



**BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE**

**Faculty of Medical Sciences
MD - Emergency Medicine
New Syllabus**



**Bharati Vidyapeeth Deemed to be University,
Pune**

Faculty of Medical Sciences

**Curriculum for MD in Emergency Medicine
As per Guidelines of
Medical Council of India**

Bharati Vidyapeeth Deemed to be University, Medical College, Pune

Department of Emergency Medicine

Name of Programme: MD Emergency medicine

Programme outcomes:

Doctors who pass out from this program can be employed as emergency physicians in any hospital.

Programme specific outcomes:

Doctors who pass out from this program will be able to handle and stabilize all adult and paediatric patients who report to the emergency of any medical facility. After doing emergency interventions, investigations, diagnosis and stabilization of the patient, they will be shifted to their permanent location in the hospital. Doctors will also be proficient in handling medicolegal aspects of patients reporting to the emergency. In some places the ambulance services are also coordinated by the emergency department.

Programme structure:

It is a three year residency program.

1. The student will be working in the emergency department.
2. In addition the student will be rotated to various other departments (ICU, OT, Labour Room, Paediatric and neonatal ICUs, etc) in a structured manner.
3. The student will have to undertake part in various academic activities conducted by the department.
4. The student will have to conduct a research program and prepare and submit a dissertation.
5. The student will attend conferences and present posters, do oral presentations and publish article in subject journals.

SYLLABUS FOR M.D (EMERGENCY MEDICINE)

INTRODUCTION

Bharati Vidyapeeth Deemed University Medical College is one of the premier medical colleges imparting high quality medical education in private Sector. Established in 1989 it can boast of a well experienced, dedicated and committed faculty members, excellent infrastructure with spacious class rooms, well equipped laboratories, a well stocked library with round the clock internet and digital library facilities and an 850 bedded attached tertiary care Bharati Hospital. The hospital caters for all the services and has a multidisciplinary OPD and IPD with super specialty services. It has well equipped and modern critical care facilities like the, ICU, NICU and PICU. It also has a very modern and state of art operation theatre and all the diagnostic facilities like CT scan, MRI, mammography etc. are available. It has a 24 hours functional blood bank and a pharmacy.

Introduction to Emergency Medicine

Emergency Medicine (EM) is a vital specialty which provides an essential service for patients and communities and fulfils a unique and crucial remit within the national healthcare system.

International Federation for Emergency Medicine defines Emergency Medicine (EM) as a field of practice based on the knowledge and skills required for the prevention, diagnosis and management of acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of undifferentiated physical and behavioral disorders. It further encompasses an understanding of the development of pre-hospital and in-hospital emergency medical systems and the skills necessary for this development.

Emergency Medicine is an inter-disciplinary specialty, one which is interdependent with all other clinical disciplines. The overarching aim of the Emergency Medicine Programme (EMP) is to improve the safety and quality of care and reduce waiting times for patients in Emergency Departments (EDs) throughout the country. It encompasses a large amount of general medicine and surgery including the surgical sub-specialties. Some of the competencies identified for Emergency physicians are those required of a hospital specialist in any medical discipline whilst others are more specific to the practice of Emergency Medicine.

Emergency Medicine has a unique field of action, both within the Emergency Department and in the community. The practice of Emergency Medicine includes the pre-hospital and in-hospital reception, resuscitation and management of undifferentiated urgent and emergency cases until discharge from the Emergency Department or transfer to the care of another physician. It also includes involvement in the development of pre-hospital and in-hospital emergency medical systems.

The emergency physician requires a broad field of knowledge and advanced procedural skills often including surgical procedures, trauma resuscitation, advanced cardiac life support and advanced airway management.

Emergency Physicians are able to look after patients with a wide range of pathologies from the life-threatening to the self-limiting. They are experts in identifying the critically ill and injured,

providing safe and effective immediate care. They are also expert in resuscitation and skilled in the practical procedures needed.

Emergency medicine is a relatively new academic discipline in its infancy in India. As the medical field is an ever growing field, and emergency medicine is rapidly progressing, there is a need to update the knowledge and practice evidence based approach. A dedicated Emergency Medicine faculty will be the key factor in developing a national skilled emergency care workforce.

OBJECTIVES:

A candidate who successfully completes the course should

1. Demonstrate growing understanding of the literature and its clinical application.
2. Master certain technical skills.
3. Manage (with increasing autonomy) medically compromised patients.
4. Acquire judgment and ability to communicate clearly & effective team work.

CLINICAL ROTATIONAL POSTING

The residents will rotate through both the emergency department and other clinical services. The residents will spend 7 months on the first and second year and in the third year will spend 8 months in the Emergency Department and of the remainder time rotating through other services. The rotations in the other departments will provide the residents with opportunities to develop important knowledge and skills in the core subjects. Expected rotations will be as follows:

Year I

1. Emergency Department: 7 months
2. Orthopedic & wound care: 2wks/2wks
3. Pediatric EM: 1 month
4. ICU-1 month
5. CCU- 1 month
6. Anaesthesia-1 month

Year II

1. Emergency Department: 7 months
2. Ophthalmology/ENT- 2wks/2wks
3. OBG/Psychiatry – 2 wks/2wks
4. PICU- 1 month
5. Trauma- 1 month
6. Pediatric EM: 1 month

Year III

1. Emergency Department: 7 months
2. Trauma- 1 month
3. Research – 1 month
4. Radiology & Ultrasound- 2 wks
5. Administration (EM Services)-2 wks
6. Elective- 1 month

PRACTICAL AND CLINICAL TRAINING

Apart from the clinical training of emergency cases in the Emergency Departments, practical hands on training in the various procedures are required:

Minimum numbers of procedures that a candidate needs to perform are:

1. Advanced Life Support procedures in support of CPR- 10
2. Advanced Trauma Life Support procedures in support of stabilization of the
 1. traumatized patient- 10
 2. Tracheal intubation with the use of paralyzing and induction agents as
 3. appropriate for rapid sequence intubation- 20
 4. Cardioversion and defibrillation -10
 5. Pediatric resuscitation- 10
 6. Venous cut downs -1
 7. Closed chest cardiac massage- 10
 8. Open chest cardiac massage -1
 9. Emergency cricothyroidotomy- 1 & emergency tracheostomy-1
 10. Pacemaker placement- external, transvenous and transthoracic, E = 4, TV=2
 11. Emergency pericardiocentesis -1
 12. Central venous catheter insertion- 5
 13. Pulmonary artery catheter insertion- 1
 14. Management of oxygen therapy and ventilators- 10
 15. Incision and drainage of abscess, hematoma, furuncle and hemorrhoid-5
 16. Wound debridement and laceration repair -10
 17. Local field block, hematoma block and peripheral nerve blocks -4
 18. Preservation of served extremities- 2
 19. Nail trephination -1
 20. Tube thoracostomy -4
 21. Closed reduction of hernias -1
 22. Peritoneal lavage- 1
 23. Arthrocentesis -2
 24. Culdocentesis- 1
 25. Thoracentesis- 2
 26. Application and removal of splints and casts -10
 27. Closed reduction of dislocated joints -2

28. Use of emergency immobilization and traction techniques- 10
29. Compartment pressure measurement -1
30. Management of epistaxis - 1
31. Removal of foreign bodies -2
32. Drainage of peritonsillar abscesses- 1
33. Stabilization of traumatically avulsed teeth- 1
34. Direct, fiberoptic and indirect laryngoscopy- 10
35. Emergency delivery of babies- 1
36. Removal of intrauterine devices- 1
37. Introduction of urethral catheters- 10
38. Suprapubic catheterization- 2
39. Lumbar puncture- 2
40. Sigmoidoscopy and anoscopy -2
41. Use of the slit lamp-removal of conjunctival and corneal foreign bodies-4
42. Ocular tonometry -1
43. Insertion of Blakemore tube -1
44. Insertion of nasogastric, orogastric or intestinal tube- 10
45. Peripheral arterial puncture and cannulation- 25
46. Intraosseous infusion and administration of sedation and analgesia- 1
47. ECHO and emergency ultrasound
48. Correct documentation in the electronic medical record (EMR)
49. ECMO
50. IABP (Intra Aortic Balloon pump) & ventricular assisted devices

TEACHING & TRAINING METHODS

The fundamental components of the teaching programme in the department of Emergency Medicine should include:

1. Case presentations & discussion- once a week
2. Seminar – Once a week
3. Journal club- once in 2 weeks
4. Grand round presentation (by rotation departments and subspecialties) - once a week
5. Emergency case discussions – once a week
6. Statistical & mortality meet- once a month
7. Clinico-pathological meetings- once a month

8. Clinico-radiological meetings- once a month
9. Faculty lecture teaching- once a month
10. Clinical Audit-Once a Month
11. A poster and have one oral presentation at least once during their training period in a recognized conference.
12. Emergency ambulance services i.e retrieval of patients & transportation of patients by the resident.

The rounds should include bedside sessions, file rounds, documentation of case history and examination, progress notes, round discussions, investigations and management plan),interesting and difficult case unit discussions.

RECOMMENDED CORE SYLLABUS

A. SYSTEM-BASED CORE KNOWLEDGE

This section of the curriculum gives an index of the system-based core knowledge appropriate to the management of patients presenting with undifferentiated symptoms and complaints. This list is mostly given in the following sequence: congenital disorders; inflammatory and infectious disorders; metabolic disorders; traumatic and related problems; tumors; vascular disorders, ischaemia and bleeding; other disorders. These lists cannot be exhaustive.

1. CARDIOVASCULAR EMERGENCIES IN ADULTS AND CHILDREN

- a. Arrhythmias
- b. Congenital heart disorders
- c. Contractility disorders, pump failure
- d. Cardiomyopathies, congestive heart failure, acute pulmonary oedema, tamponade, valvular emergencies
- e. Inflammatory and infectious cardiac disorders, endocarditis, myocarditis, pericarditis
- f. Ischaemic heart disease
- g. acute coronary syndromes, stable angina
- h. Traumatic injuries
- i. Vascular and thromboembolic disorders
- j. Aortic dissection/aneurysm rupture, deep vein thrombosis, hypertensive emergencies, occlusive arterial disease, thrombophlebitis, pulmonary embolism, pulmonary hypertension

2. DERMATOLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Inflammatory and Infectious disorders
- b. Skin manifestations of immunological disorders, systemic disorders, toxic disorders

3. ENDOCRINE AND METABOLIC EMERGENCIES IN ADULTS AND CHILDREN

- a. Acute presentation of inborn errors of metabolism
- b. Adrenal insufficiency and crisis
- c. Disorders of glucose metabolism hyperosmolar hyperglycaemic state, hypoglycaemia, ketoacidosis

- d. Thyroid disease emergencies hyperthyroidism, hypothyroidism, myxoedema coma, thyroid storm

4. FLUID AND ELECTROLYTE DISTURBANCES

- a. Acid-Base disorders
- b. Electrolyte disorders
- c. Volume status and fluid balance

5. EAR, NOSE, THROAT, ORAL AND NECK EMERGENCIES IN ADULTS AND CHILDREN

- a. Bleeding
- b. Complications of tumours, airway obstruction
- c. Foreign bodies
- d. Inflammatory and Infectious disorders angio-oedema, epiglottitis, laryngitis, paratonsillar abscess
- e. Traumatic problems

6. GASTROINTESTINAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Congenital disorders Hirschsprung's disease, Meckel's diverticulum, pyloric stenosis
- b. Inflammatory and infectious disorders appendicitis, cholecystitis, cholangitis, diverticulitis, exacerbations and complications of inflammatory bowel diseases, gastritis, gastroenteritis, gastro-oesophageal reflux disease, hepatitis, pancreatitis, peptic ulcer, peritonitis
- c. Metabolic disorders hepatic disorders, hepatic failure
- d. Traumatic and mechanical problems foreign bodies, hernia strangulation,
- e. intestinal obstruction and occlusion
- f. Tumours
- g. Vascular disorders/Ischaemia and bleeding: ischaemic colitis, upper and lower gastrointestinal bleeding, mesenteric ischaemia
- h. Other problems complications of gastrointestinal devices and surgical procedures

7. GYNAECOLOGICAL AND OBSTETRIC EMERGENCIES

- a. Inflammatory and Infectious disorders mastitis, pelvic inflammatory disease, vulvovaginitis
- b. Obstetric emergencies, abruptio placentae, eclampsia, ectopic pregnancy, emergency delivery,
- c. HELLP syndrome during pregnancy, hyperemesis gravidarum, placenta praevia, post-partum haemorrhage
- d. Traumatic and related problems ovarian torsion
- e. Tumours
- f. Vascular disorders/ Ischaemia and bleeding: vaginal bleeding

8. HAEMATOLOGY AND ONCOLOGY EMERGENCIES IN ADULTS AND CHILDREN

- a. Anaemias
- b. Complications of lymphomas and leukaemias
- c. Congenital disorders haemophilias and Von Willebrand's disease,
- d. hereditary haemolytic anaemias, sickle cell disease
- e. Inflammatory and Infectious disorders neutropenic fever, infections in immuno-compromised patients
- f. Vascular disorders/ Ischaemia and bleeding: acquired bleeding disorders (coagulation factor deficiency, disseminated intravascular coagulation),
- g. drug induced bleeding (anticoagulants, antiplatelet agents, fibrinolytics),
- h. idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura
- i. Transfusion reactions

9. IMMUNOLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Allergies and anaphylactic reactions
- b. Inflammatory and Infectious disorders
- c. Acute complications of vasculitis

10. INFECTIOUS DISEASES AND SEPSIS IN ADULTS AND CHILDREN

- a. Common viral and bacterial infections
- b. Food and water-borne infectious diseases
- c. HIV infection and AIDS
- d. Common tropical diseases
- e. Parasitosis
- f. Rabies
- g. Sepsis and septic shock
- h. Sexually transmitted diseases
- i. Streptococcal toxic shock syndrome
- j. Tetanus

11. MUSCULO-SKELETAL EMERGENCIES

- a. Congenital disorders dislocated hip, osteogenesis imperfecta
- b. Inflammatory and Infectious disorders arthritis, bursitis, cellulitis,
- c. complications of systemic rheumatic diseases, necrotising fasciitis,
- d. osteomyelitis, polymyalgia rheumatica, soft tissue infections
- e. Metabolic disorders complications of osteoporosis and other systemic diseases
- f. Traumatic and degenerative disorders back disorders, common fractures and dislocations, compartment syndromes, crush syndrome, osteoarthritis, rhabdomyolysis, soft tissue trauma
- g. Tumours: pathological fractures

12. NEUROLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Inflammatory and Infectious disorders brain abscess, encephalitis, febrile seizures in children, Guillain-Barré syndrome, meningitis, peripheral facial palsy (Bell's palsy), temporal arteritis
- b. Traumatic and related problems complications of CNS devices, spinal
- c. cord syndromes, peripheral nerve trauma and entrapment, traumatic brain injury

- d. Tumours common presentations and acute complications of neurological and metastatic tumours
- e. Vascular disorders: carotid artery dissection, stroke, subarachnoid haemorrhage, subdural and extradural haematoma, transient ischaemic attack, venous sinus thrombosis
- f. Other problems acute complications of chronic neurological conditions (e.g. myasthenic crisis, multiple sclerosis), acute peripheral neuropathies,
- g. seizures and status epilepticus

13. OPHTHALMIC EMERGENCIES IN ADULTS AND CHILDREN

- a. Inflammatory and Infectious disorders conjunctivitis, dacryocystitis,
- b. Endophthalmitis, iritis, keratitis, orbital and periorbital cellulitis, uveitis
- c. Traumatic and related problems foreign body in the eye, ocular injuries,
- d. Vascular disorders: retinal artery and vein occlusion, vitreous haemorrhage
- e. Others like acute glaucoma, retinal detachment

14. PULMONARY EMERGENCIES IN ADULTS AND CHILDREN

- a. Congenital cystic fibrosis
- b. Inflammatory and Infectious disorders asthma, bronchitis, bronchiolitis,
- c. pneumonia, empyema, COPD exacerbation, lung abscess, pleurisy and pleural effusion, pulmonary fibrosis, tuberculosis
- d. Traumatic and related problems foreign body inhalation, haemothorax, tension pneumothorax, pneumomediastinum
- e. Tumours common complications and acute complications of pulmonary and metastatic tumours,
- f. Vascular disorders pulmonary embolism
- g. Other disorders: acute lung injury, atelectasis, ARDS, spontaneous pneumothorax

15. PSYCHIATRIC AND BEHAVIOUR DISORDERS

- a. Behaviour disorders affective disorders, confusion and consciousness
- b. disturbances, intelligence disturbances, memory disorders, perception disorders, psychomotor disturbances, thinking disturbances.
- c. Common psychiatric emergencies acute psychosis, anorexia and bulimia
- d. complications, anxiety and panic attacks, conversion disorders, deliberate self-harm and suicide attempt, depressive illness, personality disorders,
- e. substance, drug and alcohol abuse

16. RENAL AND UROLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Inflammatory and Infectious disorders epididymo-orchitis,
- b. Glomerulonephritis, pyelonephritis, prostatitis, sexually transmitted diseases, urinary tract infections
- c. Metabolic disorders acute renal failure, nephrotic syndrome, nephrolithiasis, uraemia
- d. Traumatic and related problems urinary retention, testicular torsion
- e. Tumours
- f. Vascular disorders: Ischaemia and Bleeding
- g. Other disorders comorbidities in dialysis and renal transplanted patients,
- h. complications of urological procedures and devices, haemolytic uraemic syndrome

17. TRAUMA IN ADULTS AND CHILDREN

- a. Origin of trauma: burns, blunt trauma, penetrating trauma
- b. Anatomical location of trauma: head and neck, maxillo-facial, thorax, abdomen, pelvis, spine, extremities
- c. Polytrauma patient
- d. Trauma in specific populations: children, elderly, pregnant women.

B. Common Presenting Symptoms

This section of the Curriculum lists the more common presenting symptoms of patients in the emergency setting. The differential diagnoses are listed according to the systems involved and then in alphabetical order.

1. Acute Abdominal Pain

- a. Gastrointestinal causes - Appendicitis, cholecystitis, cholangitis, acute pancreatitis, complications of hernias, diverticulitis, hepatitis, hiatus hernia, inflammatory bowel disease, intestinal obstruction, ischaemic colitis, mesenteric ischaemia, peptic ulcer, peritonitis, viscus perforation
- b. Cardiac/vascular causes - Acute myocardial infarction, aortic dissection, aortic aneurysm rupture
- c. Dermatological causes - Herpes zoster
- d. Endocrine and metabolic causes - Addison's disease, diabetic ketoacidosis, other metabolic acidosis, porphyria
- e. Gynaecological and Obstetric causes - Complications of pregnancy, ectopic pregnancy, pelvic inflammatory disease, rupture of ovarian cyst, ovarian torsion
- f. Hematological causes - Acute porphyria crisis, familial mediterranean fever, sickle cell crisis
- g. Musculo-skeletal causes - Referred pain from thoraco-lumbar spine
- h. Renal and Genitourinary causes - Pyelonephritis, renal stones
- i. Respiratory causes - Pneumonia, pleurisy
- j. Toxicology - Poisoning
- k. Trauma - Abdominal

2. Altered behaviour and Agitation

- a. Psychiatric causes - Acute psychosis, depression
- b. Cardiac/Vascular causes - Hypertension, vasculitis
- c. Endocrine and metabolic causes - Hypoglycaemia, hyperglycaemia, electrolyte imbalance, hyperthermia, hypoxaemia
- d. Neurological causes - Cerebral space-occupying lesions, dementia, hydrocephalus, intracranial hypertension, CNS infections
- e. Toxicology - Alcohol and drug abuse, poisoning

3. Altered Level of Consciousness in Adults and Children

- a. Neurological causes - Cerebral tumour, epilepsy and status epilepticus, meningitis, encephalitis, stroke, subarachnoid haemorrhage, subdural and extradural haematomata, traumatic brain injury
- b. Cardiovascular causes - Hypoperfusion states, shock

- c. Endocrine and metabolic causes - Electrolyte imbalances, hepatic coma, hypercapnia, hypothermia, hypoxia, hypoglycaemia / hyperglycaemia, uraemia
- d. Gynaecological and Obstetric causes - Eclampsia
- e. Infectious causes - Septic shock
- f. Psychiatric causes - Conversion syndrome
- g. Respiratory causes - Respiratory failure
- h. Toxicology - Alcohol intoxication, carbon-monoxide poisoning, narcotic and sedative poisoning, other substances

4. Back Pain

- a. Musculo-Skeletal causes - Fractures, intervertebral disc strain and degeneration, strain of muscles, ligaments and tendons, spinal stenosis, arthritides, arthrosis
- b. Cardiovascular causes - Aortic aneurysm, aortic dissection
- c. Infectious causes - Osteomyelitis, discitis, pyelonephritis, prostatitis
- d. Endocrine and metabolic causes - Paget's disease
- e. Gastrointestinal causes - Pancreatitis, cholecystitis
- f. Dermatological causes - Herpes zoster
- g. Gynaecological causes - Endometriosis, pelvic inflammatory disease
- h. Haematological and Oncological causes - Abdominal or vertebral tumours
- i. Neurological cause - Subarachnoid haemorrhage
- j. Renal and Genitourinary causes - Renal abscess, renal calculi
- k. Trauma

5. Bleeding (Non Traumatic)

- a. Ear, Nose, Throat causes - Ear bleeding (otitis, trauma, tumours), epistaxis
- b. Gastrointestinal causes - Haematemesis and melaena (acute gastritis, gastro-duodenal ulcer, Mallory Weiss syndrome, oesophageal varices) rectal bleeding (acute diverticulitis, haemorrhoids, inflammatory bowel disease, tumours)
- c. Gynaecological and Obstetric causes - Menorrhagia/metrorrhagia (abortion, abruptio placentae, tumours)
- d. Renal and Genitourinary causes - Haematuria (pyelitis, tumours, urolithiasis)
- e. Respiratory causes - Haemoptysis (bronchiectasia, pneumonia, tumours, tuberculosis)

6. Cardiac Arrest

- a. Cardiac arrest treatable with defibrillation - Ventricular fibrillation, pulseless ventricular tachycardia
- b. Pulseless electric activity - Acidosis, hypoxia, hypothermia, hypo/hyperkalaemia, hypocalcaemia, hypo/hyperglycaemia, hypovolaemia, tension pneumothorax, cardiac tamponade, myocardial infarction, pulmonary embolism, poisoning
- c. Asystole

7. Chest Pain

- a. Cardiac/vascular causes - Acute coronary syndrome, aortic dissection, arrhythmias, pericarditis, pulmonary embolism
- b. Respiratory causes
- c. Pneumonia, pneumomediastinum, pneumothorax (especially tension pneumothorax), pleurisy

- d. Gastrointestinal causes - Gastro-oesophageal reflux, oesophageal rupture, oesophageal spasm
- e. Musculo-Skeletal causes - Costosternal injury, costochondritis, intercostal muscle pain, pain referred from thoracic spine
- f. Psychiatric causes - Anxiety, panic attack
- g. Dermatological causes - Herpes zoster

8. Crying Baby

- a. I – Infections: herpes stomatitis, meningitis, osteomyelitis, urinary tract infection
- b. T – Testicular torsion, trauma, teeth problems,
- c. C – Cardiac: arrhythmias, congestive heart failure
- d. R -Reaction to milk, reaction to medications, reflux
- e. I - Immunization and allergic reactions, insect bites
- f. E – Eye: corneal abrasions, glaucoma, ocular foreign bodies
- g. S – Some gastrointestinal causes: hernia, intussusception, volvulus

9. Diarrhea

- a. Infectious causes - AIDS, bacterial enteritis, viral, parasites, food-borne, toxins
- b. Toxicological causes - Drugs related, poisoning (including heavy metals, mushrooms, organophosphates, rat poison, and seafood)
- c. Endocrine and metabolic causes - Carcinoids, diabetic neuropathy
- d. Gastrointestinal causes - Diverticulitis, dumping syndrome, ischaemic colitis, inflammatory bowel disease, enteritis due to radiation or chemotherapy
- e. Haematological and Oncological causes
- f. Toxicity due to cytostatic therapies
- g. Immunology - Food allergy
- h. Psychiatric disorders - Diarrhea “factitia”

10. Dyspnoea

- a. Respiratory Causes - Airway obstruction, broncho-alveolar obstruction, parenchymal diseases, pulmonary shunt, pleural effusion, atelectasis, pneumothorax
- b. Cardiac/vascular causes - Cardiac decompensation, cardiac tamponade, pulmonary embolism
- c. Ear, Nose, Throat causes - Epiglottitis, croup and pseudocroup
- d. Fluid & Electrolyte disorders - Hypovolaemia, shock, anaemia
- e. Gastrointestinal causes - Hiatus hernia
- f. Immunological causes - Vasculitis
- g. Metabolic causes - Metabolic acidosis, uraemia
- h. Neurological causes - Myasthenia gravis, Guillain Barrè syndrome, amyotrophic lateral sclerosis
- i. Psychiatric disorders - Conversion syndrome
- j. Toxicology - CO intoxication, cyanide intoxication
- k. Trauma - Flail chest, lung contusion, traumatic pneumothorax, haemothorax

11. Fever and Endogenous Increase in Body Temperature

- a. Systemic infectious causes - Sepsis and septic shock, parasitosis, flu-like syndrome

- b. Organ-specific infectious causes - Endocarditis, myocarditis, pharyngitis, tonsillitis, abscesses, otitis, cholecystitis and cholangitis, meningitis, encephalitis
- c. Non-infectious causes - Lyell syndrome, Stephen-Johnson syndrome, thyroid storm, pancreatitis, inflammatory bowel disease, pelvic inflammatory disease, toxic shock
- d. Haematological and Oncological causes - Leukaemia and lymphomas, solid tumours
- e. Immunological causes - Arteritis, arthritis, lupus, sarcoidosis
- f. Musculo-Skeletal causes - Osteomyelitis, fasciitis and cellulitis
- g. Neurological causes - Cerebral hemorrhage
- h. Psychiatric causes - Factitious fever
- i. Renal and Genitourinary causes - Pyelonephritis, prostatitis
- j. Toxicology

12. Headache in Adults and Children

- a. Vascular causes - Migraine, cluster headache, tension headache, cerebral haemorrhage, hypertensive encephalopathy, ischaemic stroke
- b. Haematological and Oncological causes - Brain tumours
- c. Immunological causes - Temporal arteritis, vasculitis
- d. Infectious causes - Abscesses, dental infections, encephalitis, mastoiditis, meningitis, sinusitis
- e. Musculo-Skeletal causes - Cervical spine diseases, temporomandibular joint syndrome
- f. Neurological causes - Trigeminal neuralgia
- g. Ophthalmological causes - Optic neuritis, acute glaucoma
- h. Toxicology - Alcohol, analgesic abuse, calcium channel blockers, glutamate, nitrates, opioids and caffeine withdrawal
- i. Trauma - Head trauma

13. Jaundice

- a. Gastrointestinal causes - Cholangitis, hepatic failure, pancreatic head tumour, pancreatitis, and obstructive cholestasis
- b. Cardiac/Vascular causes - Chronic cardiac decompensation
- c. Haematological and Oncological causes - Haemolytic anaemias, thrombotic thrombocytopenic purpura, haemolytic uraemic syndrome, disseminated intravascular coagulation
- d. Infectious causes - Malaria, leptospirosis
- e. Gynaecological causes - HELLP syndrome
- f. Toxicology - Drug induced haemolytic anaemias, snake venom

14. Pain in Arms

- a. Cardiac/Vascular causes - Aortic dissection, deep venous thromboembolism, ischaemic heart disease
- b. Musculo-skeletal causes - Periarthritis, cervical spine arthrosis
- c. Trauma

15. Pain in Legs

- a. Cardiac/Vascular causes - Acute ischaemia, arteritis, deep venous thrombosis, superficial thrombophlebitis
- b. Immunological causes - Polymyositis

- c. Infectious causes - Arthritis, cellulites, necrotising fasciitis, osteomyelitis
- d. Musculo-Skeletal causes - Sciatalgia
- e. Neurological causes - Sciatica
- f. Nervous system causes - Peripheral nerve compression
- g. Trauma

16. Palpitations

- a. Cardiac/Vascular causes - Brady-arrythmias (including sinus bradycardia and AV blocks), extrasystoles, tachyarrythmias (including atrial fibrillation, sinus tachycardia, supraventricular tachycardia, ventricular tachycardia)
- b. Endocrine and metabolic causes - Thyrotoxicosis
- c. Toxicology - Drugs

17. Seizures in Adults and Children

- a. Neurological causes - Generalised epilepsy, partial complex or focal epilepsy, status epilepticus
- b. Cardiac/Vascular causes - Hypertensive encephalopathy, syncope, dysrhythmias, migraines
- c. Endocrine and metabolic causes - Metabolic seizures
- d. Gynaecological causes - Eclampsia
- e. Infectious causes - Febrile seizures in children
- f. Psychiatric causes - Narcolepsy, pseudo-seizures
- g. Respiratory causes - Respiratory arrest
- h. Toxicology - Drugs/toxins

18. Shock in Adults and Children

- a. Anaphylactic
- b. Cardiogenic
- c. Hypovolaemic
- d. Obstructive
- e. Septic
- f. Neurogenic
- g. Cardiac/Vascular causes -- Cardiogenic shock, arrhythmias
- h. Endocrine and metabolic causes -- Addison's crisis
- i. Fluid and Electrolyte disorders -- Hypovolaemic shock
- j. Gastrointestinal causes -- Vomiting, diarrhoea
- k. Gynaecological causes -- Toxic shock
- l. Immunological causes -- Anaphylactic shock
- m. Infectious causes -- Septic shock
- n. Neurological causes -- Neurogenic shock
- o. Trauma -- Hypovolaemic shock, neurogenic shock.

19. Skin Manifestations in Adults and Children

- a. Dermatological causes - Eczema, psoriasis, skin tumours
- b. Immunological causes - Vasculitides, urticaria, Stevens-Johnson syndrome, Lyell syndrome

- c. Infectious causes - Viral exanthemata, meningococcaemia, herpes zoster/simplex, abscesses of the skin
- d. Psychiatric causes - Self-inflicted skin lesions or from abuse
- e. Toxicology
- f. Haematological and Oncological causes - Idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura

20. Syncope

- a. Cardiac/vascular causes - Aortic dissection, cardiac arrhythmias (including brady-tachy syndrome, Brugada syndrome, drug overdose, long QT syndrome, sick sinus syndrome, torsades de pointes, ventricular tachycardia), other causes of hypoperfusion (including ischaemia, valvular, haemorrhage, obstruction: e.g. aortic stenosis, pulmonary embolism, tamponade), orthostatic hypotension
- b. Endocrine and metabolic causes - Addison's disease
- c. Fluid and Electrolyte disorders - Hypovolaemia
- d. Gastrointestinal causes - Vomiting, diarrhoea
- e. Neurological causes - Autonomic nervous system disorder, epilepsy, vasovagal reflex,
- f. Toxicology - Alcoholic or drug consumption

21. Urinary Symptoms (Dysuria, Oligo/Anuria, Polyuria)

- a. Renal and Genitourinary causes - Acute renal failure, acute urinary retention, cystitis and pyelonephritis, prostatitis
- b. Cardiac/Vascular causes - Cardiac decompensation
- c. Endocrine and metabolic causes - Diabetes mellitus, diabetes insipidus
- d. Fluid and Electrolyte disorders - Hypovolaemia

22. Vertigo and Dizziness

- a. Ear and Labyrinth causes -- Benign postural vertigo, Meniere's disease, otitis, vestibular neuritis, viral labyrinthitis
- b. Cardiac/Vascular causes -- Arrhythmias, hypotension
- c. Endocrine and metabolic causes -- Hypoglycaemia
- d. Haematological and Oncological causes -- Anaemias
- e. Nervous system causes -- Acoustic neuroma, bulbar or cerebellar lesions, multiple sclerosis, temporal epilepsy
- f. Psychiatric causes -- Anxiety
- g. Respiratory causes -- Hypoxia
- h. Toxicology -- Alcohol abuse, drugs and substances

23. Vomiting

- a. Gastrointestinal causes -- Appendicitis, cholecystitis, gastroparesis, gastric obstruction and retention, gastroenteritis, hepatitis, pancreatitis, pyloric stenosis, small bowel obstructions
- b. Cardiac/Vascular causes -- Myocardial ischaemia
- c. Ear, Nose, Throat causes -- Vestibular disorders
- d. Endocrine and metabolic causes -- Diabetic ketoacidosis, hypercalcaemia
- e. Fluid and Electrolyte disorders -- Hypovolaemia
- f. Gynaecological and Obstetric causes - Pregnancy

- g. Infectious causes - Sepsis, meningitis
- h. Neurological causes - Cerebral oedema or haemorrhage, hydrocephalus, intracranial space occupying lesions
- i. Ophthalmological causes - Acute glaucoma
- j. Psychiatric causes - Eating disorders
- k. Renal and Genitourinary causes - Renal calculi, uraemia
- l. Toxicology

C. SPECIFIC ASPECTS OF EMERGENCY MEDICINE

1. ABUSE AND ASSAULT IN ADULTS AND CHILDREN

- a. Abuse in the elderly and impaired
- b. Child abuse and neglect
- c. Intimate partner violence and abuse
- d. Sexual assault
- e. Patient safety in Emergency Medicine
- f. Violence management and prevention in the Emergency Department

2. ANALGESIA AND SEDATION IN ADULTS AND CHILDREN

- a. Pain transmission (anatomy, physiology, pharmacology)
- b. Pain assessment
- c. Pharmacology of sedative and pain relieving drugs
- d. Psychological and social aspects of pain in paediatric, adult and elderly patients

3. DISASTER MEDICINE

- a. Disaster preparedness
- b. Major incident planning/procedures/practice
- c. Disaster response
- d. Mass gatherings
- e. Specific medical topics (triage, bioterrorism, blast and crush injuries, chemical agents, radiation injuries)
- f. Debriefing and mitigation

4. ENVIRONMENTAL ACCIDENTS IN ADULT AND CHILDREN

- a. Electricity (electrical and lightning injuries)
- b. Flora and Fauna (injuries from exposure, bites and stings)
- c. High-altitude (medical problems)
- d. NBCR (nuclear, biological, chemical and radiological; decontamination, specific aspects)
- e. Temperature (heat and cold related emergencies)
- f. Travel medicine
- g. Water (near-drowning, dysbarism and complications of diving, marine fauna)

5. FORENSIC ISSUES

- a. Basics of relevant legislation in the country of practice
- b. Recognize and preserve evidence
- c. Provide appropriate medical documentation (including forensic and clinical photography, collection of biological samples, ballistics)

- d. Appropriate reporting and referrals (e.g. child abuse or neglect, gunshot and other forms of penetrating wounds, elder abuse, sexual assault allegations)
- e. Medico-legal documentation

6. INJURY PREVENTION AND HEALTH PROMOTION

- a. Collection and interpretation of data related to prevention and health promotion
- b. Epidemiology of Accidents and Emergencies
- c. Formulation of recommendations

7. PATIENT MANAGEMENT ISSUES IN EMERGENCY MEDICINE

- a. Emergency Department organization (administration, structure, staffing, resources)
- b. Management of specific populations:
- c. Children in special circumstances including child protection
- d. Elderly patients
- e. Homeless patients
- f. Mentally incompetent adults
- g. Psychiatric patients

8. PROBLEMS IN THE ELDERLY

- a. Atypical presentations (e.g. abdominal pain, infections, myocardial
- b. infarction)
- c. Delirium
- d. Dementia
- e. Falls (causes & investigations)
- f. Immobility
- g. Multiple pathology and multiple therapies
- h. Self-dependency
- i. Trauma & co-morbidity

9. TOXICOLOGY IN ADULTS AND CHILDREN

- a. General principles of toxicology and management of poisoned patients
- b. Principles of drug interactions
- c. Specific aspects of poisoning
- d. Drugs (including paracetamol, amphetamine, anticholinergics, anticonvulsants, antidepressants, antihypertensives, benzodiazepines, digitalis, monoamine oxidase inhibitors, neuroleptics) industrial, chemicals plants & mushrooms alcohol abuse and alcohols poisoning drugs of abuse
- e. Local poisonings such as OPC, aluminium phosphide, yellow phosphorous, heavy metal poisoning, plant poisonings, paraquat poisoning, cyber methrine poisoning, corrosives petroleum products, methanol and ethanol, dyes and nitrobenzene.
- f. Organization and information (e.g. poison centres, databases)

10. PRE-HOSPITAL CARE

- a. Emergency Medical Services organisation (administration, structure, staffing, resources)
- b. Medical transport (including neonates and children, air transport)
- c. Paramedic training and function
- d. Safety at the scene

- e. Collaboration with other emergency services (e.g. police, fire department)

11. PSYCHO-SOCIAL PROBLEMS

- a. Social wellbeing of specific populations
- b. Patients with social issues
- c. Frequent visitors
- d. Social care following discharge

D. CORE CLINICAL PROCEDURES AND SKILLS

1. CPR SKILLS

- a. Cardio-pulmonary resuscitation procedures in a timely and effective manner according to the current ILCOR guidelines for adults and children
- b. Advanced CPR skills (e.g. therapeutic hypothermia, open chest CPR)

2. AIRWAY MANAGEMENT SKILLS

- a. Open and maintain the airway in the emergency setting (insertion of oropharyngeal or nasopharyngeal airway)
- b. Endotracheal intubation
- c. Alternative airway techniques in the emergency setting (e.g. laryngeal mask insertion, surgical airway)
- d. Difficult airway management algorithm
- e. Use of rapid sequence intubation in the emergency setting

3. ANALGESIA AND SEDATION SKILLS

- a. Assessment of the level of pain and sedation
- b. Monitor vital signs and potential side effects during pain management
- c. Provide procedural sedation and analgesia including conscious sedation (including testing of life support equipment)
- d. Use of appropriate local, topical and regional anaesthesia techniques

4. BREATHING AND VENTILATION MANAGEMENT SKILLS

- a. Assessment of breathing and ventilation
- b. Oxygen therapy
- c. Interpretation of blood gas analysis, pulse oximetry and capnography
- d. Bag-mask-valve ventilation
- e. Thoracocentesis
- f. Chest tube insertion, connection to under-water drainage and assessment of functioning
- g. Non-invasive ventilation techniques
- h. Invasive ventilation techniques

5. CIRCULATORY SUPPORT AND CARDIAC SKILLS AND PROCEDURES

- a. Administration of fluids including blood and substitutes
- b. Monitoring of ECG and the circulation
- c. Defibrillation and pacing (e.g. cardioversion, transcutaneous pacing)
- d. Emergency pericardiocentesis
- e. Vascular access (peripheral venous, arterial, and central venous catheterisation, intraosseous access)

6. DIAGNOSTIC PROCEDURES AND SKILLS

- a. Interpretation of ECG
- a. Appropriate request and interpretation of laboratory investigations (blood chemistry, blood gases, respiratory function testing and biological markers)
- b. Appropriate request and interpretation of imaging (e.g. x-rays, ultrasound, CT/MRI)
- c. Focused Assessment of Sonography in Trauma (FAST).
- d. Emergency Ultrasound and Echocardiology
- e. Gastrointestinal Procedures: Shangstaken tube insertion, endoscopic banding, sclerotherapy in UGI bleed

7. ENT SKILLS AND PROCEDURES

- a. Anterior rhinoscopy
- b. Insertion of nasal pack
- c. Inspection of oropharynx and larynx
- d. Otoscopy
- e. Removal of foreign body if airway is compromised
- f. Insertion and replacement of tracheostomy tube

8. GASTROINTESTINAL PROCEDURES

- a. Insertion of nasogastric tube
- b. Gastric lavage
- c. Peritoneal lavage
- d. Abdominal hernia reduction
- e. Abdominal paracentesis
- f. Measurement of abdominal pressure
- g. Proctoscopy

9. GENITOURINARY PROCEDURES

- a. Insertion of indwelling urethral catheter
- b. Suprapubic cystostomy
- c. Testicular torsion reduction
- d. Evaluation of patency of urethral catheter

10. HYGIENE SKILLS AND PROCEDURES

- a. Decontamination of patient and the environment
- b. Patient isolation and staff protection

11. MUSCULOSKELETAL TECHNIQUES

- a. Aseptic joint aspiration
- b. Fracture immobilisation
- c. Reduction of joint dislocation
- d. Log roll and spine immobilisation
- e. Splinting (plasters, braces, slings, tapes and other bandages)
- f. Management of compartment syndrome
- g. Fasciotomy, escharotomy

12. NEUROLOGICAL SKILLS AND PROCEDURES

- a. Evaluation of consciousness including the Glasgow Coma Scale
- b. Fundoscopy
- c. Lumbar puncture
- d. Interpretation of neuro-imaging

13. OBSTETRIC AND GYNAECOLOGICAL SKILLS AND PROCEDURES

- a. Emergency delivery
- b. Vaginal examination using speculum
- c. Assessment of the sexual assault victim

14. OPHTHALMIC SKILLS AND PROCEDURES

- a. Removal of foreign body from the eye
- b. Slit lamp use
- c. Lateral canthotomy

15. TEMPERATURE CONTROL PROCEDURES

- a. Measuring and monitoring of body temperature
- b. Cooling techniques (evaporative cooling, ice water or slush immersion)
- c. Internal cooling methods
- d. Warming techniques
- e. Monitoring heat stroke patients
- f. Treatment and prevention of hyper- and hypothermia

16. TRANSPORTATION OF THE CRITICALLY ILL PATIENT

- a. Telecommunication and telemedicine procedures
- b. Preparation of the EMS vehicle
- c. Specific aspects of monitoring and treatment during transportation

17. WOUND MANAGEMENT

- a. Abscess incision and drainage
- b. Aseptic techniques
- c. Treatment of lacerations and soft tissue injuries
- d. Wound irrigation and wound closure

DURATION: Three years or six academic terms.

STRUCTURE OF THE COURSE:

Structure of the postgraduate course can be classified under four major headings –

1. Knowledge
2. Technical skills
3. Patient management and communication skills
4. Medicolegal aspects
5. **Research methodology including periodic thesis reviews**

SEMESTERWISE PROGRAMME:

1. Teaching programme of the department includes:
2. Research Methodology training programme
3. Simulation based teaching (when applicable)
4. Practical OR teaching
5. Lectures
6. Seminars
7. Case presentations
8. Journal clubs
9. Clinical presentation of morbidity & mortality cases.
10. Stepwise 'Pain medicine teaching module' will be inserted in post graduate teaching activities.
11. Teaching staff of other department will also conduct teaching activity in certain related and pertinent topics.

At The End of First SIX MONTHS Training, Student Should Be Able To Demonstrate

A. Knowledge of fundamentals of:

1. Crash cart, Emergency kit, Anaesthesia machine
2. Breathing systems – Magills, Bains, closed circuit, Ayre'T piece
3. Routine monitors, Ventilators, Pulse oximeter, ETCO₂ monitor, ECG Monitor with defibrillator, O₂ cylinder for transportation
4. Comprehensive airway examination, mallampatti classification, Wilson's classification
5. ASA grading
6. Preoperative evaluation
7. Drugs and doses of anaesthetics, anxiolytics, sedatives, analgesics, muscle relaxants, anticholinergics, anticholinesterases, inotropes, vasopressors, local anaesthetics

B. TECHNICAL AND PATIENT MANAGEMENT SKILLS:

1. Crash cart, Emergency kit checking
2. Setup for a case including monitors, drugs, airway equipment
3. IV line for adult and older children
4. Mask ventilation and Intubation – adult with easy airway
5. Perform nerve blocks

6. Perform basic life support
7. Manage ASA grade I & II patients with uncomplicated procedures with assistance
8. Estimate blood and fluid requirement in routine cases
9. Recognize common but serious problems (in time)
10. Manage the transportation of a patient from emergency room (ER) to ICU via radiology department for imaging.
11. Obtain informed consent
12. Maintain legible and accurate record

C. COMMUNICATION SKILLS:

1. Communicate effectively with the patient
2. Present concise summary of cases to seniors and consultants
3. Explain and communicate pros & cons of the procedure to the patient
4. Present plan for dissertation

At the End of One Year Training Student Should Be Able To Demonstrate

A. In addition to the above

1. The student should be able to recognize indications and contraindications for securing invasive airway management.
2. Monitoring of critically ill patients & their transportation with assistance
3. Manage ASA I & II patients undergoing uncomplicated procedures with minimal assistance

B. COMMUNICATION SKILLS:

1. Formulate and present plan for management of patients, this includes anticipated problems and proposed solutions
2. Should be able to teach undergraduate students and junior residents
3. Present results and progress and dissertation cases to the seniors

At the End of Second Year Training Student Should Be Able To Demonstrate

A. Student should know in addition to the above

1. ATLS & ACLS training from AHA
2. Implications of sedation in minor procedures like elbow relocation, shoulder relocation.
3. Recognition and management of anaphylactic and anaphylactoid reactions
4. Implication of personal hygiene & universal precautions while handling the patients in emergency room.

B. COMMUNICATION SKILLS:

1. Presentation of seminars
2. Journal clubs
3. Case presentations
4. Teaching junior trainees and undergraduate students

At the End of Two and Half Year Training Student Should Be Able To Demonstrate

1. KNOWLEDGE:

The student should be able to demonstrate knowledge of physiological and/or pharmacological principles underlying

- a. Invasive monitoring
- b. Important cardiorespiratory events
- c. Relief of acute and chronic pain
- d. Cardiopulmonary bypass
- e. ECMO role in patients with cardiac arrest
- f. Advanced cardiac life support
- g. Interpretation of arterial blood gas values
- h. Mechanical ventilation
- i. Oxygen therapy
- j. Management and transport of critically ill and polytrauma patient
- k. Literature search and research methodology

2. TECHNICAL SKILLS:

Student is expected to learn to

- a. Insert arterial and central venous catheters in adults
- b. Insert peripheral venous cannulae in paediatric patients
- c. Manage difficult airways
- d. Perform standard nerve blocks
- e. Perform spinal blocks in patients with difficult landmarks

3. PATIENT MANAGEMENT SKILLS:

The student should demonstrate ability to

- a. Manage airway in ASA III & IV patients with ABC compromise.
- b. Resuscitate victims of trauma in correct sequence
- c. Manage airway of critically ill patient in intensive care setting

- d. Manage patients with chronic pain states
- e. Manage ABC of neonate & pediatric patient in emergency room.
- 4. COMMUNICATION SKILLS:**
- a. Formulate and present a plan for management of MLC cases & brought dead cases including anticipated problems and proposed solutions.
- b. Make and communicate a decision on a problem patient
- c. Present results of dissertation
- d. Teach and supervise medical students and junior residents
- e. Make sound judgments in decision making and application
- f. Adapt to rapidly changing academic and technological advances
- 5. MEDICO-LEGAL ASPECTS** and its implications to emergency medicine will be learnt by student throughout the post graduate course as a part of patient management and communication.

INTERNAL ASSESSMENT

Internal assessment of student will be carried out at the end of every term in theory as well as practical (**when applicable**). **Student should be able to demonstrate minimum required eligibility**

1. LOGBOOK will be maintained by student regarding periodical progress.
2. TRAINING ROTATION: Rotation spaced during 3 yrs. in following areas:
 - a. ICU / HDU/PICU/NICU/CCU/Anesthesia/ Radiology/
 - b. Medicine/ Surgery/ Ortho/pulmonary medicine/
 - c. ENT/Ophthalmology/Trauma/Pain Clinic
3. THESIS / DISSERTATION
 - a. The student will work on the thesis under the guidance of a recognized post graduate teacher.
 - b. Subject of thesis should be submitted to the University along with a synopsis and duly approved by ethical committee of College, before the end of first term
 - c. The student will have to put in at least two complete academic terms for working on the thesis
 - d. Periodic thesis review meetings: During which students will present the progress of dissertation.
 - e. The completed dissertation should be submitted at least six months prior to the date of written/practical University examination
 - f. Acceptance of dissertation by the examiners is a pre-condition to appear for the University examination (theory & practical)

Pattern of Final Examination

A. Theory:

1. Four papers of 100 marks each and of 3 hours duration
2. Each paper consisting of two long answer questions (LAQs) of 15 marks each, (30 marks) and eight semi – long answer questions of 10 marks each, with one option, (70 marks).
3. Students should note that - Following mentioned subdivisions of topics are for guideline purpose only. Overlapping of the topics to some extent is unavoidable in different papers.

Paper I: Basic Sciences & principles as applied to Emergency Medicine.

1. Applied Anatomy, applied physiology, pathophysiology
2. Pharmacology, Relevant Biochemistry
3. Historical Aspects including Scientists, Events, equipments & Drugs.
4. Emergency room design / Hazards / sterilization
5. Pre hospital care

Paper II: Medical Emergencies including techniques

1. BLS/ACLS/ATLS/PALS/NRP
2. Breathing & ventilatory management
3. Diagnostic procedures
4. Emergency life saving procedures
5. Paediatric, skin and psychiatric emergencies

Paper III: Surgical emergencies including the following.

1. Orthopaedics
2. ENT
3. Ophthalmology
4. Obstetrics
5. Dental,
6. Anaesthesia
7. Radiology

Paper IV: Clinical Emergency medicine including critical care, pain medicine & recent advances.

1. Monitoring in emergency room & transportation

2. Hematology & coagulation disorders, Acid – Base & Fluid electrolyte disturbances.
3. Critical Care situations relevant to Emergency Medicine.
4. Newer Guidelines
5. Recent advances in Emergency medicine including Equipment, Drugs & Techniques.
6. Pain medicine
7. Research methodology including statistics

B. Practical:

PATTERN OF EXAMINATION:

A. PRACTICAL

1. Total 400 marks
 - a. One Long case: 150 marks
 - b. Two Short cases: 100 marks (50 marks each)
 - c. Viva-voce: 150 marks (75 marks each table)
 - i. One table with instruments & drugs
 - ii. 2nd table with ECG, X- RAYs, CT, MRI, PFTs, ABGs etc

There will be two heads of passing:

1. Four theory papers will form one head of passing
2. Clinical, oral and practical examinations will form second head of passing.

Student must pass separately in both the heads of examination in one and the same attempt.

ILLUSTRATIVE STUDY MATERIAL

Recommended Text Books

1. Tintinallis emergency medicine: a comprehensive study guide. 8th edition authors-judith E Tintinalli, J. Stephan stapc zynski, O.John.Ma, David M... Cline:
2. Rosen's emergency medicine: concepts and clinical practice expert consult premium edition, 2volumes, 8th edition , John Marx MD, Robert Hockberger MD, Ron Walls MD
3. Marino's The ICU Book, 4th edition, paul L. marino, publisher- Lippincott Williams & wilkins.
4. Textbook of Emergency Medicine, David, S (Editor), New York: Lippincott, Williams & Wilkins.
5. Emergency Medicine (latest edition) Anthony FT Brown, Michael D Cadgan, London, Hodder Arnold

6. Goldberger's clinical electrocardiography: a simplified approach, 8th edition, Ary L. Goldberger, Zachary L. Goldberger, Alexei Shuilkin. Publisher- Elsevier.
7. Harwood-Nuss' Clinical Practice of Emergency Medicine, Wolfson, A (Editor), New York: Lippincott, Williams & Wilkins.
8. An Introduction to Clinical Emergency Medicine, Mahadevan, S.V. (Editor), New York: Cambridge University Press
9. ECG For Emergency Physician, Mattu and Brady (Editors), London: BMJ Publishing.
10. Harrison's principle of internal medicine, 2 volumes, 19th edition ,
11. Guyton & Hall Text book of medical physiology, a south asian edition, author- John. E. Hall, publisher-Elsevier
12. Accident & Emergency Radiology, A survival guide- Nigel Raby
13. Ma & Mateer's emergency ultrasound, 3rd edition , O. John Ma, James Mateer, publisher McGraw-Hill Education
14. Goldfrank's Toxicologic Emergencies, 10th edition, Robert S. Hoffman, Mary Ann Howland, Neal A. Lewin , Lewis S. Nelson, publisher- Mc Graw Hill Education
15. Modern Medical Toxicology, Pillay, V.V.
16. Textbook of Critical Care, Fink, M (Editor): Philadelphia, Elsevier Saunders.
17. Irwin & Rippe's Intensive care medicine(Lippincott) 7th edition- 2011 authors Richard S Irwin, James M Rippe.
18. Oxford Hand Book of Accident and Emergency Medicine (LLATEST Edition) JP Wyatt, RN Illingworth, CE Robertson, MJ Clancy, PT Munro eds. Oxford, oxford University Press
19. Text book of pediatric Emergency Medicine (Latest edition) Peter Cameron, George Jelinek, Ian Everitt, Gary Browne, Jeremy Raftos. London, Churchill Livingstone.
20. Textbook of Adult Emergency Medicine, Edinburgh: Churchill Livingstone.
21. Medicine Textbook of Adult Emergency (Latest Edition) Peter Cameron, George Jelinek, Anne- Maree Kelly, Lindsay murray, Anthony FT Brown, Jhon Heyworth eds. Edinburgh, Churchill Livingstone
22. Text book of paediatric emergency medicine 2nd edition -2011. Authors- peter Cameron , GEORGE Jelinek , Ian Everih
23. Manipal medical manual : medical emergencies, treatment of serious infections,4th edition, CBS publisher and distributors
24. Emergency medicine procedures, 2nd edition,2013, Eric Reichman, publisher-Mc Graw Hill Education.
25. Clinical application of Mechanical ventilation, David W Chang, 4th edition, Delmar cengage learning.
26. American Heart Association Basic Life Support, Advanced Cardiovascular Life Support and Pediatric Life Support manuals

27. Advanced Trauma Life Support manual published by the American College of Surgeons.

JOURNALS

1. The journal of Emergency Medicine- Elsevier (the official journal of the American Academy of Emergency Medicine)
2. American Journal of Emergency Medicine
3. European Journal of Emergency Medicine (the official journal of the European Society for Emergency Medicine)
4. Annals of Emergency Medicine (the official journal of the American College of Emergency Medicine)
5. Emergency Medicine Australasia
6. Academy Emergency Medicine
7. National Journal of Emergency Medicine published by SEMI
8. American Heart Association journal, Circulation

Online Resources

1. American Academy Of Emergency Medicine- Position Statements
2. American College Of Emergency Physicians- Practice Resources
3. Association Of Emergency Physicians- Policy And Position Statements
4. Australasian College For Emergency Medicine – Policies And Guidelines
5. Australian And New Zealand Intensive Care Society- Policy Statements
6. Council Of Emergency Medicine Residency Directors- Position Statements
7. Emergency Management Australia- Publications
8. European Resuscitation Council- Guidelines
9. Intensive Care Society (UK)- Standards And Guidelines
10. National Electronic Library For Health (UK) Emergency Care
11. Resuscitation Council (UK)
12. Society For Academic Emergency Medicine – Position Statements
13. Society Of Critical Care Medicine- Guidelines
14. Triage – Injury, Treatment And Recovery, Shoestring G



**BHARATI VIDYAPEETH
(DEEMED TO BE UNIVERSITY), PUNE**

**Faculty of Medical Sciences
MD - Emergency Medicine
Old Syllabus**



**Bharati Vidyapeeth Deemed to be University,
Pune**

Faculty of Medical Sciences

**Curriculum for MD in Emergency Medicine
As per Guidelines of
Medical Council of India**

Bharati Vidyapeeth Deemed to be University, Medical College, Pune

Department of Emergency Medicine

Name of Programme: MD Emergency medicine

Programme outcomes:

Doctors who pass out from this program can be employed as emergency physicians in any hospital.

Programme specific outcomes:

Doctors who pass out from this program will be able to handle and stabilize all adult and paediatric patients who report to the emergency of any medical facility. After doing emergency interventions, investigations, diagnosis and stabilization of the patient, they will be shifted to their permanent location in the hospital. Doctors will also be proficient in handling medicolegal aspects of patients reporting to the emergency. In some places the ambulance services are also coordinated by the emergency department.

Programme structure:

It is a three year residency program.

1. The student will be working in the emergency department.
2. In addition the student will be rotated to various other departments (ICU, OT, Labour Room, Paediatric and neonatal ICUs, etc) in a structured manner.
3. The student will have to undertake part in various academic activities conducted by the department.
4. The student will have to conduct a research program and prepare and submit a dissertation.
5. The student will attend conferences and present posters, do oral presentations and publish article in subject journals.

SYLLABUS FOR M.D (EMERGENCY MEDICINE)

INTRODUCTION

Bharati Vidyapeeth Deemed University Medical College is one of the premier medical colleges imparting high quality medical education in private Sector. Established in 1989 it can boast of a well experienced, dedicated and committed faculty members, excellent infrastructure with spacious class rooms, well equipped laboratories, a well stocked library with round the clock internet and digital library facilities and an 850 bedded attached tertiary care Bharati Hospital. The hospital caters for all the services and has a multidisciplinary OPD and IPD with super specialty services. It has well equipped and modern critical care facilities like the, ICU, NICU and PICU. It also has a very modern and state of art operation theatre and all the diagnostic facilities like CT scan, MRI, mammography etc. are available. It has a 24 hours functional blood bank and a pharmacy.

Introduction to Emergency Medicine

Emergency Medicine (EM) is a vital specialty which provides an essential service for patients and communities and fulfils a unique and crucial remit within the national healthcare system.

International Federation for Emergency Medicine defines Emergency Medicine (EM) as a field of practice based on the knowledge and skills required for the prevention, diagnosis and management of acute and urgent aspects of illness and injury affecting patients of all age groups with a full spectrum of undifferentiated physical and behavioral disorders. It further encompasses an understanding of the development of pre-hospital and in-hospital emergency medical systems and the skills necessary for this development.

Emergency Medicine is an inter-disciplinary specialty, one which is interdependent with all other clinical disciplines. The overarching aim of the Emergency Medicine Programme (EMP) is to improve the safety and quality of care and reduce waiting times for patients in Emergency Departments (EDs) throughout the country. It encompasses a large amount of general medicine and surgery including the surgical sub-specialties. Some of the competencies identified for Emergency physicians are those required of a hospital specialist in any medical discipline whilst others are more specific to the practice of Emergency Medicine.

Emergency Medicine has a unique field of action, both within the Emergency Department and in the community. The practice of Emergency Medicine includes the pre-hospital and in-hospital reception, resuscitation and management of undifferentiated urgent and emergency cases until discharge from the Emergency Department or transfer to the care of another physician. It also includes involvement in the development of pre-hospital and in-hospital emergency medical systems.

The emergency physician requires a broad field of knowledge and advanced procedural skills often including surgical procedures, trauma resuscitation, advanced cardiac life support and advanced airway management.

Emergency Physicians are able to look after patients with a wide range of pathologies from the life-threatening to the self-limiting. They are experts in identifying the critically ill and injured,

providing safe and effective immediate care. They are also expert in resuscitation and skilled in the practical procedures needed.

Emergency medicine is a relatively new academic discipline in its infancy in India. As the medical field is an ever growing field, and emergency medicine is rapidly progressing, there is a need to update the knowledge and practice evidence based approach. A dedicated Emergency Medicine faculty will be the key factor in developing a national skilled emergency care workforce.

OBJECTIVES:

A candidate who successfully completes the course should

1. Demonstrate growing understanding of the literature and its clinical application.
2. Master certain technical skills.
3. Manage (with increasing autonomy) medically compromised patients.
4. Acquire judgment and ability to communicate clearly & effective team work.

CLINICAL ROTATIONAL POSTING

The residents will rotate through both the emergency department and other clinical services. The residents will spend 7 months on the first and second year and in the third year will spend 8 months in the Emergency Department and of the remainder time rotating through other services. The rotations in the other departments will provide the residents with opportunities to develop important knowledge and skills in the core subjects. Expected rotations will be as follows:

Year I

1. Emergency Department: 7 months
2. Orthopedic & wound care: 2wks/2wks
3. Pediatric EM: 1 month
4. ICU-1 month
5. CCU- 1 month
6. Anaesthesia-1 month

Year II

1. Emergency Department: 7 months
2. Ophthalmology/ENT- 2wks/2wks
3. OBG/Psychiatry – 2 wks/2wks
4. PICU- 1 month
5. Trauma- 1 month
6. Pediatric EM: 1 month

Year III

1. Emergency Department: 7 months
2. Trauma- 1 month
3. Research – 1 month
4. Radiology & Ultrasound- 2 wks
5. Administration (EM Services)-2 wks
6. Elective- 1 month

PRACTICAL AND CLINICAL TRAINING

Apart from the clinical training of emergency cases in the Emergency Departments, practical hands on training in the various procedures are required:

Minimum numbers of procedures that a candidate needs to perform are:

1. Advanced Life Support procedures in support of CPR- 10
2. Advanced Trauma Life Support procedures in support of stabilization of the
 1. traumatized patient- 10
 2. Tracheal intubation with the use of paralyzing and induction agents as
 3. appropriate for rapid sequence intubation- 20
 4. Cardioversion and defibrillation -10
 5. Pediatric resuscitation- 10
 6. Venous cut downs -1
 7. Closed chest cardiac massage- 10
 8. Open chest cardiac massage -1
 9. Emergency cricothyroidotomy- 1 & emergency tracheostomy-1
 10. Pacemaker placement- external, transvenous and transthoracic, E = 4, TV=2
 11. Emergency pericardiocentesis -1
 12. Central venous catheter insertion- 5
 13. Pulmonary artery catheter insertion- 1
 14. Management of oxygen therapy and ventilators- 10
 15. Incision and drainage of abscess, hematoma, furuncle and hemorrhoid-5
 16. Wound debridement and laceration repair -10
 17. Local field block, hematoma block and peripheral nerve blocks -4
 18. Preservation of served extremities- 2
 19. Nail trephination -1
 20. Tube thoracostomy -4
 21. Closed reduction of hernias -1
 22. Peritoneal lavage- 1
 23. Arthrocentesis -2
 24. Culdocentesis- 1
 25. Thoracentesis- 2
 26. Application and removal of splints and casts -10
 27. Closed reduction of dislocated joints -2

28. Use of emergency immobilization and traction techniques- 10
29. Compartment pressure measurement -1
30. Management of epistaxis - 1
31. Removal of foreign bodies -2
32. Drainage of peritonsillar abscesses- 1
33. Stabilization of traumatically avulsed teeth- 1
34. Direct, fiberoptic and indirect laryngoscopy- 10
35. Emergency delivery of babies- 1
36. Removal of intrauterine devices- 1
37. Introduction of urethral catheters- 10
38. Suprapubic catheterization- 2
39. Lumbar puncture- 2
40. Sigmoidoscopy and anoscopy -2
41. Use of the slit lamp-removal of conjunctival and corneal foreign bodies-4
42. Ocular tonometry -1
43. Insertion of Blakemore tube -1
44. Insertion of nasogastric, orogastric or intestinal tube- 10
45. Peripheral arterial puncture and cannulation- 25
46. Intraosseous infusion and administration of sedation and analgesia- 1
47. ECHO and emergency ultrasound
48. Correct documentation in the electronic medical record (EMR)
49. ECMO
50. IABP (Intra Aortic Balloon pump) & ventricular assisted devices

TEACHING & TRAINING METHODS

The fundamental components of the teaching programme in the department of Emergency Medicine should include:

1. Case presentations & discussion- once a week
2. Seminar – Once a week
3. Journal club- once in 2 weeks
4. Grand round presentation (by rotation departments and subspecialties) - once a week
5. Emergency case discussions – once a week
6. Statistical & mortality meet- once a month
7. Clinico-pathological meetings- once a month

8. Clinico-radiological meetings- once a month
9. Faculty lecture teaching- once a month
10. Clinical Audit-Once a Month
11. A poster and have one oral presentation at least once during their training period in a recognized conference.
12. Emergency ambulance services i.e retrieval of patients & transportation of patients by the resident.

The rounds should include bedside sessions, file rounds, documentation of case history and examination, progress notes, round discussions, investigations and management plan),interesting and difficult case unit discussions.

RECOMMENDED CORE SYLLABUS

A. SYSTEM-BASED CORE KNOWLEDGE

This section of the curriculum gives an index of the system-based core knowledge appropriate to the management of patients presenting with undifferentiated symptoms and complaints. This list is mostly given in the following sequence: congenital disorders; inflammatory and infectious disorders; metabolic disorders; traumatic and related problems; tumors; vascular disorders, ischaemia and bleeding; other disorders. These lists cannot be exhaustive.

1. CARDIOVASCULAR EMERGENCIES IN ADULTS AND CHILDREN

- a. Arrhythmias
- b. Congenital heart disorders
- c. Contractility disorders, pump failure
- d. Cardiomyopathies, congestive heart failure, acute pulmonary oedema, tamponade, valvular emergencies
- e. Inflammatory and infectious cardiac disorders, endocarditis, myocarditis, pericarditis
- f. Ischaemic heart disease
- g. acute coronary syndromes, stable angina
- h. Traumatic injuries
- i. Vascular and thromboembolic disorders
- j. Aortic dissection/aneurysm rupture, deep vein thrombosis, hypertensive emergencies, occlusive arterial disease, thrombophlebitis, pulmonary embolism, pulmonary hypertension

2. DERMATOLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Inflammatory and Infectious disorders
- b. Skin manifestations of immunological disorders, systemic disorders, toxic disorders

3. ENDOCRINE AND METABOLIC EMERGENCIES IN ADULTS AND CHILDREN

- a. Acute presentation of inborn errors of metabolism
- b. Adrenal insufficiency and crisis
- c. Disorders of glucose metabolism hyperosmolar hyperglycaemic state, hypoglycaemia, ketoacidosis

- d. Thyroid disease emergencies hyperthyroidism, hypothyroidism, myxoedema coma, thyroid storm

4. FLUID AND ELECTROLYTE DISTURBANCES

- a. Acid-Base disorders
- b. Electrolyte disorders
- c. Volume status and fluid balance

5. EAR, NOSE, THROAT, ORAL AND NECK EMERGENCIES IN ADULTS AND CHILDREN

- a. Bleeding
- b. Complications of tumours, airway obstruction
- c. Foreign bodies
- d. Inflammatory and Infectious disorders angio-oedema, epiglottitis, laryngitis, paratonsillar abscess
- e. Traumatic problems

6. GASTROINTESTINAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Congenital disorders Hirschsprung's disease, Meckel's diverticulum, pyloric stenosis
- b. Inflammatory and infectious disorders appendicitis, cholecystitis, cholangitis, diverticulitis, exacerbations and complications of inflammatory bowel diseases, gastritis, gastroenteritis, gastro-oesophageal reflux disease, hepatitis, pancreatitis, peptic ulcer, peritonitis
- c. Metabolic disorders hepatic disorders, hepatic failure
- d. Traumatic and mechanical problems foreign bodies, hernia strangulation,
- e. intestinal obstruction and occlusion
- f. Tumours
- g. Vascular disorders/Ischaemia and bleeding: ischaemic colitis, upper and lower gastrointestinal bleeding, mesenteric ischaemia
- h. Other problems complications of gastrointestinal devices and surgical procedures

7. GYNAECOLOGICAL AND OBSTETRIC EMERGENCIES

- a. Inflammatory and Infectious disorders mastitis, pelvic inflammatory disease, vulvovaginitis
- b. Obstetric emergencies, abruptio placentae, eclampsia, ectopic pregnancy, emergency delivery,
- c. HELLP syndrome during pregnancy, hyperemesis gravidarum, placenta praevia, post-partum haemorrhage
- d. Traumatic and related problems ovarian torsion
- e. Tumours
- f. Vascular disorders/ Ischaemia and bleeding: vaginal bleeding

8. HAEMATOLOGY AND ONCOLOGY EMERGENCIES IN ADULTS AND CHILDREN

- a. Anaemias
- b. Complications of lymphomas and leukaemias
- c. Congenital disorders haemophilias and Von Willebrand's disease,
- d. hereditary haemolytic anaemias, sickle cell disease
- e. Inflammatory and Infectious disorders neutropenic fever, infections in immuno-compromised patients
- f. Vascular disorders/ Ischaemia and bleeding: acquired bleeding disorders (coagulation factor deficiency, disseminated intravascular coagulation),
- g. drug induced bleeding (anticoagulants, antiplatelet agents, fibrinolytics),
- h. idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura
- i. Transfusion reactions

9. IMMUNOLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Allergies and anaphylactic reactions
- b. Inflammatory and Infectious disorders
- c. Acute complications of vasculitis

10. INFECTIOUS DISEASES AND SEPSIS IN ADULTS AND CHILDREN

- a. Common viral and bacterial infections
- b. Food and water-borne infectious diseases
- c. HIV infection and AIDS
- d. Common tropical diseases
- e. Parasitosis
- f. Rabies
- g. Sepsis and septic shock
- h. Sexually transmitted diseases
- i. Streptococcal toxic shock syndrome
- j. Tetanus

11. MUSCULO-SKELETAL EMERGENCIES

- a. Congenital disorders dislocated hip, osteogenesis imperfecta
- b. Inflammatory and Infectious disorders arthritis, bursitis, cellulitis,
- c. complications of systemic rheumatic diseases, necrotising fasciitis,
- d. osteomyelitis, polymyalgia rheumatica, soft tissue infections
- e. Metabolic disorders complications of osteoporosis and other systemic diseases
- f. Traumatic and degenerative disorders back disorders, common fractures and dislocations, compartment syndromes, crush syndrome, osteoarthritis, rhabdomyolysis, soft tissue trauma
- g. Tumours: pathological fractures

12. NEUROLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Inflammatory and Infectious disorders brain abscess, encephalitis, febrile seizures in children, Guillain-Barré syndrome, meningitis, peripheral facial palsy (Bell's palsy), temporal arteritis
- b. Traumatic and related problems complications of CNS devices, spinal
- c. cord syndromes, peripheral nerve trauma and entrapment, traumatic brain injury

- d. Tumours common presentations and acute complications of neurological and metastatic tumours
- e. Vascular disorders: carotid artery dissection, stroke, subarachnoid haemorrhage, subdural and extradural haematoma, transient ischaemic attack, venous sinus thrombosis
- f. Other problems acute complications of chronic neurological conditions (e.g. myasthenic crisis, multiple sclerosis), acute peripheral neuropathies,
- g. seizures and status epilepticus

13. OPHTHALMIC EMERGENCIES IN ADULTS AND CHILDREN

- a. Inflammatory and Infectious disorders conjunctivitis, dacryocystitis,
- b. Endophthalmitis, iritis, keratitis, orbital and periorbital cellulitis, uveitis
- c. Traumatic and related problems foreign body in the eye, ocular injuries,
- d. Vascular disorders: retinal artery and vein occlusion, vitreous haemorrhage
- e. Others like acute glaucoma, retinal detachment

14. PULMONARY EMERGENCIES IN ADULTS AND CHILDREN

- a. Congenital cystic fibrosis
- b. Inflammatory and Infectious disorders asthma, bronchitis, bronchiolitis,
- c. pneumonia, empyema, COPD exacerbation, lung abscess, pleurisy and pleural effusion, pulmonary fibrosis, tuberculosis
- d. Traumatic and related problems foreign body inhalation, haemothorax, tension pneumothorax, pneumomediastinum
- e. Tumours common complications and acute complications of pulmonary and metastatic tumours,
- f. Vascular disorders pulmonary embolism
- g. Other disorders: acute lung injury, atelectasis, ARDS, spontaneous pneumothorax

15. PSYCHIATRIC AND BEHAVIOUR DISORDERS

- a. Behaviour disorders affective disorders, confusion and consciousness
- b. disturbances, intelligence disturbances, memory disorders, perception disorders, psychomotor disturbances, thinking disturbances.
- c. Common psychiatric emergencies acute psychosis, anorexia and bulimia
- d. complications, anxiety and panic attacks, conversion disorders, deliberate self-harm and suicide attempt, depressive illness, personality disorders,
- e. substance, drug and alcohol abuse

16. RENAL AND UROLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- a. Inflammatory and Infectious disorders epididymo-orchitis,
- b. Glomerulonephritis, pyelonephritis, prostatitis, sexually transmitted diseases, urinary tract infections
- c. Metabolic disorders acute renal failure, nephrotic syndrome, nephrolithiasis, uraemia
- d. Traumatic and related problems urinary retention, testicular torsion
- e. Tumours
- f. Vascular disorders: Ischaemia and Bleeding
- g. Other disorders comorbidities in dialysis and renal transplanted patients,
- h. complications of urological procedures and devices, haemolytic uraemic syndrome

17. TRAUMA IN ADULTS AND CHILDREN

- a. Origin of trauma: burns, blunt trauma, penetrating trauma
- b. Anatomical location of trauma: head and neck, maxillo-facial, thorax, abdomen, pelvis, spine, extremities
- c. Polytrauma patient
- d. Trauma in specific populations: children, elderly, pregnant women.

B. Common Presenting Symptoms

This section of the Curriculum lists the more common presenting symptoms of patients in the emergency setting. The differential diagnoses are listed according to the systems involved and then in alphabetical order.

1. Acute Abdominal Pain

- a. Gastrointestinal causes - Appendicitis, cholecystitis, cholangitis, acute pancreatitis, complications of hernias, diverticulitis, hepatitis, hiatus hernia, inflammatory bowel disease, intestinal obstruction, ischaemic colitis, mesenteric ischaemia, peptic ulcer, peritonitis, viscus perforation
- b. Cardiac/vascular causes - Acute myocardial infarction, aortic dissection, aortic aneurysm rupture
- c. Dermatological causes - Herpes zoster
- d. Endocrine and metabolic causes - Addison's disease, diabetic ketoacidosis, other metabolic acidosis, porphyria
- e. Gynaecological and Obstetric causes - Complications of pregnancy, ectopic pregnancy, pelvic inflammatory disease, rupture of ovarian cyst, ovarian torsion
- f. Hematological causes - Acute porphyria crisis, familial mediterranean fever, sickle cell crisis
- g. Musculo-skeletal causes - Referred pain from thoraco-lumbar spine
- h. Renal and Genitourinary causes - Pyelonephritis, renal stones
- i. Respiratory causes - Pneumonia, pleurisy
- j. Toxicology - Poisoning
- k. Trauma - Abdominal

2. Altered behaviour and Agitation

- a. Psychiatric causes - Acute psychosis, depression
- b. Cardiac/Vascular causes - Hypertension, vasculitis
- c. Endocrine and metabolic causes - Hypoglycaemia, hyperglycaemia, electrolyte imbalance, hyperthermia, hypoxaemia
- d. Neurological causes - Cerebral space-occupying lesions, dementia, hydrocephalus, intracranial hypertension, CNS infections
- e. Toxicology - Alcohol and drug abuse, poisoning

3. Altered Level of Consciousness in Adults and Children

- a. Neurological causes - Cerebral tumour, epilepsy and status epilepticus, meningitis, encephalitis, stroke, subarachnoid haemorrhage, subdural and extradural haematomata, traumatic brain injury
- b. Cardiovascular causes - Hypoperfusion states, shock

- c. Endocrine and metabolic causes - Electrolyte imbalances, hepatic coma, hypercapnia, hypothermia, hypoxia, hypoglycaemia / hyperglycaemia, uraemia
- d. Gynaecological and Obstetric causes - Eclampsia
- e. Infectious causes - Septic shock
- f. Psychiatric causes - Conversion syndrome
- g. Respiratory causes - Respiratory failure
- h. Toxicology - Alcohol intoxication, carbon-monoxide poisoning, narcotic and sedative poisoning, other substances

4. Back Pain

- a. Musculo-Skeletal causes - Fractures, intervertebral disc strain and degeneration, strain of muscles, ligaments and tendons, spinal stenosis, arthritides, arthrosis
- b. Cardiovascular causes - Aortic aneurysm, aortic dissection
- c. Infectious causes - Osteomyelitis, discitis, pyelonephritis, prostatitis
- d. Endocrine and metabolic causes - Paget's disease
- e. Gastrointestinal causes - Pancreatitis, cholecystitis
- f. Dermatological causes - Herpes zoster
- g. Gynaecological causes - Endometriosis, pelvic inflammatory disease
- h. Haematological and Oncological causes - Abdominal or vertebral tumours
- i. Neurological cause - Subarachnoid haemorrhage
- j. Renal and Genitourinary causes - Renal abscess, renal calculi
- k. Trauma

5. Bleeding (Non Traumatic)

- a. Ear, Nose, Throat causes - Ear bleeding (otitis, trauma, tumours), epistaxis
- b. Gastrointestinal causes - Haematemesis and melaena (acute gastritis, gastro-duodenal ulcer, Mallory Weiss syndrome, oesophageal varices) rectal bleeding (acute diverticulitis, haemorrhoids, inflammatory bowel disease, tumours)
- c. Gynaecological and Obstetric causes - Menorrhagia/metrorrhagia (abortion, abruptio placentae, tumours)
- d. Renal and Genitourinary causes - Haematuria (pyelitis, tumours, urolithiasis)
- e. Respiratory causes - Haemoptysis (bronchiectasia, pneumonia, tumours, tuberculosis)

6. Cardiac Arrest

- a. Cardiac arrest treatable with defibrillation - Ventricular fibrillation, pulseless ventricular tachycardia
- b. Pulseless electric activity - Acidosis, hypoxia, hypothermia, hypo/hyperkalaemia, hypocalcaemia, hypo/hyperglycaemia, hypovolaemia, tension pneumothorax, cardiac tamponade, myocardial infarction, pulmonary embolism, poisoning
- c. Asystole

7. Chest Pain

- a. Cardiac/vascular causes - Acute coronary syndrome, aortic dissection, arrhythmias, pericarditis, pulmonary embolism
- b. Respiratory causes
- c. Pneumonia, pneumomediastinum, pneumothorax (especially tension pneumothorax), pleurisy

- d. Gastrointestinal causes - Gastro-oesophageal reflux, oesophageal rupture, oesophageal spasm
- e. Musculo-Skeletal causes - Costosternal injury, costochondritis, intercostal muscle pain, pain referred from thoracic spine
- f. Psychiatric causes - Anxiety, panic attack
- g. Dermatological causes - Herpes zoster

8. Crying Baby

- a. I – Infections: herpes stomatitis, meningitis, osteomyelitis, urinary tract infection
- b. T – Testicular torsion, trauma, teeth problems,
- c. C – Cardiac: arrhythmias, congestive heart failure
- d. R -Reaction to milk, reaction to medications, reflux
- e. I - Immunization and allergic reactions, insect bites
- f. E – Eye: corneal abrasions, glaucoma, ocular foreign bodies
- g. S – Some gastrointestinal causes: hernia, intussusception, volvulus

9. Diarrhea

- a. Infectious causes - AIDS, bacterial enteritis, viral, parasites, food-borne, toxins
- b. Toxicological causes - Drugs related, poisoning (including heavy metals, mushrooms, organophosphates, rat poison, and seafood)
- c. Endocrine and metabolic causes - Carcinoids, diabetic neuropathy
- d. Gastrointestinal causes - Diverticulitis, dumping syndrome, ischaemic colitis, inflammatory bowel disease, enteritis due to radiation or chemotherapy
- e. Haematological and Oncological causes
- f. Toxicity due to cytostatic therapies
- g. Immunology - Food allergy
- h. Psychiatric disorders - Diarrhea “factitia”

10. Dyspnoea

- a. Respiratory Causes - Airway obstruction, broncho-alveolar obstruction, parenchymal diseases, pulmonary shunt, pleural effusion, atelectasis, pneumothorax
- b. Cardiac/vascular causes - Cardiac decompensation, cardiac tamponade, pulmonary embolism
- c. Ear, Nose, Throat causes - Epiglottitis, croup and pseudocroup
- d. Fluid & Electrolyte disorders - Hypovolaemia, shock, anaemia
- e. Gastrointestinal causes - Hiatus hernia
- f. Immunological causes - Vasculitis
- g. Metabolic causes - Metabolic acidosis, uraemia
- h. Neurological causes - Myasthenia gravis, Guillain Barrè syndrome, amyotrophic lateral sclerosis
- i. Psychiatric disorders - Conversion syndrome
- j. Toxicology - CO intoxication, cyanide intoxication
- k. Trauma - Flail chest, lung contusion, traumatic pneumothorax, haemothorax

11. Fever and Endogenous Increase in Body Temperature

- a. Systemic infectious causes - Sepsis and septic shock, parasitosis, flu-like syndrome

- b. Organ-specific infectious causes - Endocarditis, myocarditis, pharyngitis, tonsillitis, abscesses, otitis, cholecystitis and cholangitis, meningitis, encephalitis
- c. Non-infectious causes - Lyell syndrome, Stephen-Johnson syndrome, thyroid storm, pancreatitis, inflammatory bowel disease, pelvic inflammatory disease, toxic shock
- d. Haematological and Oncological causes - Leukaemia and lymphomas, solid tumours
- e. Immunological causes - Arteritis, arthritis, lupus, sarcoidosis
- f. Musculo-Skeletal causes - Osteomyelitis, fasciitis and cellulitis
- g. Neurological causes - Cerebral hemorrhage
- h. Psychiatric causes - Factitious fever
- i. Renal and Genitourinary causes - Pyelonephritis, prostatitis
- j. Toxicology

12. Headache in Adults and Children

- a. Vascular causes - Migraine, cluster headache, tension headache, cerebral haemorrhage, hypertensive encephalopathy, ischaemic stroke
- b. Haematological and Oncological causes - Brain tumours
- c. Immunological causes - Temporal arteritis, vasculitis
- d. Infectious causes - Abscesses, dental infections, encephalitis, mastoiditis, meningitis, sinusitis
- e. Musculo-Skeletal causes - Cervical spine diseases, temporomandibular joint syndrome
- f. Neurological causes - Trigeminal neuralgia
- g. Ophthalmological causes - Optic neuritis, acute glaucoma
- h. Toxicology - Alcohol, analgesic abuse, calcium channel blockers, glutamate, nitrates, opioids and caffeine withdrawal
- i. Trauma - Head trauma

13. Jaundice

- a. Gastrointestinal causes - Cholangitis, hepatic failure, pancreatic head tumour, pancreatitis, and obstructive cholestasis
- b. Cardiac/Vascular causes - Chronic cardiac decompensation
- c. Haematological and Oncological causes - Haemolytic anaemias, thrombotic thrombocytopenic purpura, haemolytic uraemic syndrome, disseminated intravascular coagulation
- d. Infectious causes - Malaria, leptospirosis
- e. Gynaecological causes - HELLP syndrome
- f. Toxicology - Drug induced haemolytic anaemias, snake venom

14. Pain in Arms

- a. Cardiac/Vascular causes - Aortic dissection, deep venous thromboembolism, ischaemic heart disease
- b. Musculo-skeletal causes - Periarthritis, cervical spine arthrosis
- c. Trauma

15. Pain in Legs

- a. Cardiac/Vascular causes - Acute ischaemia, arteritis, deep venous thrombosis, superficial thrombophlebitis
- b. Immunological causes - Polymyositis

- c. Infectious causes - Arthritis, cellulites, necrotising fasciitis, osteomyelitis
- d. Musculo-Skeletal causes - Sciatalgia
- e. Neurological causes - Sciatica
- f. Nervous system causes - Peripheral nerve compression
- g. Trauma

16. Palpitations

- a. Cardiac/Vascular causes - Brady-arrythmias (including sinus bradycardia and AV blocks), extrasystoles, tachyarrythmias (including atrial fibrillation, sinus tachycardia, supraventricular tachycardia, ventricular tachycardia)
- b. Endocrine and metabolic causes - Thyrotoxicosis
- c. Toxicology - Drugs

17. Seizures in Adults and Children

- a. Neurological causes - Generalised epilepsy, partial complex or focal epilepsy, status epilepticus
- b. Cardiac/Vascular causes - Hypertensive encephalopathy, syncope, dysrhythmias, migraines
- c. Endocrine and metabolic causes - Metabolic seizures
- d. Gynaecological causes - Eclampsia
- e. Infectious causes - Febrile seizures in children
- f. Psychiatric causes - Narcolepsy, pseudo-seizures
- g. Respiratory causes - Respiratory arrest
- h. Toxicology - Drugs/toxins

18. Shock in Adults and Children

- a. Anaphylactic
- b. Cardiogenic
- c. Hypovolaemic
- d. Obstructive
- e. Septic
- f. Neurogenic
- g. Cardiac/Vascular causes -- Cardiogenic shock, arrhythmias
- h. Endocrine and metabolic causes -- Addison's crisis
- i. Fluid and Electrolyte disorders -- Hypovolaemic shock
- j. Gastrointestinal causes -- Vomiting, diarrhoea
- k. Gynaecological causes -- Toxic shock
- l. Immunological causes -- Anaphylactic shock
- m. Infectious causes -- Septic shock
- n. Neurological causes -- Neurogenic shock
- o. Trauma -- Hypovolaemic shock, neurogenic shock.

19. Skin Manifestations in Adults and Children

- a. Dermatological causes - Eczema, psoriasis, skin tumours
- b. Immunological causes - Vasculitides, urticaria, Stevens-Johnson syndrome, Lyell syndrome

- c. Infectious causes - Viral exanthemata, meningococcaemia, herpes zoster/simplex, abscesses of the skin
- d. Psychiatric causes - Self-inflicted skin lesions or from abuse
- e. Toxicology
- f. Haematological and Oncological causes - Idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura

20. Syncope

- a. Cardiac/vascular causes - Aortic dissection, cardiac arrhythmias (including brady-tachy syndrome, Brugada syndrome, drug overdose, long QT syndrome, sick sinus syndrome, torsades de pointes, ventricular tachycardia), other causes of hypoperfusion (including ischaemia, valvular, haemorrhage, obstruction: e.g. aortic stenosis, pulmonary embolism, tamponade), orthostatic hypotension
- b. Endocrine and metabolic causes - Addison's disease
- c. Fluid and Electrolyte disorders - Hypovolaemia
- d. Gastrointestinal causes - Vomiting, diarrhoea
- e. Neurological causes - Autonomic nervous system disorder, epilepsy, vasovagal reflex,
- f. Toxicology - Alcoholic or drug consumption

21. Urinary Symptoms (Dysuria, Oligo/Anuria, Polyuria)

- a. Renal and Genitourinary causes - Acute renal failure, acute urinary retention, cystitis and pyelonephritis, prostatitis
- b. Cardiac/Vascular causes - Cardiac decompensation
- c. Endocrine and metabolic causes - Diabetes mellitus, diabetes insipidus
- d. Fluid and Electrolyte disorders - Hypovolaemia

22. Vertigo and Dizziness

- a. Ear and Labyrinth causes -- Benign postural vertigo, Meniere's disease, otitis, vestibular neuritis, viral labyrinthitis
- b. Cardiac/Vascular causes -- Arrhythmias, hypotension
- c. Endocrine and metabolic causes -- Hypoglycaemia
- d. Haematological and Oncological causes -- Anaemias
- e. Nervous system causes -- Acoustic neuroma, bulbar or cerebellar lesions, multiple sclerosis, temporal epilepsy
- f. Psychiatric causes -- Anxiety
- g. Respiratory causes -- Hypoxia
- h. Toxicology -- Alcohol abuse, drugs and substances

23. Vomiting

- a. Gastrointestinal causes -- Appendicitis, cholecystitis, gastroparesis, gastric obstruction and retention, gastroenteritis, hepatitis, pancreatitis, pyloric stenosis, small bowel obstructions
- b. Cardiac/Vascular causes -- Myocardial ischaemia
- c. Ear, Nose, Throat causes -- Vestibular disorders
- d. Endocrine and metabolic causes -- Diabetic ketoacidosis, hypercalcaemia
- e. Fluid and Electrolyte disorders -- Hypovolaemia
- f. Gynaecological and Obstetric causes - Pregnancy

- g. Infectious causes - Sepsis, meningitis
- h. Neurological causes - Cerebral oedema or haemorrhage, hydrocephalus, intracranial space occupying lesions
- i. Ophthalmological causes - Acute glaucoma
- j. Psychiatric causes - Eating disorders
- k. Renal and Genitourinary causes - Renal calculi, uraemia
- l. Toxicology

C. SPECIFIC ASPECTS OF EMERGENCY MEDICINE

1. ABUSE AND ASSAULT IN ADULTS AND CHILDREN

- a. Abuse in the elderly and impaired
- b. Child abuse and neglect
- c. Intimate partner violence and abuse
- d. Sexual assault
- e. Patient safety in Emergency Medicine
- f. Violence management and prevention in the Emergency Department

2. ANALGESIA AND SEDATION IN ADULTS AND CHILDREN

- a. Pain transmission (anatomy, physiology, pharmacology)
- b. Pain assessment
- c. Pharmacology of sedative and pain relieving drugs
- d. Psychological and social aspects of pain in paediatric, adult and elderly patients

3. DISASTER MEDICINE

- a. Disaster preparedness
- b. Major incident planning/procedures/practice
- c. Disaster response
- d. Mass gatherings
- e. Specific medical topics (triage, bioterrorism, blast and crush injuries, chemical agents, radiation injuries)
- f. Debriefing and mitigation

4. ENVIRONMENTAL ACCIDENTS IN ADULT AND CHILDREN

- a. Electricity (electrical and lightning injuries)
- b. Flora and Fauna (injuries from exposure, bites and stings)
- c. High-altitude (medical problems)
- d. NBCR (nuclear, biological, chemical and radiological; decontamination, specific aspects)
- e. Temperature (heat and cold related emergencies)
- f. Travel medicine
- g. Water (near-drowning, dysbarism and complications of diving, marine fauna)

5. FORENSIC ISSUES

- a. Basics of relevant legislation in the country of practice
- b. Recognize and preserve evidence
- c. Provide appropriate medical documentation (including forensic and clinical photography, collection of biological samples, ballistics)

- d. Appropriate reporting and referrals (e.g. child abuse or neglect, gunshot and other forms of penetrating wounds, elder abuse, sexual assault allegations)
- e. Medico-legal documentation

6. INJURY PREVENTION AND HEALTH PROMOTION

- a. Collection and interpretation of data related to prevention and health promotion
- b. Epidemiology of Accidents and Emergencies
- c. Formulation of recommendations

7. PATIENT MANAGEMENT ISSUES IN EMERGENCY MEDICINE

- a. Emergency Department organization (administration, structure, staffing, resources)
- b. Management of specific populations:
- c. Children in special circumstances including child protection
- d. Elderly patients
- e. Homeless patients
- f. Mentally incompetent adults
- g. Psychiatric patients

8. PROBLEMS IN THE ELDERLY

- a. Atypical presentations (e.g. abdominal pain, infections, myocardial
- b. infarction)
- c. Delirium
- d. Dementia
- e. Falls (causes & investigations)
- f. Immobility
- g. Multiple pathology and multiple therapies
- h. Self-dependency
- i. Trauma & co-morbidity

9. TOXICOLOGY IN ADULTS AND CHILDREN

- a. General principles of toxicology and management of poisoned patients
- b. Principles of drug interactions
- c. Specific aspects of poisoning
- d. Drugs (including paracetamol, amphetamine, anticholinergics, anticonvulsants, antidepressants, antihypertensives, benzodiazepines, digitalis, monoamine oxidase inhibitors, neuroleptics) industrial, chemicals plants & mushrooms alcohol abuse and alcohols poisoning drugs of abuse
- e. Local poisonings such as OPC, aluminium phosphide, yellow phosphorous, heavy metal poisoning, plant poisonings, paraquat poisoning, cyber methrine poisoning, corrosives petroleum products, methanol and ethanol, dyes and nitrobenzene.
- f. Organization and information (e.g. poison centres, databases)

10. PRE-HOSPITAL CARE

- a. Emergency Medical Services organisation (administration, structure, staffing, resources)
- b. Medical transport (including neonates and children, air transport)
- c. Paramedic training and function
- d. Safety at the scene

- e. Collaboration with other emergency services (e.g. police, fire department)

11. PSYCHO-SOCIAL PROBLEMS

- a. Social wellbeing of specific populations
- b. Patients with social issues
- c. Frequent visitors
- d. Social care following discharge

D. CORE CLINICAL PROCEDURES AND SKILLS

1. CPR SKILLS

- a. Cardio-pulmonary resuscitation procedures in a timely and effective manner according to the current ILCOR guidelines for adults and children
- b. Advanced CPR skills (e.g. therapeutic hypothermia, open chest CPR)

2. AIRWAY MANAGEMENT SKILLS

- a. Open and maintain the airway in the emergency setting (insertion of oropharyngeal or nasopharyngeal airway)
- b. Endotracheal intubation
- c. Alternative airway techniques in the emergency setting (e.g. laryngeal mask insertion, surgical airway)
- d. Difficult airway management algorithm
- e. Use of rapid sequence intubation in the emergency setting

3. ANALGESIA AND SEDATION SKILLS

- a. Assessment of the level of pain and sedation
- b. Monitor vital signs and potential side effects during pain management
- c. Provide procedural sedation and analgesia including conscious sedation (including testing of life support equipment)
- d. Use of appropriate local, topical and regional anaesthesia techniques

4. BREATHING AND VENTILATION MANAGEMENT SKILLS

- a. Assessment of breathing and ventilation
- b. Oxygen therapy
- c. Interpretation of blood gas analysis, pulse oximetry and capnography
- d. Bag-mask-valve ventilation
- e. Thoracocentesis
- f. Chest tube insertion, connection to under-water drainage and assessment of functioning
- g. Non-invasive ventilation techniques
- h. Invasive ventilation techniques

5. CIRCULATORY SUPPORT AND CARDIAC SKILLS AND PROCEDURES

- a. Administration of fluids including blood and substitutes
- b. Monitoring of ECG and the circulation
- c. Defibrillation and pacing (e.g. cardioversion, transcutaneous pacing)
- d. Emergency pericardiocentesis
- e. Vascular access (peripheral venous, arterial, and central venous catheterisation, intraosseous access)

6. DIAGNOSTIC PROCEDURES AND SKILLS

- a. Interpretation of ECG
- a. Appropriate request and interpretation of laboratory investigations (blood chemistry, blood gases, respiratory function testing and biological markers)
- b. Appropriate request and interpretation of imaging (e.g. x-rays, ultrasound, CT/MRI)
- c. Focused Assessment of Sonography in Trauma (FAST).
- d. Emergency Ultrasound and Echocardiology
- e. Gastrointestinal Procedures: Shangstaken tube insertion, endoscopic banding, sclerotherapy in UGI bleed

7. ENT SKILLS AND PROCEDURES

- a. Anterior rhinoscopy
- b. Insertion of nasal pack
- c. Inspection of oropharynx and larynx
- d. Otoscopy
- e. Removal of foreign body if airway is compromised
- f. Insertion and replacement of tracheostomy tube

8. GASTROINTESTINAL PROCEDURES

- a. Insertion of nasogastric tube
- b. Gastric lavage
- c. Peritoneal lavage
- d. Abdominal hernia reduction
- e. Abdominal paracentesis
- f. Measurement of abdominal pressure
- g. Proctoscopy

9. GENITOURINARY PROCEDURES

- a. Insertion of indwelling urethral catheter
- b. Suprapubic cystostomy
- c. Testicular torsion reduction
- d. Evaluation of patency of urethral catheter

10. HYGIENE SKILLS AND PROCEDURES

- a. Decontamination of patient and the environment
- b. Patient isolation and staff protection

11. MUSCULOSKELETAL TECHNIQUES

- a. Aseptic joint aspiration
- b. Fracture immobilisation
- c. Reduction of joint dislocation
- d. Log roll and spine immobilisation
- e. Splinting (plasters, braces, slings, tapes and other bandages)
- f. Management of compartment syndrome
- g. Fasciotomy, escharotomy

12. NEUROLOGICAL SKILLS AND PROCEDURES

- a. Evaluation of consciousness including the Glasgow Coma Scale
- b. Fundoscopy
- c. Lumbar puncture
- d. Interpretation of neuro-imaging

13. OBSTETRIC AND GYNAECOLOGICAL SKILLS AND PROCEDURES

- a. Emergency delivery
- b. Vaginal examination using speculum
- c. Assessment of the sexual assault victim

14. OPHTHALMIC SKILLS AND PROCEDURES

- a. Removal of foreign body from the eye
- b. Slit lamp use
- c. Lateral canthotomy

15. TEMPERATURE CONTROL PROCEDURES

- a. Measuring and monitoring of body temperature
- b. Cooling techniques (evaporative cooling, ice water or slush immersion)
- c. Internal cooling methods
- d. Warming techniques
- e. Monitoring heat stroke patients
- f. Treatment and prevention of hyper- and hypothermia

16. TRANSPORTATION OF THE CRITICALLY ILL PATIENT

- a. Telecommunication and telemedicine procedures
- b. Preparation of the EMS vehicle
- c. Specific aspects of monitoring and treatment during transportation

17. WOUND MANAGEMENT

- a. Abscess incision and drainage
- b. Aseptic techniques
- c. Treatment of lacerations and soft tissue injuries
- d. Wound irrigation and wound closure

DURATION: Three years or six academic terms.

STRUCTURE OF THE COURSE:

Structure of the postgraduate course can be classified under four major headings –

1. Knowledge
2. Technical skills
3. Patient management and communication skills
4. Medicolegal aspects
5. **Research methodology including periodic thesis reviews**

SEMESTERWISE PROGRAMME:

1. Teaching programme of the department includes:
2. Research Methodology training programme
3. Simulation based teaching (when applicable)
4. Practical OR teaching
5. Lectures
6. Seminars
7. Case presentations
8. Journal clubs
9. Clinical presentation of morbidity & mortality cases.
10. Stepwise 'Pain medicine teaching module' will be inserted in post graduate teaching activities.
11. Teaching staff of other department will also conduct teaching activity in certain related and pertinent topics.

At The End of First SIX MONTHS Training, Student Should Be Able To Demonstrate

A. Knowledge of fundamentals of:

1. Crash cart, Emergency kit, Anaesthesia machine
2. Breathing systems – Magills, Bains, closed circuit, Ayre'T piece
3. Routine monitors, Ventilators, Pulse oximeter, ETCO₂ monitor, ECG Monitor with defibrillator, O₂ cylinder for transportation
4. Comprehensive airway examination, mallampatti classification, Wilson's classification
5. ASA grading
6. Preoperative evaluation
7. Drugs and doses of anaesthetics, anxiolytics, sedatives, analgesics, muscle relaxants, anticholinergics, anticholinesterases, inotropes, vasopressors, local anaesthetics

B. TECHNICAL AND PATIENT MANAGEMENT SKILLS:

1. Crash cart, Emergency kit checking
2. Setup for a case including monitors, drugs, airway equipment
3. IV line for adult and older children
4. Mask ventilation and Intubation – adult with easy airway
5. Perform nerve blocks

6. Perform basic life support
7. Manage ASA grade I & II patients with uncomplicated procedures with assistance
8. Estimate blood and fluid requirement in routine cases
9. Recognize common but serious problems (in time)
10. Manage the transportation of a patient from emergency room (ER) to ICU via radiology department for imaging.
11. Obtain informed consent
12. Maintain legible and accurate record

C. COMMUNICATION SKILLS:

1. Communicate effectively with the patient
2. Present concise summary of cases to seniors and consultants
3. Explain and communicate pros & cons of the procedure to the patient
4. Present plan for dissertation

At the End of One Year Training Student Should Be Able To Demonstrate

A. In addition to the above

1. The student should be able to recognize indications and contraindications for securing invasive airway management.
2. Monitoring of critically ill patients & their transportation with assistance
3. Manage ASA I & II patients undergoing uncomplicated procedures with minimal assistance

B. COMMUNICATION SKILLS:

1. Formulate and present plan for management of patients, this includes anticipated problems and proposed solutions
2. Should be able to teach undergraduate students and junior residents
3. Present results and progress and dissertation cases to the seniors

At the End of Second Year Training Student Should Be Able To Demonstrate

A. Student should know in addition to the above

1. ATLS & ACLS training from AHA
2. Implications of sedation in minor procedures like elbow relocation, shoulder relocation.
3. Recognition and management of anaphylactic and anaphylactoid reactions
4. Implication of personal hygiene & universal precautions while handling the patients in emergency room.

B. COMMUNICATION SKILLS:

1. Presentation of seminars
2. Journal clubs
3. Case presentations
4. Teaching junior trainees and undergraduate students

At the End of Two and Half Year Training Student Should Be Able To Demonstrate

1. KNOWLEDGE:

The student should be able to demonstrate knowledge of physiological and/or pharmacological principles underlying

- a. Invasive monitoring
- b. Important cardiorespiratory events
- c. Relief of acute and chronic pain
- d. Cardiopulmonary bypass
- e. ECMO role in patients with cardiac arrest
- f. Advanced cardiac life support
- g. Interpretation of arterial blood gas values
- h. Mechanical ventilation
- i. Oxygen therapy
- j. Management and transport of critically ill and polytrauma patient
- k. Literature search and research methodology

2. TECHNICAL SKILLS:

Student is expected to learn to

- a. Insert arterial and central venous catheters in adults
- b. Insert peripheral venous cannulae in paediatric patients
- c. Manage difficult airways
- d. Perform standard nerve blocks
- e. Perform spinal blocks in patients with difficult landmarks

3. PATIENT MANAGEMENT SKILLS:

The student should demonstrate ability to

- a. Manage airway in ASA III & IV patients with ABC compromise.
- b. Resuscitate victims of trauma in correct sequence
- c. Manage airway of critically ill patient in intensive care setting

- d. Manage patients with chronic pain states
- e. Manage ABC of neonate & pediatric patient in emergency room.
- 4. COMMUNICATION SKILLS:**
- a. Formulate and present a plan for management of MLC cases & brought dead cases including anticipated problems and proposed solutions.
- b. Make and communicate a decision on a problem patient
- c. Present results of dissertation
- d. Teach and supervise medical students and junior residents
- e. Make sound judgments in decision making and application
- f. Adapt to rapidly changing academic and technological advances
- 5. MEDICO-LEGAL ASPECTS** and its implications to emergency medicine will be learnt by student throughout the post graduate course as a part of patient management and communication.

INTERNAL ASSESSMENT

Internal assessment of student will be carried out at the end of every term in theory as well as practical (**when applicable**). **Student should be able to demonstrate minimum required eligibility**

1. LOGBOOK will be maintained by student regarding periodical progress.
2. TRAINING ROTATION: Rotation spaced during 3 yrs. in following areas:
 - a. ICU / HDU/PICU/NICU/CCU/Anesthesia/ Radiology/
 - b. Medicine/ Surgery/ Ortho/pulmonary medicine/
 - c. ENT/Ophthalmology/Trauma/Pain Clinic
3. THESIS / DISSERTATION
 - a. The student will work on the thesis under the guidance of a recognized post graduate teacher.
 - b. Subject of thesis should be submitted to the University along with a synopsis and duly approved by ethical committee of College, before the end of first term
 - c. The student will have to put in at least two complete academic terms for working on the thesis
 - d. Periodic thesis review meetings: During which students will present the progress of dissertation.
 - e. The completed dissertation should be submitted at least six months prior to the date of written/practical University examination
 - f. Acceptance of dissertation by the examiners is a pre-condition to appear for the University examination (theory & practical)

Pattern of Final Examination

A. Theory:

1. Four papers of 100 marks each and of 3 hours duration
2. Each paper consisting of two long answer questions (LAQs) of 15 marks each, (30 marks) and eight semi – long answer questions of 10 marks each, with one option, (70 marks).
3. Students should note that - Following mentioned subdivisions of topics are for guideline purpose only. Overlapping of the topics to some extent is unavoidable in different papers.

Paper I: Basic Sciences & principles as applied to Emergency Medicine.

1. Applied Anatomy, applied physiology, pathophysiology
2. Pharmacology, Relevant Biochemistry
3. Historical Aspects including Scientists, Events, equipments & Drugs.
4. Emergency room design / Hazards / sterilization
5. Pre hospital care

Paper II: Medical Emergencies including techniques

1. BLS/ACLS/ATLS/PALS/NRP
2. Breathing & ventilatory management
3. Diagnostic procedures
4. Emergency life saving procedures
5. Paediatric, skin and psychiatric emergencies

Paper III: Surgical emergencies including the following.

1. Orthopaedics
2. ENT
3. Ophthalmology
4. Obstetrics
5. Dental,
6. Anaesthesia
7. Radiology

Paper IV: Clinical Emergency medicine including critical care, pain medicine & recent advances.

1. Monitoring in emergency room & transportation

2. Hematology & coagulation disorders, Acid – Base & Fluid electrolyte disturbances.
3. Critical Care situations relevant to Emergency Medicine.
4. Newer Guidelines
5. Recent advances in Emergency medicine including Equipment, Drugs & Techniques.
6. Pain medicine
7. Research methodology including statistics

B. Practical:

PATTERN OF EXAMINATION:

A. PRACTICAL

1. Total 400 marks
 - a. One Long case: 150 marks
 - b. Two Short cases: 100 marks (50 marks each)
 - c. Viva-voce: 150 marks (75 marks each table)
 - i. One table with instruments & drugs
 - ii. 2nd table with ECG, X- RAYs, CT, MRI, PFTs, ABGs etc

There will be two heads of passing:

1. Four theory papers will form one head of passing
2. Clinical, oral and practical examinations will form second head of passing.

Student must pass separately in both the heads of examination in one and the same attempt.

ILLUSTRATIVE STUDY MATERIAL

Recommended Text Books

1. Tintinallis emergency medicine: a comprehensive study guide. 8th edition authors-judith E Tintinalli, J. Stephan stapc zynski, O.John.Ma, David M... Cline:
2. Rosen's emergency medicine: concepts and clinical practice expert consult premium edition, 2volumes, 8th edition , John Marx MD, Robert Hockberger MD, Ron Walls MD
3. Marino's The ICU Book, 4th edition, paul L. marino, publisher- Lippincott Williams & wilkins.
4. Textbook of Emergency Medicine, David, S (Editor), New York: Lippincott, Williams & Wilkins.
5. Emergency Medicine (latest edition) Anthony FT Brown, Michael D Cadgan, London, Hodder Arnold

6. Goldberger's clinical electrocardiography: a simplified approach, 8th edition, Ary L. Goldberger, Zachary L. Goldberger, Alexei Shuilkin. Publisher- Elsevier.
7. Harwood-Nuss' Clinical Practice of Emergency Medicine, Wolfson, A (Editor), New York: Lippincott, Williams & Wilkins.
8. An Introduction to Clinical Emergency Medicine, Mahadevan, S.V. (Editor), New York: Cambridge University Press
9. ECG For Emergency Physician, Mattu and Brady (Editors), London: BMJ Publishing.
10. Harrison's principle of internal medicine, 2 volumes, 19th edition ,
11. Guyton & Hall Text book of medical physiology, a south asian edition, author- John. E. Hall, publisher-Elsevier
12. Accident & Emergency Radiology, A survival guide- Nigel Raby
13. Ma & Mateer's emergency ultrasound, 3rd edition , O. John Ma, James Mateer, publisher McGraw-Hill Education
14. Goldfrank's Toxicologic Emergencies, 10th edition, Robert S. Hoffman, Mary Ann Howland, Neal A. Lewin , Lewis S. Nelson, publisher- Mc Graw Hill Education
15. Modern Medical Toxicology, Pillay, V.V.
16. Textbook of Critical Care, Fink, M (Editor): Philadelphia, Elsevier Saunders.
17. Irwin & Rippe's Intensive care medicine(Lippincott) 7th edition- 2011 authors Richard S Irwin, James M Rippe.
18. Oxford Hand Book of Accident and Emergency Medicine (LLATEST Edition) JP Wyatt, RN Illingworth, CE Robertson, MJ Clancy, PT Munro eds. Oxford, oxford University Press
19. Text book of pediatric Emergency Medicine (Latest edition) Peter Cameron, George Jelinek, Ian Everitt, Gary Browne, Jeremy Raftos. London, Churchill Livingstone.
20. Textbook of Adult Emergency Medicine, Edinburgh: Churchill Livingstone.
21. Medicine Textbook of Adult Emergency (Latest Edition) Peter Cameron, George Jelinek, Anne- Maree Kelly, Lindsay murray, Anthony FT Brown, Jhon Heyworth eds. Edinburgh, Churchill Livingstone
22. Text book of paediatric emergency medicine 2nd edition -2011. Authors- peter Cameron , GEORGE Jelinek , Ian Everih
23. Manipal medical manual : medical emergencies, treatment of serious infections,4th edition, CBS publisher and distributors
24. Emergency medicine procedures, 2nd edition,2013, Eric Reichman, publisher-Mc Graw Hill Education.
25. Clinical application of Mechanical ventilation, David W Chang, 4th edition, Delmar cengage learning.
26. American Heart Association Basic Life Support, Advanced Cardiovascular Life Support and Pediatric Life Support manuals

27. Advanced Trauma Life Support manual published by the American College of Surgeons.

JOURNALS

1. The journal of Emergency Medicine- Elsevier (the official journal of the American Academy of Emergency Medicine)
2. American Journal of Emergency Medicine
3. European Journal of Emergency Medicine (the official journal of the European Society for Emergency Medicine)
4. Annals of Emergency Medicine (the official journal of the American College of Emergency Medicine)
5. Emergency Medicine Australasia
6. Academy Emergency Medicine
7. National Journal of Emergency Medicine published by SEMI
8. American Heart Association journal, Circulation

Online Resources

1. American Academy Of Emergency Medicine- Position Statements
2. American College Of Emergency Physicians- Practice Resources
3. Association Of Emergency Physicians- Policy And Position Statements
4. Australasian College For Emergency Medicine – Policies And Guidelines
5. Australian And New Zealand Intensive Care Society- Policy Statements
6. Council Of Emergency Medicine Residency Directors- Position Statements
7. Emergency Management Australia- Publications
8. European Resuscitation Council- Guidelines
9. Intensive Care Society (UK)- Standards And Guidelines
10. National Electronic Library For Health (UK) Emergency Care
11. Resuscitation Council (UK)
12. Society For Academic Emergency Medicine – Position Statements
13. Society Of Critical Care Medicine- Guidelines
14. Triage – Injury, Treatment And Recovery, Shoestring G