

Khesar Gyalpo University of Medical Sciences of Bhutan



Academic Programme

Doctor of Medicine (MD) in Internal Medicine

Department of Medicine

JDWNR Hospital

Thimphu: Bhutan

PROGRAMME OVERVIEW

The Khesar Gyalpo University of Medical Sciences of Bhutan has launched the 4-year Postgraduate Residency programme in five disciplines, namely, General Surgery, Pediatrics, Obstetrics and Gynaecology, Anesthesiology, and Ophthalmology in July 2014. The main aim of the program is to address the shortage of specialists in critical areas to strengthen patient care.

The internal medicine residency programme is a four-year structured training programme offering clinical training in general medicine and the major medical sub-specialties. The programme is designed to provide academic environment, formal teaching and broad clinical experience to the trainee, necessary to become an excellent general medical specialist/internist. The structured internal medicine residency programme is expected to develop knowledge, skills and competency of the resident trainees in the clinical, epidemiological and scientific research culminating in the provision of a quality, evidence-based and holistic care to the patients and their families/ care giver.

DURATION

The Postgraduate Residency programme in Internal Medicine is a 4-year structured and full-time course including rotations in various disciplines.

GOAL

The goal of the programme is to produce broad Specialists in Internal Medicine who are capable of providing expertise in the diagnosis and management of diseases and ill-health conditions including promotive and preventive services.

LEARNING OBJECTIVES

The Postgraduate Residency programme in Internal Medicine aims to:

- a) Train the residents in performing thorough and comprehensive history and physical examination for a wide range of general medical conditions in adults;
- b) Inculcate skills to present the relevant history and physical findings in a coherent and precise manner;
- c) Train residents in carrying out an effective diagnostic and therapeutic plan;
- d) Develop competency in management of acute medical emergencies;
- e) Impart knowledge on the fundamental principles and management of all of the major medical subspecialties including intensive care, palliative care, therapeutics and toxicology, and behavioral science;
- f) Provide knowledge and skills in correlating and interpreting some aspects of clinical biochemistry, immunology, microbiology, radio imaging and nuclear medicine;
- g) Formulate a total evaluation of the patient and prioritize treatment, which may include relevant medical procedures;
- h) Coordinate the care for all patients including multi-disciplinary team whenever deemed necessary;
- i) Develop skills in clinical, counseling, education, leadership and management roles

LEARNING OUTCOMES

At the end of the MD course in Medicine, the student should be able to:

- a) Recognize the key importance of medical problems in the context of the health priority of the country;
- b) Practice the specialty of medicine in keeping with the principles of professional ethics;
- c) Identify social, economic, environmental, biological and emotional determinants of adult medicine and know the therapeutic, rehabilitative, preventive and promotional measures to provide holistic care to all patients;
- d) Take detailed history, perform full physical examination and make a clinical diagnosis including differential diagnosis;
- e) Order and interpret relevant investigations (Imaging and Laboratory);
- f) Perform and interpret important diagnostic procedures;
- g) Make a final Diagnose based on the analysis of history, physical examination and investigative work up.
- h) Plan and deliver comprehensive treatment for patients applying principles of rational drug therapy;
- i) Plan and advise measures for the prevention of medical diseases;
- j) Plan rehabilitation of patients suffering from chronic illness, and those with special needs;
- k) Manage medical emergencies efficiently;
- l) Demonstrate skills in documentation of case details, and of morbidity and mortality data relevant to the assigned situation;
- m) Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities;
- n) Demonstrate effective communication skills in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.
- o) Develop skills as a self-directed learner, recognize continuing educational needs; use appropriate learning resources, and critically analyze relevant published literature in order to practice evidence-based medicine;
- p) Demonstrate competence in basic concepts of research methodology and epidemiology;
- q) Facilitate learning of medical/nursing students, practicing physicians, Para-medical health workers and other providers as a teacher-trainer;
- r) Play the assigned role in the implementation of national health programs, effectively and responsibly;
- s) Organize and supervise the desired managerial and leadership skills;
- t) Function as a productive member of a team engaged in health care, research and education.

Core Competencies

1. Patient care
2. Medical knowledge
3. Practice-based learning and improvement
4. Interpersonal and communication skills
5. Professionalism.
6. Systems-based practice

1. Patient Care

Residents must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health. Residents are expected to:

- a. communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families;
- b. gather essential and accurate information about their patients;
- c. make informed decisions about diagnostic and therapeutic interventions, based on patient information and preferences, up-to-date scientific evidence and clinical judgment;
- d. develop and carry out patient management plans;
- e. counsel and educate patients and their families;
- f. use information technology to support patient care decisions and patient education;
- g. perform competently the medical and invasive procedures considered essential for the area of practice;
- h. provide health care services aimed at preventing health problems and maintaining health;
- i. Work with health care professionals, including those from other disciplines, to provide patient-focused care.

2. Medical Knowledge

Residents must demonstrate knowledge about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences and the application of this knowledge to patient care. Residents are expected to:

- demonstrate an investigatory and analytic thinking approach to clinical situations;
- Know and apply the basic and clinically supportive sciences which are appropriate to Pediatrics.

3. Practice-based Learning and Improvement

Residents must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. Residents are expected to:

- a. analyze practice experience and perform practice-based improvement activities using a systematic methodology;
- b. locate, appraise, and assimilate evidence from scientific studies related to their patients' health problems;
- c. obtain and use information about their own population of patients and the larger population from which their patients are drawn;
- d. apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness;
- e. use information technology to manage information, access on-line medical information; and support their own education; and
- f. Facilitate the learning of students and other health care professionals.

4. Interpersonal and Communication Skills

Residents must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates. Residents are expected to:

- create and sustain a therapeutic and ethically sound relationship with patients;
- use effective listening skills and elicit and provide information using effective nonverbal, explanatory, questioning, and writing skills; and
- Work effectively with others as a member or leader of a health care team or other professional group.

5. Professionalism

Residents must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. Residents are expected to:

- a) Demonstrate respect, compassion, and integrity; a
- b) Responsiveness to the needs of patients and society that supersedes self-interest;
- c) Be accountable to patients, society, and the profession; and a
- d) Be commitment to excellence and on-going professional development;
- e) Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices; and
- f) Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities.

6. Systems-based Practice

Residents must demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value. Residents are expected to:

- understand how their patient care and other professional practices affect other health care professionals, the health care organization and the larger society, and how these elements of the system affect their own practice;
- know how types of medical practice and delivery systems differ from one another, including methods of controlling health care costs and allocating resources;
- practice cost-effective health care and resource allocation that do not compromise quality of care;
- advocate for high quality patient care and assist patients in dealing with system complexities; and
- know how to partner with health care managers and health care providers to assess, coordinate, and improve health care and know how these activities can affect system performance

Professional attitudes and conduct require that Resident must also have developed a style of care which is:

1. humane
2. reflective
3. ethical
4. scientific

ELIGIBILITY

- MBBS or equivalent degree approved by the Bhutan Medical & Health Council (BMHC);
- Completion of one year internship;
- Completed one year of probation period in case of civil service employees;

SELECTION EXAMINATION

Candidates are required to sit for selection/entry examination held each year by the Postgraduate Medical Education Centre. A candidate who score the prescribed minimum marks is shortlisted for selection. Selection of the candidates for the programme is based on merit ranking of their performance in the selection examination.

COURSE CONTENTS

Residents are given graded responsibility for patient care during their years of residency. The senior resident is able to demonstrate a level of knowledge, clinical skills, technical skills and attitudes consistent with independent consulting practice. The residency programme provides adequate opportunities for residents to gain skills in all the common and emergency procedures. The resident functions within the context of a team approach to patient care.

The residents are given provision of an appropriate balance of inpatient, outpatient, critical care and ambulatory training experiences. Residents have sufficient exposure to each of the recognised medical subspecialties so as to become fully familiar with the role and contribution of each to effective patient care. In the residency programme, methods are in place of careful and fair evaluation of residents performances.

Appropriate feedback, guidance, and counseling are given to assure proper development in all areas of training and professional behavior.

SYLLABUS

THEORY

The theory syllabus should include the cardinal manifestations, definition, epidemiology, etiopathogenesis, clinical presentation, complications, differential diagnosis, investigations, treatment and prevention of all diseases. It should also cover the recent advances that have occurred in the science of medicine into its armamentarium of diagnosis, prevention and treatment.

❖ Introduction to clinical medicine

- The practice of Medicine
- Global issues in medicine
- Decision-making in clinical Medicine
- Screening and prevention of disease
- Principles of clinical pharmacology
- Women's health
- Child and adolescent Health

- Medical disorders during pregnancy
- Medical evaluation of the surgical patient
- Geriatric Medicine
- Complementary and alternative medicines
- Palliative and End-of-Life Care
- The safety and quality of health care
- Economic considerations in the Practice of Medicine
- Racial and Ethnic disparities in health care
- Ethical issues in clinical medicine
- Neuron psychotics manifestations

❖ **Cardinal manifestations and presentation of diseases**

- Pain
- Alterations in body temperature
- Nervous system dysfunction
- Disorders of eyes, ears, nose and throat
- Alterations in circulatory and respiratory functions
- Alterations in gastrointestinal function
- Alterations in renal and urinary tract function
- Alteration in sexual function and reproduction
- Alteration in the skin
- Hematologic alterations

❖ **Nutrition**

- Nutritional requirements and dietary assessment
- Malnutrition and nutritional assessment
- Biology of Obesity, evaluation and management of obesity.
- Enteral and Parenteral therapy
- Eating disorders
- Vitamins and trace mineral deficiency and excess.

❖ **Genetics**

- Principles of human genetics
- Chromosomal disorders
- Practice of genetics in clinical medicine
- Gene therapy in clinical medicine.

❖ **Regenerative Medicine**

- Stem cell biology
- applications of stem cell biology in clinical medicine
- Hematopoietic stem cells, tissue engineering

❖ **Cardiovascular**

- Introduction to Cardiovascular disorders
- diagnosis of cardiovascular disorders
- disorders of rhythms and disorders of heart
- Vascular diseases.

- Valvular heart disease
- Hypertension
- IHD
- Congenital heart diseases
- Cardio myopathy
-

❖ **Respiratory**

- Diagnosis of respiratory disorders
- Diagnostic procedures in respiratory diseases
- COPDs
- Diseases of the respiratory system
- Respiratory failure
- Disorders of the pleura and Mediastinum
- Chest imaging (X-Ray and CT scan), Bronchoscopy and Spirometry.

❖ **Gastrointestinal and liver diseases**

- Disorders of the alimentary tract
- Liver and biliary tract Diseases
- Disorder of the pancreas

❖ **Disorder of the kidney and urinary tract**

- Cellular and molecular biology of the kidney
- Adaptation of the kidney to the renal injury
- Acute renal failure
- Chronic kidney disease
- Dialysis in the treatment of renal failure
- Glomerular diseases
- Polycystic kidney disease and other inherited tubular disorders
- Tubulointerstitial diseases of the kidney
- Vascular injury to the kidney
- Nephrolithiasis
- Urinary tract infections, pyelonephritis, prostatitis
- Urinary tract obstruction

❖ **Neurological disorders**

- Diagnosis of neurologic disorders:
- Diseases of the central nervous system:
- Nerve and muscle disorders peripheral neuropathy, guillainbarre and other immune mediated neuropathies, myasthenia gravis and other diseases of the neuromuscular junction, muscular dystrophies and other muscle diseases, polymyositis, dermatomyositis and inclusion body myositis, special issues in inpatient neurologic consultations.
- Chronic fatigue syndrome

❖ **Neuropsychiatric disorders**

- Biology of psychiatric disorder, mental disorders.
- Alcoholism and drug dependency: alcohol and alcoholism, opioid drug abuse and

dependence, cocaine and other commonly abused drugs, nicotine addiction

❖ Hematology and oncology

- **Neoplastic disorders:** approach to the patient with cancer, prevention and early detection, cancer genetics, cancer cell biology and angiogenesis, principles of cancer treatment, infections in patients with cancer, cancer of the skin, head and neck cancer, neoplasms of the lung, breast cancer, gastrointestinal tract cancer, tumors of the liver and biliary tree, pancreatic cancer, bladder and renal cell carcinomas, benign and malignant diseases of the prostate, testicular cancer, gynecologic malignancies, soft tissue and bone sarcomas and bone metastases, carcinoma of unknown primary, paraneoplastic syndrome (endocrinologic/ hematologic), paraneoplastic neurologic syndromes, thymoma, late consequences of cancer and its treatment.
- **Hematocology disorders:** iron deficiency and hypoproliferative anemias, disorders of the hemoglobin, megaloblastic anemias, hemolytic anemia and anemia due to acute blood loss, aplastic anemia, myelodysplasia, related bone marrow failure syndromes, polycythemia vera and other myeloproliferative diseases, acute and chronic myeloid leukemia, malignancies of lymphoid cells, plasma cell disorders, transfusion biology and therapy, hematopoietic cell transplantation.

❖ Disorders of hemostasis

Disorder of platelets and vessel wall, coagulation disorders, venous thrombosis, antiplatelet, anticoagulant, and fibrinolytic drugs.

❖ Endocrinology and metabolism

- **Endocrinology:** principles of endocrinology, disorders of the anterior pituitary and hypothalamus, disorders of the neurohypophysis, disorders of the thyroid gland, disorders of the adrenal cortex, pheochromocytoma, diabetes mellitus, hypoglycemia, disorders of the testes and male reproductive system, the female reproductive system (infertility and contraception), the menopause transition and post-menopausal hormone therapy, disorders of sex development, endocrine tumors of the gastrointestinal tract and pancreas, disorders affecting multiple endocrine systems.
- **Disorders of bone and mineral metabolism:** bone and mineral metabolism in health and disease, diseases of the parathyroid gland and other hyper and hypocalcemic disorders, osteoporosis, paget disease and other dysplasias of bone.
- **Disorders of intermediary metabolism:** disorders of lipoprotein metabolism, hemochromatosis, the porphyrias, disorders of purine and pyrimidine metabolism, Wilson disease, lysosomal storage diseases, glycogen storage diseases and other inherited disorders of carbohydrate metabolism, heritable disorders of connective tissue, inherited disorders of amino acid metabolism in adults, inherited defects of membrane transport, atlas of clinical manifestation of metabolic diseases.

❖ Infectious diseases

- Basic considerations in infectious diseases
- Clinical syndromes: community acquired infections
- Clinical syndromes: health care associated infections

- Mycobacterial diseases
- Viral diseases: general considerations and emerging trends:
- Infections due to
 - DNA viruses
 - DNA and RNA respiratory viruses
 - human immune deficiency Virus and other human retroviruses
 - RNA viruses
 - Fungal and algal infections
 - Protozoal and helminthic infections

❖ **Bioterrorism and clinical Medicine**

- Microbial bioterrorism
- Chemical bioterrorism
- Radiation bioterrorism

❖ **Critical care Medicine**

- **Respiratory critical care:** principles of critical care medicine, acute respiratory distress syndrome, mechanical ventilatory support.
- **Shock and cardiac arrest:** approach to the patient with shock, severe sepsis and septic shock, cardiogenic shock and pulmonary edema, cardiovascular collapse, cardiac arrest, and sudden cardiac death.
- **Neurologic critical care:** coma, neurologic critical care, including hypoxic-ischemic encephalopathy and subarachnoid hemorrhage.
- **Oncologic emergencies:** hemorrhages
- **Child and Adolescent Health:** common illness, behavioral related problems (drug abuse, teenage pregnancy, violence etc)

• **Rheumatology and Disorders of the Immune system.**

- **The immune system in health and disease:** introduction to the immune system, the major histocompatibility complex, primary immune deficiency diseases, primary immunodeficiency's associated with or secondary to other diseases.
- **Disorder of immune mediated injury:** allergies, anaphylaxis and systemic mastocytosis, autoimmunity, and autoimmune diseases, systemic lupus erythematosus, rheumatoid arthritis, acute rheumatic fever, systemic sclerosis and related disorders, sjogrens syndrome, the spondyloarthritides, the vasculitis syndromes, atlas of clinical imaging of the vasculitic diseases, behcet syndrome, relapsing polychondritis, sarcoidosis, familial Mediterranean fever, amyloidosis.
- **Disorders of the joints and adjacent tissues:** approach to articular and musculoskeletal disorders, osteoarthritis, gout and other crystal arthropathies, infectious arthritis, fibromyalgia, arthritis associated with systemic diseases and other arthritides, periarticular disorders of the extremities.

- ❖ **Poisoning, drug overdose, and Envenomation:** heavy metal poisoning, poisoning and drug over dosage, disorders caused by reptile bites and marine animal exposures, ectoparasite infestations and arthropod bites and stings,

PRACTICAL

- History, examination and writing of records:
 - History taking should include the back ground information, presenting complaints and history of present illness, history of previous illness, family history, social and occupational history and treatment history.
 - Detailed physical examination should include general examination and systemic examination (Chest, Cardio-vascular system, Abdomen, Central nervous system, locomotor system and joints).
 - Skills in writing up notes, maintaining problem oriented records, progress notes, and presentation of cases during ward rounds, planning investigations and making a treatment plan.

- **Bedside procedures & Investigations:**
 - Therapeutic skills: Venepuncture and establishment of vascular access, Administration of fluids, blood, blood components and parenteral nutrition, Nasogastric feeding, Urethral catheterization, Administration of oxygen, Cardiopulmonary resuscitation, Endotracheal intubation, administration of drugs, Common dressings, Abscess drainage.
 - Investigative skills: Venous blood sampling, Arterial blood sampling, Lumbar puncture, Bone marrow aspiration and biopsy, Pleural, Peritoneal & Pericardial tap, Biopsy of liver and kidney.

CLINICAL TEACHING

Residents should have the practical knowledge and clinical skills to evaluate and manage the various medical disorders. Clinical work should be closely guided and supervised by Consultants and Residents. If a particular clinical teaching material is not available in the institution, then the resident should be posted in another institution for acquiring the practical knowledge and skills.

❖ **Infectious Diseases**

❖ **Clinical**

The residents should have knowledge and skills to assess, infectious diseases problems:

- OPD: The resident should work up OPD medical problems
- WARD: During the ward posting the resident should acquire the knowledge to assess the following problems:-
 - ✓ Investigative workup of a patient with pyrexia of unknown origin.
 - ✓ Diagnosis/investigations and management of infectious diseases
 - ✓ Management of a patient with sepsis, septicaemia and septic shock.
 - ✓ Management of patients with multi systemic involvement.
 - ✓ Awareness about local notification procedures and adult vaccination.
 - ✓ Principles of infection control.

❖ **Toxicology and Clinical Pharmacology**

❖ **Clinical**

Residents should have knowledge and skills to assess and manage acute medical emergencies of drug overdose, illicit drug use and poisonings (accidental/suicidal). The resident should have the following skills:

- Assessment and emergency care of the unconscious patient with poisoning.
- Effects of common drugs/poisons ingested.
- Toxicology screen.

- Management of various drug overdoses and poisonings.

❖ **Emergency Medicine**

Clinical

At the end of the casualty posting the Junior Resident should be able to diagnose and manage the following medical problems in the casualty:

Acute myocardial infarction, tachyarrhythmias & bradyarrhythmias, hypertensive emergencies, Cardiogenic shock, pericardial tamponade, cardiac arrest, tension pneumothorax, massive pleural effusion, pulmonary thromboembolism, acute aortic dissection, Acute exacerbation of asthma and COPD, type I respiratory failure, Type II respiratory failure, ARDS, Acute abdomen, Addisonian crisis, pheochromocytoma, diabetic ketoacidosis, and hyperosmolar nonketotic coma, hypoglycemia, myxedema coma, thyroid crisis, acute renal failure, metabolic acidosis, dyselectrolytemia, cerebrovascular accident, GBS with respiratory failure, acute compressive myelopathy, status epilepticus, meningitis, coma, acute confusional state, delirium tremens, hypovolemic shock, septicemic shock, poisonings, drowning, electrical injury, snake bite, hypothermia, hyperthermia, High Altitude Pulmonary Edema (HAPE), High Altitude Cerebral Edema (HACE), Upper and lower GI bleed, hemoptysis, generalized tetanus. He should develop skills of triage and efficient emergency care.

❖ **Procedures**

At the end of the casualty posting, the Resident should possess theoretical knowledge of and should be able to perform the following procedures.

- Cardio Pulmonary Resuscitation (CPR)
- Use of defibrillator/external cardiac pacing.
- Emergency IV cannula insertion and venesection.
- Emergency Ryle's tube insertion.
- Gastric lavage in case of poisonings.
- Insertion of Foley's catheter (both in males and females).
- CVP line and vascular catheter insertion
- Endotracheal intubation.
- Arterial puncture for blood gas analysis.
- Thoracic and abdominal paracentesis.
- Pericardiocentesis

❖ **Critical Care Medicine**

During the training in internal medicine, residents should be posted in the intensive care unit. The unit should have modern monitoring facilities as well as facilities for providing artificial ventilatory support. The residents should be physically present in the ICU during their hours of posting, including night duties. The working in the ICU is fully supervised by seniors. During their posting in the ICU, the residents should acquire the following skills:

- In the management of seriously ill patients including case work up and presentation.
- in the use of ventilators,
- In inserting central venous lines and arterial lines under supervision.
- Management of the unconscious patients.
- Management of patients with multiorgan failure.
- To look after the nutritional requirements of the patients.

- Infection control practices
- End of life care including declaring patient brain dead.

❖ **Cardiology**

Clinical

- **OPD:** Work up and management of OPD cases. He/She should be able to give advice regarding primary/secondary prevention of cardiac disease.
- **WARD:** Duties should include diagnostic case work up and day to day management of all cardiac cases.
- **Intensive coronary care unit (ICCU):** A resident should acquire the expertise/knowledge to diagnose and manage acute myocardial infarction and its complications, common arrhythmias, cardiogenic shock, pericardial tamponade etc. The resident should also learn to perform the procedures and investigations (listed below) necessary to manage such patients.
- Residents should be familiar with the indications/contraindications/complications of thrombolytic therapy and antithrombotic therapy. They should be fully conversant with the pharmacology and usage of anti-arrhythmic drugs, vasopressors and inotropes and indications of pace maker implantation.

❖ **Procedures**

The Residents should be trained to carry out the required procedures:

- Performing and interpreting a 12-lead electrocardiogram.
- Pericardiocentesis (under cardiac monitoring).
- Cardio version (elective/emergency).
- Defibrillation.
- Hemodynamic monitoring.

❖ **Investigations**

The residents should have adequate knowledge and practical application of the following test and devices: Tread Mill Test (TMT).

- Echocardiography/Doppler.
- Holter monitoring.
- Stress echo.
- Cardiac CT and MRI
- Thallium scan
- Angiography & Angioplasty.
- Pacing (Permanent and temporary).
- ICD and CRT (write full form)

❖ **Respiratory Medicine**

Clinical

- **OPD:** management of OPD respiratory cases under consultant supervision.
- **WARD:** Admission of patient, diagnostic case work up, and day to day management of respiratory cases, discharge and follow up of patients from the ward. Residents should be fully trained in assessment/management of emergencies like acute severe asthma, pneumothorax, haemoptysis and respiratory failure. They are expected to be fully

conversant with the diagnosis/investigations/treatment of tuberculosis and the National Tuberculosis Control Programme including DOTS (directly observed therapy short course) treatment.

❖ **Procedures**

The Resident should be trained to carry out the following common procedures:

- Pleural fluid tapping.
- Pleural biopsy.
- chest tube insertion

❖ **Investigations**

The Resident should be guided and helped in acquiring theoretical and practical knowledge about the following investigations and their interpretation and applications to the various clinical situations.

- Basic chest radiology.
- CT scans chest (spiral/HRCT) -
- fiberoptic bronchoscopy.
- Spirometry.

❖ **Neurology**

Clinical

OPD: A Resident should work up patients, discuss them with the consultant and suggest relevant investigations and management of common neurological problems.

WARD: The Resident should be able to admit patients, carry out diagnostic case work up and day to day management of all neurological cases:

Neurological critical care: Residents should be able to recognize and manage critical neurological cases including stroke protocol. Patients requiring Inter departmental referral should be promptly identified. Rehabilitation especially for stroke patients should be part of the management

❖ **Procedures and Investigations**

The resident should be able to perform the following procedures and also know the indications/interpretation:

- Fundoscopy
- CSF examination.
- Muscle and Nerve biopsy.
- Interpretation of plain X-ray-skull, CT scan, and MRI scans.
- Interpretation of EEG record.
- Nerve conduction studies.
- EMG record.
- Indications/applications of evoked potentials.
- Edrophonium test.
- Application and interpretation of carotid Doppler

❖ **Gastroenterology**

○ **Clinical**

- **OPD:** A Resident should be able to do work up of all gastroenterology cases and discuss with the consultant.
- **WARD:** A Resident should be able to admit patients and perform diagnostic case work

up and day to day management and discharge of the cases, as well as follow up.

❖ **Procedures**

The Resident should have acquired practical knowledge of/and should be able to carry out the following:

- Per rectal examination and proctoscopy.
- Nasogastric/ Naso-jejunal (post pyloric) insertion.
- Ascitic tap.

❖ **Investigations**

The Resident should have acquired the theoretical/practical knowledge about following investigations:

- Interpretation of plain X-ray of the abdomen, barium studies abdominal ultrasound, fibro scan and CT scan of the abdomen and CT angiography.
- Esophageal manometry
- Indications for Liver biopsy, Indication for upper GI Endoscopy, Sigmoidoscopy, Colonoscopy, Endoscopic Sclerotherapy and Banding, Enteroscopy, capsule endoscopy.
- ERCP and MRCP- indications and interpretations.

❖ **Endocrinology**

Clinical

- OPD: A Resident should be able to do work up of all endocrinology cases and discuss with the consultant.
- WARD: A Resident should be able to admit patients and perform diagnostic case work up and day to day management and discharge of the cases, as well as follow up.

❖ **Procedures and Investigations**

The Resident should have the knowledge about the following procedures:

- Diabetic work up
- Endocrine disorder work up

❖ **Oncology/Hematology**

Clinical

- OPD: A Resident should be able to do work up of all Hemato-oncology cases and discuss with the consultant.
- WARD: A Resident should be able to admit patients and perform diagnostic case work up and day to day management and discharge of the cases, as well as follow up.

❖ **Procedures:**

The Resident should be able to know the indications of the following diagnostic and therapeutic procedures:

- Intra thecal drug administration.
 - Chemo port needle insertion.
 - PICC line insertion.
 - Stem cell transplantation.
 - Bone marrow transplantation.
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- Perform bone marrow aspiration and biopsy

❖ Nephrology

○ Clinical

- **OPD:** Resident should be able to do work up of all Nephrology cases and discuss with the consultant.
- **WARD:** A Resident should be able to admit patients and perform diagnostic case work up and day to day management and discharge of the cases, as well as follow up.

❖ Investigations

The Resident should have practical and theoretical knowledge of following investigations:

- Urine examination in nephrology.
- Glomerular and renal function test studies.
- Renal dynamic screening and imaging. CT angiography in RAS.
- Immunological tests related to renal diseases.
- perform and interpret renal biopsy
- Transplant work up
- Post-transplant monitoring

❖ Dialysis training

The Resident should be exposed to dialysis unit functioning. They should acquire the knowledge of:

- Initiation/indications/monitoring/complication and management of continuous peritoneal dialysis.
- Initiation/Indications/monitoring/ complication and its management of hemodialysis.
- Familiarity with various routes of dialysis access: AV fistulas, shunt, perm catheter, temporary hemodialysis catheter, etc.
- Indications for hemofiltration.

❖ Rheumatology

○ Clinical

- **OPD:** A Resident should be able to do work up of all Rheumatology cases and discuss with the consultant.
- **WARD:** A Resident should be able to admit patients and perform diagnostic case work up and day to day management and discharge of the cases, as well as follow up.

❖ Procedures

- The resident should be able to advise and interpret the following test and procedures:
 1. Imaging
 2. Joint aspiration and joint fluid analysis
 3. Intra articular steroid injection
 4. Various Immunological tests

❖ Nutrition

During training in wards and ICU, resident should have the knowledge and skills in nutritional issues that are listed below:

- Assessment of nutritional status.
- Malnutrition.
- Impact of disease on nutritional status.
- Calculation of caloric requirement in various disease states.
- Principles and routes of nutrition support (enteral/parenteral).

- Methods of providing nutrition support.

CLINICAL ROTATIONS

The four-year M.D. programme is a full-time residency programme, of which approximately two thirds of this time is spent in Internal Medicine under the direct supervision of Internal Medicine consultants. During the four years of residency training the core curriculum is covered through formal core lectures, clinical rotations, tutorials, problem-based learning, grand rounds, morning report, journal club, mortality and morbidity meetings, practice guidelines, bedside examinations and group discussions.

The rest of the programme consists of rotations through acute specialties relevant to Internal Medicine.

The Residents in medicine undergo the following rotation-training during their 4 years' course towards M D (Medicine):

(i) Medicine Units	: 17 months
(ii) Respiratory Unit	: 02 Months
(iii) Nephrology	: 02 months
(iv) Gastroenterology	: 02 months
(v) Rheumatology	: 03 months
(vi) Geriatric	: 01 month
(vii) Cardiology	: 03 months
(viii) Neurology	: 03 months
(ix) Endocrinology	: 02 month
(x) Radio-diagnosis & imaging	: 01 month
(xi) ICU	: 02 months
(xii) Oncology	: 01 month
(xiii) Neuropsychiatry	: 01 months
(xiv) Dermatology	: 01 months
(xv) Child & Adolescent	: 02 months
(xvi) Infectious Disease	: 01 Month
(xvii) District posting	: 01 month
(xviii) Elective Posting	: 03 Months
Total	: 48 months

PG Residency: Academic Module

Sl No	Activity	Year 1		Year 2		Year 3		Year 4	
1	Lecture class								
2	Internal Medicine	8 months						3 months	6 months
3	Respiratory unit		2 months						
4	Radiology Unit		1 month						
5	Cardiology Unit			3 months					

6	Nephrology Unit			2 months				
7	Gastroenterology Unit				2 months			
8	ICU Unit				2 months			
9	Geriatric Unit				1 month			
10	Endocrinology Unit					2 months		
11	Neurology Unit					3 months		
12	Rheumatology						3 months	
13	Oncology						1 month	
14	Neuropsychic			1 month				
15	Dermatology				1 month			
16	Infectious Disease						1 month	
17	Child & Adolescent					2 months		
18	District Posting						1 month	
19	Elective Posting (Ex-country)							3 months

❖ TEACHING AND LEARNING METHODOLOGIES

During the four years of residency training the core curriculum is covered through formal core lectures, clinical rotations, tutorials, problem-based learning, grand rounds, morning report, journal club, mortality and morbidity meetings, practice guidelines, bedside examinations and group discussions.

❖ TEACHING SCHEDULE

Following is the suggested weekly teaching programme in the Department of Medicine:

- | | |
|---|---|
| a) Core lectures | Weekly (sat, afternoon) |
| b) Teaching Ward Rounds | Daily |
| c) Case Presentation & Discussion: | Once a week (mon, afternoon) |
| d) Seminar: | Once (1 st week every month) |
| e) Journal Club: | Once a week (wed, afternoon) |
| f) Grand Round presentation (by rotation medical units & subspecialties): | Once a week (Sat, morning) |
| g) Statistical & Mortality Meet: | Once a month (last week) |
| h) Clinico-Pathological meet: | Once a month |
| i) Clinico-Radiological meet: | Once a month |
| j) ACLS Course twice | Once in first semester and then in the eight semester |

❖ **Daily Schedule**

- **9:00 AM: Morning conference**
 - Attendance register to be signed by the Residents
 - On call Resident presents all the new admissions over the last 24 hours, mortalities, etc.
 - Discussion on the new cases will be done.
 - To be attended by all unit consultants, Residents and Interns

- **9:30 AM to 3:00 PM:**
 - Morning round (Residents should have all the case notes and plan well prepared before rounds)
 - Resident will present the case, plan the management in consultation with the seniors either in the wards/ OPD
 - Discharge summary to be prepared after rounds

- **Extra activities:** To be attended by all unit consultants, Residents and Interns
 - Mondays (2:30PM) – major case presentation
 - Wednesdays (2:30PM) – Journal club presentation
 - Saturdays (9:30 AM) – Grand rounds
 - Monthly (Last week) – Mortality meetings

- **On Call Duty**
 - 9:00AM - 9:00AM (one week)
 - Residents should be On call every alternate week from Monday to Monday
 - Hand over cases/ pager to next on call
 - Have to be in hospital premises throughout
 - Attend to all ward/ ICU/ ER calls
 - Discuss with consultant on call
 - Evening rounds with on call consultant
 - Admit and work up patients from ER and or patients sent from OPD
 - Post on call duty Residents will proceed with regular ward/ OPD duties

- **Holiday Duties**
 - Morning and evening Rounds to be done by on call consultant and Resident
 - On call resident will attend to the usual on call duties

- **Work Area**
 - Medical ward Male and Female, Extended medical ward (Notes should be prepared for all patients admitted)
 - Cabin, ICU, TB ward round will be done together with the consultant (prior notes may not be necessary due to human resource constraints)

JOB RESPONSIBILITIES OF THE RESIDENTS

The trainees in internal medicine should be designated as residents. According to year of residency he/she should be designated as First/Second/Third and Fourth year resident.

1. OUTDOOR PATIENT (OPD) RESPONSIBILITIES

- The working of the residents in the OPD should be fully supervised.
- They should evaluate each patient and write the observations on the OPD card with date and signature.
- Investigations should be ordered as and when necessary using prescribed forms.
- Residents should discuss all the cases with the consultant and formulate a management plan.
- Patient requiring admission according to resident's assessment should be shown to the consultant on duty.
- Patient requiring immediate medical attention should be sent to the casualty services with details of the clinical problem clearly written on the card.
- Patient should be clearly explained as to the nature of the illness, the treatment advice and the investigations to be done.
- Resident should specify the date and time when the patient has to return for follow up.

2. IN-PATIENT RESPONSIBILITIES

Each resident should be responsible and accountable for all the patients admitted under his care. The following are the general guidelines for the functioning of the residents in the ward:

- Detailed work up of the case and case sheet maintenance:
 - ✓ He/She should record a proper history and document the various symptoms. Perform a proper patient examination using standard methodology. He should develop skills to ensure patient comfort/consent for examination. Based on the above evaluation he/she should be able to formulate a differential diagnosis and prepare a management plan. Should develop skills for recording of medical notes, investigations and be able to properly document the consultant round notes.
 - ✓ To organize his/her investigations and ensure collection of reports.
 - ✓ Bedside procedures for therapeutic or diagnostic purpose.
- Presentation of a precise and comprehensive overview of the patient in clinical rounds to facilitate discussion with senior residents and consultants.
- To evaluate the patient twice daily - morning and evening (and more frequently if necessary) and maintain a progress report in the case file.
- To establish rapport with the patient for communication regarding the nature of illness and further plan management.
- To write instructions about patient's treatment clearly in the patients record/case sheet along with time, date and the bed number with legible signature of the resident.
- All treatment alterations should be done by the residents with the advice of the concerned consultants and senior residents of the unit.

2.1 Admission day

Following guidelines should be observed by the resident during admission day.

- Resident should work up the patient in detail and be ready with the preliminary necessary investigations reports for the evening discussion with the consultant on duty.

- After the evening round the resident should make changes in the treatment and plan out the investigations for the next day in advance.

2.2 Doctor on Duty

- Each resident does an average of one night in four on-calls within the Hospital premises, although occasionally one night in three may be necessary.
 - Duty days for each Resident should be allotted according to the duty roster.
 - The resident on duty for the day should know about all sick patients in the wards and relevant problems of all other patients, so that he could face an emergency situation effectively.
 - In the morning, detailed hand over (written and verbal) should be given to the next resident on duty and should continue with regular duties in wards/ OPD. This practice should be rigidly observed.
 - If a patient is critically ill, discussion about management should be done with the senior resident or consultant at any time.
 - The doctor on duty should be available in the ward throughout the duty hours.

2.3 Care of Sick Patients

- Care of sick patients in the ward should have precedence over all other routine work for the doctor on duty.
- Patients in critical condition should be meticulously monitored and records maintained.
- If patient merits ICU care then it must be discussed with the senior residents and consultants for transfer to ICU.

2.4 Resuscitation skills

At the time of joining the residency programme, the resuscitation skills should be demonstrated to the residents and practical training provided at various work stations.

- Residents should be fully competent in providing basic and advanced cardiac life support.
- They should be fully aware of all advanced cardiac support algorithms and be aware of the use of common resuscitative drugs and equipment like defibrillators and external cardiac pacemakers.
- The resident should be able to lead a cardiac arrest management team.

2.5 Discharge of the Patient

- All discharge should be done after completing the round
- Patient should be informed about his/her discharge one day in advance.
- The discharge card should include the salient points in history and examination, complete diagnosis, important management decisions, hospital course and procedures done during hospital stay and the final advice to the patient.
- Consultants and Residents should check the particulars of the discharge card and counter sign it.
- Patient should be briefed regarding the date, time and location of OPD for the follow up visit.

2.6 In Case of Death

- In case it is anticipated that a particular patient is in a serious condition, relatives should be informed about the critical condition of the patient beforehand.
- Residents should be expected to develop appropriate skills for breaking bad news and bereavements.

- Follow up death summary should be written in the file and face sheet notes must be filled up and the sister in charge should be requested to send the body to the mortuary with respect and dignity from where the patient's relatives can be handed over the body.
- In case of a medico legal case, death certificate has to be prepared in triplicate and the body handed over to the mortuary and the local police authorities should be informed.
- Autopsy should be attempted for all patients who have died in the hospital especially if the patient died of an undiagnosed illness.

2.7 Bedside Procedures

The following guidelines should be observed strictly:

- Be aware of the indications and contraindications for the procedure and record it in the case sheet. Rule out contraindications like low platelet count, prolonged prothrombin time, etc.
- Plan the procedure during routine working hours, unless it is an emergency. Explain the procedure with its complications to the patient and his/her relative and obtain written informed consent on a proper form. Perform the procedure under strict aseptic precautions using standard techniques. Emergency tray should be ready during the procedure.
- Make a brief note on the case sheet with the date, time, nature of the procedure and immediate complications, if any.
- Monitor the patient and watch for complication(s).

2.8 Medico-Legal Responsibilities of the Residents

- All the residents are given education regarding medico-legal responsibilities at the time of admission in a short workshop.
- They must be aware of the formalities and steps involved in making the correct death certificates, mortuary slips, medico-legal entries, requisition for autopsy etc.
- They should be fully aware of the ethical angle of their responsibilities and should learn how to take legally valid consent for different hospital procedures & therapies.
- They should ensure confidentiality at every stage.

ASSESSMENTS AND EXAMINATIONS

The trainees will be assessed as follows:

a) Formative

- b)** The continuous assessment of the residents will comprise of the following:
 - i. Monthly continuous in-training evaluation;
 - ii. End of first semester Examination;
 - iii. End of second year Examination;
 - iv. Resident Log-book signing off;

c) Summative

A comprehensive University examination will be conducted at the end of the training and will comprise of the following components:

- i. Written Examinations
- ii. Practical Examinations

iii.Oral Examinations

iv.Thesis

c) General structure of the examination is given below:

Examinations	Schedule	Components				Total marks	Weightage [‡]
		Written		Practical			
Institute Examination I	End of 1st Term	MCQ 50%	SAQ 50%	OSPE 100%		200 marks	10
Institute Examination II	End of 4th Term	MCQ 50%	SAQ 50%	OSCE 100%	2 short cases 100 %	300 marks	20
Submission of Thesis	End of 6th Term	(i) Written contents: 100 marks*				200 marks	10
		(ii) Oral /viva voce: 100 marks*					
University Examination	End of 8th Term	Paper I		1 Long case: 100 % 2 short cases: 100 % Instrument/imaging: 100 % Viva voce: 100 %	600 marks	60	
		MCQ 100%					
		SAQ					
		Paper II					
		Essay questions 100 %					
Cumulative marking for the Award of Degrees							100

- a) * Thesis will be assessed for (i) written contents for 100 mark; and defence of thesis during viva voce -for 100 marks and both will carry a weightage of 10 marks for the final award of degree.
- b) [‡]Cumulative weightage for the purpose of award of degrees will be computed as 10, 20, 10, and 60 percentages respectively for the Institute Examinations I, Institute Examinations II, Thesis, and the University Examinations.
- c) MCQ: Multiple choice questions;
- d) SAQ: Short answered questions;
- e) OSPE: Objective structured practical examinations;
- f) OSCE: Objective structured clinical examinations;

THESIS

Currently the residents at the Khesar Gyalpo University of Medical Sciences of Bhutan are required to submit a thesis based on a research protocol developed by them with the help of one or more members of the faculty of the Department of Medicine or allied subspecialties.

The these written by the residents are evaluated and graded by two external examiners in terms of research design, methodology employed, analytical methods used, and validity of the conclusions reached. Acceptance of thesis as being satisfactory is a pre-requisite for a resident to be able to take the M.D Examination.

Every candidate shall carry out work on an assigned research project under the guidance of a recognized Postgraduate Teacher; the project shall be written and submitted in the form of a thesis. Every candidate shall submit thesis plan to the University within the time frame specified by the university.

AWARD OF DEGREE

On successful completion of the residency training, acceptance of the thesis and after passing the examinations will lead to award of the Doctor of Medicine (MD) in Medicine by the Khesar Gyalpo University of Medical Sciences of Bhutan.

SUGGESTED READING

Core Books

- a) Hutchinson's Clinical Methods
- b) Harrison's Principles of Medicine
- c) Oxford Text Book of Medicine
- d) Cecil Text Book of Medicine
- e) API Text Book of Medicine

Reference Books

- a) Braunwald's Heart Disease
- b) Hurst's The Heart
- c) Sheila Sherlock's Diseases of the Liver and Biliary system
- d) Adams and Victor's Principles of Neurology
- e) Crofton and Douglas Respiratory Diseases
- f) Brenner and Rector's The Kidney
- g) William's Text Book of Endocrinology
- h) Mandell's Principles and Practice of Infectious Diseases
- i) Kelley's Text Book of Rheumatology
- j) Devita's Principles and Practice of Oncology
- k) Text Book of Critical Care Medicine
- l) Shamroth's An Introduction to Electrocardiography

Core Journals

- a) New England Journal of Medicine
- b) The Lancet
- c) Annals of Internal Medicine
- d) Journal of Association of Physicians of India
- e) Medical Clinics of North America

Reference Journals

- a) Circulation
- b) Heart
- c) Indian Heart Journal
- d) JIMA (Journal of Indian Medical Association)
- e) Journal of Indian Academy of Clinical Medicine
- f) Quarterly Journal of Medicine
- g) National Medical Journal of India

- h) Critical Care Medicine
- i) Diabetes Care
- j) Cancer
- k) Gastroenterology
- l) Neurology India
- m) Chest
- n) American Journal of Kidney Diseases