

***Residency Program
Doctor of Medicine (MD)
Curriculum (Phase-A)***

Critical Care Medicine (CCM)



**Bangabandhu Sheikh Mujib Medical University
Dhaka, Bangladesh**

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1. Introduction:

Critical Care Medicine (CCM) also referred to as Intensive Care Medicine, is that body of specialist knowledge and practice concerned with the treatment of patients, with at risk of or recovering from potentially life threatening failure of one or more of the body organ systems. It includes the provision of organ system support, investigations, diagnosis and treatment of acute illness, systems management and patient safety, ethics, end-of-life care and support of families.

CCM is dynamic specialty with the responsibility for caring for the most critical ill patients in hospital. Whilst other medical specialties deal exclusively with specific organs or body systems, CCM encompasses patients with the entire spectrum of medical and surgical pathology. A CCM doctor is able to provide advanced organ support during critical illness and is responsible for co-ordinating the care of patients on the ICU. CCM is high-tech, life-saving care that underpins and interacts with all other areas of the hospital.

The Critical Care Medicine Curriculum has been designed according to Residency program laid down by Bangabandhu Sheikh Mujib Medical University which is a five year course.

The total 5 Years residency course is divided in to two Phases: Phase A and Phase B. Phase A has been designated as Basic Medical Training (BMT) to provide broad experience in General Internal Medicine including Emergency Medicine, Airway Management and CCM, Anesthesiology within two years. This training program will focus on developing core knowledge and skills, providing a foundation for consolidation and further study within advanced specialty-specific training. Phase 'B' designated as 'specialty training' (ST) during 3

years. In-depth specialty-specific educational and training program in this phase will make the resident competent and prepare them for the specialty qualification.

This document identifies the aims and objectives, content, outcomes and processes of postgraduate specialist training leading to MD in Critical Care Medicine. It defines the structure and expected methods of learning, teaching, feedback and supervision. It sets out what knowledge, skills, attitudes and behaviors the trainee will achieve. These are identified as learning outcomes that are specific enough to be a precise guide for trainers and trainees. A system of assessments is used to monitor the trainee's progress through the stages of training. In the absence of Critical Care Medicine Department in an institute/ Medical College the residency program in Critical Care Medicine will be run under the supervision of Anesthesiology dept under the Faculty of Surgery temporarily.

2. Competencies to be Obtained by the Resident:

The competencies to be developed through the course are as follows:

- a. Medical Knowledge.
- b. Clinical competency.
- c. Communication skills.
- d. Teaching skills.
- e. Conducting research.
- f. Team member.
- g. Humanism.
- h. Professionalism
- i. Ethical and legal issues.

a. Medical Knowledge:

- Core medical knowledge should include an appropriate content of anatomy, biochemistry, immunology, physiology, pharmacology, statistics, ethics and human behavior, cardinal features and classifications of common diseases, as needed for the clinical practice of critical care medicine.
- In-depth knowledge of critically ill patients
- Knowledge of history-taking, examination, relevant investigations and interpretations to diagnose and manage a critically ill patient
- Knowledge of therapeutic intervention including details of drug use which includes rational and evidence based use of such interventions, drug interactions, adverse effects etc.

b. Clinical competencies:

- Data gathering skills- Interviewing the patient, physical examination, data interpretation.
- Clinical reasoning skills- formulating diagnosis, planning further investigation.
- Therapeutic decision making- formulating diagnosis (provisional/differential diagnosis), making a cost-effective plan of laboratory and imaging studies, outline of therapeutic management and patient education.
- Procedural skills- diagnostic and therapeutic procedures common to the practice of CCM.
- Cardio pulmonary and other life saving procedures.

c. Communication skills:

Both verbal and written communication skills are necessary with patients and family members of patients admitted in ICU.

d. Teaching skills:

They should develop themselves in teaching and learning. The resident should achieve understanding and competency in different adult learning systems, principles of teaching and learning, use of effective teaching aids and assessment methods. They should be at times prepared to facilitate the learning sessions.

e. Conducting research:

A period of supervised research of good quality is considered a highly desirable part of MD (CCM) course. The resident will be competent in dealing with the principles of research ethics and contribute to the process by which ethical research in human subjects is ensured.

f. Team member:

As a team player specialist should effectively work with in a health and social care team to achieve optimal patient care.

g. Humanism:

This should signify a set of defined knowledge, skills and attitudes that bring about admirable clinical process and desired health outcomes. Within the broad topic of humanism reside several core topics, some of which will be dealt like medical interview, counseling with the patient attendant, behavioral medicine and medical ethics. These competencies are essential to deal with patients to meet the needs associated with medical problems and processes and the lifestyle issues that contribute to health and disease.

Competencies for humanistic practice of medicine are essential for the intensives to:

- Create and sustain doctor patient relationship that maximizes the likelihood of the best outcome for the patients and the greatest personal satisfaction for the physician.
- Be able to identify the types of patient physician relationship, factors promoting their relationship and one's own relating style, preference and limitations.
- Deal with dying critical patients; demonstrate knowledge and skill in obtaining and interpreting advance directives for care at the end of life, and providing comfort care and managing the family's grieves.
- Recognize one's own personal reactions to difficult situation; use these reactions to generate explanatory hypothesis and to understand potential barriers to communication.

h. Professionalism:

Professionalism in medical practice requires the physician to place the interest of the patient above the physicians self interest. Professionalism aspires to self sacrifice, accountability, excellence, service, honor, integrity and respect for others. The resident should develop further development of qualities of professionalism and respect for patients, peer and paramedical personnel.

i. Ethical and legal issues:

Ethics is the systematic application of values. Medical ethics focuses on the prevention, recognition, clarification and resolution of ethics issues and conflicts that arise in the care of particular patients and on the prevention and resolution of conflicts associated with ethical issues. Topics in clinical medical ethics include professional responsibility, informed consent, determination of decision making capacity, truth telling, confidentiality and the physician's role in cost containment.

3. Objectives of the Course:

General:

- To promote quality standards education in Critical Care Medicine in Bangladesh.
- To produce Specialist in Critical Care Medicine who will be knowledgeable, independent and clinically competent to manage the critically ill patient.
- To produce Specialist in Critical Care Medicine who will be acknowledged as role model for others to follow.

Specific:

- ❖ To provide a strong foundation of knowledge and skills in General Internal Medicine and allied subjects required for specialty specific training in the next phase (Phase B).
- ❖ To promote compassion and professionalism among the trainees and refine their skills in communicating with patients, their families and other healthcare professional.
- ❖ To enhance critical thinking, self learning, and interest in research and development of patient-care service.
- ❖ To cultivate the practice of evidence-based medicine and critical appraisal of skills
- ❖ To inculcate a commitment to continuous medical education and professional development
- ❖ To develop the skills of an effective teacher.

4. Admission Requirements:

Medical graduate with successful completion of internship and with full registration with the BMDC will be selected by competitive admission test.

Pre-requisites for admission in Phase-A

1. a) MBBS or equivalent to MBBS degree recognized by BMDC
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- b) One year of internship / in-service training
- c) Registration with BMDC
2. The applicants should not be above 45 years of age on enrolment.
3. Candidates for residency have to sit for a written MCQ-based admission test on Basic Medical Sciences and Faculty-based Topics.

5. Phase-A (Basic Medical) Training:

5.1. Structure of training

1. The basic training program consists of two years supervised training with formative assessment and feedback. The residents of the Critical Care Medicine after admission will be placed in the CCM/Anaesthesiology department for the initial exposure of the subject and to learn basics of airway management. Thereafter they will be placed in the Department of Internal Medicine for a period of 15 (fifteen) months for training in Internal Medicine and allied. The residents will be placed for three months in Emergency Department where they will be exposed to diversity of medical, surgical, orthopedic and obstetrical and gynae emergencies. The last three months will be placed in the parent department, preparing themselves for the phase A summative examination.
 2. This training program will focus on developing core knowledge and skills, providing a foundation for consolidation and further study within advanced specialty-specific training (in Phase B)
 3. Residents should attend the mandatory courses, workshop, etc as per curriculum requirements.
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5.2. Training rotations:

Subject	Duration	No of Block
Airway Management and critical care	03 months	1 Block
Internal Medicine	15 months	5 Block
Emergency	03 months	1 Block
Preparation for Examination	03 months	1 Block

6. Domains of Learning:**A. Knowledge**

1. Integrate advanced basic science to clinical science context
2. Etiology, clinical presentations, disease course and prognosis, investigation and management of common medical disorders
3. Management of medical, surgical and obstetrical emergencies
4. Spectrum of clinical manifestations and interaction of multiple medical, surgical & or obstetrical disorders in the same patient.
5. Psychological and social aspects of medical illnesses.
6. Patient safety and risk management.
7. Medical audit and quality assurance

B. Skill

1. Elicit medical history, obtain relevant data, conduct appropriate physical examination, arrange investigations appropriately and formulate given care plan with reasoning.
2. Ability to recognize and manage the critically ill patient

3. Competence in eliciting abnormal physical signs and interpreting their significance.
4. Ability to relate clinical abnormalities with pathophysiologic states and diagnosis of diseases.
5. Skills in performing important bedside diagnostic and therapeutic procedures and understanding of their indications. Residents should acquire competence through supervised performance of the required number of procedures during the 2-year training period and should record them in the Logbook.
6. Ability to present clinical problems and literature review in grand rounds, journal club and seminars.
7. Good communication skills and interpersonal relationship with patients, families, medical colleagues, nursing and allied health professionals.

C. Attitude

1. Altruism: The well-being and restoration of health of patients must be of paramount consideration
2. Empathy and good rapport with patient and relatives are essential attributes
3. The cost-effectiveness of various investigations and treatments in patient care should be recognized.
4. The privacy and confidentiality of patients and sanctity of life must be respected.

7. Teaching and Learning:

For trainees to maximize their learning opportunities it is important that they work in 'a good learning environment'. This includes encouragement for self-directed learning as well as recognizing the learning potential in all aspect of day to day work. The bulk of learning occurs as a result of clinical

experiences (experiential learning, on-the-job learning) and self-directed study. The degree of self-directed learning will increase as trainees become more experienced. Teaching and learning occurs using several methods that range from formal didactic lectures to planned clinical experiences. Aspects covered will include knowledge, skills and practices relevant to General Medicine in order to achieve specific learning outcomes and competencies. The theoretical part of the curriculum presents the current body of knowledge necessary for practice as an Internist. In this program this will be imparted using lectures, grand teaching rounds, clinico-pathological meetings, morbidity/mortality review meetings, literature reviews and presentations, journal clubs, self-directed learning, conferences and seminars.

8. Record of Training:

The evidence requires confirming progress through training includes:

1. Details training plan agreed with weekly timetables and duty roster.
2. Confirmation of attendance at events in the educational program, at departmental and interdepartmental meetings and other educational events.
3. Confirmation (certificates) of attendance at subject-based/skill- training/instructional course.
4. Recorded attendance at conference and meetings.
5. A properly completed logbook with entries capable of testifying to the training objectives which have been attained the standard of performance achieved.
6. Supervisor's reports on Observed performance in the workplace.

8.1. Logbook

The Residents will maintain log book in which entries of academic or professional work done during the period of training should be made on a daily basis from their enrolment to finish the residency program and duly signed by supervisor in each block. Completed and duly certified logbook will form a part of the application for appearing in phase final examination.

8.2. Portfolio

The portfolio of learning is more than a logbook. This is collection of evidence documenting trainee's learning and achievements during their training. The trainee takes responsibilities for the portfolio's creation and maintenance. It will form the basis of assessment of progression.

9. Assessment:

The assessment for certification of the MD degree of the University is comprehensive, integrated and phase-centered attempting to identify attributes expected of specialists of for independent practice and lifelong learning and covers cognitive, psychomotor and affective domain. It keeps strict reference to the components, the contents, the competencies and the criteria laid down in the curriculum.

Assessment includes both Formative assessment and Summative examination (**Phase A final**)

9.1. Formative Assessment:

Formative assessment will be conducted throughout the training phase. It will be carried out for tracking the progress of residents, providing feedback, and preparing them for final assessment (phase completion exam). There will be continuous (day-to-day) and periodic type of formative assessment.

- i) **Continuous (day-to-day) formative** assessment in classroom and work place settings provides guide to a resident's learning and a faculty's teaching / learning strategies to ensure formative lesson / training outcomes.
- ii) **Periodic formative assessment** is quasi-formal and is directed to assessing the outcome of a block placement or academic module completion. It is held at the end of block placement and Academic Module completion. The contents of such examinations include **Block Units** of the Training Curriculum and **Academic Module Units** of the Academic Curriculum.
- End of Block Assessment (EBA) is a periodic formative assessment and is undertaken after completion of each training block, assessing knowledge, skills and attitude of the residents. Components of EBA are written examination, Structured Clinical Assessment (SCA), medical record review, logbook review and portfolio assessment. Incomplete block training must be satisfactorily completed by undergoing further training for the block to be eligible for appearing in the next phase completion examination.

9.2. Summative (Phase-A final) Examination:

Conducted by the University Examination Department.

Phase final examination will have following components:

- Written examination (SAQ /SEQ)
- Clinical examination :
 - Long case (1)
 - Short cases (4)
 - Structured Clinical Assessment (SCA-12: 10 static stations and 2 interactive stations)

10. Supervision and Training Monitoring:

As the training progresses the resident should have the opportunity for increasing autonomy consistent with safe and effective care for the patient. Resident will at all times have a supervisor, responsible for overseeing their education and training.

Supervisors are responsible for supervision of learning throughout the program to ensure patient safety, service delivery as well as the progress of the resident with learning and performance. They set the lesson plan based on the curriculum, undertaken appraisal, review progress against the curriculum, give feedback on both formative and summative assessment and ensure proper recording and signing of the logbook. The residents are made aware of their limitations and are encouraged to seek advice and receive help at all times.

The Course coordinator of each department coordinates all training and academic activities of the program in collaboration with the course manager(s).

The course director of each faculty directs guides and manages curriculum activities under his/her jurisdiction and is the person to be reported for all events and performances of the resident and the supervisor.

11. Curriculum Implementation, Review and Updating:

Both Supervisors and residents are expected to have a good knowledge of the curriculum and should use it as a guide for their training program. Since A critical care has historically been rapidly changing specialty the need for review and up-dating of curriculum is evident. The curriculum is specifically designed to guide an educational process and will continue to be the subject of active redrafting to reflect changes in both critical care medicine and educational theory and practice. Residents and supervisors

are encouraged to discuss the curriculum and to feedback on content and issue regarding implementation with the course director. Review will be time tabled to occur annually for any minor changes to the curriculum.

12. Syllabus:

The aim of the syllabus for phase A training is to guide the residents to acquire broad based knowledge on Internal Medicine and allied subspecialties, Critical Care Medicine & Emergency Medicine before entering the phase B specialty-specific training. By the end of phase A training the resident should be able to:

- a. Assess the patient as a whole
- b. Formulate appropriate investigation and accurately interpret investigation reports
- c. Communicate the diagnosis and prognosis
- d. Institute appropriate management recognizing indications, contraindications and complication of common clinical conditions:

On this background, it is expected that Residents will be able to (i) acquire knowledge [of common medical conditions, emergencies, & rehabilitations], (ii) acquire skills [diagnostic, clinical and decision making] and (iii) develop attitude [caring, learning, & ethical].

12.1. Critical Care Medicine and airway management: 1 block/ 3 months

Learning objectives:

The aim of this rotation is to introduce the residents with the department of Critical Care Medicine, organization of intensive care services, basics of airway management. This will provide the residents a comprehensive description of the learning

objectives and assessment system and career building.

At the end of the rotation the residents will be able to learn

- The basics of recognizing a critically ill patient
- The clinical criteria for ICU admission, diagnostic efforts and therapeutic approaches
- Monitoring of the critically ill patient
- About the basics of infection control in ICU
- To manage and maintain patient's airway in critically ill patient

Core Clinical Syllabus:

- Development of skill of intubation at different situation & critical airway management.
- Understanding the indication, technique and management of cricothyrotomy
- Understanding the indication, technique and management of nasotracheal intubation
- Indication of tracheostomy in ICU, tracheostoma care
- Indication, technique and maintenance of Laryngeal mask airway (LMA)/ I-gel
- Indication, technique and maintenance of Combi-tube
- Basic principles of Rapid sequence intubation: how to use sedatives and muscle relaxants during intubation?
- Management of difficult or failed intubation
- Post-intubation management and maintenance
- Extubation: indications, technique and management

12.2. Internal Medicine: 15 months/ 5 blocks

Learning Objectives:

At the end of this module the residents will be able to

1. Demonstrate proper knowledge on basics of different systems regarding Internal medicine

2. Take proper history and examine the patient
3. Assess presenting symptoms and signs
4. Formulate a clinical diagnosis and differential diagnoses
5. Formulate first line and second line investigations and to interpret them
6. Communicate patients' data clearly and professionally to fellow professionals
7. Communicate the investigation reports, diagnosis and prognosis to the patients
8. Manage all emergency medical cases
9. Manage common medical problems in in-patient and out-patient settings
10. Initiate management in all other common medical problems/disorders
11. Know when to refer, how to refer and to whom to refer
12. Know how to identify critically ill patient who will require transfer to ICU

Outline of Core Syllabus:

Core Syllabus in which the Resident in Critical Care Medicine should acquire good knowledge, clinical competence including appropriate technical abilities is outlined below.

Respective applied basic sciences will be integrated with the clinical science content

1) Disorders of Cardiovascular System:

Applied Basic Science:

Regional anatomy: fetal circulation, principal blood vessels, coronary anatomy and circulation; conducting system of the heart; Cardiac cycle; Cardiac performance.

Core Clinical Knowledge:

<ul style="list-style-type: none"> ▪ Chronic IHD and Acute coronary syndrome ACS ▪ Arrhythmias and conduction defects ▪ Heart failure ▪ Cardiogenic shock ▪ Hypertension 	<ul style="list-style-type: none"> ▪ Valvular heart disease ▪ Infective endocarditis ▪ Pericarditis with pericardial effusion ▪ Cardiomyopathies & Myocarditis ▪ Peripheral vascular disease ▪ Congenital heart disease
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Emergency management:

<ul style="list-style-type: none"> ▪ Acute coronary syndrome (ACS) ▪ Cardiac arrest ▪ DVT and PE ▪ Left heart failure (acute) 	<ul style="list-style-type: none"> ▪ Hypertensive emergencies and urgencies ▪ Cardiac tamponade ▪ Aortic dissection ▪ Critical limb ischaemia
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Common presentation scenarios:

<ul style="list-style-type: none"> ▪ Chest pain syndrome ▪ Shock state ▪ Acute pulmonary edema ▪ Cyanosis 	<ul style="list-style-type: none"> ▪ Breathlessness ▪ Palpitations ▪ Edema
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Investigations, procedures, and interpretation:

<ul style="list-style-type: none"> ▪ ECG interpretation ▪ Echocardiography in the ICU 	<ul style="list-style-type: none"> ▪ Right heart catheterization ▪ Temporary cardiac pacing ▪ Central venous cannulation
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2) Endocrine and metabolic disorders including diabetes mellitus

Applied Basic Science:

<ul style="list-style-type: none"> ▪ Mechanisms of hormone action ▪ Hypothalamic regulatory hormones ▪ Pituitary hormones 	<ul style="list-style-type: none"> ▪ Adrenal gland ▪ Thyroid ▪ Pancreas
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Core Clinical Knowledge:

<ul style="list-style-type: none"> ▪ Diabetes mellitus ▪ Thyroid disorders ▪ Parathyroid disorders ▪ Diseases of the adrenal glands 	<ul style="list-style-type: none"> ▪ Obesity ▪ Pheochromocytoma ▪ Pituitary tumors ▪ Hypopituitarism
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Emergency management:

<ul style="list-style-type: none"> ▪ Diabetic ketoacidosis ▪ Hyperosmolar non-ketotic coma ▪ Hypoglycemia ▪ Addisonian crisis 	<ul style="list-style-type: none"> ▪ Thyrotoxic crisis ▪ Tetany ▪ Hypercalcemic Crisis ▪ Acutely ill diabetic patient
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Common clinical scenarios:

<ul style="list-style-type: none"> ▪ Thirst, polyuria syndrome ▪ Hyperpigmentation 	<ul style="list-style-type: none"> ▪ Appetite and weight symptoms ▪ Weakness, fatigue
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Investigations, procedures and interpretations:

<ul style="list-style-type: none"> ▪ CT and MRI pituitary and adrenals ▪ Radionuclide scan of thyroid & RAIU ▪ Ultrasound of thyroid ▪ Short Synacthin Test 	<ul style="list-style-type: none"> ▪ Fine needle aspiration of thyroid nodules ▪ Oral glucose tolerance test ▪ Thyroid function tests/ FT3, FT4, TSH ▪ X-ray skull
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3) Disorders of Gastrointestinal and Hepatopancreatic System:**Applied Basic science:**

- Regional anatomy & surface markings: diaphragm, thoracic duct, esophagus, stomach, duodenum, and liver.
- Physiology of stomach, pancreas, biliary system, small intestine, and colon.

Core Clinical Knowledge:

<ul style="list-style-type: none"> ▪ Oral Medicine ▪ Dysphagia ▪ Peptic ulcer disease ▪ Ulcerative Colitis ▪ Crohn's disease ▪ Gastric cancer ▪ Malabsorption ▪ Pancreatic cancer ▪ Pancreatitis: acute & chronic ▪ Colorectal cancer 	<ul style="list-style-type: none"> ▪ Diverticular disease ▪ Alcoholic liver disease ▪ Acute viral hepatitis ▪ Chronic viral hepatitis ▪ Cirrhosis of liver with portal hypertension ▪ Gastro-intestinal hemorrhage ▪ Ischemic bowel disease ▪ Hepatic encephalopathy ▪ Liver transplantation
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Emergency management:

<ul style="list-style-type: none"> ▪ Upper gastrointestinal hemorrhage ▪ Acute pancreatitis 	<ul style="list-style-type: none"> ▪ Acute abdomen ▪ Fulminant hepatic failure
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Common presentation scenarios:

<ul style="list-style-type: none"> ▪ Diarrhea: Acute & Chronic/ Dysentery ▪ Abdominal pain ▪ Dyspepsia 	<ul style="list-style-type: none"> ▪ Jaundice ▪ Abdominal distension, ascites and masses ▪ Anorexia and weight loss
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Investigations, procedures and interpretation:

<ul style="list-style-type: none"> ▪ Upper gastrointestinal endoscopy ▪ ERCP, MRCP ▪ Sigmoidoscopy and Colonoscopy ▪ Ultrasonography of the hepatobiliary system 	<ul style="list-style-type: none"> ▪ Liver biopsy ▪ Abdominal paracentesis ▪ Plain radiology ▪ Abdominal CT, MRI
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4) Disorders of Haemopoetic System and Oncology**Applied Basic Science:**

<ul style="list-style-type: none"> ▪ Hematopoiesis and hematopoietic growth factors ▪ Haemostasis 	<ul style="list-style-type: none"> ▪ Immunohematology; HLA typing ▪ Grading and staging of tumor
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Core Clinical Knowledge:

<ul style="list-style-type: none"> ▪ The anemias <ul style="list-style-type: none"> - Iron-Deficiency Anemia - Megaloblastic Anemia - Anemia of Chronic Disease - Aplastic Anemia ▪ Primary and Secondary Erythrocytosis ▪ Hemolytic Anemia: Congenital and Acquired ▪ Iron-Overload Disorders ▪ Immunohematology; HLA typing ▪ Genetic Disorders of Hemoglobin ▪ Platelet Disorders: Hereditary and Acquired ▪ Myeloproliferative Diseases ▪ Myelodysplastic Syndromes ▪ Clinical assessment of a cancer patient 	<ul style="list-style-type: none"> ▪ Acute Leukemia <ul style="list-style-type: none"> - Acute Myeloid Leukemia - Acute Lymphoblastic Leukemia ▪ Chronic Leukemia ▪ Chronic Myeloid Leukemia ▪ Chronic Lymphocytic Leukemia ▪ Multiple Myeloma and related Monoclonal Gammopathies ▪ Lymphomas <ul style="list-style-type: none"> - Hodgkin's Disease - Non Hodgkin's Lymphoma ▪ Hemostasis: Hemorrhagic and Thrombotic Disorders ▪ Transfusions: Blood and Blood Components, Safe transfusion procedure, and complications of transfusions ▪ Stem-Cell Transplantation
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Emergency management:

<ul style="list-style-type: none"> ▪ Acute severe blood loss ▪ Neutropenic fever with sepsis ▪ Severe anemia ▪ Acute ITP 	<ul style="list-style-type: none"> ▪ Disseminated intravascular coagulation ▪ Bleeding due to hemophilia ▪ Oncological emergencies and their management
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Common presentation scenarios:

<ul style="list-style-type: none"> ▪ Anaemia ▪ Polycythemia ▪ Pancytopenia ▪ Purpura 	<ul style="list-style-type: none"> ▪ Bleeding ▪ Hepatosplenomegaly ▪ Lymphadenopathy
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Investigations, procedures and interpretation:

<ul style="list-style-type: none"> ▪ Interpretation of CBC results ▪ Interpretation of blood films ▪ Bone marrow aspiration and trephine biopsy 	<ul style="list-style-type: none"> ▪ Immunophenotyping ▪ BT, CT, PT, APTT ▪ D-dimer
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5) Infectious Diseases and Tropical Medicine**Applied Basic Science:**

<ul style="list-style-type: none"> ▪ Classification of micro-organisms ▪ Antibacterial chemotherapy ▪ Antiviral chemotherapy ▪ Slow viruses ▪ Oncogenic viruses 	<ul style="list-style-type: none"> ▪ Opportunistic pathogens ▪ Immunology: cells involved in the immune response to infection ▪ Pathophysiology of fever ▪ Antifungal chemotherapy
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Core Clinical Knowledge:

<ul style="list-style-type: none"> ▪ Broad knowledge of bacterial, viral, fungal chlamydial and rickettsial diseases 	<ul style="list-style-type: none"> ▪ HIV infection ▪ Cryptococcosis ▪ Systemic nosocomial invasive mycoses including Aspergillosis and Candidiasis
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<ul style="list-style-type: none"> ▪ Staphylococcal, streptococcal diseases ▪ Typhoid ▪ Malaria ▪ Bacterial meningitis ▪ Viral meningitis ▪ Pulmonary tuberculosis ▪ Extra pulmonary tuberculosis ▪ Tetanus ▪ Varicella-zoster ▪ Major diseases of gastro-entero-colitis: salmonellosis, campylobacteriosis, shigellosis, yersiniosis, clostridium difficile, giardiasis, Amoebiasis 	<ul style="list-style-type: none"> ▪ Antimicrobials: classification, mode of action, principles and practice of use ▪ Principles of Infection Control ▪ Important emergent infectious diseases ▪ Infection in the immunocompromised ▪ Severe acute Respiratory illness (SARI) ▪ Acute infectious neurologic syndrome (AINS) ▪ Systemic inflammatory response syndrome-Sepsis (SIRS-S)
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Emergency management:

<ul style="list-style-type: none"> ▪ Septicemia & septic shock ▪ Bacterial meningitis 	<ul style="list-style-type: none"> ▪ Severe typhoid ▪ Severe malaria
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Common presentation scenarios:

<ul style="list-style-type: none"> ▪ Fever ▪ Fever of unknown origin 	<ul style="list-style-type: none"> ▪ Rash ▪ Lymphadenopathy & hepatosplenomegaly
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Investigations, procedures and interpretations:

<ul style="list-style-type: none"> ▪ Lumbar Puncture ▪ Bone marrow examination ▪ Splenic aspiration ▪ Serological tests related to specific disease ▪ Interpretation of microbiology stains, culture results 	<ul style="list-style-type: none"> ▪ Tuberculin testing ▪ Sputum examination ▪ Radiology investigations ▪ FNAC
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6) Disorders of Renal and Genitourinary System:**Applied Basic Science:**

<ul style="list-style-type: none"> ▪ Fluid balance ▪ Acid-base balance ▪ Kidney functions ▪ Renal sodium transport 	<ul style="list-style-type: none"> ▪ Salt and water balance ▪ Renal transport of other solutes ▪ Renal transport of water
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Core Clinical Knowledge:

<ul style="list-style-type: none"> ▪ Acid-base balance ▪ Urinary tract infection ▪ Chronic kidney disease/CRF ▪ Dialysis: Haemo and peritoneal dialysis ▪ Glomerulonephritis ▪ Renal tract malignancies 	<ul style="list-style-type: none"> ▪ Nephrotic syndrome ▪ Urinary tract obstruction ▪ Enlargement of prostate ▪ Polycystic renal disease ▪ Over Active Bladder (OAB) ▪ Renal transplantation
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Emergency management:

<ul style="list-style-type: none"> ▪ Acute kidney injury/ ARF 	<ul style="list-style-type: none"> ▪ Acute retention of urine
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Common presentation scenarios:

<ul style="list-style-type: none"> ▪ Edema ▪ Polyuria, oliguria ▪ Renal and ureteric colic 	<ul style="list-style-type: none"> ▪ Proteinuria ▪ Hematuria ▪ Dysuria
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Investigation, procedures and interpretation:

<ul style="list-style-type: none"> ▪ Renal function: Urea, Creatinine and GFR ▪ Renal biopsy ▪ Radionuclide studies 	<ul style="list-style-type: none"> ▪ Renal imaging: Xray KUB, US, CT, IVU ▪ Interpretation of acid-base disturbances ▪ Interpretation of electrolyte imbalance ▪ Urine ME and CS
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7) Disorders of Nervous System:**Applied Basic Science:**

- Regional anatomy: dermatomes, spinal nerves, autonomic nervous system, central nervous system, cranial nerves.

Core Clinical Knowledge:

▪ Stroke	▪ Myopathy
▪ Intracranial hemorrhages	▪ Myasthenia gravis
▪ Cerebral tumors	▪ Spinal cord diseases
▪ Meningitis and encephalitis	▪ Multiple sclerosis and demyelinating diseases
▪ Basal ganglia diseases	▪ Cranial nerve diseases
▪ Movement disorders	▪ Paraneoplastic syndromes
▪ Epilepsy	▪ Neuropathy
▪ Degenerative diseases	
▪ Motor neuron disease	

Emergency management:

▪ Coma	▪ Status epilepticus
▪ Bacterial meningitis	▪ Subarachnoid hemorrhage
▪ Encephalitis	▪ Guillain Barre syndrome
▪ Raised intracranial pressure	▪ Stroke

Common presentation scenarios:

▪ Headache	▪ Hemiplegia
▪ Confusion	▪ Speech problems
▪ Loss of consciousness/TIA	▪ Abnormal movements
▪ Dizziness and vertigo	▪ Ptosis
▪ Paresthesia	▪ Facial palsy
▪ Lower limb weakness	▪ Visual disturbances

Investigations, procedures and interpretations:

▪ Lumbar Puncture	▪ Angiography
▪ Interpretation of nerve conduction studies, EMG and characteristic types of EEG	▪ CT, MRI, radionuclide scanning
	▪ Muscle and nerve biopsy

8) Disorders of Respiratory System:**Applied Basic Science:**

▪ Regional anatomy: cricoid cartilage, larynx, thorax	▪ Pulmonary gas exchange and blood gas transport
▪ Lung volumes and capacities	▪ Pulmonary circulation
▪ Mechanics of breathing	▪ Control of breathing

Core Clinical Knowledge:

▪ Asthma	▪ Pneumothorax
▪ Chronic obstructive lung disease	▪ Sarcoidosis
▪ Community acquired pneumonia	▪ Fungal lung diseases
▪ Hospital acquired pneumonia	▪ Sleep apnoea
▪ Bronchial carcinoma	▪ Pulmonary hypertension
▪ Bronchiectasis	▪ Interstitial lung disease/DPLD
▪ Mediastinal diseases	▪ Respiratory failure
▪ Chest wall diseases	▪ Adult respiratory distress syndrome
▪ Lung abscess	▪ Pulmonary TB
▪ Pleural diseases	▪ Pulmonary thrombo-embolic disease
▪ Cystic fibrosis	

Emergency management:

▪ Acute severe asthma	▪ Respiratory failure
▪ Sever Pneumonia	▪ Acute respiratory distress syndrome
▪ Pulmonary embolism	▪ Tension Pneumothorax
	▪ Acute exacerbation of COPD

Common presentation scenarios:

▪ Hemoptysis	▪ Wheezing
▪ Acute and chronic breathlessness	▪ Fever
▪ Cough	▪ Pleuretic chest pain

Investigations, procedures and interpretations:

<ul style="list-style-type: none"> ▪ Chest radiography ▪ Pulmonary function tests & their interpretations ▪ Bronchoscopy ▪ Anti-asthma drug delivery system 	<ul style="list-style-type: none"> ▪ Arterial blood gas & their interpretations ▪ Intercostal tube placement & its management ▪ Pleural fluid aspiration and study the report
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9). Disorders of Musculoskeletal System:

<ul style="list-style-type: none"> ▪ Rheumatoid arthritis ▪ Spondyloarthropathies ▪ Gout ▪ Systemic lupus erythromatosis ▪ Systemic Vasculitis 	<ul style="list-style-type: none"> ▪ Systemic sclerosis ▪ Dermatomyositis and polymyositis ▪ Septic arthritis ▪ Low back pain ▪ Joint fluid aspiration
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10) Medical Psychiatry

- Anxiety disorders
- Stress related disorders
- Mood disorders
- Schizophrenia
- Alcohol misuse and dependence
- Substance misuse disorders
- Dissociative disorders
- Organic disorders: Delirium, Dementia
- Acute psychosis
- Acute confusional state

11) Poisoning and snake bites

<ul style="list-style-type: none"> • Comprehensive evaluation of the poisoned patient • General principles of management of poisoned patient 	<ul style="list-style-type: none"> • Paracetamol poisoning • Commuter poisoning • Sedative poisoning • Amitryptalline poisoning
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<ul style="list-style-type: none"> • Evaluation of the envenomed patient • Management of venomous snake bite and sting bites Organophosphorous compound (OPC) and related poisoning 	<ul style="list-style-type: none"> • Corrosive poisoning • Puffer fish and other Marine poisoning
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12) Skin disorders and STDs

- Pemphigus and pemphigoid
- Steven Johnson syndrome and TEN

13) Palliative care

- I. Compare and contrast between the philosophies of palliative care and intensive care
- II. Management of patient with pain
- III. Gastrointestinal symptoms in advanced diseases and their management
- IV. Respiratory symptoms in advanced diseases and their management
- V. Withholding and withdrawing life sustaining care or treatment
- VI. Breaking the bad news
- VII. Care of the care givers
- VIII. Ethical issues related to ICU practice

12.3. Emergency Medicine: 1 block/ 3months

The residents will be placed for three months training in Emergency Medicine where they will be exposed to diversity of medical, surgical, orthopedic and obstetrical and Gynae emergency cases. In the institute where there is no Emergency Medicine Department right at now they will be placed in the Department of Surgery and Gyne-Obs department (6 weeks +6 weeks).

Learning Objectives: At the end of the rotation the residents will be able to

- 1) Take a full history and examine, elicit relevant physical signs, commence resuscitation and arrange appropriate investigation of any acutely ill patient
- 2) Assess, resuscitate and stabilize victims of major trauma e.g., head injury, spinal injury, chest injury, abdominal injury, maxilla-facial injury, and fracture etc
- 3) Assess and manage an unconscious patient
- 4) Assess and manage a patient with shock
- 5) Integrate applied basic sciences to the respective clinical science context
- 6) To be familiar and compliant with the legal aspects of Emergency Medicine.

Core Clinical Syllabus:

- 1) Acute abdominal pain: Perforation, intestinal obstruction, pancreatitis, cholecystitis, biliary colic, acute appendicitis, ischemic colitis, diverticular disease, obstructed hernia, renal colic, dysmenorrhoea
- 2) Acute chest pain: Acute myocardial infarction, acute pulmonary embolism
- 3) Acute arrhythmias
- 4) Acute breathlessness: acute severe asthma, acute exacerbations of COPD, acute respiratory failure, tension pneumothorax, acute heart failure, pulmonary edema
- 5) Upper and lower airway obstruction
- 6) Massive pleural effusion
- 7) Pericardial effusion and cardiac tamponade
- 8) Haematemesis and malaena
- 9) Acute liver failure
- 10) Anaphylaxis

- 11) Hypertensive emergencies
- 12) Poisoning
- 13) Acute metabolic and endocrine disorders
- 14) Stroke and other acute neurological disorders
- 15) Unconsciousness
- 16) Shock
- 17) Acute confusional state
- 18) Psychosis
- 19) Acute seizures/ convulsions
- 20) Bleeding per rectum, PV bleeding
- 21) Oliguria and anuria
- 22) Heat stroke and heat exhaustion
- 23) High fever and hyperpyrexia
- 24) Hypothermia
- 25) Near drowning
- 26) Burn
- 27) Electric burn/electric shock/electrocution/lightning
- 28) Major orthopedic trauma
- 29) Wound management
- 30) Chest injuries
- 31) Head injury, Spinal injury
- 32) Abdominal trauma
- 33) Maxillo facial trauma
- 34) Obstetric Gynae emergency: inevitable abortion, missed abortion, threatened abortion, abruptio placenta, placenta praevia, ruptured ectopic pregnancy
- 35) Interpretations of various images and investigation reports