In the name of God, the Beneficent, the Merciful

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INTRODUCTION

The objective of the Postgraduate Medical Institute is to promote the Postgraduate Medical Education amongst the doctors by designing postgraduate medical studies programs in Balochistan keeping in view the provincial 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 possesses all the relevant learning facilities like qualified and well trained faculty, teaching hospitals, libraries, lecture halls, clinicopathological 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 Trainee of Diploma in Anaesthesia (D.A) 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 D.A COURSE:

Requirements for Admission in Anaesthesia (DA) 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 Anaesthesia.
- 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 Anesthesia (DA) is two years in this duration the trainees are suppose to attend the formal lectures in the relevant sciences but simultaneously trainees start their clinical Programme which is specially designed for acquisition of knowledge, attitude and skill in the relevant field.

Following teaching modalities will be employed:

- Lectures
- Seminar Presentation and Journal Club Presentations
- Group Discussions
- Clinico-pathological Conferences
- Skill teaching in operation theatres
- SEQ as assignments on the content areas
- and ward settings
- Self study, assignments and use of internet
- Long and short case presentations

This duration of two years is sub divided as follows:

PHASE I.

Beside clinical work formal lectures will be given in the sciences of Anatomy, Physiology, Bio-chemistry, Pathology and Pharmacology relevant to field of anaesthesiology.

22 Weeks.

PHASE II.

It include training in clinical anaesthesia and applied medicine / surgery relevant to anaesthesia.

66 Weeks.

AIMS AND OBJECTIVES OF THE COURSE

AIM

The aim of 2 years diploma program in Anaesthesiology is to equip medical graduates with relevant professional knowledge, skills and ethical values to enable them to apply their acquired expertise at primary and secondary health care organizations as non- academic consultants.

OBJECTIVES

DA training should enable a student to:

1. Demonstrate comprehensive knowledge of General Medicine, General Surgery, Physiology, Pharmacology, physical properties of gases and working of vast array of anaesthetic equipment.
2. Apply national and international guidelines to assess a patient
3. Satisfactorily addresses fears, concerns and expectations of the patients
4. Evaluate patients in the setting of outpatients department, hospital wards, labour room , emergency and operation theatre
5. Order a set of relevant investigations considering

availability, diagnostic yield, cost - effectiveness, side effects, and implications for management

6. Take proper informed consent for physical examination and ensure confidentiality & appropriate environment for intimate physical examination
7. 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
8. Exhibit emotional maturity and stability, integrity, ethical values and professional approach, sense of responsibility in day- t o- day professional activities
9. Act as an independent specialist at Tehsil and District Headquarter Hospital
10. 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

ANATOMY:

Nervous System (Central and Peripheral)

Brain and spinal cord, cranial nerves (in particular 5, 7, 10)
Cerebral Circulation
CSF formation and flow
Vertebral column, spinal and epidural spaces
Dermatomes of body
Nerve supply upper and lower limbs, thorax, abdomen and perineum
Pain Pathways

Autonomic Nervous System

Detailed anatomy of sympathetic and parasympathetic nervous system

Head and Neck

Mouth, pharynx, Great vessels neck and thorax, Thoracic inlet, intercostals spaces, Thyroid gland

Respiratory System

Nose, Larynx, trachea and bronchial tree, lungs, pleura, Mediastinum, muscles of respiration, diaphragm

Cardiovascular System

Heart, coronary circulation, conduction system, Blood supply of upper and lower limbs and other relevant organ systems of the body.

PHYSIOLOGY

Nervous System

1. Neuromuscular physiology
2. Nervous system: structure and formation of brain and spinal cord, physiology of sensation, neuromuscular transmission, synaptic transmission, cerebrospinal fluid.
3. Autonomic nervous system
4. Pain pathways
5. Stress response

Respiratory System

1. Control of Respiration
2. Mechanics of Respiration
3. Gas Exchange
4. 0_2 & $C0_2$ Transport
5. Acid-Base Balance

Cardio-Vascular System

1. Origin and Conduction of Cardiac Impulse
2. Cardiac Cycle
3. Coronary Circulation
4. Regulation of Blood Pressure
5. Regulation of Cardiac Output
6. Control of Blood Flow through Organs

Haematology

1. Physiology pertinent to anaemias
2. Physiology of Haemostasis & coagulation

3. Blood and Blood Component Therapy
4. Blood & Blood groups

Gastrointestinal System

1.Nausea & vomiting
2.Hepatic physiology

Renal System

1. Body Compartments, Body fluids, electrolytes balance
2. Renal Blood Flow Regulation
3. Glomerular Filteration,Tubular Functions, formation of urine,
4. Renal Control of Acid/Base Balance
5. Renal failure

Maternal and Neonatal Physiology

1. Physiology of Pregnancy
2. Placental Physiology
3. Foetal Physiology of Circulation
4. Neonatal Physiology and APGAR Scoring

Endocrine system

Pituitary, adrenals, thyroid & parathyroid, Insulin secretion

Physiology of Temperature Regulation

PHARMACOLOGY

A) Principles of General Pharmacology

B) Special pharmacology

General Anaesthetics

1. Intravenous induction agents.
2. Inhalation agents: Nitrous oxide, halothane, Isoflurane, desflurane, Sevoflurane.
3. Local Anaesthetics

Sedatives

1. Benzodiazepines
2. Butyrophenones
3. ALPHA Adrenergic Agonists
4. Clonidine, Dexmetatomidine
5. Phenothiazines

Analgesics

Analgesics: Simple analgesics, NSAIDs, Opiates

Muscle Relaxants

Depolarizing & non-depolarizing, reversal agents

Anti-Cholinergics

a) Atropine
b) Glycopyrolate

Medical Gases

c) Oxygen
d) Nitrousoxide
e) Operation theatre environment and recovery area humidity
f) Entonox

g) Co_2
h) Medical Air
Inotropes and vasopressors
Beta blockers
Antihypertensive agents, vasodilators
Antiarrhythmic drugs
Diuretics
Insulin and Oral Hypoglycaemics
Antiemetics
Anti-Histaminics
Antacids
Corticosteroids
Diuretics
Crystalloids and colloids

BIOCHEMISTRY

- Membrane biochemistry and signal transduction
- Gene expression and the synthesis of proteins
- Bioenergetics; fuel oxidation and the generation of ATP
- Enzymes and biologic catalysis
- Tissue metabolism

Vitamins

- Classification, components, sources, absorption and functions (physiological and biochemical role).
- Daily requirements, effects of deficiency and hypervitaminosis.
- Salient morphologic features of diseases

related to deficiency or excess of vitamins.

Minerals

- Sources of calcium, phosphorous, iron, iodine, fluorine, magnesium and manganese.
- Trace elements and their clinical importance.
- Absorption and factors required for it.
- Functions and fate.

Metabolism

- Metabolic rate and basal metabolic rate
- Factors influencing metabolic rate, principles of measurement.

Carbohydrates

- Classification and dietary sources.
- Digestion, absorption and utilization of dietary carbohydrates.
- Glucose tolerance test.
- Glycogenesis, glycolysis, gluconeogenesis, glycogenolysis,
- processes with the steps involved and effects of hormones.
- Citric acid cycle, steps involved, its significance and the common
  final metabolic pathway.
- Hexose monophosphate shunt: mechanism and significance.

Lipids

- Classification of simple, derived and compound lipids.
- Dietary sources.
- Digestion, absorption, utilization and control.
- Fatty acid oxidation with steps involved. Ketogenesis and its significance.
- Lipotropic factors and their actions. Lipoproteins, types and importance.

Proteins and Amino Acids

- Classification and dietary sources of proteins.
- Digestion, absorption, utilization and control.
- Fate of amino acids.
- Urea formation with steps involved.
- Functions and effects of deficiency.
- Nucleoproteins:
- Structure and metabolism.
- Pigment Metabolism
- Basic concept of endogenous and exogenous pigments.
- Causes of pigmentation and depigmentation.
- Disorders of pigment metabolism, inherited disorders, acquired disorders from deficiency or excess of vitamins, minerals, fats, carbohydrates, proteins etc.

Balanced Diet

- Requisites of an adequate diet.
- Role of carbohydrates, fats, proteins, minerals,

- vitamins and water in diet.
- Principles of nutrition as applied to medical problems
- Biotechnology and concepts of molecular biology with special emphasis on use of recombinant DNA techniques in medicine and the molecular biology of cancer

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 venousemboli

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

Urinary system: Effect of injury and disease

Respiration: disturbance resulting from injury or Disease (Asthma, emphysema, Bronchitis)

Hematology

- Blood Transfusion
- Cross matching techniques
- Infecitons and blood transfusions.
- Blood and blood component Therapy
- Complications of blood transfusion.

Salient pathophysiological and clinical Features Of:

- Different types of anemias
- Immune hemolytic anemias.
- Clotting and bleeding abnormalities
- Acute / Chronic leukemias

PART-II SYLLABUS

It includes training in clinical Anaesthesia and applied medicine & surgery.

Anaesthesiology

- Equipments & Monitoring
- Pre operative assessments and pre-medication.
- Optimization of common medical diseases
- Premedication
- Induction of anaesthesia
- Airway maintenance
- Monitoring during anaesthesia
- Recovery from anaesthesia

- Local Anaesthesia.
- Post – operative managements.
- Crisis management.
- Cardiac arrest and resuscitation.
- Post anesthesia care and recovery.

Techniques

(a) Spinal

(b) Epidural

(c) Regional nerve blocks

General Anaesthesia

- Principals and Practice of Anaesthesia.
- Practice of Anaesthesia in special condition.
- Anaesthesia for Gynaecology & Obstetric & Genitourinary tract.
- Anaesthesia for ENT Surgery.
- Anaesthesia for Ophthalmological Surgery.
- Anaesthesia for trauma and Orthopedic Surgery.
- Anaesthesia for Cardiac Surgery.
- Anaesthesia for Paediatric Surgery.

- Anaesthesia for Neuro Surgery
- Anaesthesia for Plastic Surgery
- Anaesthesia for Geraitic Surgery.
- Anaesthesia for Fasio Maxillary surgery
- Anaesthesia for Electro convulsing therapy.
- Anaesthesia for out –side operating room
- Anaesthesia for Radiology Endoscopies
- Anaesthesia for Cardiac Lab
- Anaesthesia for Laparoscopy
- Anaesthesia for Cardio Pulmonary Resuscitation
- Anaesthesia for Emergency Anaesthesia
- Anaesthesia for Malignant hypothermia
- Anaesthesia for I.C.U
- Anaesthesia for day care

MEDICINE

Cardiovascular system

- Ischemic Heart Diseases.
- Hypertension
- Arrhythmias
- Congenital defects of cardiovascular system.

Respiration System

- C.O.P.D
- Chronic chest infection

Endocrine

- Diabetes Mellitus.
- Hyperthyroidism.
- Mesoderm
- Pheo chromocytoma
- Mystheria gravis.

SURGERY

Contents

- Etiology and management of shock
- Principals of fluid and electrohyle therapy.
- Blood Trans fusion &its reaction and blood borne diseases. Hazards of miss matched blood Tran's fusion

EVALUATION / EXAMINATION.

- Monthly their will be assessment test with MCQs and essay type question.
- Every student will be having an assessment / Log book of both academic session. Which is to be shown. Complete having the record of 400 cases of independent Anaesthesia record of work in different discipline weakly or monthly test records. Which will be considered in the examinations.

EXAMINATION

The Diploma in Anaesthesia (D.A) Examination will comprise of two parts. The format of examination shall be as follows:-

Eligibility to appear in Part – I Examination

(a) Application by the Trainee recommended by the Supervisor.

(b) Certificate by the Supervisor, countersigned by Dean PGMI that Trainee has regularly attended at least 75% of the basic science lectures, demonstration, tutorials, and practical or clinical work of Part–I education.

Part I Examination:

At the end of 1st Calendar Year, the Part-I examination will comprise of Basic Sciences Education papers relevant to the specialty of Anaesthesia (D.A) of only theory MCQ types as under:

Paper I

Anatomy & Pharmacology 100 Marks

Paper II

Physiology, Pathology & Biochemistry 100 Marks

Total= 200 Marks

Eligibility to appear in Part – II Examination

1. The Trainee has completed the prescribed period of training of the course.
2. The Trainee has passed the Intermediate Evaluation (Part-I Examination).
3. Certificate by the Supervisor that the Log Book of Trainee is complete in all aspects and is signed by the Co-Supervisor and the Supervisor. The

original Log Book will be presented by the Trainee during Practical / Oral examination.

4. The application form for Part-II examination with recommendation of the Supervisor.

Part II Examination:

At completion of training, papers will comprise of Anaesthesia (D.A) Examination, consist of theory (MCQ & Short Essay) & clinical assessment.

Theory 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

Note: - Trainees who pass theory examination are allowed to appear in viva Voce / practical examination.

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

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 Trainee 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:

Trainee's Name: _____

Roll No. _____

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

PROCEDURES PERFORMED

- I/V cannulation
- Airway management (intubation technique)
- Infiltration
- Nerve blocks

- Femoral nerve block
- Spinal aneasethesia
- Epidural anaesthesia
- Sub-arachnoid block
- I/V regional anaesthesia (Bier's Block)
- Intra-thecal anaesthesia
- Thoracic anaesthesia
- Caudal block
- Resuscitation

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

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 Trainee 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.

RECOMMENDED BOOKS

BOOKS.

1) Text Book of Anaesthesia.
   By Alan –R- Aitkin head.
2) Clinical Anaesthesia
   By G.Edward Morgan & smikail.
3) Text Book of Anatomy for Anesthetist.
4) Guyton text Book of Physiologist.
5) D.R Laurence text Book of Pharmacology.
6) Robbins Pathology.

JOURNALS.

1) British journal Anaesthesia.
2) American journal of Anaesthesia.
3) Local literature published from time to time.

TRAINING SITES.

- Post Graduate Medical Institute, Quetta.
- Bolan Medical Complex Hospital Quetta.
- Sandeman (Prov:) Teaching Hospital Quetta.
- Helper's Eye Hospital.
- Fathima Jinnah T.B & General Hospital

FACULTY MEMBERS

PROFESSOR:

Dr. Amjad Ali MBBS, FCPS.

ASSISTANT PROFESSOR

Dr. Muhammad Arif. MBBS, FCPS

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