CURRICULUM / STATUTES & REGULATIONS

MD - GENERAL MEDICINE

FOUR YEARS DEGREE PROGRAMME

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LIAQUAT UNIVERSITY OF MEDICAL & HEALTH SCIENCES, JAMSHORO

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STATUTES

1. Nomenclature of the Proposed Course

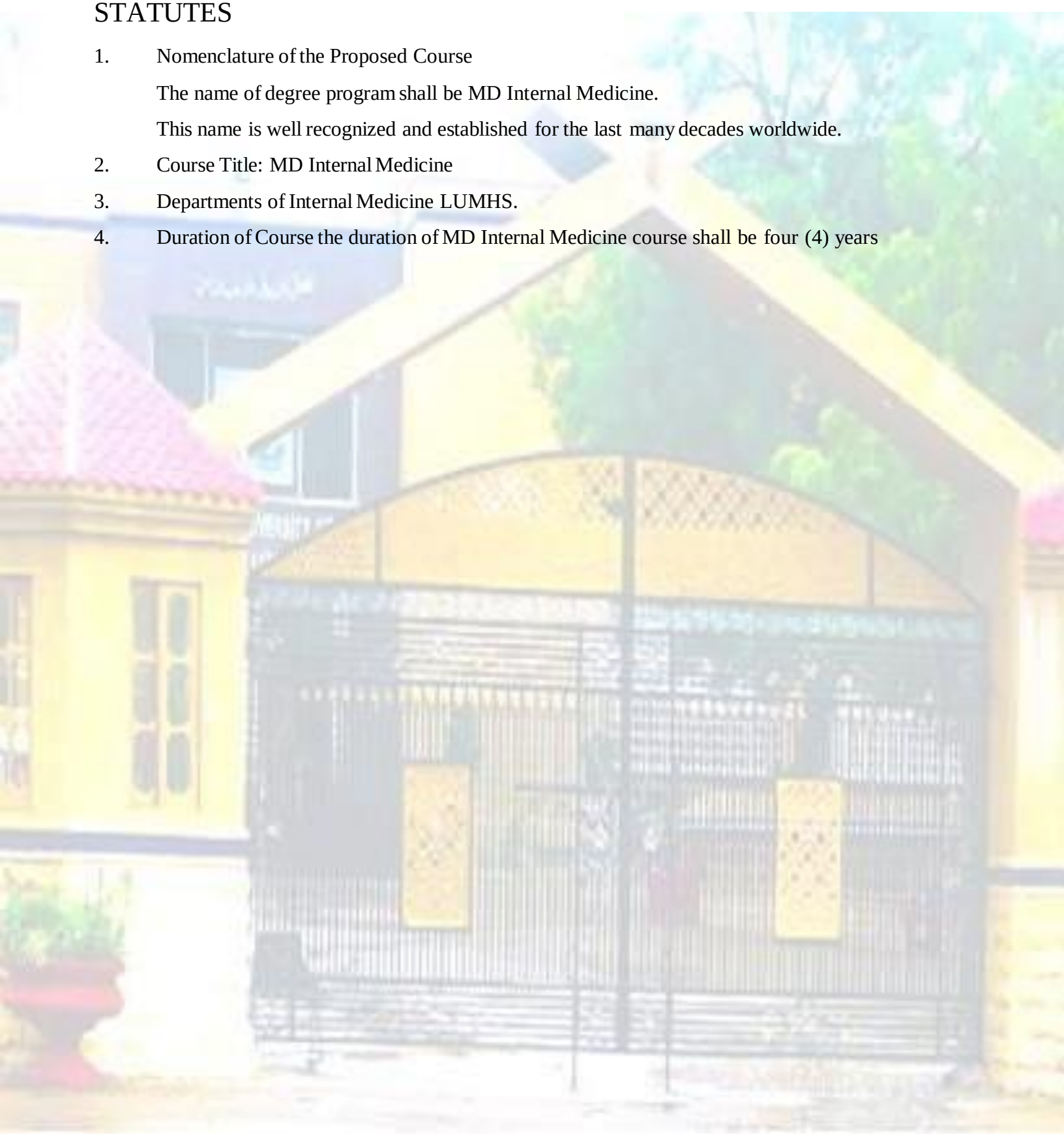
   The name of degree program shall be MD Internal Medicine.

   This name is well recognized and established for the last many decades worldwide.

2. Course Title: MD Internal Medicine

3. Departments of Internal Medicine LUMHS.

4. Duration of Course the duration of MD Internal Medicine course shall be four (4) years



ELIGIBILITY FOR ADMISSION IN MD GENERAL MEDICINE

Applications for admission to MD Training Programs will be invited through advertisement in print and electronic media mentioning closing date of applications and date of Entry Examination

ELIGIBILITY:

The applicant on the last date of submission of applications for admission must possess the:

1) Basic Medical Qualification of MBBS recognized by Pakistan Medical & Dental Council.

2) Certificate of one year's House Job experience in institutions recognized by Pakistan Medical & Dental Council (Six months in medicine is mandatory)

3) Valid certificate of permanent registration with Pakistan Medical & Dental Council

4) After passing MD-I conducted by the postgraduate medical institute of LUMHS, the candidate must get himself/herself registered with Director postgraduate medical Centre under an approved supervisor accordingly.

DURATION OF TRAINING IN MEDICINE:

Total duration of training is four years which consists of at two and half year training in general medicine and 18 months of rotations in different subspecialties

Clinical training shall be started from 1st year. It has two components:

1. Clinical training in Internal Medicine
2. Research and thesis writing the candidate shall undergo clinical training to achieve educational objectives of MD Internal Medicine (knowledge & skills) along with rotations in relevant fields. Research component and thesis writing shall be completed over the four years duration of the course. Candidate will spend total time equivalent to one calendar year for research during the training.
3. Registration and Enrollment

- Total number of students enrolled for the course must not exceed 8 per unit/year with equal distribution of candidate supervisor ratio.
- The maximum number of trainees that can be attached with a supervisor at a given point of time (inclusive of trainees in all years/phases of MD training), must not exceed beds to trainee ratio at the approved teaching site shall be at least 5 beds per trainee.

4. The University will approve supervisors for MD courses.
5. Candidates selected for the courses after their enrollment at the relevant institutions shall be registered with LUMHS as per prescribed Registration Regulations.

AIMS AND OBJECTIVES OF THE COURSE

AIM:

The aim of four years MD program in Internal Medicine is to train residents to acquire the competency of a specialist in the field of Internal Medicine so that they can become good teachers, researchers and clinicians in their specialty after completion of their training.

GENERAL OBJECTIVES MD:

Internal Medicine training should enable a resident in:

1. History and Physical Examination – The effective acquisition of a medical history and the performance of a comprehensive physical examination in patients with acute and chronic internal medicine diseases necessitating hospital admission.
2. Case Presentations - Students are expected to effectively record an initial history and physical examination and follow-up notes as well as deliver comprehensive oral presentations to their team members based on these written documents.
3. Test Interpretation – Basic understanding of routine laboratory and ancillary tests including complete blood count, chemistry panels, ECG, chest x-rays, pulmonary function tests, and body fluid cell counts. In addition, students will properly understand the necessity of incorporating sensitivity, specificity, pre-test probability and Bayes laws/theorem in the ordering of individual tests in the context of evaluating patients' signs and symptoms.
4. Diagnostic Decision Making – The formulation of a differential diagnosis with up-to-date scientific evidence and clinical judgment using history and physical examination data and the development of a prioritized problem list to select tests and make effective therapeutic decisions.
5. Therapeutic Decision Making – This objective includes assessing the risks, benefits, and costs of varying, effective treatment options; involving the patient in decision-making via open discussion; selecting drugs from within classes; and the design of basic treatment programs and using critical pathways when appropriate.
6. Core Internal Medicine Concepts – The development of a basic understanding of core Internal Medicine concepts.
7. Communication and Relationships with Patients and Colleagues- The establishment of rapport with patients by identifying important psychosocial issues and providing patient- centered care through specific medical treatment as well as education. In addition, the development of effective communication skills demonstrating respect, compassion and integrity in working relationships with fellow students, house staff,

faculty, nurses, and ancillary personnel. In each of these components, sensitivity to racial and cultural diversity should be demonstrated.

8. Bioethics of Patient Care – The development of a functional understanding of informed consent, advanced directives, and the physician-patient relationship.

9. Self-directed Learning – The identification of key information resources and the utilization of the medical literature to expand one's knowledge base and to search for answers to medical problems. They will keep abreast of the current literature and be able to integrate it to clinical practice.

10. Preventive Medicine – The promotion of health via adult immunizations, periodic health screening, and risk factor assessment and modification.

11. Research and Scientific Knowledge - Practice evidence-based learning with reference to research and scientific knowledge pertaining to their discipline through comprehensive training in Research Methodology.

SPECIFIC LEARNING OUTCOMES:

Following competencies will be expected from a resident completing MD Internal Medicine training; Inpatient Services: All residents will have rotations in intensive care, coronary care, emergency medicine, general medical wards, ambulatory experiences etc. The required knowledge and skills pertaining to the ambulatory based training in following areas shall be demonstrated;

1. Cardiology
2. Pulmonary Medicine
3. Endocrinology
4. Rheumatology
5. Gastroenterology & Hepatology
6. Nephrology
7. Haematological Disorders
8. Psychiatry
9. Inpatient Oncology & Palliative Care Services
10. Neurology
11. Dermatology
12. Critical Care Medicine
13. Geriatric Medicine
14. Reproductive Health
15. Evidence-based Medicine and Clinical Epidemiology
16. Health Screening and Prevention
17. Infectious Diseases

1. Procedural Skills:

Residents must be able to perform competently all medical and invasive procedures essential for the practice of general internal medicine. This includes technical proficiency in taking informed consent, performing by using appropriate indications, contraindications, interpretations of findings and evaluating the results and handling the complications of the related procedures mentioned in the syllabus.

2. Additional Procedural Skills:

Residents should be instructed in additional procedural skills that will be determined by the training environment, residents' practice expectations, the availability of skilled teaching faculty, and privilege delineation.

Interpretative skills: Residents should be able to interpret basic as well as advanced laboratory data as related

to the disorder/disease.

Electives: In addition, the resident will elect rotations in a variety of electives including nutrition, nuclear medicine or any of the medicine subspecialty consultative services or clinics. They may choose electives from each medicine subspecialty and from offerings of other departments.

Residents may also select electives at other institutions if the parent department does not offer the experiences they want.

Research: All residents in the categorical program are required to complete an academic outcomes-based research project during their training. This project can consist of original bench top laboratory research, clinical research or a combination of both. The research work shall be compiled in the form of a thesis which is to be submitted for evaluation by each resident before end of the training. The designated Faculty will organize and mentor the residents through the process, as well as journal clubs to teach critical appraisal of the literature.

Outpatient Experiences: Residents should demonstrate expertise in diagnosis and management of patients in acute care clinics and longitudinal clinic and gain experience in Dermatology, Geriatrics, Clinical immunology and allergy, Endocrinology, Gastroenterology, Hematology- Oncology, Neurology, Nephrology, Pulmonology, Rheumatology etc.

MID TERM EVALUATION EXAMINTION (MTE):

To ensure better training university has introduced midterm valuation examination in discipline of medicine. This mid-training assessment strengthens the monitoring and in-training assessment systems by providing trainees with estimate of mid-training competence Midterm evaluation (MTE) examination is mandatory eligibility requirement for MD-II examination. Trainees at the end of two year training are required to take midterm (MTE) examination;

In case of failure in midterm (MTE) examination trainees are permitted to continue their training but must pass midterm (MTE) examination prior to appearing in final MD-II examination.

Training and Examination

Duration of training for midterm (MTE) is two years. Midterm (MTE) examination is taken on completion of two years training

16 months in general medicine and 08 months rotations in following Disciplines

Cardiology	02 months (mandatory)
ICU	02 months (mandatory)
Pulmonology	02 months (mandatory)
Psychiatry	02 months
Dermatology	02 months

COMPONENTS OF TRAINING:

Mandatory Workshops:

It is mandatory for all trainees to attend the following

Certified workshops/course in the first year of training:

1. Basic Life Support (BLS) Course
2. Research Methodology and Dissertation Writing
3. Communication Skills
4. Introduction to Computer and Internet

Any other workshop/s as may be introduced by the LUMHS, Jamshoro

No candidate will be allowed to appear in MTE examination without attending the above mentioned workshops

Logbook:

The trainee 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 trainee. This system ensures timely entries by the trainee and prompt verification by the supervisor. It also helps in monitoring the progress of trainees and vigilance of supervisors. At least 200 entries should be entered by trainee to appear in Midterm (MTE) Examination

Research (Synopsis/Dissertation/Thesis)

One of the training requirements for trainee is a dissertation on a topic related to the field of specialization. For trainees of program in General Medicine the synopsis of dissertation must be submitted within six months of training.

Following documents are necessary for Midterm (MTE) Examination

1) Two year training certificate with 16 months in medicine and 08 months rotations in subspecialties
2) All 04 workshops certificates
3) Evidence of submission of synopsis
4) At least 200 log book entries (150 in medicine and 50 in rotation)

Components of Midterm (MTE) Examination:

1) Written Examination = 100 Marks (100 single Best Questions)
2) Clinical including 4 short cases, TOACS/OSCE = 100 Marks (10 OSCE stations)

To be declared successful in MTE Examination the candidate must secure at least 60% marks

MD PART-II 3rd YEAR 04th YEAR TRAINIG AND EXAMINATION:

COMPONENTS OF TRAINING:

Trainees in 3rd & 4th year will do training 16 months in general medicine and 08 months rotations in following Disciplines

1. Emergency Medicine
2. Neurology
3. Nephrology
4. Gastroenterology
5. Nuclear medicine
6. Radiology

Mandatory Workshops:

All mandatory workshops should be attended during the first two years of training. Therefore no workshop is mandatory during the 3rd & 4th year of training. However the trainee will be required to take any workshop as may be introduced by LUMHS JAMSHORO

Research (Dissertation/Thesis):

One of the training requirements for trainees is a dissertation on a topic related to the field of specialization. Synopsis of the dissertation must be approved before starting the research work. The dissertation must be submitted for approval before or during first six months of fourth year of training program.

Logbook:

The trainee 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 trainee. This system ensures timely entries by the trainee and prompt verification by the supervisor. It also helps in monitoring the progress of trainees and vigilance of supervisors. At least 200 entries should be entered by trainee in 3rd year and 4rth year of training to appear in MD part -II Examination

MD PART-II EXAMINATION:

1. All candidates admitted in MD Internal Medicine course shall appear in Part-II (clinical) examination at the end of structured training program (at the end of fourth year) and having passed the MTE examination
2. The examination shall be held on biannual basis.
3. The candidate who fails to pass the examination within 7 years of enrollment shall be dropped from the course.
4. To be eligible to appear in Part-II examination the candidate must submit;

i. Duly filled, prescribed Admission Form to the Controller of Examinations duly recommended by the Principal/Head of the Institution in which he/she is enrolled;

ii. A certificate by the Principal/Head of the Institution, that the candidate has attended at least 75% of the lectures, seminars, practical/clinical demonstrations

iii. Original Log Book complete in all respect and duly signed by the Supervisor (for Oral & practical/clinical Examination)

iv. Certificates of having passed the MTE examination

v. Examination fee as prescribed by the University.

vi. Certificate of approval of thesis

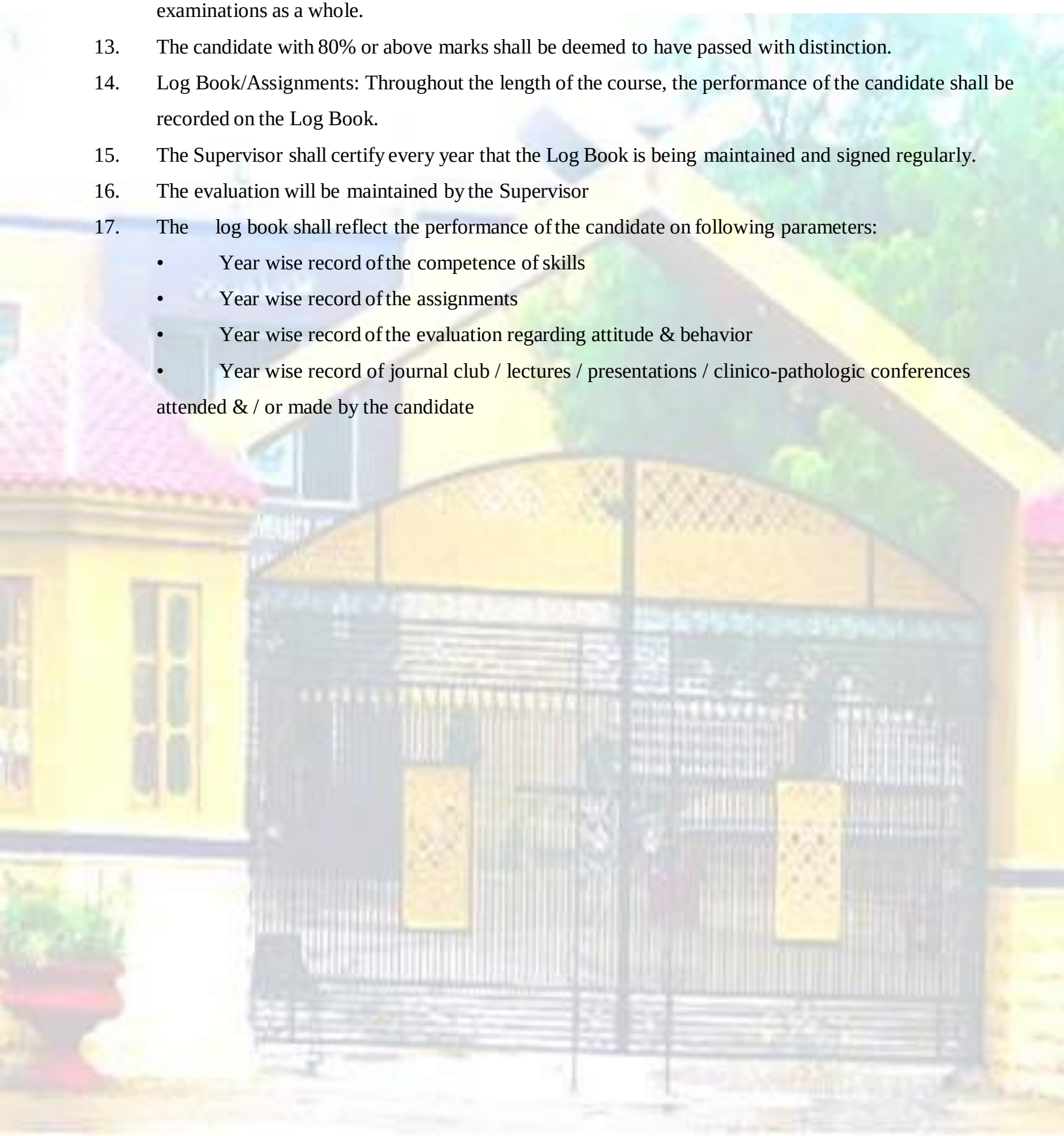
5. The examination shall have the following components:

- Written 200 marks
- Oral & practical/clinical examination 200 marks

6. There shall be two written papers of 100 marks each, Paper 01 will comprises of 100 single best questions and Paper II also comprises of 100 single best questions
7. Both papers shall have BCQs.
8. Oral & practical/clinical examination shall have 200 marks for: i. 1 Long Case 50 ii. 4 Short Cases 50 (12.5 marks each) iii. OSCE 100
9. To be declared successful in Part-II examination the candidate must secure 50% marks in each component and aggregate marks should not be less than 60 %
10. Only those candidates, who pass in theory papers, will be eligible to appear in the Oral & Practical/ Clinical Examination.
11. The candidates, who have passed written examination but failed in Oral & Practical/ Clinical Examination, will re-appear in Oral & Practical (OSCE) / Clinical examination.
12. The maximum number of attempts to re-appear in oral & practical /clinical Examination alone shall be three, after which the candidate shall have to appear in both written and oral & practical/clinical

examinations as a whole.

13. The candidate with 80% or above marks shall be deemed to have passed with distinction.
14. Log Book/Assignments: Throughout the length of the course, the performance of the candidate shall be recorded on the Log Book.
15. The Supervisor shall certify every year that the Log Book is being maintained and signed regularly.
16. The evaluation will be maintained by the Supervisor
17. The log book shall reflect the performance of the candidate on following parameters:
    - Year wise record of the competence of skills
    - Year wise record of the assignments
    - Year wise record of the evaluation regarding attitude & behavior
    - Year wise record of journal club / lectures / presentations / clinico-pathologic conferences attended & / or made by the candidate



SUBMISSION / EVALUATION OF SYNOPSIS:

i. The candidates shall prepare their synopsis as per guidelines provided by the Advanced Studies & Research Board, available on LUMHS website.

ii. The research topic in clinical subject should have 30% component related to basic sciences and 70% component related to applied clinical sciences. The research topic must consist of a reasonable sample size and sufficient numbers of variables to give training to the candidate to conduct research, to collect & analyze the data.

iii. Synopsis of research project shall be submitted by the end of the 2nd year of MD program. The synopsis after review by an Institutional Review Committee shall be submitted to the University for Consideration by the Advanced Studies & Research Board, through the Principal / Dean /Head of the institution.

SUBMISSION OF THESIS:

i. Thesis shall be submitted by the candidate duly recommended by the Supervisor.

ii. The minimum duration between approval of synopsis and submission of thesis shall be one year, but the thesis cannot be submitted later than 7 years of enrolment.

iii. The research thesis must be compiled and bound in accordance with the Thesis Format Guidelines approved by the University and available on website.

iv. The research thesis will be submitted along with the fee prescribed by the University

AWARD OF MD INTERNAL MEDICINE DEGREE:

After successful completion of the structured course of MD Internal Medicine and qualifying Part-I, MTE and Part-II examinations in totality, the degree with title MD Internal Medicine shall be awarded.

PART-II: MD INTERNAL MEDICINE PART II SHALL COMPRISE THREE COMPONENTS:

1. Clinical (both didactic & practical skills and procedures)
2. Research and Thesis writing
3. Log book; Clinical Component Organ and System Competencies in;
   i. Gastroenterology and Hepatology:
   ii. To provide Residents with opportunities to evaluate and manage patients with a wide variety of digestive disorders in an inpatient and outpatient setting. The Resident will act, under the supervision of the attending gastroenterologist, as a consultant to other clinical services.
   iii. To give Residents opportunities to learn about various aspects of a broad range of GI, liver and pancreatic disorders, with emphasis on the more common disorders.
4. To provide Residents with opportunities to learn the indications, contraindications, complications, limitations and alternatives for GI procedures.
5. Additional areas include knowledge of nutrition and nutritional deficiencies, and screening and prevention, particularly for colorectal cancer.
6. The general internist should have a wide range of competency in gastroenterology and should be able to provide primary and in some cases secondary preventive care, evaluate a broad array of gastrointestinal symptoms, and manage many gastrointestinal disorders.

GASTROENTEROLOGY:

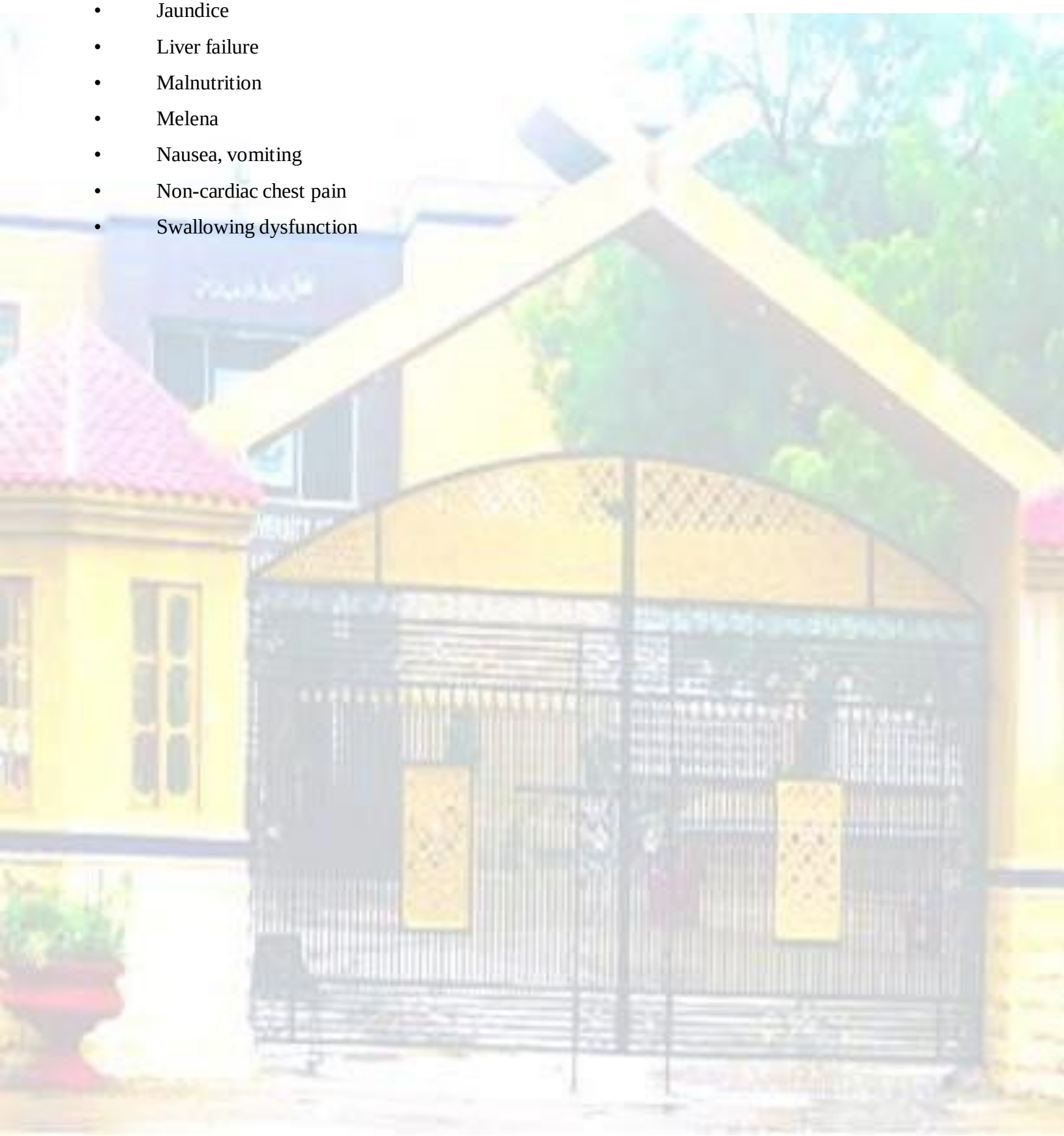
Common Clinical Disorders:

- Malabsorptive/Nutritional disorders
- Inflammatory Bowel Disease
- Irritable Bowel Syndrome
- Peptic Ulcer Diseases
- Malignancies of the Digestive System
- GI disorders and pregnancy
- Gastrointestinal Emergencies
- Indications/complications of GI procedures
- Viral hepatitis
- Chronic liver disease and Cirrhosis
- GI motility disorders
- Biliary disorders

Common Clinical Presentations:

- Abdominal distention
- Abdominal pain
- Abnormal liver function test
- Anorectal discomfort, bleeding, or pruritus
- Anorexia, weight loss
- Ascites
- Constipation
- Diarrhea
- Excess intestinal gas
- Fecal incontinence
- Food intolerance
- Gastrointestinal bleeding
- Heartburn
- Haematemesis
- Indigestion
- Iron-deficiency anemia

- Jaundice
- Liver failure
- Malnutrition
- Melena
- Nausea, vomiting
- Non-cardiac chest pain
- Swallowing dysfunction



PULMONARY MEDICINE:

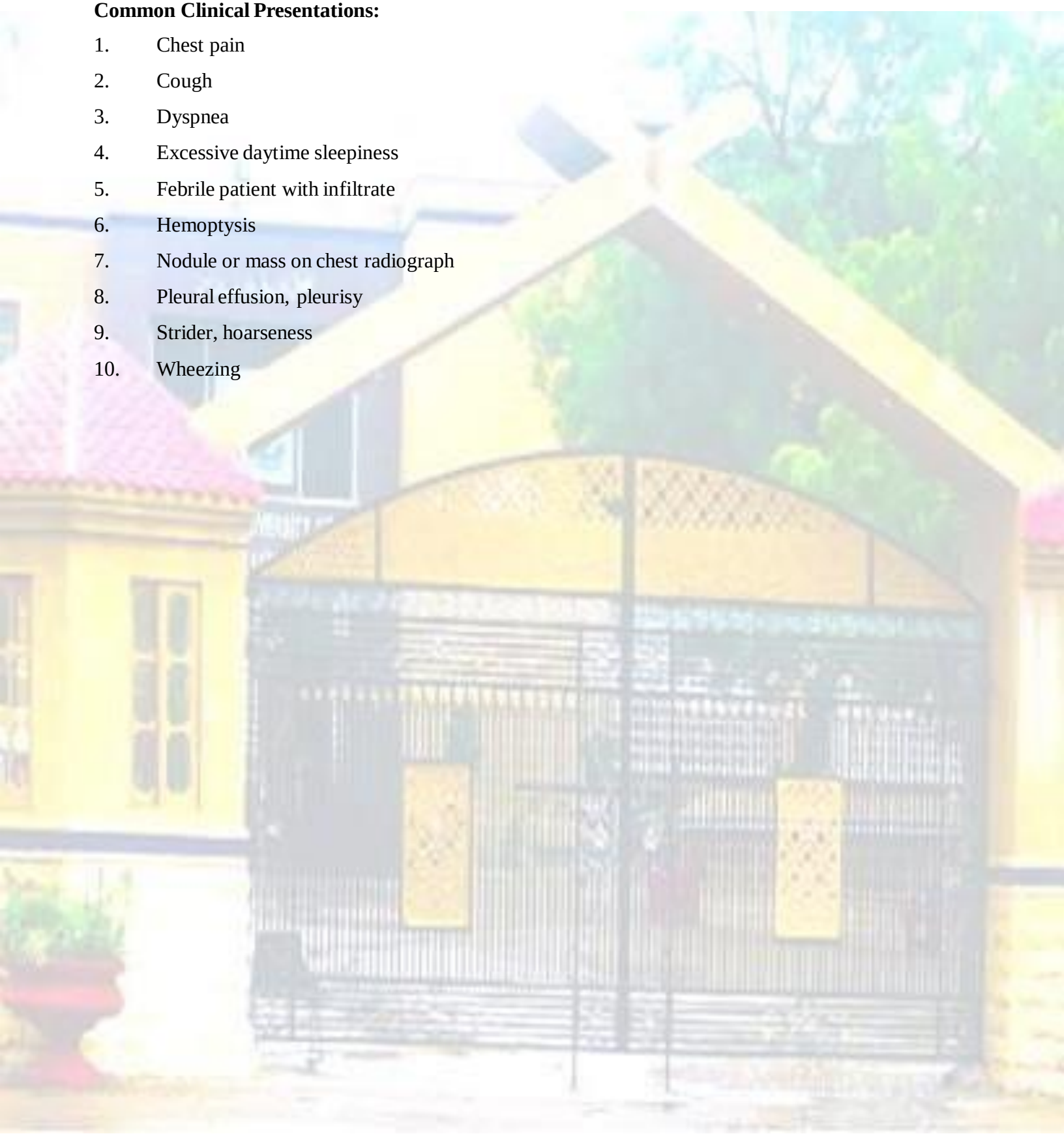
1. The resident must have expertise in understanding the Neoplastic, inflammatory, and infectious disorders of the lung parenchyma, pleura, and airways; pulmonary vascular disease and its effect on the cardiovascular system
2. Detection and prevention of occupational and environmental causes of lung disease.
3. Other specialized areas include respiratory failure and sleep-disordered breathing.
4. The general internist should be able to evaluate and manage cough, dyspnea, fever with infiltrates, mass or nodule on the chest radiograph, pleurisy, and pleural effusion.
5. He or she should also be able to diagnose and manage patients with common respiratory infections; initiate the diagnostic evaluation of respiratory neoplasm; and manage the initial approach to patients with respiratory failure, including those in intensive care units.
6. The internist will usually be assisted by the pulmonary specialist for diagnostic procedures and complicated conditions such as advanced respiratory failure. If such expertise is not available, the internist, with additional training, may have to assume these roles.

Common Clinical Disorders:

- Obstructive lung diseases: COPD, Bronchial Asthma.
- Adult and neonatal respiratory distress syndrome
- Pulmonary vascular disease: Pulmonary HTN, Pulmonary embolism.
- Lower Respiratory Infections: Community-Acquired Pneumonia, Hospital- Acquired Pneumonia, Chronic pneumonia, and complications of pneumonia
- Diffuse parenchyma lung disease
- Interstitial lung diseases
- Pulmonary disorders of immunosuppressed patients.
- Acute and chronic respiratory failure
- Staging and treatment of lung cancer
- Diagnosis and management of pleural diseases
- Sleep-disordered breathing
- Diagnosis and management of hemoptysis
- Pulmonary Database: History and Physical Examination, Imaging, Pulse Oximetry and **Pulmonary**

Common Clinical Presentations:

1. Chest pain
2. Cough
3. Dyspnea
4. Excessive daytime sleepiness
5. Febrile patient with infiltrate
6. Hemoptysis
7. Nodule or mass on chest radiograph
8. Pleural effusion, pleurisy
9. Strider, hoarseness
10. Wheezing



HEMATOLOGY:

The discipline of hematology relates to the care of patients with disorders of the blood, bone marrow, and lymphatic systems, including Anemias, hematologic malignancies, and other clonal processes, and congenital and acquired disorders of homeostasis, coagulation, and thrombosis.

The general internist should be competent in:

1. The detection of abnormal physical, laboratory and radiologic findings relating to the lymph hematopoietic system
2. The assessment of the need for bone marrow aspirate and biopsy and lymph node biopsy
3. The initial diagnostic evaluation and management of the hemostatic and clotting system
4. The assessment of the indications and procedure for transfusion of blood and its separate components
5. Management of thrombo embolic disorders.
6. The management of therapeutic and prophylactic anticoagulation
7. The diagnosis and management of common Anemias
8. The pharmacology and use of common chemotherapies
9. The management of neutropenia /immunosuppression
10. Principles of management of acute and chronic leukemias
11. Management of gammopathies.

Common Clinical Disorders:

Anemias: General aspects and classifications

- Anaemia of pregnancy
- Pancytopenia, aplastic anemia, pure red cell aplasia
- Methemoglobinemia
- Iron overload
- Porphyries
- Haemoglobinopathies
- Hemolytic Anemias
- Qualitative or quantitative disorders of white blood cells
- Disorders of the spleen
- Acquired & inherited coagulation disorders
- Thrombosis and anti-thrombotic drugs
- Transfusion of blood and blood components

- Adverse effects of blood transfusion
- Therapeutic aphaeresis
- Classification and differentiation of hematological malignancies
- Leukemias
- The Myelodysplastic syndromes
- Myeloproliferative disorders
- Lymph proliferative disorders
- Plasma cell dyscrasias
- Bone marrow transplants Common Clinical Presentations:
- Abnormalities of peripheral smear
- Bleeding, bruising, or petechiae
- Family history of anemia or bleeding disorder
- Lymphadenopathy
- Pallor or fatigue
- Recurrent infections or fever/neutropenia
- Splenomegaly
- Venous or arterial thrombosis, including recurrent thrombosis Procedure Skills
- Making a peripheral smear
- Therapeutic phlebotomy
- Bone marrow aspiration and core biopsy (optional)
- Primary Interpretation of Tests
- Bone marrow aspiration and core biopsy (optional) Ordering and Understanding Tests
- Evaluating common morphologic abnormalities on all the consults and outpatients as needed.
- Bone marrow aspirate, biopsy, and special stains
- Chromosome analysis-peripheral blood and bone marrow
- Clotting assay, including factor levels and mixing studies
- Hemoglobin electrophoresis
- Iron studies
- Lymph node biopsy and lymphoid cell immunophenotype
- Radiologic, sonographic, and nuclear studies to assess adenopathy, splenomegaly and red cell mass
- Serum and urine electrophoresis
- Vitamin B12 levels

INFECTIOUS DISEASES:

Infectious disease medicine requires an understanding of the microbiology, prevention, and management of disorders caused by viral, bacterial, fungal, and parasitic infections, including the appropriate use of antimicrobial agents, vaccines, and other immunobiologic agents. Important elements include the environmental, occupational, and host factors that predispose to infection, as well as basic principles of the epidemiology and transmission of infection. The general internist should be able to provide appropriate preventive (including optimal use of immunization and chemoprophylaxis), diagnostic, and therapeutic care for most infections. He or she should also be able to evaluate symptoms that may be caused by a wide range of infectious disorders. 3. General internists should also learn about diagnostic and management approaches to patients with HIV infection.

Common Clinical Disorders:

- Principles and practices of infection control and isolation.
- Common infectious diseases including their epidemiology, etiologic pathogens, pathogenesis, clinical manifestations, differential diagnosis, appropriate application and interpretation of diagnostic tests, treatment, and prophylaxis for:
- Respiratory tract infections
- Central nervous system infections
- Cardiovascular infections
- Fungal disease
- Mycobacterial infections
- Approach to the Patient with a Parasitic Infection
- Malaria and Babesiosis
- Soft tissue, bone, and joint infections
- Fevers of unknown origin
- Infections in immunocompromised hosts
- Gastrointestinal tract infections
- Genitourinary tract infections including sexually transmitted diseases.
- Infections of indwelling venous and arterial catheters and prosthetic devices
- Nosocomial infections, in intensive care and general care settings
- Animal and human bite wounds
- Infections in drug users

- HIV infection and its associated complications
- Travel-related infections, diagnosis, treatment, and prevention
- Bioterrorism: identifying infections, and understanding public health aspects.
- Bacillus anthracis (Anthrax)
- Yersinia pestis (Plague)
- Varicella Major (Smallpox)
- Francisella tularensis (Tularemia)
- Clostridium botulinum (Botulism)
- Filoviruses (Ebola, Marburg)
- Arenaviruses (Lassa)
- Introduction to emerging infectious diseases
- Active Immunization against infectious diseases
- Recommended immunization of infants, children and adolescents. Recommended immunization of adults.
- Recommended immunizations for travelers.
- Hypersensitivity tests and desensitization.
- Basic principles of anti-infective therapy, including the use of antibacterial, antiviral, antifungal, anti-mycobacterial, and anti-parasitic agents with regard to mechanisms of action, spectra of activity, doses and regimens, drug interactions, mechanisms of resistance, appropriate clinical applications, and adverse effects/toxicities.

Common Clinical Presentations:

- Abdominal or pelvic pain
- Cellulitis
- Cervicitis, vaginal discharge
- Diarrhea
- Dysuria
- Facial or ear pain
- Fever, including fever in immunosuppressed patient
- Hepatitis
- Joint effusion
- Limb, sacral ulcers
- Lymphadenopathy

- Meningitis
- Penile discharge
- Prevention, public health concerns (immunization, susceptibility and exposure, prophylaxis
- Productive cough, pulmonary infiltrate
- Rash (cellulitis, erythema, petechiae, purpura, tinea)
- Red eye
- Skin abscess
- Sore throat, painful swallowing
- Vomiting Counseling Skills
- Alternative health practices
- HIV risk assessment
- Post-diagnosis counseling
- Substance abuse

NEPHROLOGY:

1. The general internist should be competent to evaluate and appropriately refer patients with glomerular disorders, asymptomatic urine abnormalities, tubulointerstitial diseases, renal vascular disease, renal failure, nephrolithiasis, tubular defects, and infections and neoplasms of the kidneys, bladder, and urethra, and should also be able to provide principle treatment for some of these conditions.
2. He or she should be able to manage fluid, electrolyte, and acid-base disorders
3. Understand the ways in which systemic diseases may affect the kidneys and recognize the potential nephrotoxicity of various therapeutic and diagnostic agents.
4. The general internist must also be familiar with guidelines for predialysis management of patients with renal failure and be able to recognize indications for dialysis and for referral to a nephrologist.

Although all general internists should know the indications for dialysis, in some cases (for example: if a nephrologist is unavailable), the general internists may be responsible for initiating and maintaining patients on peritoneal dialysis.

Common Clinical Disorders:

- Fluid and electrolyte disorders
- Acid-base disorders
- Acute renal failure.
- Chronic renal failure
- Evaluation of renal function e.g. Urinalysis, urine protein-creatinine ratio, calculation of GFR.
- Obstructive uropathy.
- Renal stones and management of an acute renal colic.
- Urinarytract infection including pyelonephritis
- Tubulointerstitial disease.
- Chronic kidney disease.
- Glomerulonephropathies
- Nephrotic disease in primary renal disorders.
- Nephrotic disease from systemic disorders.
- Hypertension including hypertensive crises
- Diseases demonstrating nephritic and nephrotic components.
- Cystic diseases of the kidney.
- Multisystem diseases with variable kidney involvement.

- Medullary sponge kidney
- Effects of drugs on the kidneys. Current principles of renal transplantation
- Urologic disorders e.g. Bladder outlet obstruction, detection of prostate cancer, and incontinence
- Renal function and disease in pregnancy
- The kidney and aging.

Common Clinical Presentations:

- Abnormalities noted on urinalysis (including proteinuria, hematuria, bacteriuria, pyuria and cylinduria)
- Complaints referable to bladder outlet (urgency, hesitancy)
- Dysuria
- Edema
- Flank or suprapubic pain or tenderness
- Frequency and complaints referable to increased or decreased urine volume
- Hematuria (gross)
- Hypertension
- Incontinence
- Presenting features of uremia
- Renal colic
- Renal mass or bruit

CARDIOLOGY:

1. The general internist should be able to provide primary and secondary preventive care and initially manage the full range of cardiovascular disorders.

2. The need for additional competencies in cardiovascular disease will depend on the availability of a cardiologist in the primary practice setting.

3. In some communities, the general internist may be responsible for management of more complex cardiovascular disorders that require intensive hemodynamic monitoring (for example, balloon-tipped pulmonary artery catheters) in the intensive care unit.

Common Clinical Disorders:

- Coronary Artery Diseases
- Chronic stable angina. Unstable angina.
- Care of post-CABG and post-PTCA patients.
- Myocardial infarction (covered mainly in the coronary care unit rotation).
- Care of post myocardial infarction patients.
- Congestive heart failure: o Chronic heart failure. O Systolic heart failure from various etiologies (ischemic/ non ischemic). O Diastolic heart failure.
- Pulmonary edema.
- Valvular heart disease.
- Infective endocarditis.
- Arrhythmias o atrial fibrillation, atrial flutter and other common supraventricular arrhythmias. Ventricular arrhythmias, sudden cardiac death and indications for AICD implantation. Bradyarrhythmias and major indication of temporary and permanent pacing. Basic understanding of pacemaker function.
- Indication and value of electrophysiologic testing.
- Adult congenital heart disease.
- Cardiomyopathy and myocarditis.
- Preoperative evaluation: Assessing cardiac risk in patients undergoing non-cardiac surgeries. Interventions to minimize cardiac risk in patients undergoing no cardiac procedures.
- Hypertension: Hypertensive urgencies and emergencies. o Management of chronic hypertension, especially patients with difficult to control hypertension. Secondary hypertension.
- Aortic disease (aortic aneurysm).

- Venous thromboembolic disease / pulmonary embolism, pulmonary vascular disease, and chronic venous stasis.
- Arterial insufficiency
- Pericardial disease
- Dyslipidemia Common Clinical Presentations
- Abnormal heart sounds or murmurs
- Chest pain
- Dyspnea
- Effort intolerance, fatigue
- Hypertension
- Intermittent claudication
- Leg swelling
- Peripheral vascular disease
- Risk factor modification
- Shock, cardiovascular collapse
- Syncope, lightheadedness Procedure Skills
- Advanced cardiac life support
- Insertion of balloon-tipped pulmonary artery catheter (optional)
- Insertion of temporary pacemaker (optional) Primary Interpretation of Tests Stress electrocardiography (optional) Ordering and Understanding Tests
- Ambulatory ECG monitoring
- Echocardiography
- Electrophysiology testing
- Left ventricular catheterization and coronary angiography
- Nuclear scan wall motion study
- Right ventricular catheterization (including flotation catheter)
- Stress electrocardiography and thallium myocardial perfusion scan

PSYCHIATRY:

1. Understanding of the prevention and treatment of mental disorders and associated emotional, behavioral and stress-related problems.

2. Given a patient with a chief complaint residents will:

a. Perform a focused history

b. Request appropriate diagnostic tests

c. Formulate a set of working diagnoses,

d. Formulate appropriate treatment plans including referrals.

3. In general internal medicine practice, management of risk factors for mental disorders and early diagnosis and intervention for established disease (primary and secondary prevention) are important elements.

4. The general internist should have a wide range of competency in psychiatric disease, particularly as it is encountered in outpatient settings and should be able to diagnose symptoms and use pharmacotherapy, behavioral modification, and counseling to provide primary and secondary preventive care and initially manage many mental disorders.

5. Patients hospitalized for general medical problems and those in the intensive care unit may have significant psychiatric co morbidity that contributes to general medical morbidity and length of stay. In these and all other settings, the general internist must be able to evaluate and manage psychiatric co morbidity effectively with appropriate specialty consultation.

6. The range of competencies expected of a general internist will depend on the availability of psychiatrists in the primary practice setting.

7. Refractory cases and patients with mental disorders requiring psychotherapeutic interventions will generally be referred to a psychiatric hospitalization.

Common Clinical Disorders:

- Psychiatric assessment of common psychiatric disorders.
- Substance use disorders.
- Delirium, dementia and other cognitive disorders
- Geriatric psychiatric disorders
- Psychiatric problems associated with hospitalization and medical and surgical disorders **Common Clinical Presentations:**
- Agitation or excitement
- Anxiety

- Confusion
- Delusions or bizarre beliefs
- Depressed or sad mood
- Fatigue
- Hallucinations
- Insomnia
- Memory loss
- Poor hygiene or self-care
- Strange speech or behavior
- Suicide risk
- Suspiciousness or feelings of persecution
- Unexplained changes in personality or performance
- Unexplained physical symptoms suggesting somatization Procedure Skills
- Depression inventory
- Mental status examination, including standardized cognitive examinations when indicated
- Ordering and Understanding Tests
- Electroencephalography
- Neuropsychological evaluation

ENDOCRINOLOGY, DIABETES, AND METABOLISM:

1. The principal endocrine problems handled by the general internist include goiter, thyroid nodules, thyroid dysfunction, diabetes mellitus, hyper- and hypocalcemia, adrenal cortex hyper- and hypo function, endocrine hypertension, gonadal disorders, hyper- and hyponatremia, certain manifestations of pituitary tumors, disorders of mineral metabolism, and hyperlipidemias.
2. Recognize Type 1 from Type 2 DM
3. Plan dietary therapy, oral hypoglycemic agents and insulin therapy for all diabetics, especially Type 2 DM patients
4. Plan and advice recommendations for weight loss
5. Understand the concept of tight control, standards of care and targets of control for both Type 1 and Type 2 DM patients
6. Learn the management of acute complications of diabetes, i.e. DKA, hyperosmolar state.
7. Learn how to use a multidisciplinary team approach to diabetes management (including role of cardiology, nephrology, ophthalmology and Podiatry).
8. Learn to interpret thyroid function tests, thyroid imaging and to initiate and follow patients on thyroid hormone replacement therapy.
9. Diagnosis, evaluation, differential diagnosis and management of overt and subclinical hyperthyroidism and hypothyroidism, thyroid storm and low uptake versus high uptake thyrotoxicosis.
10. Approach to thyroid nodules and thyroid cancer.
11. Evaluate and develop treatment strategies for Pituitary disorders – pituitary tumors and Hypopitutarism, diagnosis, difference between the various etiologies and replacement hormonal therapies.
12. Learn to approach adrenal diseases including Cushing's syndrome and adrenal insufficiency focus on acute and chronic adrenal insufficiency – diagnosis and management.
13. Evaluation, D/D and management of Hypercalcemia (focus on primary hyperparathyroidism) and Hypocalcemia, Osteoporosis, Osteopenia, Vitamin D deficiency.
14. Endocrine causes of secondary hypertension- Cost efficient evaluation and management.
15. Learn to recognize and treat Poly endocrine autoimmune syndromes.
16. Evaluate and treat male and female hypogonadism (focus on testosterone replacement Therapy.
17. HRT in females and related reproductive endocrine disorders.
18. Approach to endocrine incidentalomas – (pituitary, adrenal and thyroid with a focus on adrenal incidentalomas).

19. The general internist must be able to evaluate and manage common endocrine disorders and refer appropriately. He or she must also be able to evaluate and identify the endocrinologic implications of abnormal serum electrolytes, hypertension, fatigue, and other nonspecific presentations.

20. The general internist plays a key role in managing endocrine emergencies, particularly those encountered in the intensive care unit, including diabetic ketoacidosis and hyperosmolar non ketotic stupor, severe hyper- and hypocalcemia and Addisonian crisis.

Common Clinical Disorders:

- Pathophysiology of Type 1 & 2 diabetes
- Diagnostic criteria for Diabetes, Differentiate Type I vs. Type II
- Standards of care for a patient with Diabetes `
- Targets of care for a patient with Diabetes
- Metabolic syndromes
- Importance & treatment of metabolic syndrome
- Life style modifications in metabolic syndrome and diabetes
- Classes of oral anti-hypoglycemic agents used and their mechanism of action. Indications and contraindications for each class and side effects Insulin management in Type 1 and 2 DM
- Types of insulin available today (Rapid, Short, Intermediate, Basal, Premixed insulin preparations)
- Indications, contraindications, complications associated with insulin use
- Insulin protocols used in ICU setting including IV insulin therapy
- Acute diabetes complications, diagnosis and management
- Hyperlipidemia
- Combination therapy to treat diabetic dyslipidemia
- Thyroid function tests in diagnosing various thyroid dysfunction states.
- Interpretation of TSH, FT4, T3, T7, FTI, T3RU, Thyroglobulin
- Role of thyroid scan and radioactive iodine uptake – indications and contraindications for use
- Thyroid imaging – when to use it (ultrasound, CT scan, MRI. Role of PET scan)
- Hyperthyroidism; etiology, pathophysiology, clinical features, diagnosis and management
- Differentiate hyperthyroidism from thyrotoxicosis
- Differential diagnosis of hyperthyroidism (graves' disease vs toxic MNG, single hot nodule, thyroiditis etc.)
- Thyroid hormone therapy
- Hypothyroidism: primary vs secondary hypothyroidism

- Diagnosis and management
- Thyrotoxic storm and myxedema coma
- Euthyroid sick syndrome
- Approach to thyroid nodules and thyroid cancer
- Endocrine hypertension
- Management – indications for surgery vs medical management
- Phaeochromocytoma:
- Approach to adrenal diseases
- Adrenal insufficiency
- Cushing's disease
- Hypocalcaemia and hypercalcaemia
- Osteoporosis, osteopenia, vitamin D deficiency
- Incidentalomas:
- Hypopituitarism including pituitary tumors:
- Prolactinomas and Acromegaly
- Hirsutism
- Male and Female Hypogonadism
- Testosterone replacement therapy in males
- Update on the HRT in females
- Polyendocrine autoimmune syndromes Common Clinical Presentations
- Asthenia
- Blood lipid disorders
- Breast discharge
- Change in menstrual, gonadal/sexual function
- Diarrhea
- Disorders of pigmentation
- Goiter (diffuse, nodular)
- Hirsutism
- Hypertension refractory to primary therapy
- Hypotension
- Incidentally discovered abnormalities in serum electrolytes, calcium, phosphate, or glucose
- Mental status changes

- Osteopenia
- Polyuria, polydipsia
- Signs and symptoms of osteopenia
- Symptoms of hyper- and hypoglycemia
- Symptoms of hypermetabolism
- Symptoms of hypometabolism
- Urinary tract stone
- Weight gain, obesity Procedure Skills
- Dexamethasone suppression test (overnight)
- Home blood glucose monitoring
- ACTH stimulation test Ordering and Understanding Tests
- Bone mineral analysis (densitometry)
- Fasting and standardized postprandial serum glucose concentrations
- Glycohemoglobin or serum fructosamine concentration
- Imaging studies of the sella turcica
- Microalbuminuria
- Serum alkaline phosphates activity (for Paget's disease of bone)
- Serum and urine ketone concentrations (quantitative or qualitative)
- Serum and urine osmolalities
- Serum gonadotropin concentrations (follicle-stimulating hormone, luteinizing hormone)
- Serum lipid profile
- Serum phosphate concentration
- Serum prolactin concentration
- Serum testosterone concentration
- Serum thyroid function tests
- Thyroid scanning and ultrasound
- Urinary calcium, phosphate, uric acid excretion
- Urinary sodium, potassium excretion
- Urine metanephrine, VMA (vanillylmandelic acid), and total catecholamine levels

ALLERGY AND IMMUNOLOGY:

1. An understanding of immunological basis and management of disorders related to hypersensitivity or altered reactivity caused by release of immunologic mediators or by activation of inflammatory mechanisms
2. The general internist should be able to offer primary care for several diseases involving altered immunity or hypersensitivity.
3. For these diseases, the general internist should be able to initiate diagnostic evaluation and therapy with or without the help of a sub specialist.
4. The general internist should also be able to recognize many other diseases in which altered immunity plays an important role.

Common Clinical Presentations:

- Anaphylaxis
- Conjunctival and bulbar inflammation, chemosis, ocular pruritus
- Dyspnea, cough, wheezing, sputum production, use of accessory muscles of respiration
- Nasal obstruction and pruritus, rhinorrhea, sneezing
- Skin wheeling, angioedema, bullous formation, eczematous and papular eruptions, morbilliform rashes, purpura, pruritus

NEUROLOGY:

1. The general internist should possess a broad range of competency in neurology and the knowledge should encompass the prevention and management of disorders of the central and peripheral nervous systems.
2. He or she should be able to perform and interpret a detailed neurologic examination, skilled in localization of the disease process and generation of a differential diagnosis and proper use of laboratory tests to efficaciously come to a correct diagnosis
3. Knowledge of therapeutics, surgical and medical and primary and secondary prevention of neurologic diseases and should be familiar with the presenting features, diagnosis, and treatment of common neurologic disorders and other conditions, such as headache, caused by non-neural dysfunction
4. The general internist may encounter neurologic disorders in various settings, including ambulatory care, hospital, long-term care, and home care.
5. In communities where a neurologist is not available, the general internist may be a consultant for some complex neurologic disorders (for example, control of status epilepticus).

Common Clinical Disorders:

- Headache
- Facial Pain
- Inflammatory meningeal and encephalitic lesions
- Epilepsy
- Syncope and Dysautonomia
- Sensory Disturbances
- Weakness and Paralysis
- Transient Ischemic Attacks
- Stroke
- Intracranial and Spinal Space-Occupying Lesions.
- Nonmetastatic Neurologic Complications of Malignant Disease.
- Pseudotumor Cerebri
- Selected Neurocutaneous Diseases
- Movement Disorders Curriculum/Statutes & Regulations-MD Internal Medicine 49
- Dementia
- Multiple Sclerosis

- Vitamin E Deficiency
- Spasticity
- Myelopathies in AIDS
- Myelopathy of Human T Cell Leukemia Virus
- Subacute Combined Degeneration of the Spinal Cord.
- Wernicke's Encephalopathy
- Stupor and Coma
- Head Injury
- Spinal Trauma
- Syringomyelia
- Motor Neuron Diseases
- Peripheral Neuropathies
- Discogenic Neck Pain
- Brachial and Lumbar Plexus Lesions
- Disorders of Neuromuscular Transmission
- Myopathic Disorders
- Periodic Paralysis Syndrome Common Clinical Presentations
- Abnormal speech
- Abnormal vision
- Altered sensation
- Confusion
- Disturbed gait or coordination
- Dizziness, vertigo
- Headache
- Hearing loss
- Localized pain syndromes: Facial pain, radiculopathy
- Loss of consciousness
- Memory impairment
- Seizure
- Sleep disorder
- Tremor
- Weakness/paresis (generalized, localized) Procedure Skills

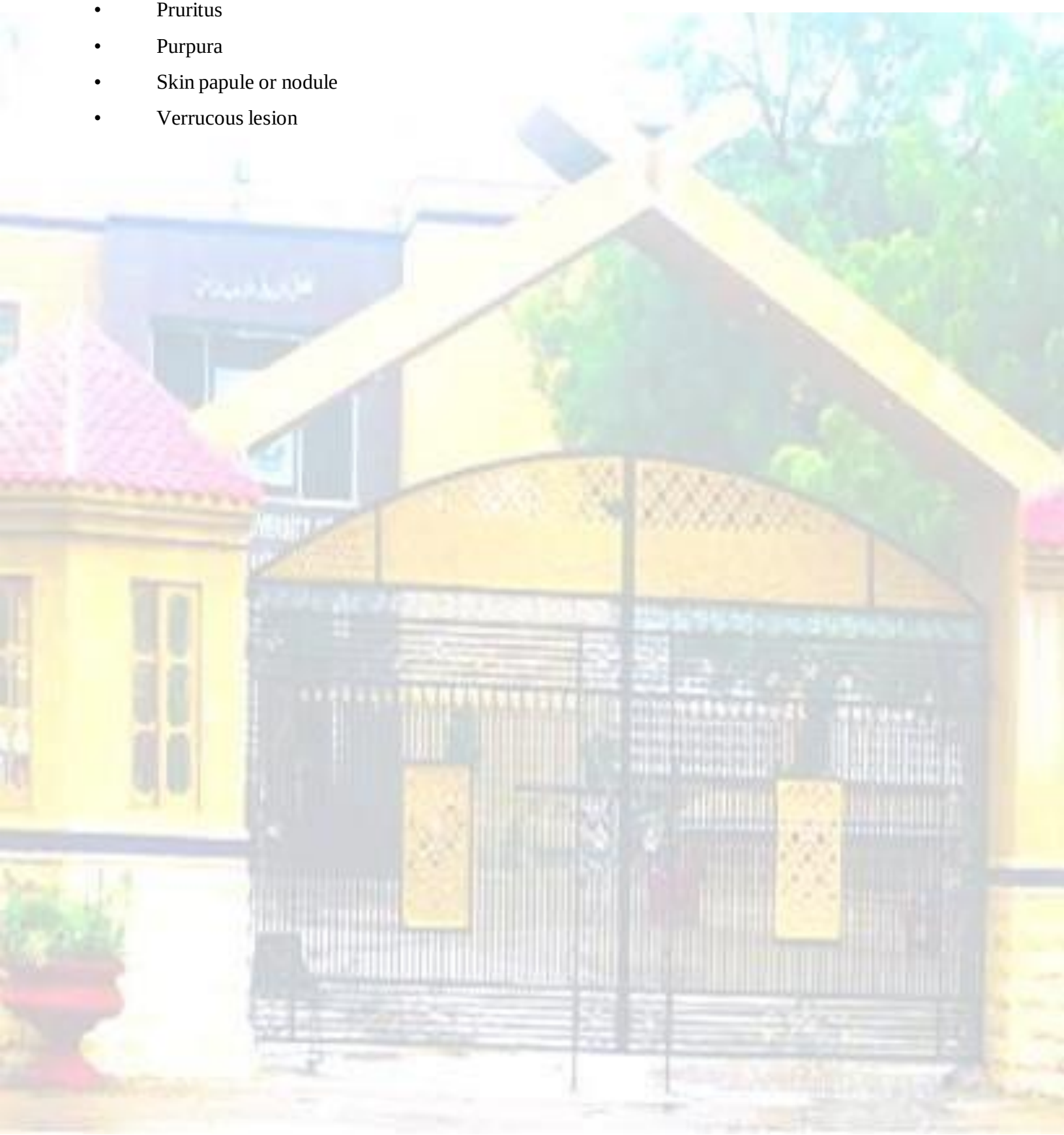
- Tensilon (edrophonium chloride) test (optional)
- Lumbar Puncture Ordering and Understanding Tests
- Anticonvulsant drug levels
- Carotid Doppler echo scans
- Computed tomography, magnetic resonance imaging of central nervous system
- Digital intravenous angiography
- Electroencephalography, evoked potentials (visual, auditory, sensory)
- Electromyography, nerve conduction studies
- Muscle biopsy
- Myelography
- Screen for toxins, heavy metals

DERMATOLOGY:

1. Understanding the morphology, differential diagnosis and management of disorders of the skin, mucous membranes, and adnexal structures, including inflammatory, infectious, Neoplastic, metabolic, congenital, and structural disorders.
2. Competence in medical and surgical interventions and dermatopathology are important facets.
3. The general internist should have a general knowledge of the major diseases and tumors of the skin. He or she should be proficient at examining the skin; describing findings; and recognizing skin, signs of systemic diseases, normal findings (including benign growths of the skin), and common skin malignancies.
4. The general internist should be able to diagnose and manage a variety of common skin conditions and make referrals where appropriate. Common Clinical Disorders

- Primary and secondary lesions of skin
- Inflammatory and infective skin lesions
- Fungal infections
- Pruritus
- Bullous diseases
- Pyoderma/viral infections
- Papulosquamous disease
- Common dermatoses
- Skin cancer
- Skin biopsy technique
- Hair and nail diseaseCommon Clinical Presentations
- Abnormalities of pigmentation
- Eruptions (eczematous, follicular, papulovesicular, vesicular, vesiculobullous)
- Hair loss
- Hirsutism
- Intertrigo
- Leg ulcer
- Mucous membrane ulceration
- Nail infections and deformities
- Pigmented lesion

- Pruritus
- Purpura
- Skin papule or nodule
- Verrucous lesion



RHEUMATOLOGY:

Rheumatology and Non-operative rheumatology

1. Rheumatology and non-operative orthopedics deal with the prevention, diagnosis, and management of crystalline diseases, systemic rheumatic diseases, spondyloarthropathies, vasculitis, inflammatory muscle disease, osteoporosis, osteoarthritis, recreational and sports injury, and soft-tissue diseases and trauma.
2. The goal of rheumatology is early diagnosis and treatment of these conditions to prevent disability and death.
3. The general internist needs to have competency in the initial diagnosis and management of acute arthritis and musculoskeletal disorders and in the long-term care of systemic disorders.
4. He or she must also be proficient in monitoring the effects of anti-inflammatory, immunosuppressive, and cytotoxic drugs.

Common Clinical Disorders

- Purine and uric acid metabolism and crystal-induced arthritis
- Autoimmune disorders (e.g. R.A., S.L.E., Scleroderma and vasculitis)
- Infectious and reactive arthritides
- Metabolic bone diseases e.g. Osteoporosis
- Bone and cartilage disorders e.g. Osteoarthritis
- Non articular and regional musculoskeletal disorders
- Inflammatory muscle diseases
- Miscellaneous rheumatic disorders
- Carpal tunnel syndrome (and Tarsal tunnel syndrome)
- Anserine and trochanteric bursitis
- Stenosing tenosynovitis
- Ganglion cysts
- Epicondylitis
- Minor sports-related injuries
- Overuse injuries
- Laboratory and diagnostic tests
- Radiographic imaging and other diagnostic procedures
- Drugs used in rheumatic diseases Common Clinical Presentations

- Joint pain and/or swelling (acute or chronic, mono articular or polyarticular)
- Muscle aches (localized or diffuse)
- Musculoskeletal weakness
- Non articular signs and symptoms of rheumatologic disease, such as Raynaud's phenomenon and skin rash
- Regional pain of the neck, shoulder, lower back, hip, knee, hands, or wrists
- Traumatic joint Procedure Skills
- Demonstrate the ability to perform a complete joint examination.
- Therapeutic injection of corticosteroid and arthrocentesis for the knee joint.
- Therapeutic injection of corticosteroid to the periarticular structures (bursal) of the shoulder, knee, elbow, and foot
- Arthrocentesis of other joints (optional)
- Aspiration of a bursitis
- Aspiration of a ganglion cyst Primary Interpretation of Tests
- Analysis of synovial fluid.
- Plain bone radiographs of joints and spine
- Ordering and Understanding Tests
- Anti-DNA, anti-Sm, anti-RNP, and anti-SS-A antibodies
- Antineutrophil cytoplasmic antibody (ANCA)
- Complement level
- Erythrocyte sedimentation rate
- Fluorescent antinuclear antibody (ANA)
- Rheumatoid factor
- Synovial analysis for crystals

ONCOLOGY:

1. Medical oncology rotation shall prepare the internist in the diagnosis and management of benign and malignant lesions of the musculoskeletal system.
2. The general internist should have a wide range of competencies in the evaluation and management of neoplastic disease.
3. He or she must be able to identify patients at risk for malignancy and
4. Counsel them regarding risk reduction and screening
5. Investigate clinical syndromes suggestive of underlying malignancy
6. Undertake the palliative care of patients with common solid and hematologic tumors
7. Identify neoplasms with a potential for cure and direct affected patients to the appropriate centers or providers and participate in the difficult decisions regarding all aspects of management, including diagnostic evaluation and screening, treatment and palliative care.
8. In addition, the general internist must be familiar with the administration, side effects and drug interactions of therapeutic agents commonly used for the treatment of malignant disease.
9. Whether a generalist assumes full responsibility for any or all of these functions will depend on the clinical setting of his or her practice.
10. The general internist should seek subspecialty consultation early in the care of patients with malignant disease who may be candidates for aggressive treatment with curative intent.

Common Malignant Disorders:

- Breast cancer
- Lung cancer - small cell and non-small cell
- Colon cancer
- Prostate cancer
- Ovarian cancer
- Testicular cancer
- Other systemic malignancies common in Pakistan
- Pain management therapy
- Palliative care
- Chemotherapy
- Principles of cancer
- Supportive care

- Screening
- Tumor markers, Oncogenes and apoptosis
- Bone marrow transplantation Common Clinical Presentations
- Anemia
- Ascites
- Bleeding
- Bowel obstruction
- Cough, hoarseness, hemoptysis
- Lymphadenopathy, soft tissue mass Curriculum/
- Organ enlargement, mass
- Pleural or peritoneal effusion of unknown cause
- Sensory polyneuropathy
- Superior vena cava syndrome
- Weight loss Procedure Skills
- Bone marrow aspiration and biopsy (optional)
- Fine needle aspiration of thyroid and breast (optional)
- Intrathecal chemotherapy (optional) Ordering and Understanding Tests
- Biopsy
- Bone marrow cytogenetics, immunophenotyping
- Cytology and pathology
- Diagnostic and interventional radiology
- DNA content and molecular markers of tumor tissue
- Estrogen and progesterone receptors
- Imaging studies, including computed tomography and magnetic resonance imaging, nuclear studies
- Serologic markers for tumors
- Ultrasound

GERIATRICS/REHABILITATIVE MEDICINE:

1. Given an increasingly aging population and the focus on primary care practitioners as the major care providers, a solid working knowledge and understanding of the principles of geriatric medicine and long term care is essential for a well-trained general internist.
2. Geriatric aspects of psychiatric diseases
3. Adaptations and maladaptations to systemic diseases, including effects on the body systems and on laboratory and imaging studies with performance and interpretation of tests.
4. Demonstrate ability to perform assessment of needs and determine most appropriate level of care for each individual.
5. Demonstrate understanding of basic principles of: interdisciplinary teamwork; skin care and pressure ulcer prevention; health maintenance and preventive medicine; nutrition; ethics; clinical pharmacology; discharge planning and appropriate utilization of resources.
6. Understand principles of diagnosis and management of common infections in long term care; incontinence; delirium, dementia, cognitive impairment; behavior problems; disorders of vision, hearing, communication; falls; pressure ulcers.
7. Develop ability to assess ADL function and rehabilitation potential.
8. Understand indications for and risks of chemical and mechanical restraints and recognize need for use of least restrictive means of management.
9. Understand indications for and risks of psychotropic medication in this population and demonstrate ability to assess for unwanted effects.
10. Demonstrate basic understanding of the most common problems, by organ system, experienced by the elderly and disabled.

EMERGENCY MEDICINE AND CRITICAL CARE:

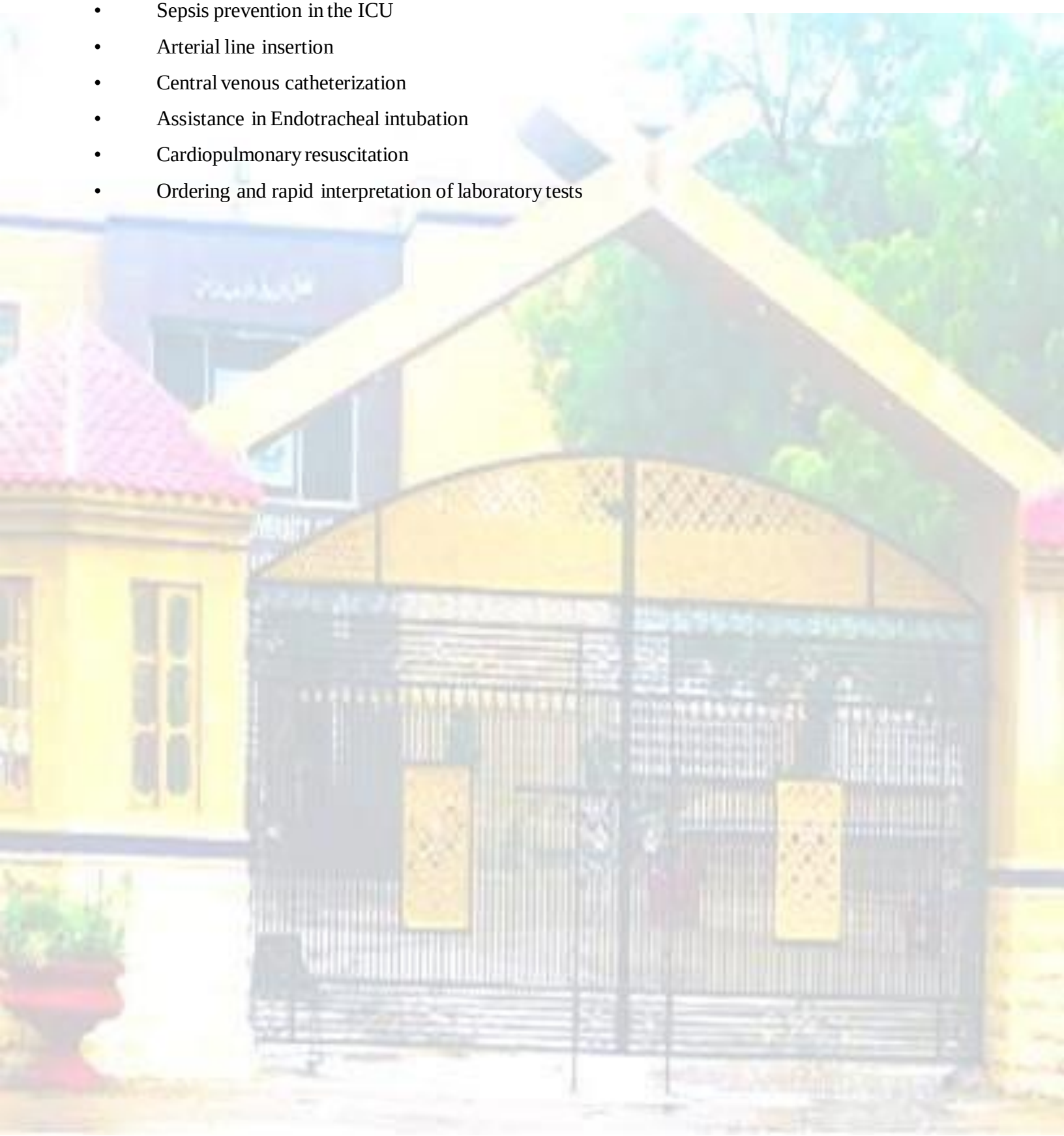
1. Training in emergency medicine and critical care is crucial for the general internist.
2. A recognition/prioritization medical emergency is the basic knowledge that should be acquired by the internist.

   Important aspects of this training include: identifying patients who are candidates for intensive care, the bedside approach to the critically-ill patient, knowledge of algorithms for diagnosis and management of common problems in the ICU, death and resuscitation issues, interaction with families.

Skills and Procedures:

- Asthma management
- Evaluation of chest pain
- Evaluation of shortness of breath
- Airway management/tracheostomy Barotrauma
- Mechanical ventilation: indications, initial set-up, trouble shooting, weaning
- Critical care nutrition: indications, disease-specific nutrition, writing TPN orders
- Management of Ob/Gynae emergencies
- Oxygen transport: physiology, alterations in the critically-ill
- Arterial blood gases: approach to analysis, common alterations
- Hemodynamics: physiology, PA catheter, hemodynamic waveforms, trouble-shooting
- Critical care pharmacology: pressors / inotropes, antibiotic dosing, drug dosing in ARF
- Shock: pathophysiology, approach to resuscitation
- Fluid and electrolyte disturbances: sodium, potassium, magnesium, calcium
- Acute renal failure: approach differential diagnosis, management
- Coma: pathophysiology, neurological exam, differential diagnosis
- Wound care
- Splinting techniques
- Ophthalmologic emergency management
- Multiple organ dysfunction syndrome
- Acute CHF
- Ethical issues in the ICU
- Management of environmental emergencies
- Basic toxicology principles

- Sepsis prevention in the ICU
- Arterial line insertion
- Central venous catheterization
- Assistance in Endotracheal intubation
- Cardiopulmonary resuscitation
- Ordering and rapid interpretation of laboratory tests



THESIS COMPONENT:

RESEARCH/ THESIS WRITING: Total of one year will be allocated for work on a research project with thesis writing. Project must be completed and thesis be submitted before the end of training. Research can be done as one block in 4th year of training or it can be stretched over four years of training in the form of regular periodic rotations during the course as long as total research time is equivalent to one calendar year.

Research Experience: The active research component program must ensure meaningful, supervised research experience with appropriate protected time for each resident while maintaining the essential clinical experience. Recent productivity by the program faculty and by the residents will be required, including publications in peer-reviewed journals. Residents must learn the design and interpretation of research studies, responsible use of informed consent, and research methodology and interpretation of data. The program must provide instruction in the critical assessment of new therapies and of the medical literature. Residents should be advised and supervised by qualified staff members in the conduct of research.

Clinical Research: Each resident will participate in at least one clinical research study to become familiar with:

1. Research design
2. Research involving human subjects including informed consent and operations of the Institutional Review Board and ethics of human experimentation
3. Data collection and data analysis
4. Research ethics and honesty
5. Peer review process

This usually is done during the consultation and outpatient clinic rotations.

Case Studies or Literature Reviews: Each resident will write, and submit for publication in a peer-reviewed journal, a case study or literature review on a topic of his/her choice.

Laboratory Research Bench Research Curriculum/Statutes & Regulations-MD Internal Medicine: 60 Participation in laboratory research is at the option of the resident and may be arranged through any faculty member of the Division. When appropriate, the research may be done at other institutions.

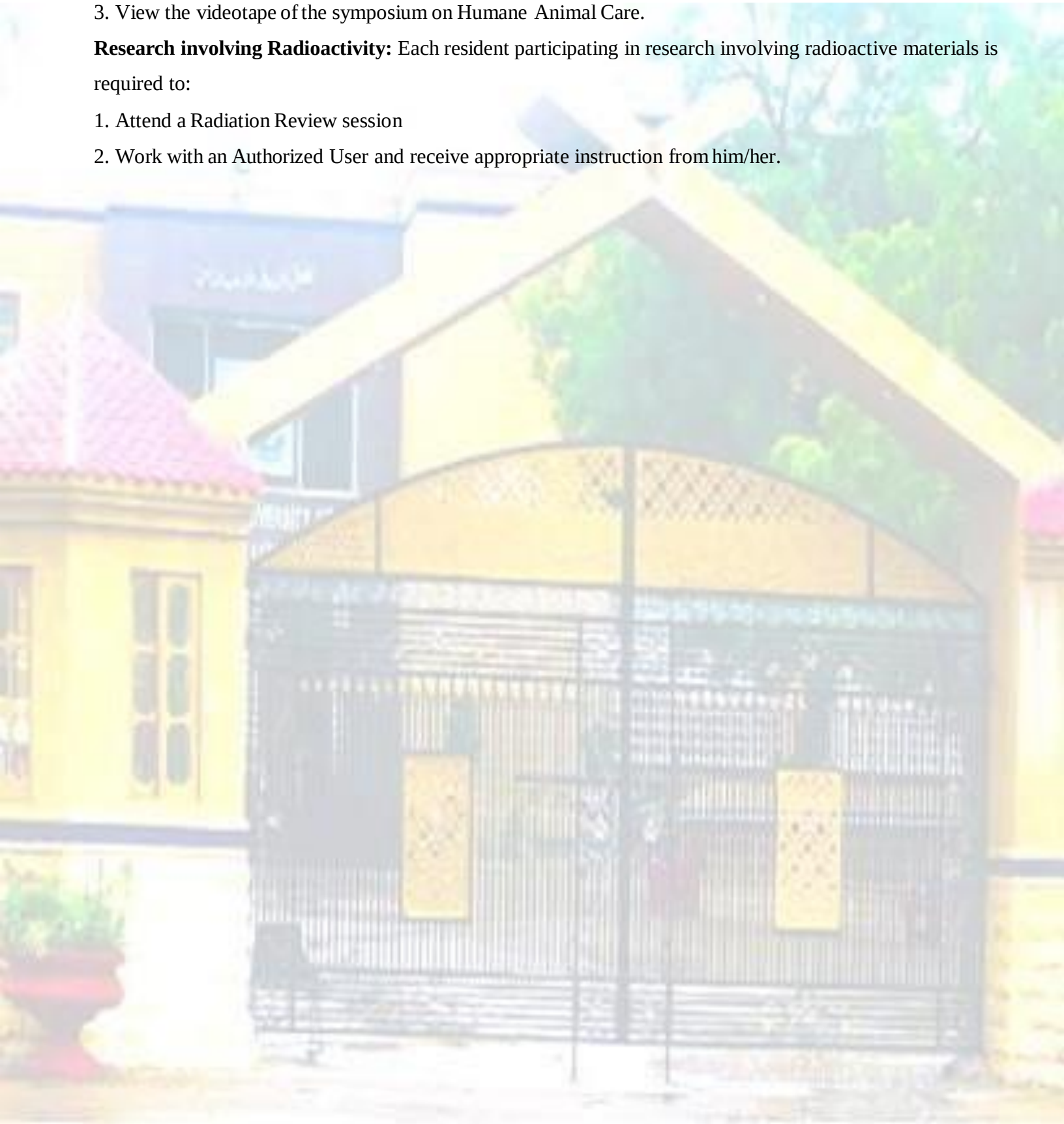
Research involving animals: Each resident participating in research involving animals is required to:

1. Become familiar with the pertinent Rules and Regulations of the University of Health Sciences Lahore i.e. those relating to "Health and Medical Surveillance Program for Laboratory Animal Care Personnel" and "Care and Use of Vertebrate Animals as Subjects in Research and Teaching".
2. Read the "Guide for the Care and Use of Laboratory Animals".

3. View the videotape of the symposium on Humane Animal Care.

Research involving Radioactivity: Each resident participating in research involving radioactive materials is required to:

1. Attend a Radiation Review session
2. Work with an Authorized User and receive appropriate instruction from him/her.



CLINICAL COMPETENCIES:

The clinical competencies are assessed by the skills and application of knowledge on the patient. There is a list of procedures in medicine and allied subjects for the candidates which will assess the competency of the candidates during the training in the parent and the rotation ward. The level of competency which would be achieved by the candidate is specific as under;

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

COMPETENCY LEVELS

Competencies	1st year	2nd year	3rd year	4th year
Patient management				
History taking	2	3	4	4
Clinical examination	2	3	4	4
Investigations (ordering and interpretation)	2	3	4	4
Treatment (deciding and implementation)	1	2	3	4
Follow ups / Records	2	3	4	4
Research / data collection	-	-	-	-

COMPETENCIES	FIRST YEAR								
	3 Months		6 Months		9 Months		12 Months		Total Cases
	Level	Cases	Level	Cases	Level	Cases	Level	Cases	First Year
Rotations to be incorporated as and whenavailable with the consent of respected supervisor									
Pleural Aspiration	1,2	2	3	2	4	2	4	2	8
Peritoneal Aspiration	1,2	2	3	2	4	2	4	2	8
Lumbar puncture	1	2	2	2	3	2	4	2	8
Nasogastric Intubation	1,2	2	3	2	4	2	4	2	8
Uretheral catheterization	1,2	2	3	2	4	2	4	2	8
Recording and reporting ECG	1	5	2	5	3	5	4	5	20
Proctoscopy	-	-	1	1	1	1	1	1	3
Endotracheal Intubation	1	1	2	2	3	2	3	1	6
Cardio-Pulmonary Resuscitation (CPR)	1,2	1	3	1	3	2	3	2	6
Insertion of CVP lines	1	1	2	1	3	2	3	2	6
Arterial puncture	-	-	-	-	-	-	1	2	2
Urine Examination	3	1	3	1	3	1	3	1	4
Liver biopsy	1	1	2	1	2	1	2	1	4
Pleural biopsy	-	-	1	1	2	1	2	1	3
Joint aspiration	-	-	-	-	1	1	1	-	1
Bone marrow aspiration	-	-	1	1	1	1	1	1	3
Renal biopsy	-	-	-	-	1	1	1	1	2

COMPETENCIES	FIRST YEAR								
	3 Months		6 Months		9 Months		12 Months		Total Cases
	Level	Cases	Level	Cases	Level	Cases	Level	Cases	First Year
Rotations to be incorporated as and whenavailable with the consent of respected supervisor									
Haemodialysis	-	-	1	1	1	1	2	1	3
Upper G.I. Endoscopy	-	-	-	-	1	1	1	1	2
Lower G.I. Endoscopy	-	-	-	-	-	-	1	1	1
Bronchoscopy	-	-	-	-	1	1	1	1	2
Abdominal Ultrasound	-	-	-	-	1	1	1	1	2
Exercise Tolerence Test	-	-	-	-	-	-	-	-	-
Echocardiography	-	-	-	-	1	1	1	1	2
CT Scan Head,Chest,Abdomen	-	-	1	1	1	1	1	1	3
EEG	-	-	-	-	-	-	-	-	-
EMG/NCS	-	-	-	-	-	-	-	-	-
Chest Intubation	-	-	-	-	-	-	-	-	-
Pericardiocentesis	-	-	-	-	-	-	-	-	-
MRI Brain	-	-	-	-	1	1	1	1	2

COMPETENCIES	SECOND YEAR				
	15 Months		18 Months		Total Cases
	Level	Cases	Level	Cases	Second Year
Rotations to be incorporated as and when available with the consent of respected supervisor					
Pleural Aspiration	4	1	4	1	2
Peritoneal Aspiration	4	1	4	1	2
Lumbar puncture	4	1	4	1	2
Nasogastric Intubation	4	1	4	1	2
Uretheral catheterization	4	1	4	1	2
Recording and reporting ECG	4	1	4	1	2
Proctoscopy	1	1	1	1	2
Endotracheal Intubation	3	1	3	1	2
(Cardio-Pulmonary Resuscitation (CPR	3	1	3	1	2
Insertion of CVP lines	3	1	3	1	2
Arterial puncture	2	1	2	1	2
Urine Examination	4	1	4	1	2
Liver biopsy	2	1	2	1	2
Pleural biopsy	2	1	2	1	2
Joint aspiration	1	-	1	1	1
Bone marrow aspiration	1	1	1	1	2
Renal biopsy	1	-	1	1	1

COMPETENCIES	SECOND YEAR				
	15 Months		18 Months		Total Cases
	Level	Cases	Level	Cases	Second Year
Rotations to be incorporated as and when available with the consent of respected supervisor					
Haemodialysis	2	1	2	1	2
Upper G.I. Endoscopy	1	1	1	-	1
Lower G.I. Endoscopy	1	1	1	1	2
Bronchoscopy	1	1	1	-	1
Abdominal Ultrasound	1	1	1	1	2
Exercise Tolerence Test	1	1	1	1	2
Echocardiography	1	1	1	1	2
CT Scan Head	1	1	1	1	2
EEG	1	1	1	1	2
EMG/NCS	1	1	1	1	2
Chest Intubation	1	1	1	1	2
Pericardiocentesis	1	1	1	1	2
MRI Brain and Spine	1	1	1	1	2
CT Scan Head,Chest,Abdomen	1	1	1	1	2
Depression and anxiety	1	1	1	1	2

ROTATIONS	Level	Cases
CARDIOLOGY (two month rotation)		
Thromvolysis in acute MI	1,2,3	6
Management of Arrythmias - Drug / Defibrillation	1,2,3	4
ECG recordings and reporting	1,2,3	6
ETT	1,2	2
ECHO	1	4
CPR	1,2	2
PULMONOLGY(twomonth rotation)		
Pleural Aspiration	1,2,3	3
Pleural Biopsy	1	1
Chest intubation	1	1
Broncoscopy	1	2
Pulmonary function test	1	2
Blood gases interpertation	1,2	2
NEUROLOGY (twomonth rotation)		
CT Scan interpretation	1,2,3	4
MRI interpretation	1,2,3	2
EEG interpretation	1	1
EMG interpretation	1	1

ROTATIONS	Level	Cases
GASTROENTEROLOGY (two month rotation)		
Peritonial Aspiration	1,2,3	3
Liver Biopsy	1	2
Upper GI Endoscopy	1	2
Colonoscopy / sigmoidoscopy	1	2
Variceal banding / Sclerothrepy	1	2
MEDICAL ONCOLOGY (two month rotation)		
Chemeotherapy	1,2	4
Radiotherapy	1	2
NEPHROLOGY (twomonth rotation)		
Haemodialysis	1,2,3	4
Renal Biopsy	1,2	2
Insertion of double lumen catheter	1,2	2

ROTATIONS

CLINICAL HEMATOLOGY (two month rotation)

	Duration (weeks)	Level	Cases
Routine Haematology	2	1,2	20
Haemoglobinopathies	1	1,2	10
Coagulation disorders	1	1	10
Stem cell transplantation	1	1	1
Malignant hematology	2	1,2	5
Blood transfusion	1	1,2	10

ROTATIONS	
DERMATOLOGY	
Psoriasis	
Scabies	
HS Purpura	
Erythema Nodosum	
Fixed Drug Eruption	

PROCEDURES	THIRD YEAR								
	3 Months		6 Months		9 Months		12 Months		Total Cases
	Level	Cases	Level	Cases	Level	Cases	Level	Cases	Third Year
Rotations to be incorporated as and when available with the consent of respected supervisor									
Pleural aspiration	4	2	4	2	4	2	4	2	8
Peritoneal aspiration	4	2	4	2	4	2	4	2	8
Lumbar puncture	4	1	4	1	4	1	4	1	4
Nasogastric intubation	4	2	4	2	`	1	4	1	6
Uretheral catheterization	4	2	4	2	4	1	4	1	6
Recording and reporting ECG	4	3	4	3	4	3	4	3	12
Proctoscopy	3	1	3	1	-	-	-	-	2
Endotracheal intubation	4	1	4	1	4	1	4	1	4
Insertion of CVP lines	4	2	4	2	4	2	4	2	8
Arterial puncture	3	1	3	1	-	-	-	-	2
Liver biopsy	3	1	3	1	-	-	-	-	2
Pleural biopsy	2	1	2	1	-	-	-	-	2
Joint aspiration	3	1	-	-	-	-	-	-	1
Bone marrow aspiration	2	1	-	-	-	-	-	-	1
Renal biopsy	-	-	-	-	2	2	-	-	2
Haemodialysis	2	2	-	-	2	2	-	-	4
Upper G.I. endoscopy	2	1	2	1	2	1	2	1	4

PROCEDURES	THIRD YEAR								
	3 Months		6 Months		9 Months		12 Months		Total Cases
	Level	Cases	Level	Cases	Level	Cases	Level	Cases	Third Year
Rotations to be incorporated as and when available with the consent of respected supervisor									
Colonoscopy	2	1	2	1	-	-	-	-	2
Bronchoscopy	2	1	-	-	-	-	-	-	1
Abdominal ultrasound	1	1	1	1	1	1	2	1	4
Exercise tolerance test	1	1	1	1	1	1	2	1	4
Echocardiography	1	1	1	1	1	1	2	1	4
CAT scan Head, Thorax and Abdomen	1	1	1	1	1	1	2	1	4
Electroencephalography (EEG)	1	1	-	-	-	-	-	-	1
Electromyography/Nerve conduction studies (EMG/NCS)	1	1	-	-	-	-	-	-	1
Chest intubation	2	1	-	-	-	-	-	-	1

PROCEDURES	FOURTH YEAR				
	15 Months		18 Months		Total Cases
	Level	Cases	Level	Cases	Fourth Year
Rotations to be incorporated as and when available with the consent of respected supervisor					
Pleural aspiration	4	2	4	2	4
Peritoneal aspiration	4	2	4	2	4
Lumbar puncture	4	1	4	1	2
Nasogastric intubation	4	10	4	10	20
Urethral catheterization	4	10	4	1	2
Recording and reporting ECG	4	10	4	2	4
Proctoscopy	4	1	4	1	2
Endotracheal intubation	4	1	4	1	2
Insertion of CVP lines	4	4	4	4	8
Arterial puncture	4	1	4	1	2
Liver biopsy	4	1	4	1	2
Pleural biopsy	3	1	3	1	2
Joint aspiration	4	2	4	2	4
Bone marrow aspiration	3	2	3	2	4
Renal biopsy	-	-	-	-	-
Haemodialysis	3	1	3	1	2
Upper G.I. endoscopy	3	2	3	2	4

PROCEDURES	FOURTH YEAR				
	15 Months		18 Months		Total Cases
	Level	Cases	Level	Cases	Fourth Year
Rotations to be incorporated as and when available with the consent of respected supervisor					
Colonoscopy	2	1	2	1	2
Bronchoscopy	2	1	-	-	1
Abdominal ultrasound	2	2	2	2	4
Exercise tolerence test	2	2	3	2	4
Echocardiography	2	2	2	2	4
CAT scan head	2	2	2	2	4
Electroencephalography (EEG)	1	1	-	-	1
Electromyography/Nerve conduction studies (EMG/NCS)	1	1	-	-	1
Chest intubation	2	1	-	-	1
MRI Brain and Spine	1	1	1	1	2
Doppler ultrasound of limbs and neck	1	1	1	1	2

PROCEDURES	Level	Cases
INTENSIVE CARE		
Endotracheal Intubation	4	6
Insertion of CVP line	4	6
Arterial puncture	3,4	4
Mechanical ventilation	3,4	4
Cardio Pulmonary Resuscitation (CPR)	3,4	4
Blood gases interpretation	4	4
CARDIOLOGY		
Thrombolysis in acute MI	4	6
Management of arrhythmias - Drug / Defibrillation	4	4
ECG recordings & reporting	4	6
Exercise tolerance test (ETT)	2,3	2
Echocardiography	1,2	4
Cardio Pulmonary	4	2
Resuscitation (CPR)		
PULMONOLOGY		
Pleural Aspiration	4	3
Pleural Biopsy	1	1
Chest Intubation	2	2
Bronchoscopy	2	2
Lung function test	2	2

PROCEDURES	Level	Cases
NEUROLOGY		
CAT Scan head	1,2,3,	4
Magnetic resonance Imaging (MRI) brain/spine	2	2
Electroencephalography (EEG)	2	2
Electromyography/Nerve conduction studies (EMG/NCS)	1	2
GASTROENTEROLOGY		
Endotracheal Intubation	4	6
Peritoneal Aspiration	4	4
Liver Biopsy	3,4	2
Upper GI Endoscopy	2,3	2
Colonoscopy / Sigmoidoscopy	2	2
Variceal banding / Sclerothrepy	1	2
ONCOLOGY		
Chemotherapy	1,2	4
Radiotherapy	1	2

PROCEDURES	Level	Cases
ENDOCRINOLOGY		
Interpretation of thyroid function tests/ thyroid isotope scan / thyroid ultrasound /thyroid FNA-C	1,2,3	5+5+5
Interpretation of pituitary function tests /stimulation/suppression testing of pituitary	1,2,3	1+1+1
Interpretation of adrenal function tests /stimulation/suppression testing of adrenals	1,2,3	1+1+1
Evaluation of disorders of Gonadal dysfunction	1,2,3	1+1+1
Disorders of growth and sexual differentiation/development	1	1
(Interpretation of calcium metabolism (calcium and phosphorus lab tests	1,2,3	1+1+1
Interpretation of DEXA scan/MRI pituitary / MRI or CT Adrenals	1	1
Interpretation of glucose lab tests/HbA1c/OGTT for diagnosis of diabetes and its complications	1,2,3	10+10+10
Clinical and laboratory evaluation of patients with diabetes to evaluate glycemic, lipemic, hypertension and obesity control and its complications	1,2,3	10+10+10
Formulate a comprehensive management plan for patients with diabetes	1,2,3	10+10+10
Clinical and laboratory evaluation and management of patients with gestational diabetes	1,2,3	2+2+2
Prescribing and adjusting insulin for management with diabetes	1,2,3	2+2+2

PROCEDURES	Level	Cases
NEPHROLOGY		
Haemodialysis	2,3	6
Renal Biopsy	1	2
Insertion of double lumen catheter	3,4	4
Peritoneal Dialysis	2	2
PSYCHIATRY		
Psychotherapy Sessions	1	2
Electro convulsive therpy (ECT)	1	2

WEEKLY DUTY SCHEDULE FOR MD RESIDENT:

Activity	Times per week	Duration	Contact hours total
General round	1	2 hours	2 x 200 hours
Consultant round	1	2 hours	2 x 200 hours
Department CME	1	2 hours	2 x 200 hours
Ward Journal Club	1/per two weeks	2 hours	4 x 12 x 4 = 192 hours
Case presentation	1/two weeks	2 hours	4 x 12 x 4 = 192 hours
Morbidity meeting	1/per month	2 hours	2 x 12 x 4 = 96 hours
Mortality meeting	1/per month	2 hours	2 x 12 x 4 = 96 hours
OPD's	1/per week	4 hours	4 x 200 = 800 hours
Night duties	2 per weeks (36 hours each)	72 hours	14,400 hours
Clinical Seminar	1 per month	1 hour	12 x 4 = 48 hours
			Gross Total: 16832/=

Total working weeks in 4 years = 200

Weekly duty hour = 88

1/3 Call, 1 Call 36 hours = 72 hours

2 mornings 8 hours per duty = 16 hours

Total contact hours in 04 years = 17600

LOG BOOK:

The residents must maintain a log book and get it signed regularly by the supervisor. A complete and duly certified log book should be a part of the requirement to sit for MD examination. Log Book should include adequate number of diagnostic and therapeutic procedures observed and performed indications for the procedure, any complications and the interpretation of the results, routine and emergency management of patients, case presentations in CPCs, journal club meetings and literature review.

Proposed Format of Log Book is as follows:

Candidate's Name:_____Roll No. _____

Supervisor: _____

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

PROCEDURES PERFORMED

SR.#	DATE	NAME OF PATIENT, AGE, SEX & ADMISSION NO.	DIAGNOSIS	PROCEDURE PERFORMED	SUPERVISOR'S SIGNATURE
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EMERGENCIES HANDLED

SR.#	DATE	NAME OF PATIENT, AGE, SEX & ADMISSION NO.	DIAGNOSIS	PROCEDURE MANAGEMENT	SUPERVISOR'S SIGNATURE
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CASE PRESENTED

SR.#	DATE	NAME OF PATIENT, AGE, SEX & ADMISSION NO.	CASE PRESENTED	SUPERVISOR'S SIGNATURE
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SEMINAR/JOURNAL CLUB PRESENTATION

SR.#	DATE	TOPIC	SUPERVISOR'S SIGNATURE
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RECOMMENDED BOOKS

STANDARD TEXT BOOKS OF MEDICINE

1) Davidson's Principles and Practice of Medicine. 24th Edition. Churchill Livingstone
2) Kumar & Clark's Clinical Medicine. 10th Edition, Elsevier
3) Cecil Essentials of Medicine 10th Edition
4) Hutchison's Clinical Methods International Edition, 25th Edition
5) Macleod's Clinical Examination 15th Edition
6) CURRENT Medical Diagnosis and Treatment 2024 63rd Edition

REFERENCE BOOKS

1) Harrison's Principles of Internal Medicine 21st edition
2) Goldman-Cecil Medicine, 2-Volume Set, 27th Edition
3) Weather DJ. Oxford Text book of Medicine. Oxford University Press. 6th Edition

Suggested Medical Journals:

1. BMJ (British Medical Journal)
2. NEJM (New England Journal of Medicine)
3. JAMA (Journal of the American Medical Association)
4. The Lancet
5. JCPSP (Journal of College of Physicians and Surgeons Pakistan)

Medical Website:
www.medscape.com