretation of Laboratory Tests

The student should be able to understand the relevance and importance of:

- Swab
  - Collection
  - Transfer
  - Plating
  
- Biopsy
  - Collection
  - Transfer
  
- Gram Staining
  - TLC
  - ESR
  - Hb%

## **5. OCULAR PATHOLOGY**

- Ocular and adnexal inflammations, acute and chronic, their causes, effects, and microscopic appearance.
- Ocular and orbital infections.
- Ocular, adnexal and orbital tumors.
- Effects of intra-ocular foreign body. -Ocular pigments and acquired ocular pigmentation.
- Dystrophies and degenerative conditions which involve the eyes.
- Genetic and hereditary ocular disorders.
- Ocular immunology.
- Systemic Diseases which involve the eye.



## **PART-II SYLLABUS.**

### **1. Clinical Ophthalmology.**

- Instrumental Skills
  - Slit Lamp Examination
  - Direct Ophthalmology
  - Indirect Examination
  - 90D Examination
  - Gonioscopy
  - Use of Microscope
  - Refraction
  - Exophthalmometry
  - Hess Test
  - Keratometry
  - Visual Field
  - Ultrasound
- Clinical Skills
  - Visual Acuity
  - Pupil Reactions
  - Digital Tonometry
  - Ocular Movements
  - Cover Test
  - Colour Vision
  - Lid Eversion
  - Regurgitation
- Regular duties in wards and OPD Routine  
history taking, examination and investigations

## **Optics**

1. The Principles of refraction.
2. The refraction of the eye
3. Clinical Anomalies
  - i. Refractive errors
  - ii. Accommodation and its disturbances
  - iii. Binocular vision and its Anomalies
    - a Anisometropia
    - b Anisokonia
    - c Orthophoria
    - d Heterophoria / Hetrotropia
    - e Convergence and its anomalies
4. Visual Acuity
5. Objective methods of refraction with optics of refraction.
6. Subjective verification of Refraction
7. The prescription of Spectacles
8. Contact Lenses

## **2. Clinical Ophthalmology and practical training.**

### **i. History Taking**

- Defects in Vision
- Pain in and around the Eye

### **ii. Ocular Examination**

- Visual Acuity, for near and distance
- use of pinhole
- Examination of Adnexa and anterior segment of the Eye
- Eversion of the upper Eyelid and lacrimal regurgitation Test

- Corneal Reflection Test
- Ocular movements
- Pupillary reflexes (Afferent papillary defect) along with its pathways
- Palpation Assessment
- Schiottz Tonometer
- Applanation Tonomete

Distant Direct Ophthalmoscopy for identification of defects in the Ocular media

Direct Ophthalmoscopy with emphasis on disc and its abnormalities (Swollen disc, cupped disc and pale disc)

Field of Vision

- Confrontation Test
- Perimetry (manual and automated)

**iii. Familiarization with Retinoscopy, Indirect Ophthalmoscopy, Slit Lamp Examination and its use, Visual Fields and use of laser in Ophthalmology (Argon and Krypton as well as YAG laser Therapy).**

**iv. Familiarization with FFA (Fundus Fluorescence Angiography).**

**v. Familiarization with Gonioscopy.**

**vi. Familiarization with Ocular Biometry (A-Scan, B-Scan).**

**vii. Diagnosis, treatment and prevention of common eye ailments.**

- Lids
- Lacrimal apparatus
- Conjunctiva
- Sclera
- Cornea
- Anterior Chamber

- The Pupil
- Crystalline Lens
- Uveal Tract
- Vitreous and retina

**viii. To Diagnose certain eye emergencies with provision of treatment e.g.**

- Ocular Foreign bodies
- Corneal Ulcers
- Uveitis
- Acute Congestive Glaucoma's
- Perforating or blunt Ocular traumas

**ix. Ocular Symptomatic Disease**

- Ocular Manifestations of diseases of the nervous System
- Ocular Manifestation of systemic disease

**x. Disorders of Ocular Motility**

- Anatomy and Physiology of the Motor mechanism
- Paralytic and kinetic strabismus
- Concomitant strabismus
- Nystagmous

**xi. Preventive Ophthalmology**

- Causes and prevention blindness
- The hygiene of vision
- Ocular general therapeutics

**xii. Different Operative procedures upon the eyeball.**

**Radiological Tests**

- X-ray
- CT
- MRI
- Ultra Sound
- A scan
- B scan

## **EXAMINATION / EVALUATION.**

The Diploma in Ophthalmology (DOMS) Examination will comprise of two parts. The format of examination shall be as under:-

### **Eligibility to appear in Part – I Examination**

- a. Application by the candidate recommended by the Supervisor.
- b. Certificate by the Supervisor, countersigned by Dean PGMI that candidate has regularly attended at least 75% of the basic science lectures, demonstration, tutorials, and practical or clinical work both in-patients and out-patients.

### **Part I Examination:**

At the end of 1<sup>st</sup> Calendar Year, the Part-I examination will comprise of Basic Sciences Education papers relevant to the specialty of Ophthalmology of only theory MCQ types as under:

#### **Paper I**

Anatomy, Pharmacology & Bio-Chemistry 100 Marks  
MCQ's 100 Questions (One Best Type)

#### **Paper II**

Physiology, Pathology & Optics 100 Marks  
MCQ's 100 Questions (One Best Type)

**Total= 200 Marks**

### **Eligibility to appear in Part – II Examination**

1. The candidate has completed the prescribed period of training of the course.
2. The candidate has passed the Intermediate Evaluation (Part-I Examination).
3. Certificate by the Supervisor that the Log Book of candidate is complete in all aspects and is signed by the Co-Supervisor and the Supervisor. The original Log Book will be presented by the candidate during Practical / Oral examination.
4. The application form for Part-II examination with recommendation of the Supervisor.

### **Part-II Examination:**

#### **Paper-I:-**

MCQ's 100 Questions 100 Marks  
(One Best Type)

#### **Paper-II:-**

Short Essay 10 Questions 100 Marks  
(Ten Marks Each) **Total = 200 Marks**

### **Clinical Examination:-**

Long Case	One Case	50 Marks
Short Case	Four Cases	80 Marks
Table Viva		60 Marks
Internal Evaluation		10 Marks

**Total =200 Marks**

**Note: -** TMO's who pass theory examination are allowed to appear in viva / practical examination.

It is compulsory to pass all the component parts of the each subject separately. In case of failure to obtain 50% marks in any of components of examination candidate will have to appear in all components of examination again. In the remaining prescribed three attempts allowed.

**The panel of examiner will be as follows:-**

**External Examiner**

**One**

(To be selected by University of Balochistan from the list of three examiners available)

**Internal Examiner**

**Two**

(From the faculty of BMC)

## **LOG BOOK.**

Log book should include adequate number of diagnostic and therapeutic procedures observed and performed the indications for the procedure, any complications and the interpretation of the results, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

Log Book will have 5% weightage in final examination.

Proposed Format of Log Book is as follows:

Candidate's Name: \_\_\_\_\_

Roll No. \_\_\_\_\_

The above mentioned procedures shall be entered in the log book as per format

### **PROCEDURES PERFORMED**

<b>S #</b>	<b>Date</b>	<b>Name of Patient, Age, Sex &amp; Admission No</b>	<b>Diagnosis</b>	<b>Procedure Performed</b>	<b>Supervisor's Signature</b>



## EMERGENCIES HANDLED

S #	Date	Name of Patient, Age, Sex & Admission No	Diagnosis	Procedure / Management	Supervisor's Signature

## CASE PRESENTED

S #	Date	Name of Patient, Age, Sex & Admission No	Case Presented	Supervisor's Signature

## SEMINAR / JOURNAL CLUB PRESENTATION

S #	Date	Topic	Supervisor's Signature

## Evaluation Record

(Excellent, Good, Adequate, Inadequate, Poor)

At the end of the rotation, each faculty member will provide an evaluation of the clinical performance of the fellow.

S #	Date	Method of Evaluation (Oral, Practical, Theory)	Rating	Signature

- Log Book will be signed by the supervisor / Co- Supervisor regularly.
- Log Book completion is must before the candidate Final examination forms are signed.
- Log Book should be used in Practical / Clinical Examination at viva voce table or at TOCS cabin.

## **LEAVE.**

The Postgraduate Trainees will be entitled to avail the leave as per S&GAD and postgraduate studies schedule, after the recommendation of their supervisor and approval of the Registrar PGMI, Quetta.

PGMIQ

## RECOMMENDED BOOKS

### BOOKS.

1. Anatomy of the eye and orbit, (By Eugene Wolf) Blackwell Scientific publication, London.
2. Physiology of the Eye.
  - Adler's, 9th ed. 1992, Mosby Year Book; St. Louis
  - Davson 4th ed. 1980 Churchill Livingstone Edinburgh.
1. Pathology of the Eye. (Greer) 4<sup>th</sup> ed. 1989 Blackwell Science, Oxford.
2. Refraction of the Eye. a. Sir Stuart Duke Elder 9<sup>th</sup> ed. 1978 Churchill Livingstone, Edinburgh.
3. General Ophthalmology. (By Frank Newell) the C.V Mosby Company, Saint Louis. USA.
4. Text Book of Ophthalmology (By J.J. Kanski ed. Butterworth-Heinemann, Oxford.
5. Neuro-Ophthalmology, (By David Cogan Vol 1 & II) Charles L Thomas Publisher Springfield Illinois.
6. Basic and Clinical Science Course by American Academy of Ophthalmology, Publisher American Academy of Ophthalmology- San Francisco.
7. Other books recommended by teachers from time to time.

## **JOURNALS.**

1. Archives of Ophthalmology. American Medical association Chicago.
2. American Journal of Ophthalmology. Elsevier science Inc. Los Angeles.
3. British Journal of Ophthalmology. BMJ Publishing Group U.K.
4. Pakistan Journal of Ophthalmology. Prof. M. Latcf Choudhry, Editor in Chief, Lahore.

## **TRAINING SITES.**

- Post Graduate Medical Institute, Quetta.
- Helper's Eye Hospital.

PGMIO

## **FACULTY MEMBERS.**

### **PROFESSORS**

Prof: Dr. Riaz Ahmed Baloch MBBS, DOMS, MCPS

### **ASSOCIATE PROFESSOR**

Dr. Abdul Qayum MBBS, DOMS, M.S

Dr. Shamsullah MBBS, Ph.D

### **ASSISTANT PROFESSOR**

Dr. Khalid Hameed MBBS, MCPS

Dr. Shaban Khan MBBS, Ph.D Opth

Dr. Iftikhar -ul-Haq Tareen MBBS, FCPS

### **SENIOR REGISTRAR**

Dr. Muhammad Aimal Khan MBBS, MCPS, FCPS, FRCS

Dr. Saifullah Tareen MBBS, FCPS

Dr. Muhammad Afzal Khan MBBS, FCPS

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