INTERMEDIATE MODULE IN PATHOLOGY

REQUIREMENTS FOR TRAINING & EXAMINATION

APPLICABLE TO RESIDENTS INDUCTED IN TRAINING FROM JULY 2025 ONWARDS

2025

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

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The College of Physicians and Surgeons Pakistan would appreciate any criticism, suggestions, advice from the readers and users of this document. Comments may be sent in writing or by e-mail to the CPSP at:

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INTRODUCTION

The College was established in 1962 through an ordinance of the Federal Government. The objectives/functions of the College include promoting specialist practice of Medicine, Obstetrics & Gynaecology, Surgery and other specialties by securing improvement of teaching and training, arranging postgraduate medical, surgical and other specialists training, providing opportunities for research, holding and conducting examinations for awarding College diplomas and admission to the Fellowship of the College.

Since its inception, the College has taken great strides in improving postgraduate medical and dental education in Pakistan. Competency-based structured Residency Programs have now been developed, along with criteria for accreditation of training institutions, and for the appointment of supervisors and examiners. The format of examinations has evolved over the years to achieve greater objectivity and reliability in methods of assessment. The recognition of the standards of College qualifications nationally and internationally, particularly of its Fellowship, has enormously increased the number of residents and consequently the number of training institutions and the supervisors. The rapid increase in knowledge base of medical sciences & consequent emergence of new sub-specialties have gradually increased the number of CPSP fellowship disciplines to eighty nine. After completing two years of core training during IMM, the residents are allowed to proceed to the advance phase of FCPS training in the specialty of choice for 2-3 years. However, it is mandatory to qualify IMM examination before taking the FCPS-II exit examination The work performed by the resident is to be recorded in the e-logbook on daily basis. The purpose of the e-logbook is to ensure that the entries are made on a regular basis and to avoid belated and fabricated entries. It will hence promote accuracy, authenticity and vigilance on the part of residents and the supervisors.

The average number of candidates taking CPSP examinations each year is to a minimum of 32,000. The College conducts

examinations for FCPS-I (11 groups of disciplines), IMM, FCPS-II (89 disciplines), MCPS (22 disciplines), including MCPS in Health Professions Education and Health Care System Management. A large number of Fellows and senior medical teachers from within the country and overseas are involved at various levels of examinations of the College.

The College, in its endeavor to decrease inter-rater variability and increase fairness and transparency, is using TOACS (Task Oriented Assessment of Clinical Skills) in IMM and FCPS-II Clinical examinations. Inclusion of foreign examiners adds to the credibility of its qualifications at an international level. It is important to note that in the overall scenario of health delivery over 85% of the total functioning and registered health care specialists of the country have been provided by the CPSP. To coordinate training and examination, and provide assistance to the candidates stationed in cities other than Karachi, the College has established 14 Regional Centres (including five Provincial Headquarter Centres) in the country. The five Provincial Headquarter Centres, in addition to organizing the capacity building workshops/short courses also have facilities of libraries, I.T, and evaluation of synopses along with providing guidance to the candidates in conducting their research work. The training towards Fellowship can be undertaken in more than 330 accredited medical institutions throughout the country and 94 accredited institutions abroad. The total number of residents in these institutions is over 37,800 who are completing residency programs with around 5,823 supervisors. These continuous efforts of the College have even more importantly developed a credible system of postgraduate medical education for the country. The College strives to make its courses and training programme 'evidence' and 'needs based' so as to meet international standards as well as to cater to the specialist healthcare needs not only for this country but also for the entire region.

Prof. Khalid Masood Gondal
President
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CPSP COMPETENCY MODEL

College of Physicians and Surgeons Pakistan has moved to competency-based medical education and has developed its own competency model shown below. A generic explanation of the model is given below and it is expected that all its residency training programmes follow the components of this model in accordance to the requirements of each specialty.

Patient or population care occupies the pivotal center. Patient care includes all clinical skills such as history taking, physical examination, ordering investigations, making diagnoses and managing the care. The inner leaves of the model represent the five major competencies directly related to patient care, while the three competencies in the outer circle are mega-competencies related to patient care and also incorporate education, professionalism, leadership, advocacy and population health.

By the end of the Residency Programme, residents are expected to acquire these competencies and their constituent learning outcomes, and provide promotive, preventive, curative and rehabilitative patient-centered (or population-centered) care.

Inner Leaves:

1. Knowledge and Critical Thinking
2. Technical Skills
3. Communication Skills
4. Teamwork
5. Research

Outer Leaves:

6. Professionalism
7. Pedagogy
8. Advocacy

1. Knowledge and Critical Thinking

- Demonstrate application of wide and current readings to critical thinking and problem solving
- Relate the alteration of body function to the presenting condition
- Interpret and integrate history and examination findings to arrive at an appropriate provisional and credible differential diagnoses
- Sequentially order, justify and interpret appropriate investigations
- Apply knowledge and reasoning skills to
    - Analyze data for problem identification and to rule in and rule out contending conditions
    - Synthesize and evaluate solutions for decision-making in solving familiar and less familiar problems based on best current evidence
    - Prioritize different problems within a time frame
    - Select, outline and provide, with evidence-based justifications, appropriate pharmacological and non-pharmacological management strategies
    - Assess new medical knowledge and apply it to resolve patient problems (Evidence-based practice)
    - Apply quality assurance procedures in daily work (Professionalism)
    - Demonstrate shared-decision-making with the patient or family
    - Provide cost-effective care while ordering investigations and in management
    - Use resources appropriately
    - Demonstrate awareness of bio-psycho-social factors in assessment and management of a patient

2. Technical Skills

- Demonstrate International Patient Safety Goals (IPSG)
- Demonstrate competent performance of all required technical skills and procedures in the specialty, including:
  - Obtaining informed consent
  - Preoperative planning
  - Pre-interventional care and preparation
  - Intra-Intervention techniques including exposure and closure, global & task specific items, and communication and teamwork skills
  - Post-interventional care
  - Follow-up care

3. Communication Skills

Written Communication Skills:

- Maintain clear, concise, accurate & updated medical records
- Write:
  - Cogent, clear progress notes documenting working diagnosis & status of diagnostic evaluation
  - Clear, focused, evidence-based & logical management plans and discharge summaries
  - Respectful, clear & focused letters and referrals to other colleagues

Verbal and other Non-verbal Communication Skills:

- Clear, focused and logical presentation of cases
- Demonstrate:
  - Effective interpersonal communication skills by being clear, considerate and sensitive towards patients, their relatives, other physicians, health professionals, team members, colleagues, students and the public
    - Empathy & respect towards patients & their relatives
    - Effective counseling of the patient and the family with cultural sensitivity by explaining options, educating them & promoting joint decision-making
    - Appropriate verbal & body language on the campus and all work situations including seminars, bedside sessions, outpatient sessions and others
    - Respect and tolerance for all health care professionals, including peers, juniors and seniors
    - Appropriate conflict resolution & management skills

4. Teamwork

- Demonstrate constructive team-communication skills
- Facilitate collaborative group interaction as a team member to build strong teams demonstrating respect, tolerance and interdependence
- Support other team members to grow
- Demonstrate willingness to assume responsibility and leadership as needed

5. Research

- Conduct a research study individually or in a group by using appropriate
    - Selection of research question(s) and objectives
    - Research design and statistical methods to answer the research question
    - REU approval of the synopsis
- Demonstrate competence in academic writing by publishing research article(s) as a step towards resolving issues or concerns in their specialty
- Guide others in conducting research by advising about research methodology including study designs and statistical methods
- Demonstrate clear, focused & logical presentations of their research
- Interpret & use results of various research studies (critical appraisal)

6. Professionalism

- Demonstrate the highest level of personal integrity: honesty, punctuality, regularity, timely task completion
- Deal with all patients in a non-discriminatory, prejudice-free manner, demonstrating the same level of care for every human being irrespective of gender, age, ethnic background, culture, socioeconomic status & religion
- Establish a trusting relationship with patients, their relatives and care-givers
- Deal with all patients with honesty, empathy & compassion, putting patients' needs first (altruism)
- Facilitate transfer of information important for promotion of health, prevention and management of disease

- Encourage questioning by the patient and be receptive to feedback
- Pursue self-directed and life-long learning. Keep abreast of medical literature and assess new knowledge and apply it to resolve patient problems
- Know one's limitations and ask for help as needed from colleagues, consultations or referrals
- Apply quality assurance procedures for improvement in daily work
- Be a role model for others

Ethics
- Maintain patient autonomy by demonstrating shared-decision-making with the patient and/or family
- Obtain informed consent, maintain patient confidentiality and do no harm
- Provide cost-effective care while ordering investigations and in management and use resources appropriately

Leadership
- Demonstrate accountability for their decisions and actions, and that of their team
- Demonstrate willingness to assume leadership role(s) when needed in given situations or events (rush call/code)
- Change and bring about change as necessary, as a leader or supportive leader

7. Pedagogy
- Demonstrate effective teaching skills, including clinical and community-based teaching, using diverse strategies
- Apply theories regarding learning & education in teaching practices
- Practice effective teaching methods, including the use of technology and multimedia tools to enhance learning experiences
- Mentor junior colleagues and residents, providing guidance and support
- Provide constructive feedback to resident learners
- Participate in continuous professional development through workshops and courses

- Reflect on teaching experiences for personal growth and improvement
- Lead educational initiatives & foster an inclusive learning environment

8. Advocacy

Advocacy is needed at multiple levels.

- Advocacy for the Patient:
  - Act as advocates for patients to ensure they are not lost in the system
  - Deliver timely care, prioritizing the patient's needs first
- Advocacy for the Practice:
  - Highlight limitations & issues within the service or practice
  - Identify solutions to problems and recommend and implement improvements for the practice(s) and institutional system(s)
- Advocacy for the Health System and Society:
  - Describe one's role in the health system(s) & contribute to building strong referral systems
  - Prioritize patient and community interests above personal or professional interests
  - Advocate for the elimination of social determinants of ill health
  - Advocate for the prevention of serious illnesses within one's specialty/sub-specialty
- Advocacy for the Profession:
  - Strive to build public trust in the medical & dental profession
  - Demonstrate efforts to improve and enhance the profession, specialty, and sub-specialty
  - Serve as conscientious gatekeepers of one's profession, specialty, and sub-specialty

INTERMEDIATE MODULE

To ensure better training, CPSP decided to introduce Intermediate Module (IMM) Examination after completion of first two years of training in 2001. A beginning was made with major disciplines. This mid-training assessment is expected to strengthen the training programs by providing supervisors and residents a measure of progress made during the initial years. In case of failure in the Intermediate Module examination, the residents are permitted to continue their training in the chosen specialty but must pass the Intermediate Module examination prior to appearing in the final FCPS-II examination. Intermediate Module (IMM) training and examination has been made mandatory for the residents in all disciplines of Pathology who registered on or after 1st July 2016 for FCPS. Consequently, the students inducted in July 2016 are eligible to appear in first exam for IMM in 2018.

The IMM Pathology includes one-year training in the specific discipline of Pathology registered for by a resident, while the other year is dedicated for rotational training in other branches of Pathology. It is preferred that the residency program begins with six moths of training in the opted specialty, so that the resident can prepare and submit his/her synopsis of research as early as possible.

GENERAL REGULATIONS

Candidate will be admitted to the examination in the name (surname and other names) as given in the MBBS degree. CPSP will not entertain any application for change of name on the basis of marriage/divorce/deed.

ELIGIBILITY REQUIREMENTS FOR ENTERING THE INTERMEDIATE MODULE TRAINING PROGRAM IN PATHOLOGY

A student after passing FCPS Part-I in Pathology can register in fellowship program in any of the following branches of Pathology:

- Chemical Pathology
- Haematology
- Histopathology
- Immunology
- Microbiology
- Virology

APPROVED TRAINING CENTRES

Training must be undertaken in units/departments/institutions approved by the college. A current list of approved centres is available from the college and its regional offices as well as on the college website.

REGISTRATION AND SUPERVISION

All training must be supervised & residents are required to register with the RTMC & submit the name of their supervisor(s) by the date indicated on the registration form. The supervisor will normally be a fellow of the college.

RESEARCH

Vide notification numbers CPSP/Sec/2024/45 dated 15th March, 2024, F-1/Exam-24/CPS/3008-A dated 30th August, 2024, and CPSP/Sec/2024/454 dated 09th September, 2024.

- Residents inducted in the CPSP 1st fellowship programs from January 2025 and onwards, will be required to provide evidence of publication of one research paper in a CPSP approved journal, for appearing in final fellowship examination
- Synopsis duly approved by the supervisor must be submitted to the REU of CPSP before six (06) months of scheduled IMM examination
- Synopsis of the research paper must be approved by the Research & Evaluation Unit (REU) of CPSP before starting the research work
- The evidence of publication of one research paper in a CPSP approved journal must be submitted along with the final FCPS-II examination form

ROTATIONS

The recommended training schedule includes one year training in the chosen specialty and one year rotational training in following branches of Pathology as under:

- Histopathology 10 weeks
- Chemical Pathology 10 weeks
- Haematology 10 weeks
- Microbiology 10 weeks
- Blood Banking * 06 weeks
- Virology** 03 weeks
- Immunology** 03 weeks

**In the institutes where blood bank is part of Haematology Department, 6 weeks will be spent in blood bank section with dedicated training in transfusion techniques.*

***In institutes where Virology and Immunology are part of another major department, this training will be carried out in that particular department(s).*

****This time period also includes the internal assessment to be carried out by every department at the end of training period.*

Guidelines for Rotations

- Residents should obtain a certificate of completion of training from each department where rotational training is completed.
- Intermediate Module (IMM) consist of two years' training as under:
    - Rotational Training (One year): All residents in IMM shall rotate in all disciplines of Pathology, so that a proper structured educational programme can be implemented. The recommended training schedule is given on the previous page
    - Specialty Training (One year): This will be in the discipline which the resident has selected for his/her FCPS
- Order of Training: The rotational training does not necessarily require that it should be conducted in continuity. It may be completed any time in any order during the first two years depending on the circumstances of the institute and availability of the rotational slot. The plan given below is just a guideline which may be preferably followed:
    - First Six Months: Should be in own specialty, so that resident can prepare and submit his/her synopsis of research
    - Next One Year (52 weeks): Should be spent in rotational training as suggested above
    - Next Six Months: Once again in own specialty and then resident can appear in IMM and continue his/her training in the discipline of choice

MANDATORY WORKSHOPS / COURSE

It is mandatory for all residents to attend the following CPSP certified workshops/course during IMM:

1. Introduction to Computer and Internet
2. Research Methodology, Biostatistics and Article Writing
3. Skills for Communication, Orientation Professionalism & Ethics (SCoPE)
4. Basic Life Support (BLS) Course

Any other workshop/s as may be introduced by the CPSP.

NOTE: 1) The workshops are conducted by the Directorate of Medical Education and the candidates are advised to get registered online. The BLS course is conducted by the Advanced Skills Department (ASD) and the registration form is to be submitted with the ASD separately.
2) No candidate will be allowed to appear in IMM examination without attending the above mentioned workshops & BLS course.

E-LOGBOOK

The CPSP council has made e-logbook system mandatory for residents of all residency programs inducted from July 2011. Upon registration with RTMC each resident is allotted a registration number and a password to log on to the e-logbook on the CPSP website. The resident is required to enter all work performed and the academic activities undertaken in the logbook on daily basis. The concerned supervisor is required to verify the entries made by the resident. This system ensures timely entries by the resident and prompt verification by the supervisor. It also helps in monitoring the progress of residents and vigilance of supervisors.

TRAINING PROGRESSION

Training should incorporate the principle of gradually increasing responsibility, and provide each resident with a sufficient scope, volume and variety of experience.

INSTRUCTIONAL METHODOLOGY

Teaching occurs using several methods that range from formal didactic lectures to planned clinical and bench experiences. Aspects covered will include knowledge, skills and practices relevant to the discipline in order to achieve specific learning outcomes and competencies.

CURRICULUM: AIM, OBJECTIVES & COMPETENCIES

AIM

The aim of the fellowship programme in different disciplines of Pathology is to produce specialists in the field who have attained the required competencies.

OBJECTIVES

By the end of the residency programme, the resident will be able to:

- Obtain appropriate history to comprehend the presenting request for a pathological test
- Collect / receive patient specimens according to prescribed protocol
- Perform requested tests
- Interpret the results of tests and prepare reports to help clinicians make diagnoses
- Apply the requisite knowledge and skills to think critically and solve problems
- Be an effective team player, leading the team if necessary
- Communicate effectively with:
  - Patients and their attendants with empathy and compassion
  - Seniors, peers, juniors, learners and other health professionals
- Demonstrate risk analysis
- Ensure patient safety
- Manage emergencies related to the specialty
- Present well in multi-disciplinary team meetings, conferences, journal club meetings, CPCs, slide seminars, culture plates reporting rounds, data interpretation sessions, quality control meetings and hospital infection committees.
- Keep up to date and practice evidence based medicine
- Demonstrate putting patients first
- Demonstrate honesty, integrity and timeliness (punctuality and task completion)

- Maintain confidentiality, patient autonomy, take appropriate consent and do no harm
- Consults with colleagues and refer as necessary
- Demonstrates effective teaching skills
- Exhibit advocacy for their patients, practice (service/ department), profession (discipline/specialty) and population-based problems related to their specialty
- Participate in clinical governance and clinical audit
- Demonstrate research, and use of research in improving clinical practice
- Maintain highest standards of practice
- Demonstrate conflict resolution, management skills and leadership

CORE COMPETENCIES

The core competencies a resident is expected to acquire at the end of two years of training and before appearing in Intermediate Module Examination are aligned to the CPSP competency frame work mentioned earlier and include:

History Taking

- Understand the symptomatology and recognize alarm symptoms
- Take history in problem situations as when patient's language is different from resident's language or when confronted with confused and deaf patients.
- Formulate a differential diagnosis after analysis and synthesis of identified problems
- Recognize psychological and social issues developing due to disease or infirmity
- Show empathy with the patient

Patient Contact for a Pathological Procedure

- Take permission to examine and explain the procedure
- Elicit signs and use instruments with maximum care
- Comprehend the ethics of privacy and confidentiality and apply it for individual cases
- Recognize the role of and seek help of attendants/relatives where required

Medical Record Keeping

- Record accurately patient's history, examination, differential diagnosis, investigations and management plan
- Fill in all the required hospital record forms accurately
- Maintain records with dates and sign each entry
- Ensure that notes are accessible to all members of the team and patients /relatives (if required)
- Use latest technology for the benefit of patient e.g. fax, email etc.

Time Management

- Set priorities for tasks to be accomplished
- Plan line of action while keeping realistic expectations of tasks to be completed by self and others

Decision Making

- Analyze and synthesize clinical problems
- Recognize the role of and consult other members of the health care team
- Approach tasks with flexibility

Basic Life Support

- Examine and assess a collapsed patient
- Maintain adequate airway and perform effective cardiopulmonary resuscitation
- Control one's own emotions and enable others to keep calm

Communication Skills

- Use open ended questions for gaining information
- Communicate effectively with patients taking care of their level of understanding
- Encourage questions from the patients and their relatives
- Avoid technical terms
- Use interpreters where necessary
- Provide information to patients in simple and precise language
- Give due respect to patients and their relatives and share information when appropriate
- While counseling give choices and help the patient in decision making

- Show empathy and concern during breaking bad news
- Avoid conveying unrealistic optimism
- Discuss ethics, medical procedure & legal implications related to organ donation with the patient and their relatives when required

Life Long Learning
- Pursue professional development activities/ programs
- Understand the role of appraisal and of assessment
- Recognize and make full use of learning opportunities
- Make effort to learn from seniors, colleagues and others
- Demonstrate proficiency in the use of information technology

Practice Evidence Based Medicine
- Show competence in use of all sources of information e.g. databases as Medline, library and the internet
- Use evidence to support patient care effectively
- Critically evaluate medical evidence using principles of EBM and Evidence Based Laboratory Medicine (EBLM)

Clinical Audit Guidelines
- Recognize the relevance of audit to benefit patient care
- Participate in clinical audits
- Comprehend the problems & benefits of existing guidelines
- Use local guidelines where applied
- Take care of individual patient needs when using guidelines

Professionalism and Ethics
- Recognize the importance of Informed consent and practice it in a manner that the patient is able to understand it fully
- Respect the patient's right to confidentiality
- Maintain patient's confidentiality
- Use and share all information with the patient and their relatives as and where appropriate
- Show responsibility in maintaining continuity of care
- Ensure satisfactory completion of delegated tasks by the end of the shift/day with appropriate handover
- Display non discriminatory attitude towards all the patients

- Refrain from giving unnecessary personal comments
- Exercise care in managing inappropriate behaviour e.g. aggression, violence, sexual harassment in patients
- Recognize own limitations and accept constructive criticism
- Act as a responsible member of health care team

Patient Education
- Educate patients about disease, investigations, possible alternatives /choices, etc.
- Counsel patients, if needed

Disease Prevention
- Comprehend the Epidemiology and screening procedures for risk factors
- Provide support and advice on quitting the use of tobacco/ alcohol etc.
- Assess individual patient's risk factors
- Encourage participation in appropriate disease prevention or screening programs

Teaching and Training (Pedagogy)
- Communicate and share information with all members of health care team
- Adopt Learner-centered approach while teaching/training
- Demonstrate willingness, enthusiasm & patience to teach
- Seek feedback from peers as well as from juniors
- Make best use of all teaching opportunities
- Develop effective presentation skills
- Use effectively multiple audio-visual aids for presentation

Safe Management while on Call
- Recognize medical indications for urgent investigations and therapy
- Identify skills and competencies of other members of the 'on- call ' team
- Prioritize the tasks to be carried out
- Call for help and refer the case whenever required
- Effectively interact with other health care professionals
- Keep patients and relatives informed
- Hand over all the information to the proceeding team staff safely

ONE YEAR ROTATIONAL TRAINING

One year for rotational training in all branches of Pathology is reserved as under:

Specialty	Duration in weeks
Histopathology	10 weeks
Chemical Pathology	10 weeks
Haematology	10 weeks
Microbiology	10 weeks
Blood Banking	06 weeks
Virology	03 weeks
Immunology	03 weeks
Total	**52 weeks**

ROTATIONAL TRAINING IN CHEMICAL PATHOLOGY (10 WEEKS)

- Basic laboratory aspects and interpretation of:
    - Diabetes Mellitus and Hypoglycaemia
    - Electrolytes and Acid Base Disorders
    - Liver Function Tests
    - Renal Function Tests
    - Cardiac biomarkers
    - Lipid Disorders
    - Iron Disorders
    - Disorders of Bones
    - Thyroid Disorders
    - Adrenal Disorders
    - Pituitary Disorders
    - Tumour Markers
- Basic concepts of following topics:
    - Quality Control
    - Pre-analytical variables
    - Sample Collection
    - Instruments of routine use
    - Lab Safety
    - Optical Techniques
    - Electro-chemistry
    - Lab Automation

ROTATIONAL TRAINING IN MICROBIOLOGY (10 WEEKS)
General Microbiology

- Relate basic structure, morphology, growth and physiology of microorganisms with their:
  - Staining and biochemical properties
  - Classification & identification
  - Normal habitat and existence as normal flora and conditions in which it could be altered
  - Growth on different culture media and environmental conditions
  - Biochemical features used for identification of microorganisms
- Interpret and apply basic principles for commonly used tests and stains in microbiology for e.g:
  - Oxidase
  - Coagulase
  - Catalase
  - String test
  - Motility
  - Gram stain
  - India ink
  - Acid fast

Principles of Laboratory Bio-risk Management

- Laboratory biosafety
- Laboratory biosecurity

Principles of sterilization and disinfection

- Chemical methods
- Thermal methods
- Radiation

Principles of various preventive measures:

- Vaccination
- Chemoprophylaxis
- Isolation precautions

Antimicrobial agents:

- Classify major groups of antimicrobial agents with their:
  - Site of action
  - Bioavailability
  - Mode of administration
  - Common side effects

Systemic Microbiology:

- Describe common agents of community acquired infections according to age groups
- Relate pathogenesis (habitat, acquisition, virulence factors, risk factors) of common community acquired infections with their causative organisms
- Clinical presentations, laboratory diagnostic features and preventive measures of common community acquired infections
- Interpret CSF DR findings to differentiate between various etiologies of meningitis/encephalitis
- Correlate Urine DR findings with urine culture (pus cells/ red cells/cast/ leukocyte esterase)
- Differentiate between inflammatory and non-inflammatory diarrhea on the basis of stool DR findings
- Sputum, urine and blood sample collection for microbiological examination
- Differentiate between:
  - Gram positive and Gram negative bacteria,
  - Acid fast and non-acid fast organisms
  - Lactose fermenting and non-lactose fermenters
  - Various types of hemolysis on blood agar
  - Common enteric bacteria on selective stool media

ROTATIONAL TRAINING IN HISTOPATHOLOGY (10 WEEKS)

- Basic principles of specimen collection including autopsy specimen collection, DNA specimen collection
- Principles of Tissue fixation & understand the importance of proper tissue preservation as well as commonly used tissue fixatives
- Gross cutting (Observation: To handle Common Surgical pathology specimens including importance of slicing large specimens. Salient gross features to be noted as per recommended guidelines)

- Principles & procedure of Tissue processing with rationale.
- Special precautions for tissues to be sent for Electron Microscopy, Immunofluorescence etc)
- Principles and tissue types requiring 'Decalcification' along with commonly used agents
- Principles of Basic Molecular Biology Techniques & FISH testing for Her-2-neu/solid tumours
- Basic principles of Quality Control in Histopathology

- Basic Principles of Staining
  - Routine H & E staining
  - Common Special stains for demonstration of mucin, glycogen, liver, and renal battery (including PAS, PASD, PASAB+-D,Reticulin, Trichrome , GMS, Perl's)
  - Immunohistochemical staining

- Surgical Pathology
  - Important differentiating features of between benign and malignant neoplasms
  - Cancer epidemiology and role of 'Population based; Pathology based & Hospital based Cancer Registries
  - Staging and grading of tumours

- Frozen Section
  - Principles, Steps, indications and interpretation of frozen section (requirement from surgeon, liaison with surgeon, communication of report) and limitations of frozen section

- Cytology including FNA
  - Utility of cervical smears and need of population based cervical screening program
  - Indications and utility of FNA in Pathology practice

ROTATIONAL TRAINING IN HAEMATOLOGY (10 WEEKS)

During the 10-week rotational training in Haematology, following areas will be covered as prescribed under:

- Routine Haematology — 2 weeks
- RBC Disorders, Haemoglobin Studies and Benign WBC Disorders — 3 weeks

- Platelet and Coagulation Disorders 2 weeks
- Bone Marrow Pathology 3 weeks

Routine Haematology (2 weeks)

Demonstrate basic knowledge of:

- Haematopoiesis
- Structure, Function and Biosynthesis of Haemoglobin
- Haemostasis and Fibrinolysis
- Haematological Changes in Systemic Diseases (Anaemia of Chronic Disorders, Renal/Liver Failure, Bacterial/Viral Infections and Malaria)

Maintain following laboratory instruments with basic quality assurance:

- Centrifuge/Serofuge
- Water Bath
- Analytical Balance
- Adjustable Pipette
- Automated Haematology/Coagulation Analyzers
- Microscope
- Thermometer
- Spectrophotometer

Red Blood Cell Disorders, Haemoglobin Studies and Benign White Cell Disorders (3 weeks)

Demonstrate basic knowledge of aetiology, pathophysiology, clinical features, and laboratory investigations of:

- Iron Deficiency Anaemia
- Megaloblastic Anaemia
- Neutrophilia, Lymphocytosis, Eosinophilia, Monocytosis and Basophilia

Platelet and Coagulation Disorders (2 weeks)

Demonstrate basic knowledge of aetiology, pathophysiology, clinical features, and laboratory investigations of:

- Coagulation Disorders (Haemophilia A/B, Vitamin K Deficiency, Hemorrhagic Disease of Newborn, Liver Disease)
- Thrombophilia
- Platelet Disorders (Hereditary & Acquired Disorders of Platelet Function, Immune/Idiopathic Thrombocytopenic Purpura (ITP)

Bone Marrow Pathology (3 weeks)

Demonstrate basic knowledge of the aetiology, pathophysiology, clinical features and laboratory investigations of:

- Aplastic Anaemia
- Benign Disorders of White Blood Cells
- Acute Leukaemias
- Myeloproliferative Disorders
- Myelodysplasia
- Chronic Lymphocytic Leukaemia
- Plasma Cell Disorders

PROCEDURAL/PRACTICAL COMPETENCIES

The procedural/practical competencies to be acquired during the 10-week Rotational training in Haematology are prescribed below. The minimum level of competence to be achieved is specified in accordance with the following key:

1. Observer Status
2. Assistant Status
3. Performed Under Supervision
4. Performed Under Indirect Supervision
5. Performed Independently

Note: Levels 4 and 5 for practical purposes are almost synonymous.

COMPETENCIES	LEVEL	CASES
HAEMATOLOGY & COAGULATION		
PREPARE AND STAIN PERIPHERAL BLOOD FILM	3 5	10 20
• IDENTIFY ABNORMALITIES OF RED CELLS IN IRON, B12 AND FOLATE DEFICIENCY, THALASSEMIA, SICKLE CELL ANAEMIA, HAEMOLYTIC ANAEMIA • IDENTIFY WHITE CELLS ABNORMALITIES IN VIRAL INFECTIONS, ACUTE LEUKEMIA AND MYELOPROLIFERATIVE NEOPLASMS	3 5	10 20
PERFORM AND INTERPRET RETICULOCYTE COUNT WITH QUALITY CONTROL (QC)	3 5	10 20
PERFORM DIFFERENTIAL WHITE CELL COUNT	3 5	10 20
INTERPRET COMPLETE BLOOD COUNT (CBC) IN COMMON HAEMATOLOGICAL CASES	3 5	10 20
PERFORM AND INTERPRET PROTHROMBIN TIME (PT), ACTIVATED PARTIAL THROMBOPLASTIN TIME (APTT) AND THROMBIN TIME (TT)	3 5	10 20
PERFORM BONE MARROW ASPIRATION/TREPHINE BIOPSY	3 5	10 5

ROTATIONAL TRAINING IN TRANSFUSION MEDICINE (6 WEEKS)

During the 6-week rotational training in Transfusion Medicine, following areas will be covered as prescribed under:

- Collection and Processing of Blood 01 week
- Transfusion of Blood and Complications 01 week
- Immunohaematology 04 weeks

Collection and Processing of Blood (01 week):

- Demonstrate Basic Knowledge of:
  - Donor Interview and Deferral Criteria
  - Techniques & Utilization of Viral Screening Procedures for Blood Components
- Conduct Blood Donor Interview

Transfusion of Blood and Complications (01 week):

Demonstrate Basic Knowledge of:

- Indications of Blood Components and Transfusion Triggers for:
  - Red Cell Concentrates
  - Fresh Frozen Plasma
  - Cryoprecipitate
  - Single and Random Donor Platelets
- Adverse Effects of Blood Component Transfusion

Immunohaematology (04 weeks):

- Demonstrate Basic Knowledge of:
  - Biochemistry, Genetic Inheritance, Immunogenicity of Common Red Cell Antigens (ABO and Rh)
  - Factors Affecting in Vitro Antigen-Antibody Serological Testing
  - Indications, Reagents, and Methods of ABO/Rh Typing, Anti-Globulin Test and Hemolytic Disease of Newborn
  - Laboratory Tests Performed on Donated Blood (Blood Typing, Compatibility Testing and Red Cell Antibody Screening)
- Prepare Red Cell Suspensions
- Perform & Interpret ABO & D Typing by Tile & Tube Methods
- Perform and Interpret Cross Matching
- Perform and Interpret Direct Coomb's Test

PROCEDURAL/PRACTICAL COMPETENCIES

The procedural/practical competencies to be acquired during the 6-week Rotational training in Transfusion Medicine are prescribed below. The minimum level of competence to be achieved is specified in accordance with the following key:

1. Observer Status
2. Assistant Status
3. Performed Under Supervision
4. Performed Under Indirect Supervision
5. Performed Independently

Note: Levels 4 and 5 for practical purposes are almost synonymous.

COMPETENCIES	LEVEL	CASES
TRANSFUSION MEDICINE		
CONDUCT BLOOD DONOR INTERVIEW	5	30
OBSERVE COLLECTION OF BLOOD UNIT FROM BLOOD DONOR	1	5
	2	5
	3	5
OBSERVE PREPARATION OF BLOOD COMPONENTS	1	15
PREPARE 3-5% RED CELL SUSPENSIONS FOR BLOOD GROUPING	3	15
	5	15
PERFORM AND INTERPRET ABO AND D TYPING BY TILE AND TUBE METHODS	3	15
	5	15
PERFORM AND INTERPRET CROSS MATCHING	3	15
	5	15
PERFORM AND INTERPRET DIRECT COOMB'S TEST	3	15
	5	15

ROTATIONAL TRAINING IN IMMUNOLOGY (3 WEEKS)

- Apply and interpret the knowledge of following topics:
  - Innate Immunity: Cells and molecules, Killing mechanisms by phagocytes and NK cells
  - Complement system: activation pathways, function and regulation
  - Specific Immunity: T and B cells, Humoral Immune response, Cell mediated immune response, lymphocyte development
  - HLA antigen processing and presentation of peptides to T cells
  - Tolerance and Autoimmunity: overview
  - Immunodeficiency overview
  - Allergy/Hypersensitivity
  - Vasculitis (classification)
  - Result interpretation of following tests
- Develop skills for the interpretation of the results of immunological tests given below:
  - Complement proteins (C3 and C4)
  - Immunofluorescent assays (for autoanti body detection)
  - ELISA (for autoimmune markers)
  - Electrophoresis (for gammopathies)
  - Interpretation of serum immunoglobulin levels including IgG, IgM, IgA & total and allergen specific IgE
  - Cell separation, HLA typing and cross matching
  - Flowcytometry (for lymphocyte subset analysis)

ROTATIONAL TRAINING IN VIROLOGY (3 WEEKS)

First Week

- Basic Virology
  - Structure and Size of Viruses
  - A-typical Virus-Like Agents
  - Replication of Viruses
  - Host Defenses Against Viruses
  - Introduction to Antiviral Drugs
- Hepatitis-A Virus
  - Epidemiology, Pathogenesis, Mode of Transmission, Incubation Period and Laboratory Diagnosis

- Hepatitis-B and Hepatitis-C Viruses
    - Epidemiology, Pathogenesis, Mode of Transmission, Incubation Period, Laboratory Diagnosis and Complications
- Lab Techniques
    - Occupational Safety Guidelines
    - Biosafety and Biosecurity in Virology Lab
    - Sample Collection and Transport in Virology
    - Enzyme Linked Immunosorbant Assay (ELISA)
    - ELISA for Detection of HBsAg and Anti-HCV and its Interpretation

Second Week

- Hepatitis-E Virus
    - Epidemiology, Pathogenesis, Mode of Transmission, Incubation Period and Laboratory Diagnosis
- Human Immunodeficiency Virus
    - Epidemiology, Pathogenesis, Mode of Transmission
    - Laboratory Diagnosis and Confirmation of Diagnosis
- SARS-CoV-2
    - Sample Collection, Transmission, Pathogenesis and Laboratory Diagnosis
- Influenza Virus
    - Transmission, Pathogenesis and Laboratory Diagnosis
- Lab Techniques
    - ELISA for Anti-HIV and its Interpretation
    - Quality Control of ELISA in Virology Lab
    - Introduction to Chemiluminescence Based Assays

Third Week

- Dengue Virus
    - Clinical Features, Transmission, Laboratory Diagnosis and Complications of Dengue Virus Infection
- Crimean Congo Haemorrhagic Fever (CCHF)
    - Clinical Features, Transmission, Laboratory Diagnosis, Complications, Prophylaxis and Management
- Transfusion Transmitted Infections
- Lab Techniques
    - Management of Spillage in Virology Lab
    - Management of Needle Stick Injury
    - Introduction to Molecular Based Assays in Virology

PROCEDURAL/PRACTICAL COMPETENCIES

The procedural/practical competencies to be acquired during the 3 weeks Rotational training in Virology are prescribed below. The minimum level of competence to be achieved is specified in accordance with the following key:

1. Observer status
2. Assistant status
3. Performed under supervision
4. Performed under indirect supervision
5. Performed independently

Note: Levels 4 and 5 for practical purposes are almost synonymous.

COMPETENCIES	LEVEL	CASES
VIROLOGY		
MANAGEMENT OF NEEDLE STICK INJURY	5	4
HAND WASHING/HAND HYGIENE STEPS AS PER STANDARD (WHO/UNICEF) GUIDELINES	5	10
PERFORM:		
• STEPS OF DONNING AND DOFFING OF PERSONAL PROTECTIVE EQUIPMENT (PPE) AS PER STANDARD GUIDELINES	5	10
• TRIPLE LAYER PACKAGING	3	5
• TESTS BASED ON IMMUNOCHROMATOGRAPHY ASSAY (ICT)	4	5
• INDIRECT ELISA	3	5
• MAC ELISA	3	5
• COMPETITIVE ELISA	3	5
SPECIMEN COLLECTION	3	20
SPECIMEN TRANSPORT	3	20
SPILL MANAGEMENT	5	10

ONE YEAR TRAINING IN SELECTED SPECIALTY

CHEMICAL PATHOLOGY

Pathophysiology of Routine Chemical Pathology (Level-2) including following topics:

- Water and Electrolyte Disorders
  - Potassium Imbalance
  - Sodium Imbalance
  - Disorders of ADH
- Acid-based disorders
  - Bicarbonate Buffer System, Anion Gap Calculation and Compensatory Mechanism and Classification of Acid Base Disorders
  - Single Disorders
  - Double Disorders
  - Decoding Blood Gases Results
- Renal Dysfunction
  - Glomerular Function Tests
  - Tubular Function Tests
  - Acute Kidney Injury
  - Chronic Kidney Disease
- Carbohydrate Disorders
  - Diabetes Mellitus
    - Definition
    - Classification
    - Pathogenesis
    - Diagnostic Criteria
    - Complications
    - Gestational Diabetes Mellitus
  - Pre-Diabetes
  - Hypoglycaemia
- Lipid Disorders
  - Lipid metabolism
  - Familial Hypercholesterolaemia
  - Familial Combined Hyperlipidaemia
  - Hypertriglyceridaemia
  - Lipid Testing
- Disorders of Plasma Proteins
  - Amino Acids

    - Protein Synthesis
    - Acute Phase Reactants
    - Plasma Protein Testing
- Liver Functional Disorders
    - Acute and Chronic Hepatitits
    - Hyperbiilirubinaemias
    - Liver Cirrhosis
    - Non-Alcoholic Fatty Liver Disease
    - Liver Function Tests
- Disorders of Iron Metabolism
    - Iron Metabolism
    - Tests of Iron Deficiency and Iron Overload
    - Diagnosis of Haemachomatosis
- Disorders of Calcium, Vitamin D and Parathyroid Hormones
    - Hypercalcaemia
        - Hypercalcaemia of Malignancy
        - Primary Hyperparathyroidism
    - Hypocalcaemia
        - Vitamin D Deficiency
        - Secondary Hyperparathyroidism
        - Hypoparathyroidism
- Cardiac Biomarkers
    - Definition of Myocardial Infarction
    - Troponins
    - BNP
    - Myoglobin
- Disorders of Uric Acid Metabolism
    - Hyperuricaemia
    - Gout

Pathophysiology of Endocrinal Disorders (Level-2) including following topics:

- Disorders of Thyroid Function
    - Hypothyroidism (Overt and Sub-Clinical)
    - Hyperthyroidism (Overt and Sub-Clinical)
    - Non-thyroidal Illness syndrome
    - Gestational Hyperthyroidism
- Adrenal Disorders
    - Hypercortisolism
        - Cushing Syndrome
        - Cushing Disease

    - Hypoadrenalism
        - Addison Disease
        - Secondary Hypocortisolism
    - Pheochromocytoma
    - Congenital Adrenal Hyperplasia
    - Growth Disorders
        - Short Stature
        - Acromegaly
- Disorders of Reproductive Endocrinology
    - Polycystic Ovarian Syndrome
    - Primary Ovarian Insufficiency
    - Male Infertility
- Disorders of Sexual Development
    - Congenital Adrenal Disorders
    - Androgen Insensitivity Syndrome

Molecular Pathology
- Basic genetics
    - Structure of DNA and RNA
    - Transcription
    - Translation
    - Genetic Control
- Genetic Disorders
    - Single Gene Disorders
    - Chromosomal Disorders
    - Polygenetic Disorders
    - Disorders of Atypical Inheritance

Tumour Markers
- Characteristics of an Ideal Tumor Marker
- PSA
- Alfafetoprotein
- CEA
- CA-125

Paediatric Metabolic Disorders
- Phenylketonuria
- Urine Disease
- Urea Cycle Defects
- Galactosaemia

Analytical Techniques and Instrumentation (Level-2) including following topics:

- Optical Techniques
- Electrochemistry
- Electrophoresis
- Automated Analyzers

Methods of Common Analytes (Level-1) following topics:

- Glucose
- Urea
- Bilirubin
- ALT
- Alkaline Phosphatase
- Albumin
- Calcium
- Cholesterol
- Urea
- Creatinine

Lab Management including following topics:

- Quality Control
- Quality Assurance
- Evidence Based Laboratory Medicine
- Pre-analytical variables
- Sample Collection
- Lab Safety
- Inventory management

Communication skills with lab staff, patients, administration & vendors

FORMATIVE ASSESSMENT

College of Physicians and Surgeons Pakistan, in order to implement competency based education in letter and spirit, is introducing Work Placed Based Assessment (WPBA) in addition to institutional/ departmental assessments. To begin with, Direct Observation of Procedural Skills is being introduced in ***one year Chemical Pathology-specific Intermediate Module training*** to ensure that the graduates are fully equipped with the required competencies.

- DOPS is entirely formative tools of assessment and is to be accompanied with constructive feedback.
- DOPS encounter lasts approximately 20 minutes, with an additional 5 minutes allocated for feedback and further action planning
- The topics given below can be covered in any order however, each time focus should be on a different topic/ procedure ***(at least one DOPS is to be conducted in each quarter).***
- The resident has the onus to report to the supervisor when he/she is prepared to appear for DOPS.
- The parent supervisor is responsible for arranging WPBA sessions and may conduct the assessment themselves or delegate it to another competent faculty member or assessor within the department.
- Direct observation of the encounter by the assessor is a must, followed immediately by specific and constructive feedback to the resident.
- If the supervisor/assessor feels that the DOPS assessment of a particular procedure selected from the given list would take longer than the prescribed time of 20 minutes for the performance and assessment, then essential steps or parts of the procedure may be mutually agreed upon between the resident and assessor/supervisor, and the DOPS may be conducted accordingly.
- The prescribed assessment form (sample provided below) are available on the e-portals of both the parent supervisors and the residents. If the parent supervisor conducts the assessment, they are responsible for completing the form and making digital entries via their e-portal. Digital entries can be made directly via a mobile

phone or other digital device without the need to first fill out a hard copy. If the assessment is conducted by another assessor, the resident must retrieve the online form from their e-portal and provide it to the assessor. After completing the assessment, the assessor will coordinate with the parent supervisor and hand over the filled form for digital entry.

- Once the parent supervisor has entered the assessment details, the resident must provide their reflection and indicate their satisfaction with the encounter through their e-portal.
- Entries from both the supervisor and the resident are saved in the e-portal database and are visible to both parties.
- In case of unsatisfactory performance of the resident on any of the prescribed WPBAs, a remedial has to be completed within the stipulated time frame.
- Non-compliance by the resident has to be reported in the quarterly feedback.

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Direct Observation of Procedural Skills (DOPS)

Topics' List for DOPS

- Demonstrate use of Water Bath
- Demonstrate use of Centrifuges
- Demonstrate use of Adjustable Pipettes/ Adjusters
- Program and Record Absorbance on Micro Lab for following Analytes:
- Glucose
- Urea
- Bilirubin
- ALT
- Alkaline Phosphatase
- Albumin
- Calcium
- Cholesterol
- Creatinine
- Demonstrate use of ABG Analyzer
- Demonstrate use of ISE Analyzer

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

SPECIALTY: IMM PATHOLOGY (ONE YEAR SPECIALTY-SPECIFIC TRAINING IN CHEMICAL PATHOLOGY

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **RTMC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: ☐ Lab ☐ Procedure Room ☐ Blood Bank ☐ Other: _____

Diagnosis of Patient: _____ **Patient Age:** _____ **Sex:** _____

Clinical Area: _____

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Number of times procedure performed by Resident: _____

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	NOT OBSERVED / APPLICABLE	BELOW EXPECTATION		SATISFACTORY	ABOVE EXPECTATION	EXCELLENT
		1	2	3	4	5
DESCRIBES PRINCIPLES OF THE METHOD						
COMPLIANCE WITH LABORATORY DOCUMENTATION AND MANUALS						
COMPLETES ASSAY SUCCESSFULLY AND PRODUCES A VALID RESULT THAT IS ABLE TO BE REPORTED						
EXPLAINS THE QC PROCEDURES FOR THE METHOD, INCLUDING INTERNAL AND EXTERNAL QA						
IDENTIFIES ANOMALIES & RESOLVES UNCERTAINTIES FOR THE METHOD						
EXPLAINS MAINTENANCE AND TROUBLE-SHOOTING						
REQUIREMENTS FOR THE METHOD						
PRESENTATION SKILLS						
PROFESSIONALISM						
OVERALL ABILITY TO PERFORM PROCEDURE OR HANDLE INSTRUMENT						

Assessor's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Strengths	Suggestions for Improvement

Encounter to be repeated ☐ **YES** ☐ **NO**

_____

Signature

ONE YEAR TRAINING IN SELECTED SPECIALTY

MICROBIOLOGY

General Microbiology

- Relate basic structure, morphology, growth and physiology of microorganisms with their:
  - Staining and biochemical properties
  - Classification & identification
  - Normal habitat and existence as normal flora and conditions in which it could be altered
  - Growth on different culture media and environmental conditions
  - Biochemical features used for identification of microorganisms

Skills:

- Identify gram positive, Gram negative, acid fast and partial acid fast organisms under light microscope
- Oxidase test
- Coagulase test
- Catalase test
- String test (3%KOH) and result interpretation
- Conventional biochemical tests for common GNB and GPC and result interpretation
- Setting API 20E, 20NE
- Setting up anaerobic Jar
- Placement of Culture and identification media on their recommended environmental condition
- Differentiation of normal commensal from the pathogenic organisms
- Rejection criteria for commonly received specimens in Microbiology

Laboratory Biosafety, Sterilization and Disinfection:

- Identify common sources of safety hazards in diagnostic microbiology laboratory
- Relate types of biosafety level laboratories with the risk level of organisms

- Relate biological agents with their risk classification and requirement of personal protective equipment (PPE)
- Relate use of different biological safety cabinets with the risk level of organisms

Skills:
- Demonstrate safe handling & processing of microbiology specimen in clinical laboratory
- Demonstrate proper donning and doffing of PPE
- Demonstrate spill management
- Demonstrate appropriate discarding of sharp and other infectious material

Antimicrobial agents:
- Classify major groups of antimicrobial agents with their site of action, bioavailability, mode of administration and common side effects

Skills:
- Demonstrate standard Inoculum preparation (McFarland standard)
- Identify Zone of Inhibition measurement and MIC reading
- Interpret D-test, cefoxitin screening, pneumococcal susceptibility to penicillin by oxacillin disc

Systemic Microbiology:
Major Clinical Syndromes
- List significant agents of common community acquired infections according to various age groups
- Relate the pathogenesis (habitat, acquisition, virulence factors, risk factors) of common community acquired infections with their causative organisms (listed below under each heading), common clinical presentations, laboratory diagnostic features, antimicrobial therapy and preventive measures
- Principles of various preventative measures (vaccination, chemoprophylaxis, isolation precautions, hand hygiene, use of personal protective equipment) for infection prevention in community and hospitals

Community Acquired Meningitis and Encephalitis:

- Streptococcus pneumoniae
- Neisseria meningitides
- Haemophilus influenzae
- HSV -1
- Enterovirus
- Naegleria fowleri
- Mycobacterium tuberculosis
- Cryptococcus neoformans

Skills:

- Interpret CSF DR findings
- CSF Sample processing & media selection for culture
- Setting up direct susceptibility testing
- CSF Gram stain interpretation and susceptibility testing advice for meningeal pathogens
- Identification of Streptococcus pneumoniae, Neisseria meningitides, Haemophilus influenza
- Identify MTB, Cryptococcus and Naegleria on acid fast, India ink and wet mount respectively

Skin & Soft Tissue Infections

- Staphylococcus aureus
- Streptococcus pyogenes
- Pseudomonas aeruginosa
- Dermatophytes

Perform:

- Skin & soft tissue sample processing and media selection Identify colony morphology, select and interpret conventional biochemical tests for Staphylococci, Streptococci and Pseudomonas
- Lancefield grouping
- Scotch tape preparation for dermatophytes

Urogenital Infections
Knowledge:

- Enterobacteriaceae family
- Enterococcus spp
- Streptococcus agalactiae

- Neisseria gonorrhoeae
- HSV-2

Skills:
- Correlate Urine DR findings with Urine culture (presence or absence of pus cells/red cells/cast/leukocyte esterase)
- Sample processing and media selection for urine and genital specimens
- Gram stain reading and interpretation of urethral swab and High Vaginal Swab, Nugent scoring for Bacterial vaginosis and interpretation
- Urine culture colony count and interpretation according to different loop volume
- Colony identification of Enterobacteriaceae family, Enterococcus spp., Streptococcus agalactiae & Neisseria gonorrhoea
- Microscopic identification of RBC, WBC, Crystal and Cast

Gastrointestinal Infections
- Salmonella, Shigella, Campylobacter, Vibrio, Clostridium difficile and Rota virus
- Protozoa
  - Entamoeba histolytica
  - Giardia intestinalis
- Nematodes
  - Ascaris lumbricoides
  - Enterobius vermicularis
  - Hook Worm

Skills:
- Sample processing and media selection for GI specimens
- Perform iodine mount for rapid microscopic examination
- Differentiate inflammatory and non-inflammatory diarrhea on basis of stool DR findings
- Identification of common enteric bacteria on selective stool media
- Identify Entamoeba histolytica, Giardia intestinalis, Ascaris lumbricoides, Enterobius vermicularis
- Stool analysis by concentration method

Respiratory Tract Infections
Knowledge:

- BHS; A, C and G
- Streptococcus pneumoniae
- Hemophilus influenzae and parainfluenzae
- Moraxella catarrhalis
- Chlamydia trachomatis
- Mycoplasma pneumoniae
- Corynebacterium diphtheriae
- RSV and Influenza virus
- Mold (Aspergillus and mucoraceous molds)
- Mycobacterium tuberculosis
- Covid-19

Skills:

- Sample processing and media selection for respiratory specimens
- Acceptability criteria for respiratory specimens
- Identification tests & their interpretation for Streptococcus pneumoniae, Hemophilus spp, Moraxella spp
- Smear preparation, Kinyoun & fluorescent staining and Microscopic observation and interpretation
- Differentiate between septate and aseptate hyphae on 10% KOH and Gram stain
- Identify Culture media used for isolation MTB
- Interpret Xpert MTB report

Endovascular Infections, Sepsis and PUO
Knowledge:

- Streptococcus viridans, Coagulase negative Staphylococci and Candida species
- Identify common diagnostic modalities used for the management of endovascular infections, PUO and malaria (including rapid diagnostic tests for malaria) Principle of Continuous blood culture monitoring system

Skills:

- Process, Gram stain interpretation and media selection for positive blood culture
- Identify Candida on Gram stain and KOH

- Salmonella spp as agents of enteric fever
- Perform ICT malaria

Virology
- Relate structure & biochemical properties with viral classification
- Relate virus-cell interaction with the pathogenesis of the disease
- Classify common types of antiviral agents with their site of action
- Common spectrum of viruses covered by each group of antiviral agents
- Identify different components of immune system activation in response to viral diseases
- Relate role of host immune system with viral pathology (immunopathology)

Immunology
- Relate concepts of antigen-antibody specificity with the principles of serological assays commonly performed in microbiology laboratory
- Relate role of innate and acquired immune system in clinical manifestation of infectious diseases (role of biochemical mediators in disease manifestation)

Infectious Serology
- Principle of Serological testing methods (precipitation agglutination, Enzyme immunoassays etc)
- Principles of serological diagnosis of non-cultureable microorganisms Treponema pallidium, pneumocystis, HBV, HCV, HIV
- Interpretation of C. difficile and Rota virus serological tests
- Dengue serology and their result interpretation
- Result interpretation of Syphilis serology (RPR, TPHA,FTA)
- Result interpretation of HBV, HCV, HIV, CCHF, Chikungunya

PROCEDURAL/PRACTICAL COMPETENCIES

The procedural/practical competencies to be acquired during IMM training in Microbiology are prescribed below. The minimum level of competence to be achieved is specified in accordance with the following key:

1. Observer Status
2. Assistant Status
3. Performed Under Supervision
4. Performed Under Indirect Supervision
5. Performed Independently

Note: Levels 4 and 5 for practical purposes are almost synonymous.

COMPETENCIES	ONE YEAR TRAINING IN MICROBIOLOGY				
	FIRST 6 MONTHS		LAST 6 MONTHS		TOTAL NO. OF CASES
	LEVEL	CASES	LEVEL	CASES	
TAKE RELEVANT HISTORY FROM A CASE OF COMMUNITY ACQUIRED INFECTION	3	10	4/5	10	20
RECOMMEND AND INTERPRET INVESTIGATIONS FROM A CASE OF COMMUNITY ACQUIRED INFECTION	3	10	4/5	10	20
PERFORM AND INTERPRET CULTURE-BASED TESTS FOR THE DIAGNOSIS OF COMMUNITY ACQUIRED INFECTIONS	3	15	4/5	15	30
PERFORM AND INTERPRET ANTIMICROBIAL SUSCEPTIBILITY OF BACTERIA ISOLATED FROM COMMUNITY ACQUIRED INFECTIONS	3	15	4/5	15	30
PERFORM SEROLOGICAL TESTS FOR THE DIAGNOSIS OF COMMUNITY ACQUIRED INFECTIONS	3	10	4/5	10	20
RECOMMEND ANTIMICROBIALS FOR COMMUNITY ACQUIRED INFECTIONS	3	15	4/5	15	30
ADVICE ON INFECTION CONTROL PRECAUTIONS INCLUDING VACCINATION FOR COMMUNITY ACQUIRED INFECTIONS	3	10	4/5	10	20
TROUBLESHOOT ELEMENTS OF PRE-ANALYTIC, ANALYTIC, AND POST-ANALYTIC TESTING	2	5	3	5	10
WORK SAFELY IN LABORATORY AT APPROPRIATE CONTAINMENT LEVEL	3	5	4/5	5	10

FORMATIVE ASSESSMENT

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- DOPS is entirely formative tools of assessment and is to be accompanied with constructive feedback.
- DOPS encounter extends for about 20 minutes with 05 minutes for feedback & further action plan.
- The topics given below can be covered in any order however, each time focus should be on a different topic/ procedure ***(at least one DOPS is to be conducted in each quarter).***
- The resident has the onus to report to the supervisor when he/she is prepared to appear for DOPS.
- The parent supervisor is responsible for arranging WPBA sessions and may conduct the assessment themselves or delegate it to another competent faculty member or assessor within the department.
- Direct observation of the encounter by the assessor is a must, followed immediately by specific and constructive feedback to the resident.
- If the supervisor/assessor feels that the DOPS assessment of a particular procedure selected from the given list would take longer than the prescribed time of 20 minutes for the performance and assessment, then essential steps or parts of the procedure may be mutually agreed upon between the resident and assessor/supervisor, and the DOPS may be conducted accordingly.
- The prescribed assessment form (sample provided below) are available on the e-portals of both the parent supervisors and the residents. If the parent supervisor conducts the assessment, they are responsible for completing the form and making digital entries via their e-portal. Digital entries can be made directly via a mobile phone or other digital device without the need to first fill

out a hard copy. If the assessment is conducted by another assessor, the resident must retrieve the online form from their e-portal and provide it to the assessor. After completing the assessment, the assessor will coordinate with the parent supervisor and hand over the filled form for digital entry.

- Once the parent supervisor has entered the assessment details, the resident must provide their reflection and indicate their satisfaction with the encounter through their e-portal.
- Entries from both the supervisor and the resident are saved in the e-portal database and are visible to both parties.
- In case of unsatisfactory performance of the resident on any of the prescribed WPBAs, a remedial has to be completed within the stipulated time frame.
- Non-compliance by the resident has to be reported in the quarterly feedback.

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

Topics' List for DOPS

- Perform and interpret staining and microscopy to identify Gram positive, Gram negative, Acid-fast, Partial Acid-fast organisms, Fungi, Parasites in Community Acquired Infections
- Process clinical samples for culture-based diagnosis of Community Acquired Infections
- Perform & interpret cultures from sterile and non-sterile sites for detection of pathogens of Community Acquired Infections
- Perform biochemical testing from cultures to identify causative agents of Community Acquired Infections
- Perform and interpret antimicrobial susceptibility testing for causative agents of Community Acquired Infections
- Demonstrate proper use of PPE, appropriate discarding of sharp and other infectious material and handling spill
- Perform and interpret urine and stool DR
- Perform Lancefield grouping and serotyping of relevant community acquired pathogens
- Perform serological testing for Malaria, Syphilis, Dengue and Rheumatic Fever diagnosis

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

SPECIALTY: IMM PATHOLOGY (ONE YEAR MICROBIOLOGY-SPECIFIC TRAINING)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **RTMC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: ☐ O.T. ☐ Procedure Room ☐ Other: _____

Diagnosis of Patient: _____ **Patient Age:** _____ **Sex:** _____

Clinical Area: _____

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Number of times procedure performed by Resident: _____

Please grade the following areas on the given scale:	**Not Observed / Applicable**	**Below Expectations**		**Satisfactory**	**Above Expectation**	**Excellent**
		1	**2**	**3**	**4**	**5**
Describes principles of procedure						
Demonstrates preparation for the procedure						
Takes patient safety measures (identification checks, adheres to SOPs etc.)						
Observes health and safety requirements						
Technical ability and correct use of equipment						
Communication skills (written and/or verbal)						
Professionalism						
Seeks help where appropriate						
Overall ability to perform whole procedure						

Assessor's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Strengths	**Suggestions for Improvement**

Encounter to be repeated ☐ **YES** ☐ **NO**

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Signature

ONE YEAR TRAINING IN SELECTED SPECIALTY

HAEMATOLOGY

During the one-year training in Haematology, following areas will be covered as prescribed under:

- Routine Haematology & Quality Assurance 04 weeks
- RBC Disorders, Haemoglobin Studies & Benign White Cell Disorders 12 weeks
- Platelet and Coagulation Disorders 12 weeks
- Bone Marrow Pathology 14 weeks
- Transfusion Medicine 10 weeks

Learning Outcomes

Routine Haematology & Quality Assurance (4 weeks)
At the end of the prescribed period of training in Haematology during IMM, residents will be able to:

- Explain the basic principle of routine lab equipment and working of Hematology and Coagulation Analyzer along with the understanding of standards, controls & calibrators
- Explain the basic principle of Hemoglobin Electrophoresis, Chromatography, G6PD Screening Test, Sickling Test, Osmotic Fragility Tests
- Explain basic quality management system including quality assurance and quality control
- Interpret results of internal quality control along with CAPA (corrective/preventive actions)
- Explain pre and post- analytic errors

RBC Disorders, Haemoglobin Studies & Benign White Cell Disorders (12 weeks)
At the end of the prescribed period of training in Haematology during IMM, residents will be able to:

- Explain the aetiology, pathophysiology, and lab tests for Iron Deficiency Anaemia, Megaloblastic Anaemia, Anaemia of Chronic Diseases, Thalassemia, Sickle Cell Disease, Hereditary Spherocytosis, G6PD Deficiency, Immune Haemolytic Anemia & Macroangiopathic Haemolytic Anaemia

- Investigate Anaemia and its causes through correct laboratory tests
- Diagnose Hemoglobinopathy by selecting & interpreting Haemoglobin Electrophoresis and High-performance/high pressure liquid (HPLC) results
- Counsel a patient for Thalassemia/other Hemoglobinopathy in pre-marital couple or in Pregnancy

Platelet and Coagulation Disorders (12 weeks)
At the end of the prescribed period of training in Haematology during IMM, residents will be able to:

- Explain normal Haemostasis including Platelet structure and function, Clotting factors, Fibrinolysis and role of endothelium and natural anticoagulants
- Discuss inheritance, natural history, presentation, and complications of Congenital Coagulation Disorders including Haemophilia A, Haemophilia B & Von Willebrand Disease (vWD)
- Discuss the aetiology, pathogenesis, presentation, and lab diagnosis of commonly Acquired Coagulopathy like Disseminated Intravascular Coagulation, Vitamin K Deficiency
- Elicit history competently and perform examination of patient with a bleeding disorder presenting in laboratory for coagulation testing
- Order correct lab tests in patient with bleeding & interpret results of routine laboratory assays accurately (like PT, APTT, TT, mixing tests, etc)

Bone Marrow Pathology (14 weeks)
At the end of the prescribed period of training in Haematology during IMM, residents will be able to:

- Discuss aetiology, pathogenesis, presentation, and Bone Marrow Pathology of the following diseases:
    - Bone Marrow Failure Syndrome: Aplastic Anaemia, Paroxysmal Nocturnal Haemoglobinuria, Myelodysplastic Syndromes
    - Myeloproliferative Neoplasms: Chronic Myelogenous Leukaemia, Essential Thrombocythaemia, Polycythaemia Rubra Vera and Myelofibrosis

- Acute Leukemia: Acute Myeloid Leukaemia & Acute Lymphoblastic Leukaemia
- Plasma Cell Disorders: Multiple Myeloma
- Chronic Leukemia: Chronic Lymphocytic Leukaemia
- Correlate Bone Marrow morphology with other supplementary tests like Cytochemistry & Immunohistochemistry

Transfusion Medicine (10 weeks)

At the end of the prescribed period of training in Haematology during IMM, residents will be able to:

- Explain the basic physiology, inheritance, immunogenicity of ABO and RhD Blood Groups, other Red Cell, White Cell, Platelet Antigens and Red Cell Antibodies
- Describe ABO and RhD Blood Grouping Techniques in patients and Donors
- Demonstrate competency in performing and interpreting Blood Grouping, Cross-matching Techniques, Routine Serology such as Direct Anti-globulin Test
- Enumerate types of Donors & strategies to improve Donor recruitment
- Select the Blood Donor based on Donor interview with consideration for Donor safety and be able to defer Donor and manage Donor Complications
- Interpret the Blood Screening Tests for infections & counsel the Donor for infections
- Investigate and interpret a Transfusion Reaction including wrong Blood Transfusion

Syllabus

Routine Haematology & Quality Assurance

- Basic concepts of good Laboratory Practice, Biosafety, Infection Control and Management
- Principle, use and troubleshooting of basic lab equipment such as pipette, thermometer, centrifuge, water bath etc
- Principles and use of Automated Blood Counters including trouble shooting
- Principles of Routine/Special Staining of Peripheral Blood and Bone Marrow Aspirate Films

- Normal and abnormal Peripheral Blood Film findings and correlation with Complete Blood Count
- Indications, contraindications, technique of performing Bone Marrow Aspirate and Trephine Biopsies
- Principle & technique of lab tests used in the diagnosis of Thalassemia and other Haemoglobinopathies, Coagulation & Thrombophilia Tests
- Laboratory investigations of Haemolytic Disorders including Disorders of the Red Cell Membrane, Enzyme Disorders, Microangiopathic and Immune Haemolysis

RBC Disorders & Haemoglobin Studies

Anaemia

- Aetiology & pathophysiology of Iron Deficiency Anaemia, Megaloblastic Anaemia & Anaemia of Chronic Disease
- Haematological and biochemical techniques required for the investigation of Anaemia

Haemoglobinopathies

- Epidemiology, presentation & natural history of Thalassemia and Sickle Cell Syndromes
- Investigations for the diagnosis of Haemoglobin Disorders

Platelet & Coagulation Disorders

Platelet Disorders

- Platelet structure and function including Platelet & Vessel wall interaction
- Congenital and Acquired Qualitative Platelet Disorders
- Measurement of Platelet Counts by various methods

Congenital Coagulation Disorders

- Haemostasias, Coagulation Pathways and Fibrinolysis
- Inheritance, natural history, presentation & complications of Congenital Coagulation Disorders including Haemophilia A, Haemophilia B and Von Willebrand Disease
- Role of the clinical history in assessment of the bleeding patient
- Diagnostic methods and their interpretation in assessment of Coagulation Disorders

Acquired Bleeding Disorders

- Pathogenesis & mechanisms of Acquired Bleeding Disorders including Disseminated Intravascular Coagulation

Thrombosis

- Natural Anticoagulants & the Fibrinolytic Pathway
- Principles, limitations and Techniques for the measurement of Protein C, Protein S, Antithrombin, Activated Protein C Resistance & Lupus Anticoagulant

Bone Marrow Pathology

Myeloproliferative Neoplasms

- Pathophysiology and classification of Myeloproliferative Disorders
- Methods used in the assessment & diagnosis of Myeloproliferative Disorders

Acute Leukaemia

- Presentation, natural history, pathogenesis, and diagnosis of Acute Leukaemia in adults and children

Chronic Leukaemia

- Presentation, natural history, pathogenesis, and diagnosis of Chronic Leukaemia

Myeloma and other Plasma Cell Dyscrasias

- Presentation, natural history, pathogenesis, and diagnosis of Myeloma

Transfusion Medicine

- Principles of Immune System
- Blood grouping techniques in Patients and Donors
- Crossmatching Techniques
- Types of Donors, recruitment strategies, principles of Donor selection and the preparation of blood components including Apheresis products
- Donor and Patient Safety including Donor interview, Donor deferral, Donor complications and management of the complications.

- Preparation of blood components, including characteristics of components and fractionated products
- Donation/Donor testing for infections and interpretation of results in relation to clinical/serological course of the disease
- Roles of Quality Assurance systems in Blood Banking

PROCEDURAL/PRACTICAL COMPETENCIES

The procedural/practical competencies to be acquired during IMM training in Haematology are prescribed below. The minimum level of competence to be achieved is specified in accordance with the following key:

1. Observer status
2. Assistant status
3. Performed under supervision
4. Performed under indirect supervision
5. Performed independently

Note: Levels 4 and 5 for practical purposes are almost synonymous.

COMPETENCIES	LEVEL	CASES
HAEMATOLOGY AND COAGULATION		
PREPARE, STAIN, REVIEW PERIPHERAL FILM AND CORRELATE FINDINGS WITH CBC IN COMMON HEMATOLOGICAL DISORDERS	5	50
PERFORM RETICULOCYTE COUNT AND CORRELATE FINDINGS WITH CBC	5	50
PERFORM DIFFERENTIAL WHITE CELL COUNT AND INTERPRET FINDINGS	5	50
PREPARE, STAIN, AND INTERPRET THICK AND THIN FILM FOR MALARIAL PARASITE AND PERFORM PARASITE COUNT	5	50
INTERPRET HAEMOGLOBIN ELECTROPHORESIS/HPLC FINDINGS AND CORRELATE WITH CBC AND PERIPHERAL FILM TO DIAGNOSE HAEMOGLOBINOPATHY	5	50
INTERPRET DAILY QUALITY CONTROL OF HAEMATOLOGY/COAGULATION ANALYZERS	4	50
INTERPRET PROFICIENCY TESTING OF VARIOUS ROUTINE TESTS	4	50
PERFORM BONE MARROW ASPIRATE AND TREPHINE AND PREPARE TOUCH PREPS. PERFORM ROUTINE AND SPECIAL STAINING (IRON, PAS, SBB ETC.) ON ASPIRATE SAMPLES	5	50
REVIEW MARROW ASPIRATE, TOUCH PREP AND TREPHINE IN COMMON HEMATOLOGICAL DISORDERS LIKE LEUKEMIA, MDS, MPN, MARROW FAILURE, PLASMA CELL NEOPLASMS ETC.	3	50
PERFORM AND INTERPRET PT IN BLEEDING DISORDERS AND VKA MONITORING	5	50
PERFORM AND INTERPRET APTT IN BLEEDING DISORDERS AND HEPARIN MONITORING	5	50
PERFORM AND INTERPRET THROMBIN TIME	5	50
PERFORM AND INTERPRET D-DIMER/FIBRIN DEGRADATION PRODUCTS	5	50
ELICIT HISTORY FROM A PATIENT WITH BLEEDING DISORDER AND TAKE DECISION OF APPROPRIATE TEST ORDERS	5	50
PERFORM AND INTERPRET UREA CLOT LYSIS	4	20

COMPETENCIES	LEVEL	CASES
TRANSFUSION MEDICINE / BLOOD BANKING		
ELICIT PROPER HISTORY AND PERFORM APPROPRIATE PHYSICAL EXAMINATION OF POTENTIAL DONORS	5	50
PERFORM AND INTERPRET BLOOD GROUPING BY TILE AND TUBE METHOD	5	50
PREPARE RED CELL SUSPENSIONS FOR GROUPING AND SEROLOGY	5	50
PERFORM AND INTERPRET CROSSMATCH TEST	5	50
PERFORM AND INTERPRET ANTI-GLOBULIN TEST	5	50

FORMATIVE ASSESSMENT

College of Physicians and Surgeons Pakistan, in order to implement competency based education in letter and spirit, is introducing Work Placed Based Assessment (WPBA) in addition to institutional/ departmental assessments. To begin with, Mini Clinical Evaluation Exercise & Direct Observation of Procedural Skills are being introduced in ***one year Haematology–specific Intermediate Module training*** to ensure that the graduates are fully equipped with the required competencies.

- WPBA tools are entirely formative tools of assessment and are to be accompanied with constructive feedback.
- Each Mini-CEX/DOPS encounter extends for about 20 minutes with 05 minutes for feedback & further action plan.
- All of the following topics are to be covered as prescribed below.
- The resident has the onus to report to the supervisor when he/she is prepared to appear for either Mini-CEX or DOPS.
- The parent supervisor is responsible for arranging WPBA sessions and may conduct the assessment themselves or delegate it to another competent faculty member or assessor within the department.
- Direct observation of the encounter by the assessor is a must, followed immediately by specific and constructive feedback to the resident.
- If the supervisor/assessor feels that the DOPS assessment of a particular procedure selected from the given list would take longer than the prescribed time of 20 minutes for the performance and assessment, then essential steps or parts of the procedure may be mutually agreed upon between the resident and assessor/supervisor, and the DOPS may be conducted accordingly.
- The prescribed assessment form (sample provided below) are available on the e-portals of both the parent supervisors and the residents. If the parent supervisor conducts the assessment, they are responsible for completing the form and making digital entries via their e-portal. Digital entries can be made directly via a mobile phone or other digital device without the need to first fill out a hard copy. If the assessment is conducted by another assessor, the resident must retrieve the online form

from their e-portal and provide it to the assessor. After completing the assessment, the assessor will coordinate with the parent supervisor and hand over the filled form for digital entry.

- Once the parent supervisor has entered the assessment details, the resident must provide their reflection and indicate their satisfaction with the encounter through their e-portal.
- Entries from both the supervisor and the resident are saved in the e-portal database and are visible to both parties.
- In case of unsatisfactory performance of the resident on any of the prescribed WPBAs, a remedial has to be completed within the stipulated time frame.
- Non-compliance by the resident has to be reported in the quarterly feedback.

MINIMUM NUMBER OF WPBA ENCOUNTERS REQUIRED TO BE COMPLETED

IMM PATHOLOGY (HAEMATOLOGY-SPECIFIC TRAINING)	SECOND YEAR
MINI-CEX	ATLEAST 2
DOPS	ATLEAST 7

MINI CLINICAL EVALUATION EXERCISE (MINI-CEX)

Topics' List for Mini-CEX:

- Eliciting History and Performing Examination of a Patient with Bleeding Disorders
- Eliciting History, Performing Examination & Obtaining Informed Consent of a Patient prior to undergoing Bone Marrow Aspiration / Biopsy

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MINI CLINICAL EVALUATION EXERCISE (CEX)

SPECIALTY: IMM PATHOLOGY (ONE YEAR SPECIALTY-SPECIFIC TRAINING IN HAEMATOLOGY)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **R&RC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: ☐ Lab ☐ Blood Bank ☐ Others: _____

Diagnosis of Patient: _____ **Patient Age:** _____ **Sex:** _____

Clinical Area: _____

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Focus of Clinical Encounters: ☐ History taking ☐ Physical Examination ☐ Management

☐ Communication Skills ☐ Patient Monitoring ☐ Other: _____

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	NOT OBSERVED / APPLICABLE	BELOW EXPECTATION		SATISFACTORY	ABOVE EXPECTATION	EXCELLENT
		1	2	3	4	5
TAKES INFORMED CONSENT						
HISTORY TAKING SKILLS						
EXAMINATION SKILLS						
INTERPRETATION OF POSITIVE & SIGNIFICANT NEGATIVE FINDINGS						
USE OF CLINICAL JUDGEMENT TO DECIDE FOR FURTHER TESTS						
TIME MANAGEMENT (OBSERVES EFFICIENCY OF WORK PROGRESSION)						
COMMUNICATION SKILLS (INCLUDING INTERVIEWING SKILLS)						
SYSTEMATIC PROGRESSION						
JUSTIFICATION OF ACTIONS ORGANIZATION/EFFICIENCY DOCUMENTATION SKILLS (WRITES BRIEF NOTES FOR INFORMATION RECORDING)						
PROFESSIONALISM (INCLUDES MAINTENANCE OF PRIVACY, CONFIDENTIALITY)						
OVERALL COMPETENCE						

Assessor's Satisfaction with Mini-CEX:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with Mini-CEX:

(Low) 1 2 3 4 5 (High)

Strengths	Suggestions for Improvement

Encounter to be repeated ☐ **YES** ☐ **NO**

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Signature

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

Topics' List for DOPS

- Thick and Thin Smear for Malarial Parasite
- Prothrombin Time (PT) test
- Activated Partial Thromboplastin Time (aPTT) test
- Bone Marrow Aspiration / Biopsy
- Bone Marrow Smear Preparation and Routine Staining
- ABO-and D-typing by Tube
- Cross-matching

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DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

SPECIALTY: IMM PATHOLOGY (ONE YEAR SPECIALTY-SPECIFIC TRAINING IN HAEMATOLOGY)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **R&RC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: ☐ Lab ☐ Procedure Room ☐ Blood Bank ☐ Other: _____

Diagnosis of Patient: _____ **Patient Age:** _____ **Sex:** _____

Clinical Area: _____

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Number of times procedure performed by Resident: _____

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	NOT OBSERVED / APPLICABLE	BELOW EXPECTATION		SATISFACTORY	ABOVE EXPECTATION	EXCELLENT
		1	2	3	4	5
INDICATIONS & STEPS OF PROCEDURE [FOR BONE MARROW ASPIRATION/BIOPSY]						
PRE-PROCEDURE ORGANIZATION (CHECKING AVAILABILITY OF ALL NECESSARY MATERIAL [NEEDLES, SLIDES, XYLOCAINE ETC.]) [FOR BONE MARROW ASPIRATION/BIOPSY] PRE-ANALYTIC STEPS (APPROPRIATE LABELING OF						
TUBES, USING 2 IDENTIFIERS FOR PATIENT IDENTIFICATION, CHECKING EXPIRY OF REAGENTS, PROPER HANDLING OF RACKS AND REAGENTS, SETTING CORRECT TEMPERATURE OF WATER BATH AND LIGHT SOURCE)						
SETTING (KEEPS BENCH ORGANIZED & DISCIPLINED)						
TECHNICAL SKILLS (PERFORMS TEST AS PER SOPS AND THE GIVEN GUIDELINES; USE OF CORRECT STEP BY STEP TECHNIQUES)						
INTERPRETATION OF TEST RESULTS (INTERPRETS FINDINGS CORRECTLY AND CORRELATES WITH THE GIVEN CLINICAL SCENARIO)						
CLINICAL JUDGEMENT (RECOMMENDS FURTHER TESTS AND IS AWARE OF LIMITED RESOURCES)						
LABORATORY REPORT PREPARATION (REPORTS A LAB RESULT FOR A CLINICIAN ADEQUATELY)						
PROFESSIONALISM						
BIOSAFETY (OBSERVES PPE; DEMONSTRATES BIOSAFETY MEASURES AND SAFE WASTE DISPOSAL)						
COMMUNICATION SKILLS (COMMUNICATES RESULTS CLEARLY AND ARTICULATES WELL; DEBATES AND DISCUSSES ANY SIGNIFICANT FINDINGS)						
POST-PROCEDURE ORGANIZATION & INSTRUCTIONS [FOR BONE MARROW ASPIRATION/BIOPSY]						
OVERALL COMPETENCE						

Assessor's Satisfaction with DOPS: (Low) 1 2 3 4 5 (High)

Resident's Satisfaction with DOPS: (Low) 1 2 3 4 5 (High)

Strengths	Suggestions for Improvement

Encounter to be repeated ☐ **YES** ☐ **NO**

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Signature

GUIDELINES FOR PROCEDURE-SPECIFIC ASSESSMENT

Note: *The procedure-specific accepted techniques are given (below) as guidelines only; they may be modified as per SOPs of respective lab. Though the accepted techniques/steps given are those written in AABB technical manual but there may be changes for example, in speed of centrifuge or time of incubation etc. depending upon the size of centrifuge and potency of reagents used by the lab.*

PROTHROMBIN TIME TEST

ACCEPTED TECHNIQUES

- ADDS 0.1 ML OF TEST PLASMA/ CONTROL INTO RESPECTIVE LABELED TUBES
- INCUBATES AT 37^{O}C IN WATER BATH AND WAITS FOR 1-3 MIN
- ADDS 0.2 ML PRE-WARMED THROMBOPLASTIN IN EACH TUBE
- GENTLY MIXES TUBE CONTENTS AND START STOP-WATCH
- USES CORRECT TILT TECHNIQUE
- RECORDS END POINT IN SECONDS
- PERFORMS TEST IN DUPLICATE
- EXPRESSES RESULTS IN SECONDS AS A MEAN OF THE DUPLICATE READINGS

ABO TUBE METHOD

ACCEPTED TECHNIQUES

FORWARD ABO TYPING

- ADDS 1 DROP OF ANTI-SERA A/B IN THE RESPECTIVE LABELED TUBES
- ADDS 1 DROP OF 5% RBC SUSPENSION FROM TEST SAMPLE TO EACH TUBE

REVERSE ABO TYPING

- ADDS 2 DROPS OF SERUM/PLASMA IN THE RESPECTIVE LABELED TUBES
- ADDS 1 DROP OF 5% KNOWN A, B AND O RBC SUSPENSION TO RESPECTIVE TUBE

ALL TUBES

- GENTLY MIXES TUBE CONTENTS
- SPINS AT 3000 RPM FOR 30 SECONDS*
- RE-SUSPENDS CELL BUTTON
- EXAMINES FOR HEMOLYSIS /AGGLUTINATION AND GRADES AGGLUTINATION FROM 0-4

**PLEASE USE CENTRIFUGE SPEED AND TIME AS SPECIFIC TO YOUR CENTRIFUGE*

D-TYPING

ACCEPTED TECHNIQUES

D-TYPING
• ADDS 1 DROP OF ANTI-D TO ITS RESPECTIVE LABELED TUBES
• ADDS 1 DROP OF CONTROL REAGENT TO ITS RESPECTIVE LABELED TUBE
• ADDS 1 DROP OF 5% RBC SUSPENSION TO EACH TUBE
• GENTLY MIXES TUBE CONTENTS
• SPINS AT 3000 RPM FOR 30 SECONDS
• RE-SUSPENDS CELL BUTTON
• EXAMINES FOR HEMOLYSIS /AGGLUTINATION AND GRADES AGGLUTINATION FROM 0-4
• PROCEEDS FOR WEAK D IF D-NEGATIVE
WEAK D-TYPING
• INCUBATES 2 TUBES (TEST/CONTROL) AT 37^{O}C FOR 15-30 MINUTES
• GENTLY MIXES TUBE CONTENTS
• SPINS AT 3000 RPM FOR 30 SECONDS
• RE-SUSPENDS CELL BUTTON
• EXAMINES FOR HEMOLYSIS /AGGLUTINATION AND GRADES AGGLUTINATION FROM 0-4
• PROCEEDS WITH NEXT STEP, IF RESULTS ARE NEGATIVE
• WASHES RED CELLS 3X WITH 0.9% NACL
• DECANTS COMPLETELY
• ADDS ANTI-GLOBULIN REAGENT TO BOTH TUBES
• GENTLY MIXES TUBE CONTENTS
• SPINS AT 3000 RPM FOR 30 SECONDS
• RE-SUSPENDS RED CELL BUTTON
• GRADES AGGLUTINATION FROM 0-4
• ADDS IGG-COATED RED CELLS TO NEGATIVE TEST RESULTS
• CENTRIFUGES FOR 30 SECONDS AT 3000 RPM, RE-SUSPENDS AND READS

BONE MARROW ASPIRATION / BIOPSY

ACCEPTED TECHNIQUES

- DEMONSTRATES UNDERSTANDING OF THE INDICATIONS FOR THE PROCEDURE, AND AWARENESS REGARDING MARROW COLLECTION FOR FLOW CYTOMETRY, CYTOGENETICS, CULTURE ETC. IF REQUIRED FOR THE PATIENT
- 'TIME OUT' PERFORMED BEFORE THE PROCEDURE (CHECKING AVAILABILITY OF ALL NECESSARY MATERIAL [NEEDLES, SLIDES, XYLOCAINE ETC.])
- IDENTIFIES ANATOMIC BONY LANDMARKS CORRECTLY
- MAINTAINS ASEPTIC TECHNIQUE
- USES ADEQUATE LOCAL ANESTHESIA
- USES APPROPRIATE TECHNIQUE FOR ASPIRATE/BIOPSY
- PREPARES SMEAR OR OBTAINS ADEQUATE BIOPSY SAMPLE
- SAVES SAMPLE IN PROPER ANTICOAGULANT/FORMALIN AS PER REQUIREMENT
- COMMUNICATION SKILLS (USES CLEAR, UNDERSTANDABLE TERMS WITH THE PATIENT, USES RESPECTFUL LANGUAGE WITH THE PATIENT, ETC.)
- PROFESSIONALISM (RESPECTS PATIENT'S PRIVACY AND DIGNITY, IS COURTEOUS TO NURSING AND ALLIED HEALTH STAFF, ETC.)
- PROVIDES POST-PROCEDURE INSTRUCTIONS TO PATIENT AND STAFF
- UNDERSTANDS LOGISTICS OF SPECIMEN HANDLING, TRANSPORTATION TO LAB

ONE YEAR TRAINING IN SELECTED SPECIALTY

HISTOPATHOLOGY

Basic Techniques:

- Biopsy and large Specimen collection including cytology specimens
- Tissue fixation (principle & rationale, types & techniques)
- Gross cutting (Observation to handle common surgical pathology specimens including importance of slicing large specimens, Salient features to be described as per recommended guidelines)
- Tissue processing (principle, steps & rationale)
- Special precaution for tissue to be sent for (Frozen section, electron microscopy, special biopsies, immunofluorescence etc)
- Decalcification (Methods)
- Principles of Basic Molecular Biology Techniques, -PCR, NGS & FISH testing for HER2/common solid tumours, genetic alterations in common diseases and common solid tumour
- Specimen, slides and block storage protocols
- Staining
    - Hematoxylin & Eosin (H&E) principles and staining requirements
    - Special stains requirements and principles & common applications
    - Immuno-histochemical staining, Principles, technique and common applications

Surgical Pathology

- Develop an understanding of etiology, pathogenesis, clinical findings, histological features, immunohistochemical & molecular genetics profile with prognostic features of entities listed in various organ systems
- International reporting protocols, checklists, synoptic reporting of common resections including grading and TNM staging (Breast, Gastric, Colon, Prostate, Urinary Bladder, Uterus & Cervix)

Head & Neck

- Sino-nasal papilloma
- Common developmental anomalies like branchial cyst, oral dermoid cyst included
- Benign Salivary gland tumours (Pleomorphic adenoma, Warthin's Tumour)
- Oro-pharyngeal carcinoma and precursor lesions (immunohistochemistry, TNM staging, molecular genetics, prognosis)

Gastrointestinal Tract

- Esophagus
  - Esophagitis (Reflux/ Herpes / Candida)
  - Barrett's esophagus with dysplasia
  - Carcinoma esophagus (TNM staging, molecular genetics, prognosis)
- Stomach
  - Gastritis (Types)
  - H. Pylori infection/gastritis
  - Adenocarcinoma: Grading & Staging (subtypes, grading, immunohistochemistry, TNM staging, molecular genetics, prognosis)
- Small Intestine / Large Bowel:
  - Coeliac disease
  - Polyps (Types, classification)
  - Inflammatory bowel disease
  - Carcinoma colon (sub-types, grading, immunohistochemistry, TNM staging, molecular genetics, prognosis)
  - Common infective organism – giardiasis, amebiasis
- Appendix
  - Acute appendicitis
  - Infection / Infestation (identification of Enterobius)
  - Neuroendocrine tumors
- Rectum
  - Hirschsprung's disease
  - Solitary rectal ulcer
  - Rectal carcinoma (sub-types, grading, immunohistochemistry, TNM staging, molecular genetics, prognosis)

- Gall Bladder
  - Cholecystitis
  - Cholesterolsis
  - Carcinoma Gall Bladder (grading, immunohistochemistry, TNM staging, molecular genetics, prognosis)

Female Genital System

- Endometrium
  - Normal phases of menstrual cycle
  - Precise dating of endometrial biopsy
  - Acute & chronic endometritis
  - Polyp
  - Hyperplasia
  - Adenomyosis /endometriosis
  - Adenocarcinoma- Types
  - FIGO staging and Grading (grading, immunohistochemistry, TNM staging, molecular genetics, prognosis)
- Mesenchymal
  - Leiomyoma, Leiomyosarcoma
  - Stromal Tumors
- Cervix
  - Cervicitis, / Squamous metaplasia / Tunnel clusters / Nabothian cysts
  - Cervical intraepithelial squamous lesions/ CA in situ
  - Squamous cell carcinoma (grading, immunohistochemistry, TNM staging, molecular genetics, prognosis)
  - Adenocarcinoma
- Fallopian Tube
  - Acute and chronic Salpingitis
  - Ectopic tubal pregnancyy
- Ovary
  - Classification of ovarian tumours
- Products of Conception (POC)
  - Partial & complete hydatidiform mole (Pathogenesis, morphological features, IHC, Molecular alterations)

- Breast
  - Mastitis/Abscess
  - Duct ectasia
  - Common patterns of adenosis such as sclerosing adenosis
  - Fibroadenoma
  - Fibrocystic change
  - Lactational change
  - DCIS / LCIS (types and grading)
  - Invasive ductal and lobular carcinoma (sub-types, grading, TNM staging, immunohistochemistry, molecular genetics)

Male Genital System Including Urinary

- Prostate
  - BPH
  - Carcinoma prostate Acinar Adenocarcinoma only with Gleason Grading and group grade
- Bladder
  - Cystitis – all variants
  - Urothelial carcinoma (WHO grading & staging)

Thyroid

- Thyroiditis (types)
- Goiter
- Graves' Disease (Pathogenesis, morphology, laboratory diagnosis
- Follicular adenoma
- Thyroid Carcinoma (Papillary carcinoma & follicular carcinoma) with staging, molecular genetics and staging

Hematolymphoid System

- Non neoplastic lymphoid pathology
- Reactive lymphoid follicular hyperplasia
- Non neoplastic pathology for e.g. (Rosai Dorfman, Kikuchi's lymphadenitis) Chronic granulomatous
- Inflammation (Etiology and Differential diagnosis)
- Lymphoma classification - WHO

Respiratory System

- Bronchogenic carcinoma: Major Sub-types, prognosis, Molecular genetics

Soft Tissue

- Common benign soft tissue tumors like Lipoma, Leimyoma, Schwannoma, Neurofibroma etc

Frozen Section

- To have an insight of Principles, steps, and technique (block preparation and microtomy including cryostat temperature & mounting media) Steps, indications, limitations, and interpretation of frozen section technique, (requirement from surgeon, liaison with surgeon, conveying of report etc).
- Decontamination of the cryostat (procedure and artefacts)

Cytology Including FNA

- Adequacy of cervical smear, its role in cervical screening as well as diagnosing common infectious agents (negative for intraepithelial lesion (NILM) criteria, infectious agents (bacterial, viral, fungal & protozoal), atrophy (identification, cytologic mimics), endometrial cells (identification, reporting criteria)
- Principle of aspiration (FNAC) and exfoliative cytology
- Papanicolaou (PAP) stain, diff-quick (principles & staining requirements)
- Take appropriate history and clinical examination of the patients of FNAC
- Perform FNAC followed by smear preparation, smear preparation, fixation, and assessment of adequacy
- Cytology samples collection, preservation in proper fixative

Principles of Quality Management in Histopathology Including Preanalytical, Analytic & Post-Analytic Variables in:

- Specimen identification
- Specimen grossing and processing
- Routine, special and IHC staining
- Turnaround time

Communication Skills

- Should be able to develop rapport with laboratory staff
- Should be able to communicate effectively with other clinicians and contribute to multi-disciplinary teamwork
- Should be able to communicate with patients with empathy and respect

FORMATIVE ASSESSMENT

College of Physicians and Surgeons Pakistan, in order to implement competency based education in letter and spirit, is introducing Work Placed Based Assessment (WPBA) in addition to institutional/ departmental assessments. To begin with, Case-based Discussion and Direct Observation of Procedural Skills are being introduced in ***one year Histopathology-specific Intermediate Module training*** to ensure that the graduates are fully equipped with the required competencies.

- CBD is intended to test resident's higher order thinking & synthesis as it allows assessors to explore deeper understanding of how trainees compile, prioritise & apply knowledge. Meanwhile, DOPS is utilized to assess resident's performance on short procedures that have a maximum duration of 15 – 20 minutes
- WPBA tools are entirely formative tools of assessment and are to be accompanied with constructive feedback.
- Each CBD/ DOPS encounter extends for about 20 minutes with 05 minutes for feedback & further action plan.
- The topics given below are to be covered as per availability of cases, focusing each time on a different area/procedure/ topic ***(at least one CBD and one DOPS are to be conducted in each quarter).***
- The resident has the onus to report to the supervisor when he/she is prepared to appear for either CBD or DOPS.
- The parent supervisor is responsible for arranging WPBA sessions and may conduct the assessment themselves or delegate it to another competent faculty member or assessor within the department.
- Direct observation of the encounter by the assessor is a must, followed immediately by specific and constructive feedback to the resident.

- If the supervisor/assessor feels that the DOPS assessment of a particular procedure selected from the given list would take longer than the prescribed time of 20 minutes for the performance and assessment, then essential steps or parts of the procedure may be mutually agreed upon between the resident and assessor/supervisor, and the DOPS may be conducted accordingly.
- The prescribed assessment form (sample provided below) are available on the e-portals of both the parent supervisors and the residents. If the parent supervisor conducts the assessment, they are responsible for completing the form and making digital entries via their e-portal. Digital entries can be made directly via a mobile phone or other digital device without the need to first fill out a hard copy. If the assessment is conducted by another assessor, the resident must retrieve the online form from their e-portal and provide it to the assessor. After completing the assessment, the assessor will coordinate with the parent supervisor and hand over the filled form for digital entry.
- Once the parent supervisor has entered the assessment details, the resident must provide their reflection and indicate their satisfaction with the encounter through their e-portal.
- Entries from both the supervisor and the resident are saved in the e-portal database and are visible to both parties.
- In case of unsatisfactory performance of the resident on any of the prescribed WPBAs, a remedial has to be completed within the stipulated time frame.
- Non-compliance by the resident has to be reported in the quarterly feedback.

CASE BASED DISCUSSION (CBD)

Topics' List for CBD:

- Specimen Cutup
- Report writing of Biopsy:
    - Routine Report Writing
    - Complex cases with Ancillary Studies
    - Synoptic Reporting

- Histopathology Case Assessment
- Cytopathology Case Assessment/ Report Writing
- Frozen Section
- Discussion of Case Involving Divergent Diagnostic Opinions

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

CASE BASED DISCUSSION (CBD)

SPECIALTY: IMM PATHOLOGY (ONE YEAR SPECIALTY-SPECIFIC TRAINING IN HISTOPATHOLOGY)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **R&RC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Focus of Assessment:

Specimen Cutup ☐

Report Writing of Biopsy:

- Routine Report Writing ☐
- Complex Cases with Ancillary Studies ☐
- Synoptic Reporting ☐

Histopathology Case Assessment ☐

Cytopathology Case Assessment/ Report writing ☐

Frozen Section ☐

Discussion of Case Involving Divergent Diagnostic Opinions ☐

Other: _____ ☐

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	NOT OBSERVED / APPLICABLE	BELOW EXPECTATION		SATISFACTORY	ABOVE EXPECTATION	EXCELLENT
		1	2	3	4	5
UNDERSTANDS THEORY OF ENCOUNTER/EVENT						
APPLIES CLINICAL/PATHOLOGICAL KNOWLEDGE APPROPRIATELY						
APPLIES ESTABLISHED PROCEDURES (SOPS OR GUIDELINES)						
DEMONSTRATES APPROPRIATE COMMUNICATION SKILLS (VERBAL AND WRITTEN)						
MAINTAINS A PATIENT FOCUS AND DELIVERS PATIENT CENTERED CARE (E.G. RESPECT FOR PATIENT DIGNITY, CONSENT, CONFIDENTIALITY, TURNAROUND TIMES)						
PROFESSIONALISM (INCLUDING CONSIDERATION OF PROFESSIONAL ISSUES LIKE RECORD KEEPING, CONSULTATION WITH COLLEAGUES, LINKAGE OF DEPARTMENT TO OTHER)						
SEEKS HELP WHERE APPROPRIATE						
ADVICE TO CLINICAL USERS						
OVERALL COMPETENCE						

Assessor's Satisfaction with CBD:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with CBD:

(Low) 1 2 3 4 5 (High)

Strengths	Suggestions for Improvement

Encounter to be repeated ☐ **YES** ☐ **NO**

_____ **Signature of Assessor**

_____ **Signature of Resident**

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

Topics' List for DOPS

- Specimen Cutup (Grossing)
- Setup and use of Microscopy
- Systemic Assessment of Cytology/Biopsy
- Use of Camera & Specimen Photography
- Taking a Fine Needle Aspirate
- Reporting Procedure
- Handling & Reporting of Frozen Section

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

SPECIALTY: IMM PATHOLOGY (ONE YEAR SPECIALTY-SPECIFIC TRAINING IN HISTOPATHOLOGY)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **R&RC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: Other: _____

Tick the Category of Case for Assessment:

☐ Specimen cutup (grossing)
☐ Systemic assessment of cytology/biopsy
☐ Taking a fine needle aspirate
☐ Handling & reporting of frozen section
☐ Setup and use of Microscopy
☐ Use of camera & specimen photography
☐ Reporting procedure

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Number of times procedure performed by Resident: _____

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	NOT OBSERVED / APPLICABLE	BELOW EXPECTATION		SATISFACTORY	ABOVE EXPECTATION	EXCELLENT
		1	2	3	4	5
UNDERSTANDS BASIC PRINCIPLES OF PROCEDURE						
DEMONSTRATES APPROPRIATE PRE-PROCEDURE PREPARATION						
ENSURES PATIENT SAFETY (IDENTIFICATION CHECKS, ADHERES TO SOPs)						
COMPLIES WITH HEALTH & SAFETY REQUIREMENTS (E.G. ASSESSMENT OF RISK, USE OF PPE, ASEPTIC TECHNIQUES WHERE APPROPRIATE)						
TECHNICAL ABILITY & CORRECT USE OF EQUIPMENT						
COMMUNICATION SKILLS (WRITTEN &/OR VERBAL)						
PROFESSIONALISM (INCLUDING CONSIDERATION OF						
PATIENT FOCUS AND PROFESSIONAL ISSUES LIKE RESPECT FOR PATIENT DIGNITY AND CONSENT, COMPLIANCE WITH HUMAN TISSUE ACT)						
SEEKS HELP WHERE APPROPRIATE						
OVERALL ABILITY TO PERFORM PROCEDURE						

Assessor's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Strengths	Suggestions for Improvement

Encounter to be repeated ☐ **YES** ☐ **NO**

Signature of Assessor **Signature of Resident**

ONE YEAR TRAINING IN SELECTED SPECIALTY

IMMUNOLOGY

- Lab safety and good lab practice
- Innate immunity
- Specific immunity
- Antigens, antibodies and immune response
- HLA system
- Complement system
- Autoimmune disorders
- Immunodeficiency disorders
- Allergy/hypersensitivity
- Indications and sample requirements for immunology lab tests

Practical Skills (Perform)

- Agglutination procedures
- ELISA
- Observe/understand the principles of:
  - Immunofluorescence
- HLA typing (serology & DNA based)
- Skin prick test for allergy
- Flow cytometry
- Immunoelectrophoresis/
  - Immunofixation
- Microbead array procedures (Luminex)

Communication Skills

- Should be able to develop rapport with laboratory staff
- Should be able to communicate effectively with other clinicians and contribute to multi-disciplinary team work
- Should be able to communicate with patients with empathy and respect

FORMATIVE ASSESSMENT

College of Physicians and Surgeons Pakistan, in order to implement competency based education in letter and spirit, is introducing Work Placed Based Assessment (WPBA) in addition to institutional/ departmental assessments. To begin with, Mini Clinical and Laboratory Evaluation Exercise (Mini-CLEX) and Direct Observation of Procedural Skills (DOPS) are being introduced in ***One year Immunology-specific Intermediate Module training*** to ensure that the graduates are fully equipped with the required competencies.

- WPBA tools are entirely formative tools of assessment and are to be accompanied with constructive feedback.
- Each Mini-CLEX / DOPS encounter extends for about 20 minutes with 05 minutes for feedback & further action plan.
- The topics given below are to be covered as per availability of cases, focusing each time on a different area/procedure/ topic ***(at least one Mini-CLEX and one DOPS are to be conducted in each quarter).***
- The resident has the onus to report to the supervisor when he/she is prepared to appear for either Mini-CLEX or DOPS.
- The parent supervisor is responsible for arranging WPBA sessions and may conduct the assessment themselves or delegate it to another competent faculty member or assessor within the department.
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- If the supervisor/assessor feels that the DOPS assessment of a particular procedure selected from the given list would take longer than the prescribed time of 20 minutes for the performance and assessment, then essential steps or parts of the procedure may be mutually agreed upon between the resident and assessor/supervisor, and the DOPS may be conducted accordingly.
- The prescribed assessment form (sample provided below) are available on the e-portals of both the parent supervisors and the residents. If the parent supervisor conducts the assessment, they are responsible for completing the form and making digital entries via their e-portal. Digital entries can be made directly via a mobile

phone or other digital device without the need to first fill out a hard copy. If the assessment is conducted by another assessor, the resident must retrieve the online form from their e-portal and provide it to the assessor. After completing the assessment, the assessor will coordinate with the parent supervisor and hand over the filled form for digital entry.

- Once the parent supervisor has entered the assessment details, the resident must provide their reflection and indicate their satisfaction with the encounter through their e-portal.
- Entries from both the supervisor and the resident are saved in the e-portal database and are visible to both parties.
- In case of unsatisfactory performance of the resident on any of the prescribed WPBAs, a remedial has to be completed within the stipulated time frame.
- Non-compliance by the resident has to be reported in the quarterly feedback.

MINI CLINICAL AND LABORATORY EVALUATION EXERCISE (MINI-CLEX)

Topics' list for Mini-CLEX

*Mini-CLEX encounters will be arranged (by the Supervisor) to cover/assess skills essential to provision of good clinical care including History taking, Physical Examination, Laboratory Management, Communication skills & Patient Monitoring.

- Immunodeficiency Diseases
- Allergy & Urticaria
- Autoimmune Diseases
- Transplant
- Paraproteins and Related Disorders
- Immunotherapy and its Monitoring

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

MINI CLINICAL AND LABORATORY EVALUATION EXERCISE (MINI-CLEX)

SPECIALTY: IMM PATHOLOGY (ONE YEAR SPECIALTY-SPECIFIC TRAINING IN IMMUNOLOGY)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **RTMC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: ☐ Clinics ☐ Ward/Daycare ☐ Outdoor(Hospital/Community) ☐ Immunology Laboratory ☐ Others: ____

Diagnosis of Patient: _____ **Patient Age:** _____ **Sex:** _____

Clinical Area: _____

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Focus of Clinical Encounters: ☐ History taking ☐ Physical Examination ☐ Management

☐ Communication Skills ☐ Patient Monitoring ☐ Other: _____

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	NOT OBSERVED / APPLICABLE	BELOW EXPECTATION		SATISFACTORY	ABOVE EXPECTATION	EXCELLENT
		1	2	3	4	5
INFORMED CONSENT OF PATIENT WHERE REQUIRED						
INTERVIEWING SKILLS/ORGANISATION ON LABORATORY BENCH						
SYSTEMATIC PROGRESSION						
PRESENTATION OF POSITIVE & SIGNIFICANT NEGATIVE FINDINGS (INTERPRETATION)						
JUSTIFICATION OF ACTIONS						
PROFESSIONALISM						
ORGANIZATION/EFFICIENCY						
DOCUMENTATION SKILLS						
OVERALL CLINICAL/ LABORATORY COMPETENCE						

Assessor's Satisfaction with Mini-CLEX:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with Mini-CLEX:

(Low) 1 2 3 4 5 (High)

Strengths	Suggestions for Improvement

Encounter to be repeated ☐ **YES** ☐ **NO**

_____

Signature

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

Topics' list for DOPS

- Latex Agglutination Test , Immunochromatography and Variations/Modifications
- Enzyme-linked Immunosorbent Assay and the Variations/ Modifications
- Immunofluorescence Assays
- Immunoblot Assay
- Protein Electrophoresis Techniques and their Variations/ Modifications
- Immunonephlometry/Immunoturbidimetry
- Cryoglobulin Detection Assay
- Flow Cytometry and Luminex Technology-based Assays

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

SPECIALTY: IMM PATHOLOGY (ONE YEAR SPECIALTY-SPECIFIC TRAINING IN IMMUNOLOGY)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **RTMC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: ☐ O.T. ☐ Procedure Room Other: _____

Diagnosis of Patient: _____ **Patient Age:** _____ **Sex:** _____

Clinical Area: _____

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Number of times procedure performed by Resident: _____

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	NOT OBSERVED / APPLICABLE	BELOW EXPECTATION		SATISFACTORY	ABOVE EXPECTATION	EXCELLENT
		1	2	3	4	5
UNDERSTANDING OF BASIC CONCEPTS, PRACTICAL APPLICATION AND INTERPRETATION						
ORGANISATION OF PRACTICAL WORK AND TIME MANAGEMENT						
PREPARATION FOR PROCEDURE						
COMPREHENSION OF AVAILABLE RESOURCES IN THE LABORATORY						
OBSERVANCE OF LABORATORY SAFETY						
SAFE USE OF INSTRUMENTS						
USE OF ACCEPTED TECHNIQUES						
MANAGEMENT OF UNEXPECTED EVENT (OR SEEKS HELP)						
POST-PROCEDURE INSTRUCTIONS TO THE LABORATORY STAFF						
DOCUMENTATION SKILLS						
OVERALL ABILITY TO PERFORM WHOLE PROCEDURE						

Assessor's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Strengths	Suggestions for Improvement

Encounter to be repeated ☐ **YES** ☐ **NO**

_____

Signature

ONE YEAR TRAINING IN SELECTED SPECIALTY

VIROLOGY

Basic Virology

- Structure of Virus
- International Committee on Taxonomy of Viruses Criteria used for Virus Classification using the terms orders, Families, Subfamilies, Genera and Species
- Baltimore Classification of Viruses
- Viral Replication
- Viral Tropism
- Routes of Viral Transmission
- Atypical Virus Like Agents
- Viral Pathogenesis
- Viral Immunity
- Immune Response to Infection and the Role of Innate and Adaptive Immunity, Principles of Active & Passive Immunization and Virus Strategies to evade Host Immune Responses
- Viral Epidemiology
- Disease Control and Prevention
- Steps involved in Recognizing, Investigating & Controlling Outbreaks of Infections
- Basis of Different types of Host Parasite Relationships, e.g. the Importance and Evolution of Normal Flora, Viral Latency and Quasi Species Evolution

General Virology

- Sterilization & Disinfection
- Standard Precautions
- Contact Precautions
- Droplet Precautions
- Airborne Precautions
- Hospital Waste Management
- Transfusion Transmitted Viruses
- Risk Groups of Pathogens
- Risk Assessment for dealing with Category 3 and 4 Pathogens and the requirements for handling of such pathogens

- Biosafety Levels
- Biosafety Cabinets
- Management of Biological Spill
- Viral Vaccines and their use in Childhood Vaccination, campaigns for eradication and international travels
- The technology of vaccine production and the advantages and disadvantages of various types of vaccines, e.g. Live Attenuated, Inactivated, Recombinant, DNA Vaccines, e.g. Derived, Cell Culture Derived, Transgenic Vaccines
- Testing for Immunity pre- and post-vaccination, the methods available for measuring this and their limitations
- Ring Vaccination in outbreak control
- Importance of keeping concise, accurate, confidential, and legible records of laboratory investigations
- Use of viruses as vaccine vectors
- Correct sample type, volume and optimal conditions for storage & transport that are required for the individual test
- Repertoire of investigations available for a given clinical scenario, and their merits and limitations

Clinical Virology
- Hepatitis Viruses
- Human Immunodeficiency Virus
- Measles
- Mumps
- Rubella
- Varicella
- Influenza

Basic Microbiology
- Structure of Bacteria
- Growth of Bacteria
- Mechanisms of DNA transfer between Bacterial Cells
- Classification of Medically Important Bacteria
- Concept of Normal Flora
- Mechanism of Action of Common Antimicrobial Drugs
- Antimicrobial Resistance
- Bacterial Vaccines
- Surface/Air Sampling of High Risk Areas (Operation Theaters, Surgical ICU, Medical ICU, NICU & Labor Room)

Clinical Microbiology

- Gram Positive Cocci
- Gram Negative Cocci
- Gram Positive Rods
- Gram Negative Rods
- Mycobacteria
- Mycoplasma
- Treponema Pallidum
- Chlamydiae
- Rickettsiae

Techniques

- Enzyme Linked Immunosorbent Assay (ELISA)
- Types of ELISA
- Quality Control ELISA
- Chemiluminescence Based Assays
- Gram Staining
- Ziel-Neelsen Staining
- Specimen Dealing (Pus, Urine, Stool and Blood)
- Biochemical Tests (Catalase, Coagulase, Analytical Profile Index, etc)
- Common Agar and Media
- Bacteriological Growth Media Preparation

Lab Management

- Organization of Virology Lab
- Administration
- Allocation of Lab Space
- Engineering Controls
- Management of Resources
    - Personal
    - Equipment
    - Monetary
- Equipment Log Book
- Safety Procedures

FORMATIVE ASSESSMENT

College of Physicians and Surgeons Pakistan, in order to implement competency based education in letter and spirit, is introducing Work Placed Based Assessment (WPBA) in addition to institutional/ departmental assessments. To begin with, Mini Clinical Evaluation Exercise and Direct Observation of Procedural Skills are being introduced in ***one year Virology –specific Intermediate Module training*** to ensure that the graduates are fully equipped with the required competencies.

- Workplace-Based Assessment (WPBA) tools are entirely formative and should be accompanied by constructive feedback.
- Each Mini Clinical Evaluation Exercise (Mini-CEX) or Direct Observation of Procedural Skills (DOPS) encounter lasts approximately 20 minutes, with an additional 5 minutes allocated for feedback and further action planning.
- The topics given below are to be covered as per availability of cases, focusing each time on a different area/procedure/ topic ***(at least one Mini-CEX and one DOPS are to be conducted in each quarter).***
- The resident has the onus to report to the supervisor when he/she is prepared to appear for either Mini-CEX or DOPS.
- The Parent Supervisor is responsible for arranging WPBA sessions and may conduct the assessment themselves or delegate it to another competent faculty member or assessor within the department.
- Direct observation of the encounter by the Assessor is a must, followed immediately by specific and constructive feedback to the resident.
- The prescribed assessment forms (sample provided below) are available on the e-portals of both the Parent Supervisors and the residents. If the Parent Supervisor conducts the assessment, they are responsible for completing the form and making digital entries via their e-portal. Digital entries can be made directly via a mobile phone or other digital device without the need to first fill out a hard copy. If the assessment is conducted by another assessor, the resident must retrieve the online form from their e-portal and provide it to the assessor. After completing the assessment, the assessor will coordinate

with the Parent Supervisor and hand over the filled form for digital entry.

- Once the Parent Supervisor has entered the assessment details, the resident must provide their reflection and indicate their satisfaction with the encounter through their e-portal.
- Entries from both the supervisor and the resident are saved in the e-portal database and are visible to both parties.
- In case of unsatisfactory performance of the resident on any of the prescribed WPBAs, a remedial has to be completed within the stipulated time frame.
- Non-compliance by the resident has to be reported in the quarterly feedback.

MINI CLINICAL EVALUATION EXERCISE (CEX)

Topics' List for Mini-CEX:

- Breaking Bad News to Human Immunodeficiency Virus (HIV) positive Patient
- Counselling the Patient on managing needle stick injuries from a source infected with:
  - Hepatitis-B Virus
  - Hepatitis-C Virus
  - Human Immunodeficiency Virus (HIV)
- Assessment of Exposure on History, Examination of Wound and Post-exposure Prophylaxis Management of Rabies
- Patient Education on Disease Transmission and Prevention of Hepatitis-A and Hepatitis-E
- Clinical Diagnosis of a Rash on the Basis of History and General Physical Examination

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

MINI CLINICAL EVALUATION EXERCISE (CEX)

SPECIALTY: IMM PATHOLOGY (ONE YEAR VIROLOGY SPECIFIC TRAINING)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

PLEASE COMPLETE THE QUESTIONNAIRE BY FILLING/CHECKING APPROPRIATE BOXES

Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **RTMC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: ☐ Lab ☐ Blood Bank ☐ Others: _____

Diagnosis of Patient: _____ **Patient Age:** _____ **Sex:** _____

Clinical Area: _____

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Focus of Clinical Encounters: ☐ History taking ☐ Physical Examination ☐ Management

☐ Communication Skills ☐ Patient Monitoring ☐ Other: _____

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	NOT OBSERVED / APPLICABLE	BELOW EXPECTATION		SATISFACTORY	ABOVE EXPECTATION	EXCELLENT
		1	2	3	4	5
INTRODUCTION WITH THE PATIENT						
INFORMED CONSENT						
HISTORY TAKING SKILLS (INCLUDING INTERVIEWING SKILLS)						
EXAMINATION SKILLS						
PRESENTATION OF POSITIVE & SIGNIFICANT NEGATIVE FINDINGS						
CRITICAL THINKING						
COMMUNICATION SKILLS						
COUNSELLING/TECHNICAL ADVICE TO THE PATIENT						
SYSTEMATIC PROGRESSION						
JUSTIFICATION OF ACTIONS						
ORGANIZATION / EFFICIENCY						
ADHERENCE TO ETHICAL PRACTICES						
PROFESSIONALISM						
OVERALL CLINICAL COMPETENCE						

Assessor's Satisfaction with Mini-CEX:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with Mini-CEX:

(Low) 1 2 3 4 5 (High)

Strengths	Suggestions for Improvement

Encounter to be repeated ☐ **YES** ☐ **NO**

_____

Signature

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)
Topics' List for DOPS

- Proform:
  - Steps of Hand Washing as per standard (WHO/Unicef) guidelines
  - Steps of Donning and Doffing of PPE as per standard guidelines
  - Triple Layer Packaging
  - Tests based on Immunochromatography Assay (ICT)
  - Tests based on Chemiluminescence Immunoassay
  - Indirect ELISA
  - Sandwich ELISA
  - MAC ELISA
  - Competitive ELISA
  - Confirmatory Serological Assay for HCV
  - Confirmatory Serological Assay for HIV
- Biological Spill Management in Laboratory
- Nasopharyngeal Swab Specimen Collection

COLLEGE OF PHYSICIANS AND SURGEONS PAKISTAN

DIRECT OBSERVATION OF PROCEDURAL SKILLS (DOPS)

SPECIALTY: IMM PATHOLOGY (ONE YEAR VIROLOGY SPECIFIC TRAINING)

TIME DURATION = 20 MINS (15 MINS ASSESSMENT AND 5 MINS FEEDBACK)

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Assessor: _____ **Assessment Date:** _____

Resident`s Name: _____

Hospital Name: _____ **RTMC Number:** _____

Year of Residency: ☐ R2

Quarter: ☐ 1st ☐ 2nd ☐ 3rd ☐ 4th

Setting: ☐ O.T. ☐ Procedure Room ☐ Other: _____

Diagnosis of Patient: _____ **Patient Age:** _____ **Sex:** _____

Clinical Area: _____

Complexity of Case/ Procedure: ☐ Low/Easy ☐ Moderate/Average ☐ High/Difficult ☐ N/A

Number of times procedure performed by Resident: _____

PLEASE GRADE THE FOLLOWING AREAS ON THE GIVEN SCALE:	**NOT OBSERVED / APPLICABLE**	**BELOW EXPECTATION**		**SATISFACTORY**	**ABOVE EXPECTATION**	**EXCELLENT**
		1	**2**	**3**	**4**	**5**
INDICATIONS AND STEPS OF PROCEDURE						
DEMONSTRATES UNDERSTANDING OF THE SCIENTIFIC PRINCIPLE OF THE TEST/PROCEDURE						
PRE-PROCEDURE /TEST PREPARATION						
COMPLIES WITH HEALTH & SAFETY REQUIREMENTS						
USE OF ACCEPTED TECHNIQUES						
INTERPRETATION AND REPORTING OF PROCEDURE/ TEST RESULTS						
TECHNICAL EXPERTISE AND CORRECT USE OF EQUIPMENT						
QUALITY CONTROL						
USE OF MAINTENANCE & TROUBLE SHOOTING SKILLS						
PROFESSIONALISM						
OVERALL ABILITY TO PERFORM WHOLE PROCEDURE						

Assessor's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Resident's Satisfaction with DOPS:

(Low) 1 2 3 4 5 (High)

Strengths	**Suggestions for Improvement**

Encounter to be repeated ☐ **YES** ☐ **NO**

_____

Signature

SUMMATIVE ASSESSMENT

Eligibility requirements for appearing in Intermediate Module examination a candidate should have:

- Passed FCPS Part-I in Pathology or granted exemption
- Registered with the Research & Training Monitoring Cell (RTMC)
- Completed two years of training under an approved supervisor in an institution recognized by CPSP. A certificate of completion of training must be submitted
- Completed entries in e-logbook along with validation by the supervisor
- Completed CPSP mandated workplace based assessment
- Submitted certificates of attendance of mandatory workshops
- Submitted synopsis for one research paper

EXAMINATION SCHEDULE

- The Intermediate Module theory examination will be held twice a year.
- Theory examinations are held in various cities of the country usually at Abbottabad, Bahawalpur, Faisalabad, Hyderabad, Islamabad, Karachi, Lahore, Larkana, Nawabshah, Multan, Peshawar, Quetta and Rawalpindi centers. The College shall decide where to hold TOACS examination depending upon the number of candidates in a city and shall inform the candidates accordingly.
- English is the medium of all examinations i.e. theory and TOACS.
- The College will notify of any change in the centers, the dates and format of the examination.
- A competent authority appointed by the College has the power to debar any candidate from any examination if it is satisfied that such a candidate is not a suitable person to take the College examination because of using unfair means in the examination, misconduct or other disciplinary reasons.

EXAMINATION FEES

- Fee deposited for a particular examination shall not be carried over to the next examination in case of withdrawal, absence or exclusion.
- Applications along with the prescribed examination fee and required documents must be submitted by the last date notified for this purpose before each examination.
- The details of examination fee & fee for change of centre, subject, etc shall be notified before each examination.

REFUND OF FEES

If after submitting an application for examination, a candidate decides not to appear, a written request for a refund must be submitted before the last date for withdrawal with the receipt of application. In such cases a refund is admissible to the extent of 75% of fees only. No request for refund will be accepted after the closing date for receipt of applications. If an application is rejected by the CPSP, 75% of the examination fee will be refunded, the remaining 25% being retained as a processing charge. No refund will be made for fees paid for any other reason, e.g. late fee, change of centre/subject fee, etc.

FORMAT OF EXAMINATION

Intermediate Module examination consists of theory and Task Oriented Assessment of Clinical Skills (TOACS) examination.

THEORY EXAM:

For each branch of Pathology, there will be two papers:

- **Paper-I:** (MCQs) This will be a common paper for all the disciplines of Pathology and shall consist of 100 Single best type of MCQs with following distribution:
  - Haematology, Histopathology, Chemical Pathology and Microbiology: 20 MCQs each
  - Blood Banking: 10 MCQs
  - Virology and Immunology: 05 MCQs each
  - Total: 100 MCQs

- **Paper-II:**
  - All branches of Pathology except Chemical Pathology: A paper of 10 Short Answer Questions (SAQs) of the specialty in which resident has been registered for FCPS
  - Chemical Pathology: A paper of 100 Multiple Choice Questions (MCQs)

PRACTICAL EXAMINATION:
It will consist of TOACS examination with all its stations related to the specialty in which resident has been registered for FCPS.

FORMAT OF TOACS
TOACS will comprise of 12 to 15 stations with a task to be completed in a specified time. Structured clinical tasks will be set at each station. The candidate will have to perform a procedure, for example, taking history, performing a clinical examination, counseling, assembling an instrument, etc. All stations will be interactive and one examiner will be present at each station. The examiner will either rate the performance of the candidate or ask questions testing reasoning and problem-solving skills.

NOTE: The resident is required to fill a self-explanatory 'feedback proforma' at the end of the examination.

THE COLLEGE RESERVES THE RIGHT TO ALTER/AMEND ANY RULES/REGULATIONS
Any decision taken by the College on the interpretation of these regulations will be binding on the applicant.

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