GUIDE FOR 2 YEARS DIPLOMA PROGRAM IN CLINICAL PATHOLOGY

(DCP)

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DEPARTMENT OF PATHOLOGY
RAWALPINDI MEDICAL UNIVERSITY & ALLIED HOSPITALS
RAWALPINDI

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University Mission & Vision Statement

➢ Mission Statement

To impart evidence based research oriented health professional education in order to provide best possible patient care and inculcate the values of mutual respect, ethical practice of healthcare and social accountability.

➢ Vision and Values

Highly recognized and accredited center of excellence in Medical Education, using evidence-based training techniques for development of highly competent health professionals, who are lifelong experiential learner and are socially accountable.

Aim of DCP Program:

- To provide high quality diagnostic services in health care.
- To strengthen the pathological diagnosis through research & training.
- To enhance effective collaboration between the pathologist and the treating physician.
- To standardize Pathology teaching at Diploma level so that it will aid in achieving uniformity in teaching and training suitable specialists with appropriate expertise.
- To effectively administer and run the labs at primary and secondary health care centers.

Specific Learning Outcomes

At the end of the 2-year training program student should be able to:

- Independently organize, administer and run the labs at DHQ & THQ health services maintaining appropriate quality control.
- Select alternate techniques, manual procedures and reagents if required for imparting the lab services in resource limited situations.
- Execute trouble shooting in the lab.
- Train lab staff and teach basic pathology to undergraduates at affiliated teaching institutes.
- Impart ethical Pathology services.

Subject Specific Learning Objectives

The learning objectives in the cognitive, psychomotor and affective domains are:

1. Cognitive Domain

- Diagnose routine clinical problems on the basis of histopathology (Surgical Pathology) and cytopathology specimens, various tests of Laboratory Medicine (Clinical Pathology, Clinical Biochemistry) bone marrow examination and various tests of Hematology.
- Interpret and correlate clinical and laboratory data so that clinical manifestations of diseases can be explained. Should be able to teach Pathology to nurses and paramedical staff including laboratory personnel.
- Make and record observations systematically and maintain accurate records of tests and their results for reasonable periods of time.
- Identify problems in the laboratory, offer solutions thereof and maintain a high order of quality control. Capable of safe and effective disposal of laboratory waste.

- Capable of offering a high quality diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc. for the purpose of diagnosis and overall wellbeing of the ill.
- Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in medical colleges/Institutes.
- Capable of pursuing clinical and laboratory based research. He/she should be introduced to basic research methodology so that he/she can conduct fundamental and applied research.

2. Affective Domain

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

- Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.
- The student will show integrity, accountability, respect, compassion and dedicated patient care.
- The student will demonstrate a commitment to excellence and continuous professional development.
- The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
- The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

3. Psychomotor Domain

- Able to perform most of the routine tests in a Pathology Laboratory including grossing of simple specimens, processing, cutting of paraffin and frozen sections, making smears, and staining.
- Able to collect specimens by routinely performing non-invasive out-patient procedures such as venipuncture, finger-prick, fine needle aspiration of superficial lumps and provide appropriate help to colleagues performing an invasive procedure such as a biopsy or an imaging guided biopsy.
- Should be familiar with the function, handling and routine care of equipment in the laboratory.

- Given the clinical and operative data, the student should be able to identify, and systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens.
- A student should be able to demonstrate ability to perform a systematic gross examination of the tissues including the taking of appropriate tissue sections.
- Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome.
- Stain paraffin sections with at least the following:
    I. Haematoxylin and eosin
    II. Iron stain
    III. Acid fast stains

Correctly and independently perform the following special tests, in addition to doing the routine blood counts:

- Haemogram including Reticulocyte and Platelet counts.
- Bone marrow staining including stain for iron.
- Blood smear staining.
- Hemolytic anemia profile including High Performance Liquid Chromatography, Hb electrophoresis etc.

- Coagulation profile including PT, APTT (activated partial thromboplastin time), FDP.
- Describe prominent morphologic findings in the peripheral smears.

A. Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step;

B. be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.

Demonstrate familiarity with and successfully perform:

- routine urinalysis including physical, chemical and microscopic, examination of the sediment.
- macroscopic and microscopic examination of faeces and identify the ova and cysts of common parasites.
- a complete examination; physical, chemical and cell content of Cerebrospinal Fluid (C.S.F), pleural and peritoneal fluids.
- Semen analysis.
- Examination of peripheral blood for commonly occurring parasites.

- Independently and correctly perform at least the following quantitative estimations by manual techniques and/or automated techniques.

  A. Blood urea

  B. Blood sugar

  C. Serum Proteins (total and fractional)

  D. Serum Bilirubin (total and fractional)

Demonstrate familiarity with the following quantitative estimations of blood/ serum by Automated Techniques:

- Serum cholesterol
- Uric acid
- Serum Transaminases (ALT and AST/SGOT and SGPT), etc.

General Statutes and Regulations:

1. Documents Required for Admission:

- Completed DCP application form.
- Copy of MBBS degree with mark sheets of Professional examinations.
- Copy of PMDC registration certificate.
- Three latest passport size photographs.
- Certificates of completion of required experience.

2. Eligibility Criteria:

- Every candidate must be a medical graduate possessing the degree of MBBS or equivalent recognized by PMDC.
- Candidate must be registered with PMDC.
- In case of foreign candidate, the doctor must be registered with the medical registration authority of that country. If the candidate has received training in Pakistan then he must be registered with PMDC.
- Candidate must have completed one-year house job.

In addition to the above preference will be given to the candidate having:

- At least six months experience in Pathology as demonstrator in a recognized teaching institution or
- At least six months experience of working in a reputable accredited Pathology Lab.

3. Registration & Enrolment

- Up to 5 trainees can be registered with one supervisor.
- Total number of students enrolled for the course must not exceed 8 per section/unit.
- The university will approve supervisors for the program.
- Criteria for supervisors MCPS, MPhil, FCPS, PhD or equivalent with at least 2 years of experience after acquiring postgraduate degree.
- The candidates selected for the course shall be registered with the university as per prescribed registration regulations.

Outline of Training Program

- The course shall consist of instructions and training in clinical pathology lasting for two years.
    a. The examination shall be held once a year at the end of the 2 year training period.
    b. The training and oral and practical parts of the examination shall be held in the Department of Pathology, RMU and Allied Hospitals, Rawalpindi.
- The candidates of DCP shall be working in the different disciplines of Pathology as per following schedule:

	Section	Total Duration	Round 1 (First Year)	Round 2 (Second Year)
A	Hematology / blood banking	6 months	3 months	3 months
B	Chemical Pathology	6 months	3 months	3 months
C	Microbiology	6 months	3 months	3 months
D	Histopathology	6 months	3 months	months

Course Content:

The following subjects shall be taught in the course:

General pathology

- Normal cell and tissue structure and function.
- The changes in cellular structure and function in disease.
- Causes of disease and its pathogenesis.
- Reaction of cells, tissues, organ systems.

Systemic Pathology:

- The study of normal structure and function of various organ systems and the etiopathogenesis.
- Broad outline of gross and microscopic alterations of structure of these organ systems in disease and functional correlation with clinical features in brief.

Histopathology:

- Study of Systematic Pathology Histological Techniques,

- Cutting and Staining,
- Exfoliative Cytology and Staining,
- Museum Mounting and Post-mortem,
- Histo-Pathological and Cytological Diagnosis.

Microbiology and Serology:

- Bacteriological Techniques,
- Staining,
- Cultivation,
- Agglutination tests,
- Care of Laboratory Animals,
- Systematic study of Bacteria,
- Bacteriology of Water and Mild, Sensitivity of Bacteria to various Drugs,
- Immunology / Serology;
- Study of Immunological Disorders and Diagnostic Methods.

Chemical Pathology:

- Theory and Practice of Chemical Investigations of Blood, Urine, C.S.F., other Body Fluids and Excreta;
- Biochemical Investigations for Biochemical Disorders,
- Special Techniques and Tests of Functions of various organs/glands
- Working knowledge of chemistry analyzer and other equipment in special chemistry

Haematology & Blood Banking:

- Study of Erythropoiesis and Hematological Disorders,
- Basic Hematological Procedures,
- Morphological Hematology,
- Investigations of all types of Anemia,
- Hemorrhagic Disorders and Leukemia,
- Blood Groups and Blood group Anti-bodies, Rh grouping and Cross Matching Tests;
- Bone Marrow Aspiration,

- Staining and Examination
- Working knowledge of haematology analyzer and coagulation analyzer.

Record Keeping:

In the following fields, the student is expected to acquire a general acquaintance of techniques and principles and to interpret data.

- Maintenance of records.
- Information retrieval,
- Computer, Internet in medicine.
- Quality control, waste disposal.

1. The DCP course Director shall assign each candidate a short research project in any chosen specialty approved by the incharge of that specialty in first month of training and he/she shall complete and submit one research paper in a HEC category Y or above medical journal at the end of first year.
2. Final Summative examination will be held at the end of 2 years.

Teaching and Learning Methods

Teaching Methodology:

The two-year training program for Diploma in Clinical Pathology may be arranged in the form of postings to different assignments/laboratories/sections for specified periods as outlined below. Posting schedules may be modified depending on needs, feasibility and exigencies. For additional knowledge and skill, extramural postings may be undertaken. RMU has signed an MOU with NIH, COMSATS, KRL and Quaid-e-Azam University.

Guideline to Various Teaching/learning Activities:

The following is a broad guideline to various teaching/learning activities that may be employed.

- Collection of specimens including Fine Needle Aspiration of lumps.
- Grossing of specimens.
- Discussion during routine activities such as during signing out of cases.
- Presentation and work-up of cases including the identification of special stains and ancillary procedures needed.

- Clinico-pathological conferences.
- Intradepartmental and interdepartmental JCMs related to case discussions.
- Conferences, Seminars, Continuing Medical Education (CME) Programmes.
- A postgraduate student of a postgraduate degree course would be required to present one poster presentation or one oral paper at a national conference and one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Participation in workshops, conferences and presentation of papers etc.
- Laboratory diagnostic work.
- Use and maintenance of equipment.
- Maintenance of records. Log books should be maintained to record the work done which shall be checked and assessed periodically by the faculty members imparting the training.
- Postgraduate students shall be required to participate in the teaching and training program of undergraduate students and interns.

- Department should encourage e-learning activities. **During the training program, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently.**

Log Book:

The trainees must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book will be mandatory to sit for the final DCP examination. Log book should include diagnostic procedures, case presentations in JCMs and CPCs.

Proposed format of log book is as follows:

Candidate Name:

Roll No.

Procedures Performed: (150 per section)

SR.	Date	Name of Patient, Age, Sex and Admission number	Provisional Diagnosis	Procedure performed	Supervisor's Signature

Case Presentations: Weekly

SR.	Date	Name of Patient, Age, Sex and Admission number	Case Presented	Supervisor's Signature

Seminar/Journal Club Presentation: Fortnightly

SR.	Date	Topic	Supervisor's Signature

Assessment

1. Formative Assessment:

ie., during the training Formative assessment will be continual and will assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system. A term exam will be conducted at the end of every 3 months.

General Principles:

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

Quarterly (After every 3 months) assessment during the Diploma training will be based on:

- Journal based / recent advances learning
- Patient based /Laboratory or Skill based learning
- Self-directed learning and teaching

- Departmental and interdepartmental learning activity
- External and Outreach Activities / CMEs

2. Summative Assessment, i.e., assessment at the end of training:

A. There shall be a total of four written papers, one in each subject. The duration of each paper shall be three hours.

B. The practical and oral examination shall be conducted separately in each of the four subjects

Outline of the examination shall be as follow:

- **Histopathology:**

Theory	MCQs	SEQs	Total Marks	Duration
	50	10 (5 marks each)	100	3 hours
Practical	**Spotting+ Gross Specimens**	**Viva Voce**	**Total Marks**	**Duration**
	15 spots (2 marks each) + 10 gross specimens (1 mark each)	30 marks	70	Upto 3 hours

Total = 170 Marks

- **Microbiology and Serology:**

Theory	MCQs	SEQs	Total Marks	Duration
	50	10 (5 marks each)	100	3 hours
Practical	**Spotting+ Identification of bacteria from 2 culture plates + Procedure Techniques**	**Viva Voce**	**Total Marks**	**Duration**
	10 spots (1 marks each) + 20 marks + 10 marks	30 marks	70	Upto 3 hours

Total = 170 Marks

- **Chemical Pathology:**

Theory	MCQs	SEQs	Total Marks	Duration
	50	10 (5 marks each)	100	3 hours
Practical	**Separate Serum and plasma from provided sample +perform given analyte on semi- automated instrument + Lab report interpretation**	**Viva Voce**	**Total Marks**	**Duration**
	10+20+10 marks=40 marks	30 marks	70	Upto 3 hours

Total = 170 Marks

- **Hematology including Blood Banking:**

Theory	MCQs	SEQs	Total Marks	Duration
	50	10 (5 marks each)	100	3 hours
Practical	**Spotting+ Long slides**	**Viva Voce**	**Total Marks**	**Duration**
	15 spots (2 marks each) + 5 long slides (5 marks each)	30 marks	70	Upto 3 hours

Total = 170 Marks

1. **Theory Papers:**

Subject	Marks
Histopathology	100 marks
Chemical pathology	100 marks
Microbiology	100 marks
Hematology	100 marks

Total = 400 Marks

2. Practical Exam:

Subject	Marks
Histopathology	70 marks
Chemical pathology	70 marks
Microbiology	70 marks
Hematology	70 marks
Log Book	20 marks

Total = 300 Marks

GRAND TOTAL = 400 + 300 = 700 MARKS

Regulations Regarding Examination:

1. Examiners:

One internal and one external examiner of the relevant field will be appointed for the practical examination of each component who will award the marks for viva voce and observed stations independently. Final score will be an average score of marks awarded by both the examiners.

2. Passing Criteria:

- Pass marks shall be 50% for written exams (each component) and 50% for viva (each component) and 55% aggregate overall.
- Each candidate must pass in every component separately.
- Candidates failing in any one component will have to resit in the failed component.

- A maximum of 3 attempts to sit for the examination will be allowed to be availed within 3 calendar years of the first attempt.
- Re-admission in DCP course is not permissible under any circumstances.

Pre-Requisite for Appearing In Final Summative Exam:

A candidate shall enter the examination on the production of the following documents signed by the Dean.

- That he/she has attended at the minimum 75% of the DCP course.
- That he/she has performed procedures and tests in each of the disciplines of Clinical Pathology to the satisfaction of his/her Supervisor and Head of the Pathology Department as specified in the schedule and log book.
- That he/she has completed a short research project allotted to him/ her by the Supervisor / Head of the Department in any one of the four sub-specialties and submitted the research paper in a HEC category Y or above medical journal.

Fee Structure:

Registration fee: Rs.10,000

Annual fee: Rs. 35,000 (to be paid at the start of every year)

Total course fee (2 years): Rs. 70,000/-

Admission Call:

During Fall of every year through advertisement in 2 leading newspapers (English and Urdu).

Recommended Books and Journals

Books of Histopathology:

- Robbins Pathological basis of disease. By Ramzi S.Cortan. Vinay Kumar Stanley L. Robbins.
- General Pathology. J.B. Watter, M.S Israel
- Text book of histopathology : Maximow and Bloom

Journals of Histopathology

- American Journal of Surgical Pathology.
- Achieves of Pathology.
- International Journal of Cancer.

Books of Haematology

- Practical Hematology: Dacie, J.V

- Clinical Hematology: Wintrobe M. Authors. Lee,Boggs, Bithe Athens.
- Postgraduate Hematology: A.V. Hoffbrand
- Blood: Authors, James, H Jandi
- Clinical Hematology in Medical Practice D.Gruchy
- Hematology: Authors, Williams, beutler, Beuler, Erslev Liehman.

Journal of Haematology

- British Journal of Haematology
- Blood

Books of Pathology

- Practical Clinical Biochemistry 1st and 2nd Edition by Harold Varley
- Clinical Chemistry in Diagnosis and Treatment By John F. Zilva.

- Microanalysis in Medical Biochemistry, By I.D.P Wooton
- ABC of Interpretive Laboratory Data by Seymour Bakerman.
- Lecture Notes on Clinical Chemistry By L.G Whitby
- Lynch's Medical Laboratory Technology by Raphael
- A Short Text Book of Chemical Pathology by D.N Baron
- Clinical Chemistry by Teitz.
- A Text Book of Biochemistry International Edition by Lubert Stryer.

Books of Microbiology and Immunology

- Medical Microbiology: By Jawetz. Melnick and Adlberg's.
- Medical Microbiology and Immunology: By Warren E. Levinson, Ernest Jawetz.
- Bailey and Scott's Diagnostic Microbiology: By Syney M. Finegold, William J. Martin.
- Zinssev Microbiology: By Wolfgains K. Joklik, Hiladap While H. & D. Bernard Amos.
- Manual of Clinical Microbiology: By Edwin H. Lennette, Albert Baloons and William J. Hansler

- Essential Immunology: By Ivan Roitt
- Mackie and McCartney, Practical Medical Microbiology : By J.G. Collce, J.P Duguid, A.G Fraser and B.P. Marmocose.

Journals of Microbiology and Immunology

- American Journal of clinical Microbiology.
- Journal of P.M.R.C
- Journal of Postgraduate Medical Institute, Peshawar.