GUIDELINES

FOR

COMPETENCY BASED TRAINING PROGRAMME

IN

DNB EMERGENCY MEDICINE

National Board of Examinations

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INTRODUCTION

The National Board of Examinations was established in 1975 by the Government of India with the prime objective of improving the quality of the Medical Education by establishing high and uniform standards of postgraduate examinations in modern medicine on an all India basis.

DNB IN EMERGENCY MEDICINE

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.

APPROVAL OF COURSE

The DNB program shall be started only after appropriate regulatory approvals from NBE.

STUDENTS' ELIGIBILITY AND SELECTION METHODS

Eligibility* Criteria for Candidates:

i. A candidate should possess MBBS degree/ equivalent degree as per provisions of Indian Medical Council Act for Primary seat.
ii. Candidates having a recognized 2 years Diploma Qualification in any specialty can apply for DNB Post Diploma Emergency Medicine as a secondary candidate.
* and fulfill the eligibility criteria as per the Information Bulletin

Selection Procedure

Students will be granted admission as per the procedure laid down by the NBE for admission to various DNB courses in various Institutions/Hospitals accredited for running DNB Emergency Medicine courses. Currently, this is being done through a CET-Broad Specialty and DNB Post Diploma CET held as per schedule of examinations laid down by NBE from time to time followed by merit base centralized counseling conducted by NBE.

Duration of the Course

Every candidate admitted to the 3 year (2 years for secondary candidates) training programme shall pursue a regular course of study (on whole time basis) in the concerned recognized institution under the guidance of recognized post graduate teacher / senior consultant. Candidates declared successful in the examinations prescribed and fulfilling the eligibility criteria shall be conferred Diplomate of the National Board (DNB Emergency Medicine).

PROGRAMME GOALS

The goal of the training program is to produce Emergency Physicians with the necessary knowledge, skill and attitude to diagnose and manage a wide range of clinical problems in Emergency Medicine as seen in the community or in secondary/tertiary care setting in an effective manner.

The qualities to be absolutely necessary:

1. Sound knowledge and skills of the emergency aspects of medical and surgical speciality, and its application within the golden hour.
2. Competent in life saving emergency interventions and appropriately use various diagnostic tests, and interpret their results intelligently & promptly.
3. Be familiar with the fundamentals of research methodology.
4. Possess humanistic qualities, attitudes and behaviour necessary for the development of appropriate patient-doctor relationship.
5. To assist and if necessary train juniors.
6. To keep up-to-date and be familiar with all recent advances in the field of Emergency medicine.

PROGRAMME OBJECTIVES

1. KNOWLEDGE & SKILLS

As a result of the training under this program, at the end of 3 years of postgraduate training, a resident must acquire the following knowledge, skills and competencies:

a) A thorough knowledge of pathological abnormalities, clinical manifestations, and principles of management of a large variety of medical and surgical emergencies of pediatrics, adults and geriatrics, affecting any organ system.

b) Skill and competence to choose and interpret correctly the results of the various routine investigations necessary for proper management of the patient. While ordering these investigations, a resident must be able to understand the sensitivity, specificity and the predictive value of the proposed investigation, as well as its cost-effectiveness in the management of the patient.
c) Skill and competence in emergency interventions like end tracheal intubations, needle cricothyrotomy, tracheostomy, needle thoracocentesis, Intercostal drain placement, pericardiocentesis, defibrillation, mechanical ventilation, hemodialysis, ultrasonography, Echo so on and so forth.
d) Skills and competence to perform commonly used diagnostic procedures, namely, lumbar puncture, bone marrow aspiration/biopsy, liver/nerve/muscle/ skin/ kidney/ pleural biopsy, fine needle aspiration cytology of palpable lumps, pleural/pericardial/abdominal/joint fluid aspiration.
e) Skill and competence to choose and interpret correctly the results of specialized investigations including radiologic, ultra-sonographic, biochemical, hemodynamic, electro-cardio graphic, electrophysiological, pulmonary functional, hematological, immunological, nuclear isotope scanning and arterial blood gas analysis results.
f) Skill and competence to provide consultation to other medical and surgical specialties and sub-specialties, whenever needed.
g) Skill and competence to function effectively in varied clinical settings, namely emergency/critical care, ambulatory care, out-patient clinic, inpatient wards.
h) Skill and competence to take sound decisions regarding hospitalization, or timely referral to other consultants of various medical sub specialties recognizing his limitations in knowledge and skills in these areas.
i) Proficiency in selecting correct drug combinations for different clinical problems with thorough knowledge of their pharmacological effects, side effects, interactions with the other drugs, alteration of their metabolism in different clinical situations, including that in the elderly.
j) Skill and competence to advise on the preventive, restorative and rehabilitative aspects including those in the elderly, so as to be able to counsel the patient correctly after recovery from an acute or chronic illness.
k) Skill and competence to understand research methodology in Emergency medicine and to undertake a critical appraisal of the literature published in various emergency medical journals and be able to apply the same in the setting in which the resident is working.
l) Skill and competence to work cohesively in Resuscitation team along with paramedical personnel, maintain discipline and healthy interaction with the colleagues.
m) Skill and competence to communicate clearly and consciously, and teach other junior residents, medical students, nurses and other paramedical staff, the theory as well as the practical clinical skills required for the practice of Emergency Medicine.

2. INTEGRATION

The entire educational program will be conducted in an integrated and co-ordinated manner in association with various pre-clinical, para-clinical and clinical departments. The senior staff members of these departments will be requested to give lectures on various topics in relation with Emergency medicine, and focus on applied aspects.

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

Year II
Emergency Department: 7 months
Ophthalmology/ENT- 2wks/2wks
OBG/Psychiatry – 2 wks/2wks
PICU- 1 month
Trauma- 1 month
Pediatric EM: 1 month

Year III
Emergency Department: 7 months
Trauma- 1 month
Research – 1 month
Radiology & Ultrasound- 2 wks
Administration (EM Services)-2 wks
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 number 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 traumatized patient- 10
3. Tracheal intubation with the use of paralyzing and induction agents as appropriate for rapid sequence intubation- 20
4. Cardioversion and defibrillation -10
5. Paediatric resuscitation- 10
6. Venous cutdowns -1
7. Closed chest cardiac massage- 10
8. Open chest cardiac massage -1
9. Emergency cricothyroidotomy- 1
10. Pacemaker placement- external, transvenous and transthoracic, E = 4, TV=2
11. Emergency pericardiocentes -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 block anesthesia -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. Arthrocentisis -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)

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.

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

- Arrhythmias
- Congenital heart disorders
- Contractility disorders, pump failure
- cardiomyopathies, congestive heart failure, acute pulmonary oedema,
- tamponade, valvular emergencies
- Inflammatory and infectious cardiac disorders
- endocarditis, myocarditis, pericarditis
- Ischaemic heart disease
- acute coronary syndromes, stable angina
- Traumatic injuries
- Vascular and thromboembolic disorders
- aortic dissection/aneurysm rupture, deep vein thrombosis, hypertensive
- emergencies, occlusive arterial disease, thrombophlebitis, pulmonary
- embolism, pulmonary hypertension

2. DERMATOLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

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

3. ENDOCRINE AND METABOLIC EMERGENCIES IN ADULTS AND CHILDREN

- Acute presentation of inborn errors of metabolism
- Adrenal insufficiency and crisis
- Disorders of glucose metabolism hyperosmolar hyperglycaemic state, hypoglycaemia, ketoacidosis
- Thyroid disease emergencies hyperthyroidism, hypothyroidism, myxoedema coma, thyroid storm

4. FLUID AND ELECTROLYTE DISTURBANCES

- Acid-Base disorders
- Electrolyte disorders
- Volume status and fluid balance

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

- Bleeding
- Complications of tumours, airway obstruction

- Foreign bodies
- Inflammatory and Infectious disorders angio-oedema, epiglottitis, laryngitis, paratonsillar abscess
- Traumatic problems

6. GASTROINTESTINAL EMERGENCIES IN ADULTS AND CHILDREN

- Congenital disorders Hirschsprung's disease, Meckel's diverticulum, pyloric stenosis
- 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
- Metabolic disorders hepatic disorders, hepatic failure
- Traumatic and mechanical problems foreign bodies, hernia strangulation, intestinal obstruction and occlusion
- Tumours
- Vascular disorders/Ischaemia and bleeding: ischaemic colitis, upper and lower gastrointestinal bleeding, mesenteric ischaemia
- Other problems complications of gastrointestinal devices and surgical procedures

7. GYNAECOLOGICAL AND OBSTETRIC EMERGENCIES

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

8. HAEMATOLOGY AND ONCOLOGY EMERGENCIES IN ADULTS AND CHILDREN

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

9. IMMUNOLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- Allergies and anaphylactic reactions
- Inflammatory and Infectious disorders
- Acute complications of vasculitis

10. INFECTIOUS DISEASES AND SEPSIS IN ADULTS AND CHILDREN

- Common viral and bacterial infections
- Food and water-born infectious diseases

- HIV infection and AIDS
- Common tropical diseases
- Parasitosis
- Rabies
- Sepsis and septic shock
- Sexually transmitted diseases
- Streptococcal toxic shock syndrome
- Tetanus

11. MUSCULO-SKELETAL EMERGENCIES

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

12. NEUROLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- Inflammatory and Infectious disorders brain abscess, encephalitis, febrile seizures in children, Guillain-Barrè syndrome, meningitis, peripheral facial palsy (Bell's palsy), temporal arteritis
- Traumatic and related problems complications of CNS devices, spinal cord syndromes, peripheral nerve trauma and entrapment, traumatic brain injury
- Tumours common presentations and acute complications of neurological and metastatic tumours
- Vascular disorders: carotid artery dissection, stroke, subarachnoid haemorrhage, subdural and extradural haematomata, transient ischaemic attack, venous sinus thrombosis
- Other problems acute complications of chronic neurological conditions (e.g. myasthenic crisis, multiple sclerosis), acute peripheral neuropathies, seizures and status epilepticus

13. OPHTHALMIC EMERGENCIES IN ADULTS AND CHILDREN

- Inflammatory and Infectious disorders conjunctivitis, dacrocystitis, endophthalmitis, iritis, keratitis, orbital and periorbital cellulitis, uveitis
- Traumatic and related problems foreign body in the eye, ocular injuries,
- Vascular disorders: retinal artery and vein occlusion, vitreous haemorrhage
- Others like acute glaucoma, retinal detachment

14. PULMONARY EMERGENCIES IN ADULTS AND CHILDREN

- Congenital cystic fibrosis
- Inflammatory and Infectious disorders asthma, bronchitis, bronchiolitis, pneumonia, empyema, COPD exacerbation, lung abscess, pleurisy and pleural effusion, pulmonary fibrosis, tuberculosis
- Traumatic and related problems foreign body inhalation, haemothorax, tension pneumothorax, pneumomediastinum
- Tumours common complications and acute complications of pulmonary and metastatic tumours,
- Vascular disorders pulmonary embolism

- Other disorders: acute lung injury, atelectasis, ARDS, spontaneous pneumothorax

15. PSYCHIATRIC AND BEHAVIOUR DISORDERS

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

16. RENAL AND UROLOGICAL EMERGENCIES IN ADULTS AND CHILDREN

- Inflammatory and Infectious disorders epididymo-orchitis, glomerulonephritis, pyelonephritis, prostatitis, sexually transmitted diseases, urinary tract infections
- Metabolic disorders acute renal failure, nephrotic syndrome, nephrolithiasis, uraemia
- Traumatic and related problemsurinary retention, testicular torsion
- Tumours
- Vascular disorders: Ischaemia and Bleeding
- Other disorders comorbidities in dialysis and renal transplanted patients, complications of urological procedures and devices, haemolytic uraemic syndrome

17. TRAUMA IN ADULTS AND CHILDREN

- Origin of trauma: burns, blunt trauma, penetrating trauma
- Anatomical location of trauma: head and neck, maxillo-facial, thorax, abdomen, pelvis, spine, extremities
- Polytrauma patient
- 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

- **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
- **Cardiac/vascular causes**
  Acute myocardial infarction, aortic dissection, aortic aneurysm rupture
- **Dermatological causes**
  Herpes zoster
- **Endocrine and metabolic causes**
  Addison's disease, diabetic ketoacidosis, other metabolic acidosis, porphyria
- **Gynaecological and Obstetric causes**
  Complications of pregnancy, ectopic pregnancy, pelvic inflammatory disease, rupture of ovarian cyst, ovarian torsion
- **Haematological causes**
  Acute porphyria crisis, familial mediterranean fever, sickle cell crisis

- **Musculo-skeletal causes**
  Referred pain from thoraco-lumbar spine
- **Renal and Genitourinary causes**
  Pyelonephritis, renal stones
- **Respiratory causes**
  Pneumonia, pleurisy
- **Toxicology**
  Poisoning
- **Trauma**
  Abdominal

2. **Altered Behaviour and Agitation**
   - **Psychiatric causes**
     Acute psychosis, depression
   - **Cardiac/Vascular causes**
     Hypertension, vasculitis
   - **Endocrine and metabolic causes**
     Hypoglycaemia, hyperglycaemia, electrolyte imbalance, hyperthermia, hypoxaemia
   - **Neurological causes**
     Cerebral space-occupying lesions, dementia, hydrocephalus, intracranial hypertension,
     CNS infections
   - **Toxicology**
     Alcohol and drug abuse, poisoning

3. **Altered Level of Consciousness in Adults and Children**
   - **Neurological causes**
     Cerebral tumour, epilepsy and status epilepticus, meningitis, encephalitis, stroke, subarachnoid haemorrhage, subdural and extradural haematomata, traumatic brain injury
   - **Cardiovascular causes**
     Hypoperfusion states, shock
   - **Endocrine and metabolic causes**
     Electrolyte imbalances, hepatic coma, hypercapnia, hypothermia, hypoxia, hypoglycaemia/ hyperglycaemia, uraemia
   - **Gynaecological and Obstetric causes**
     Eclampsia
   - **Infectious causes**
     Septic shock
   - **Psychiatric causes**
     Conversion syndrome
   - **Respiratory causes**
     Respiratory failure
   - **Toxicology**
     Alcohol intoxication, carbon-monoxide poisoning, narcotic and sedative poisoning, other substances

4. **Back Pain**
   - **Musculo-Skeletal causes**
     Fractures, intervertebral disc strain and degeneration, strain of muscles, ligaments and tendons, spinal stenosis, arthritides, arthrosis
   - **Cardiovascular causes**
     Aortic aneurysm, aortic dissection
   - **Infectious causes**

Osteomyelitis, discitis, pyelonephritis, prostatitis
- **Endocrine and metabolic causes**
  Paget's disease
- **Gastrointestinal causes**
  Pancreatitis, cholecystitis
- **Dermatological causes**
  Herpes zoster
- **Gynaecological causes**
  Endometriosis, pelvic inflammatory disease
- **Haematological and Oncological causes**
  Abdominal or vertebral tumours
- **Neurological cause**
  Subarachnoid haemorrhage
- **Renal and Genitourinary causes**
  Renal abscess, renal calculi
- **Trauma**

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

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

7. **Chest Pain**
   - **Cardiac/vascular causes**
     Acute coronary syndrome, aortic dissection, arrhythmias, pericarditis, pulmonary embolism
   - **Respiratory causes**
   - **Pneumonia, pneumomediastinum**, pneumothorax (especially tension pneumothorax), pleurisy
   - **Gastrointestinal causes**
     Gastro-oesophageal reflux, oesophageal rupture, oesophageal spasm
   - **Musculo-Skeletal causes**
     Costosternal injury, costochondritis, intercostal muscle pain, pain referred from thoracic spine
   - **Psychiatric causes**
     Anxiety, panic attack
   - **Dermatological causes**

Herpes zoster

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

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

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

11. **Fever and Endogenous Increase in Body Temperature**
    - **Systemic infectious causes**

Sepsis and septic shock, parasitosis, flu-like syndrome

- **Organ-specific infectious causes**
  Endocarditis, myocarditis, pharyngitis, tonsillitis, abscesses, otitis, cholecystitis and cholangitis, meningitis, encephalitis
- **Non-infectious causes**
  Lyell syndrome, Stephen-Johnson syndrome, thyroid storm, pancreatitis, inflammatory bowel disease, pelvic inflammatory disease, toxic shock
- **Haematological and Oncological causes**
  Leukaemia and lymphomas, solid tumours
- **Immunological causes**
  Arteritis, arthritis, lupus, sarcoidosis
- **Musculo-Skeletal causes**
  Osteomyelitis, fasciitis and cellulitis
- **Neurological causes**
  Cerebral haemorrhage
- **Psychiatric causes**
  Factitious fever
- **Renal and Genitourinary cause**s
  Pyelonephritis, prostatitis
- **Toxicology**

12. Headache in Adults and Children

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

13. Jaundice

- **Gastrointestinal causes**
  Cholangitis, hepatic failure, pancreatic head tumour, pancreatitis, obstructive cholestasis
- **Cardiac/Vascular causes**
  Chronic cardiac decompensation
- **Haematological and Oncological causes**
  Haemolytic anaemias, thrombotic thrombocytopenic purpura, haemolytic uraemic syndrome, disseminated intravascular coagulation
- **Infectious causes**
  Malaria, leptospirosis
- **Gynaecological causes**

HELLP syndrome
- **Toxicology**
  Drug induced haemolytic anaemias, snake venom

14. Pain in Arms
- **Cardiac/Vascular causes**
  Aortic dissection, deep venous thromboembolism, ischaemic heart disease
- **Musculo-skeletal causes**
  Periarthritis, cervical spine arthrosis
- **Trauma**

15. Pain in Legs
- **Cardiac/Vascular causes**
  Acute ischaemia, arteritis, deep venous thrombosis, superficial thrombophlebitis
- **Immunological causes**
  Polymyositis
- **Infectious causes**
  Arthritis, cellulites, necrotising fasciitis, osteomyelitis
- **Musculo-Skeletal causes**
  Sciatalgia
- **Neurological causes**
  Sciatica
- **Nervous system causes**
  Peripheral nerve compression
- **Trauma**

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

17. Seizures in Adults and Children
- **Neurological causes**
  Generalised epilepsy, partial complex or focal epilepsy, status epilepticus
- **Cardiac/Vascular causes**
  Hypertensive encephalopathy, syncope, dysrhythmias, migraines
- **Endocrine and metabolic causes**
  Metabolic seizures
- **Gynaecological causes**
  Eclampsia
- **Infectious causes**
  Febrile seizures in children
- **Psychiatric causes**
  Narcolepsy, pseudo-seizures
- **Respiratory causes**
  Respiratory arrest
- **Toxicology**
  Drugs/toxins

18. Shock in Adults and Children

- **Anaphylactic**
- **Cardiogenic**
- **Hypovolaemic**
- **Obstructive**
- **Septic**
- **Neurogenic**
- **Cardiac/Vascular causes**
  Cardiogenic shock, arrhythmias
- **Endocrine and metabolic causes**
  Addison's crisis
- **Fluid and Electrolyte disorders**
  Hypovolaemic shock
- **Gastrontestinal causes**
  Vomiting, diarrhoea
- **Gynaecological causes**
  Toxic shock
- **Immunological causes**
  Anaphylactic shock
- **Infectious causes**
  Septic shock
- **Neurological causes**
  Neurogenic shock
- **Trauma**
  Hypovolaemic shock, neurogenic shock.

19. Skin Manifestations in Adults and Children

- **Dermatological causes**
  Eczema, psoriasis, skin tumours
- **Immunological causes**
  Vasculitides, urticaria, Stevens-Johnson syndrome, Lyell syndrome
- **Infectious causes**
  Viral exanthemata, meningococcaemia, herpes zoster/simplex, abscesses of the skin
- **Psychiatric causes**
  Self-inflicted skin lesions or from abuse
- **Toxicology**
- **Haematological and Oncological causes**
  Idiopathic thrombocytopenic purpura, thrombotic thrombocytopenic purpura

20. Syncope

- **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
- **Endocrine and metabolic causes**
  Addison's disease
- **Fluid and Electrolyte disorders**
  Hypovolaemia
- **Gastrointestinal causes**
  Vomiting, diarrhoea
- **Neurological causes**
  Autonomic nervous system disorder, epilepsy, vasovagal reflex,
- **Toxicology**

Alcoholic or drug consumption

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

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

22. Vertigo and Dizziness

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

23. Vomiting

- **Gastrointestinal causes**
  Appendicitis, cholecystitis, gastroparesis, gastric obstruction and retention, gastroenteritis, hepatitis, pancreatitis, pyloric stenosis, small bowel obstructions
- **Cardiac/Vascular causes**
  Myocardial ischaemia
- **Ear, Nose, Throat causes**
  Vestibular disorders
- **Endocrine and metabolic causes**
  Diabetic ketoacidosis, hypercalcaemia
- **Fluid and Electrolyte disorders**
  Hypovolaemia
- **Gynaecological and Obstetric causes**
  Pregnancy
- **Infectious causes**
  Sepsis, meningitis
- **Neurological causes**
  Cerebral oedema or haemorrhage, hydrocephalus, intracranial space occupying lesions
- **Ophthalmological causes**
  Acute glaucoma
- **Psychiatric causes**
  Eating disorders

- **Renal and Genitourinary causes**
  Renal calculi, uraemia
- **Toxicology**

C. SPECIFIC ASPECTS OF EMERGENCY MEDICINE

1. ABUSE AND ASSAULT IN ADULTS AND CHILDREN

- Abuse in the elderly and impaired
- Child abuse and neglect
- Intimate partner violence and abuse
- Sexual assault
- Patient safety in Emergency Medicine
- Violence management and prevention in the Emergency Department

2. ANALGESIA AND SEDATION IN ADULTS AND CHILDREN

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

3. DISASTER MEDICINE

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

4. ENVIRONMENTAL ACCIDENTS IN ADULT AND CHILDREN

- Electricity (electrical and lightening injuries)
- Flora and Fauna (injuries from exposure, bites and stings)
- High-altitude (medical problems)
- NBCR (nuclear, biological, chemical and radiological:, decontamination, specific aspects)
- Temperature (heat and cold related emergencies)
- Travel medicine
- Water (near-drowning, dysbarism and complications of diving, marine fauna)

5. FORENSIC ISSUES

- Basics of relevant legislation in the country of practice
- Recognise and preserve evidence
- Provide appropriate medical documentation (including forensic and clinical photography, collection of biological samples, ballistics)
- Appropriate reporting and referrals (e.g. child abuse or neglect, gunshot and other forms of penetrating wounds, elder abuse, sexual assault allegations)
- Medico-legal documentation

6. INJURY PREVENTION AND HEALTH PROMOTION

- Collection and interpretation of data related to prevention and health promotion

- Epidemiology of Accidents and Emergencies
- Formulation of recommendations

7. PATIENT MANAGEMENT ISSUES IN EMERGENCY MEDICINE

- Emergency Department organization (administration, structure, staffing, resources)
- Management of specific populations:
  Children in special circumstances including child protection
  Elderly patients
  Homeless patients
  Mentally incompetent adults
  Psychiatric patients

8. PROBLEMS IN THE ELDERLY

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

9. TOXICOLOGY IN ADULTS AND CHILDREN

- General principles of toxicology and management of poisoned patients
- Principles of drug interactions
- Specific aspects of poisoning
  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
- 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.
- Organization and information (e.g. poison centres, databases)

10. PRE-HOSPITAL CARE

- Emergency Medical Services organisation (administration, structure, staffing, resources)
- Medical transport (including neonates and children, air transport)
- Paramedic training and function
- Safety at the scene
- Collaboration with other emergency services (e.g. police, fire department)

11. PSYCHO-SOCIAL PROBLEMS

- Social wellbeing of specific populations
- Patients with social issues
- Frequent visitors
- Social care following discharge

D. CORE CLINICAL PROCEDURES AND SKILLS

1. CPR SKILLS

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

2. AIRWAY MANAGEMENT SKILLS

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

3. ANALGESIA AND SEDATION SKILLS

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

4. BREATHING AND VENTILATION MANAGEMENT SKILLS

- Assessment of breathing and ventilation
- Oxygen therapy
- Interpretation of blood gas analysis, pulse oximetry and capnography
- Bag-mask-valve ventilation
- Thoracocentesis
- Chest tube insertion, connection to under-water drainage and assessment of
- functioning
- Non-invasive ventilation techniques
- Invasive ventilation techniques

5. CIRCULATORY SUPPORT AND CARDIAC SKILLS AND PROCEDURES

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

6. DIAGNOSTIC PROCEDURES AND SKILLS

- Interpretation of ECG
- Appropriate request and interpretation of laboratory investigations (blood chemistry, blood gases, respiratory function testing and biological markers)
- Appropriate request and interpretation of imaging (e.g. x-rays, ultrasound, CT/MRI)
- Focused Assessment of Sonography in Trauma (FAST).

- Emergency Ultrasound and Echocardiology
- Gastrointestinal Procedures: Shangstaken tube insertion, endoscopic banding, scelerotherapy in UGI bleed

7. ENT SKILLS AND PROCEDURES

- Anterior rhinoscopy
- Insertion of nasal pack
- Inspection of oropharynx and larynx
- Otoscopy
- Removal of foreign body if airway is compromised
- Insertion and replacement of tracheostomy tube

8. GASTROINTESTINAL PROCEDURES

- Insertion of nasogastric tube
- Gastric lavage
- Peritoneal lavage
- Abdominal hernia reduction
- Abdominal paracentesis
- Measurement of abdominal pressure
- Proctoscopy

9. GENITOURINARY PROCEDURES

- Insertion of indwelling urethral catheter
- Suprapubic cystostomy
- Testicular torsion reduction
- Evaluation of patency of urethral catheter

10. HYGIENE SKILLS AND PROCEDURES

- Decontamination of patient and the environment
- Patient isolation and staff protection

11. MUSCULOSKELETAL TECHNIQUES

- Aseptic joint aspiration
- Fracture immobilisation
- Reduction of joint dislocation
- Log roll and spine immobilisation
- Splinting (plasters, braces, slings, tapes and other bandages)
- Management of compartment syndrome
- Fasciotomy, escharotomy

12. NEUROLOGICAL SKILLS AND PROCEDURES

- Evaluation of consciousness including the Glascow Coma Scale
- Fundoscopy
- Lumbar puncture
- Interpretation of neuro-imaging

13. OBSTETRIC AND GYNAECOLOGICAL SKILLS AND PROCEDURES

- Emergency delivery
- Vaginal examination using speculum
- Assessment of the sexual assault victim

14. OPHTHALMIC SKILLS AND PROCEDURES

- Removal of foreign body from the eye

- Slit lamp use
- Lateral canthotomy

15. TEMPERATURE CONTROL PROCEDURES

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

16. TRANSPORTATION OF THE CRITICALLY ILL PATIENT

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

17. WOUND MANAGEMENT

- Abscess incision and drainage
- Aseptic techniques
- Treatment of lacerations and soft tissue injuries
- Wound irrigation and wound closure

E. Competencies to be attained by the end of 3 years

By the end of their first year, emergency medicine residents will:

1. Demonstrate the ability to provide appropriate care to patients with non-emergent problems:
   a. Obtain an accurate and complete clinical and psychosocial history and perform a comprehensive physical examination
   b. Develop appropriate differential diagnoses
   c. Know the available investigative and therapeutic options
   d. After review, implement an appropriate investigative and therapeutic plan
   e. Develop and, after review, implement an appropriate written and verbal discharge plan
   f. Demonstrate an awareness of the available information systems to support patient care and discharge planning
   g. Demonstrate competency (including an understanding of the indications, contraindications, and techniques) in the core procedures used on non-emergent patients (eg, laceration repair, reduction in or immobilization of extremity
   h. injury, pelvic examination, slit-lamp examination)
   i. Demonstrate an understanding of the concepts of disease prevention as it
   j. applies to emergency medicine
   k. Properly document all historical, physical examination, and diagnostic test findings

2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
   a. Demonstrate a basic understanding of the principles of evidence-based medicine
   b. Demonstrate mastery of minor acute and nonemergent conditions
   c. Demonstrate mastery of the principles of ACLS and ATLS
   d. PALS and NALS (paediatric advanced life support and neonate advanced life support)

e. Demonstrate a level-appropriate understanding of the core curriculum

3. Demonstrate the ability to appraise and assimilate scientific evidence and analyze and improve their own practice:
   a. Demonstrate the ability to critically assess their competency in managing minor acute and on emergent cases
   b. Demonstrate the ability to apply published studies to their own practice
   c. Demonstrate the ability to use available information technology appropriate to the care of their patients

4. Demonstrate effective interpersonal and communication skills with:
   a. Patients and their families
   b. Other physicians
   c. Other health care providers
5. Demonstrate the professionalism required of a physician:
   a. Accept responsibility for continuity of patient care
   b. Demonstrate respect for patients' privacy and autonomy
   c. Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities
   d. Demonstrate a commitment to sound ethical principles regarding the care of patients
   e. Demonstrate respect for the dignity of patients and colleagues as persons

6. Demonstrate a basic understanding of the role of the emergency department in the larger context of health care delivery:
   a. Demonstrate an understanding of the principles of a cost-benefit analysis
   b. Know the relative costs of the various tests and treatment contemplated
   c. Serve as an advocate for the patient in their dealing with the complexities of the health care system, specifically with regard to appropriate referral and followup

By the end of their second year, residents will, in addition to the objectives achieved during the first year:

1. Demonstrate the ability to provide appropriate care to patients with emergent and life threatening conditions:
   a. Obtain an appropriately focused history and perform an appropriately focused physical examination
   b. Develop comprehensive differential diagnoses
   c. Develop an investigative and therapeutic plan
   d. Develop and, after review, implement an appropriate written and verbal discharge plan
   e. Demonstrate competency (including an understanding of the indications, contraindications, and techniques) in the core procedures used on patients with emergent and life-threatening conditions (eg, endotracheal intubation, tube thoracostomy, defibrillation/cardioversion, etc.)
2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
   a. Apply the principles of evidence-based medicine
   b. Demonstrate mastery of the emergent and life-threatening conditions that present to the emergency department
   c. Demonstrate a level-appropriate understanding of the core
3. Demonstrate the ability to appraise and assimilate scientific evidence and analyze and improve their own practice:

    a. Demonstrate the ability to critically assess their competency in managing the emergent and life-threatening conditions that present to the emergency department
    b. Use published studies to improve their own practice
    c. Use available information technology appropriate to the care of their patients
4. Demonstrate a level-appropriate understanding of the role of the emergency department in the larger context of health care delivery:
    a. Demonstrate the ability to divide his or her time and energies appropriately to provide optimal care for several patients concurrently
    b. Develop plans for evaluation and treatment that, without compromising patient care, acknowledge the patient's particular health care system

By the end of their third year, residents will, in addition to the objectives achieved during the first 2 years:

1. Demonstrate the ability to provide appropriate care to patients
    a. Listen to a history and physical examination presentation from a junior resident and provide appropriate feedback and guidance
    b. Perform an appropriately focused history and physical examination, taking into consideration the previous evaluation of the junior resident
    c. Implement an appropriate investigative and therapeutic plan
    d. Implement an appropriate written and verbal discharge plan
    e. Demonstrate understanding of the indications, contraindications, and techniques in uncommonly performed but lifesaving procedures (eg, cricothyroidotomy, burr craniotomy) and mastery of all other core procedures
    f. Demonstrate an understanding of documentation as it applies to billing and reimbursement requirements
2. Demonstrate a level-appropriate knowledge of the biochemical, clinical, epidemiologic, and social-behavioural basis of diseases seen in the emergency department:
    a. Demonstrate mastery of all conditions that commonly present to the emergency department
    b. Teach courses such as ACLS as a certified instructor
    c. Demonstrate an understanding of the core curriculum
3. Facilitate the learning of others
    a. Teach and appropriately supervise medical students and junior residents
4. Demonstrate an understanding of the role of the emergency department in the larger context of health care delivery
    a. Triage patients and direct the attention of junior-level residents so as to provide optimal care for all patients in the emergency department. Plan and participate in a mass-casualty disaster drill

THESIS

Guidelines for Submission of Thesis/Dissertation by candidates

Research shall form an integral part of the education programme of all candidates registered for DNB degrees of NBE. The Basic aim of requiring the candidates to write a thesis/dissertation is to familiarize him/her with research methodology. The members of the faculty guiding the thesis/dissertation work for the candidate shall ensure that the subject matter selected for the thesis/dissertation is **feasible, economical** and **original**.

A. Guidelines

a. The dissertation may be normally restricted to the size of 100 pages, to achieve this, following item may be kept in view :-

i. Only contemporary and relevant literature may be reviewed.
ii. The techniques may not be described in detail unless any modification / innovations of the standard techniques are used and reference may be given.
iii. Illustrative material may be restricted
iv. Since most of the difficulties faced by the residents related to the work in clinical subject or clinically oriented laboratory subjects the following steps are suggested :

- The number of clinical cases to be included in the dissertation may be limited. No number is therefore, prescribed and it will vary from topic to topic.
- For prospective study, as far as possible the number of cases should be such that adequate material, judged from the hospital attendance, will be available and the candidate will be able to collect the case material within a period of 6-12 months so that he / she is in a position to complete the work within the stipulated time.
- The objective of the study should be limited and well defined.
- As far as possible, only clinical or laboratory data of investigations of patients or such other material easily accessible in the existing facilities should be used for the study
- The laboratory work required to be performed by the residents of clinical departments should be minimal. For this purpose technical assistance, wherever necessary, may be provided by the department concerned. The resident of one specialty taking up some problem related to some other specialty should have some basic knowledge about the subject and he/she should be able to perform the investigations independently. Wherever some specialized laboratory investigations are required, a co-guide may be
- co-opted from the concerned investigative department. The quantum of laboratory work to be carried out by the candidate should be decided by the guide and co-guide by mutual consultation.
- The clinical residents may not ordinarily be expected to undertake experimental work or clinical work involving new techniques not hitherto perfected or the use of chemicals or radio isotopes not readily available. They should however, be free to enlarge the scope of their studies or undertake experimental work on their own initiative but all such studies may be feasible within the existing facilities.
- The residents should be able to use freely the surgical pathology / autopsy data if it is restricted to diagnosis only. If however, detailed histological data are required the resident will have to study the case himself with the help of guide / co-guide. The same will apply in case of clinical data.

b. Statistical methods used for analyses will be described in detail.

B. Thesis Submission to NBE

1. As per NBE norms, writing a thesis is essential for all DNB candidates towards partial fulfillment of eligibility for award of DNB degree certificate.
2. The protocol of Thesis/ Dissertation should be submitted to the office of the NBE through head of the institutions within three (3) months of joining the training in Medical college/ university/DNB accredited institution.
3. No correspondence will be made in regard to acceptance of the protocol except only in the case of rejected protocols for which individual will be informed by office through mail/website.
4. DNB candidates are required to submit their thesis before the cut off date which shall be 30th June of same year for candidates appearing for their scheduled December final theory examination. Similarly candidates who shall be appearing in their scheduled June DNB final examination shall be required to submit their thesis by 31st of preceding December.
5. Thesis should be hard bound and the front cover page should be printed in the standard format. A hard bound thesis should be accompanied with:
    i. A summary of thesis.

ii. Thesis submission form duly completed.
iii. NBE copy of challan in original.
iv. Soft copy of thesis in a CD duly labeled.
v. Copy of letter of registration with NBE.

6. A declaration of thesis work being bonafide in nature and done by the candidate himself at the institute of DNB training need to be submitted bound with thesis.
7. It must be signed by the candidate himself/herself, the thesis guide and head of the institution, failing which thesis shall not be considered.
8. If thesis is rejected or needs to be modified for acceptance, NBE will return it to the candidate with suggestion of assessors in writing for modification.
9. If any unethical practice is detected in work of the Thesis, the same is liable to be rejected. Such candidates are also liable to face disciplinary action as may be decided by NBE.
10. The thesis is to be submitted 6 MONTHS before the commencement of the DNB examination along with the prescribed thesis evaluation fees drawn in favor of NATIONAL BOARD OF EXAMINATIONS - payable at New Delhi, for evaluation.

Guidelines for Writing of Thesis/Dissertation

Title - Should be brief, clear and focus on the relevance of the topic.
Introduction – Should state the purpose of study, mention lacunae in current knowledge and enunciate the Hypothesis, if any.
Review of Literature – Should be relevant, complete and current to date.
Material and Methods- Should include the type of study (prospective, retrospective, controlled double blind) details of material & experimental design procedure used for data collection & statistical methods employed; statement of limitations ethical issues involved.
Observations– Should be organized in readily identifiable sections having correct analysis of data be presented in appropriate charts, tables, graphs & diagram etc. These should be statistically interpreted.
Discussion- Observations of the study should be discussed and compared with other research studies. The discussion should highlight original findings and should also include suggestion for future.
SUMMARY AND CONCLUSION
Bibliography - Should be correctly arranged in Vancouver pattern.
Appendix— All tools used for data collection such as questionnaire, interview schedules, observation check lists etc should be put in the annexure.

LOG BOOK

The logbook should show evidence that the previously mentioned subjects were covered (with dates and the name of the teachers). The candidate will maintain the record of all academic activities undertaken by him/her in logbook.

1. Personal profile of candidate
2. Educational qualifications/ professional data
3. Record of case histories(15 cases) studied by him/her. (Model should be given in the log
   book) Three case histories pertaining to predominantly 4 Medical problems, 3 predominantly Surgical, 2 pediatrics, 3 trauma while the rest 4 may pertain to other disciplines like Obstetrics and Gynecology, Ophthalmology, ENT,Dermatology, Psychiatry etc.
4. Procedures learnt- the candidates are expected to learn Medical and Surgical procedures during their training in Emergency Medicine. The record should depict medical and surgical
5. procedures observed, assisted and performed during the period of training
6. Record of case Demonstration/ Presentations

Record of Participation in CME activities- Direct contact activities (Lectures, seminars, workshops, c conferences); indirect contact activities (Correspondence journals, books, audio-video tapes)

7. The log book should also bear record of the training in the following:
    a. Emergency Life Support (ELS)- 2 DAY COURSE
    b. Advanced life Support- 2 day Course
    c. Advanced Trauma Life Support (ATLS) – 2 DAY COURSE
    d. Advanced Pediatric Life Support (APLS)- 3 DAY COURSE
    e. Emergency radiology for Emergency Physicians- 2 day course
    f. Neonatal Life Support- 1 day course

8. Other courses such as:
    a. Ultra sound scan
    b. Communication skill workshops
    c. Research methodology workshop
    d. Audit workshop
    e. Child Protection

ASSESSMENT

Formative assessment includes various formal and informal assessment procedures by which evaluation of student's learning, comprehension, and academic progress is done by the teachers/ faculty to improve student attainment. Formative assessment test (FAT) is called as "Formative "as it informs the in process teaching and learning modifications. FAT is an integral part of the effective teaching .The goal of the FAT is to collect information which can be used to improve the student learning process**.**

Formative assessment is essentially positive in intent, directed towards promoting learning; it is therefore part of teaching. Validity and usefulness are paramount in formative assessment and should take precedence over concerns for reliability.

The assessment scheme consists of Three Parts which has to be essentially completed by the candidates. The scheme includes:-

Part I:- Conduction of theory examination

Part-II :- Feedback session on the theory performance

Part-III :- Work place based clinical assessment

Scheme of FAT

PART – I	**CONDUCT OF THEORY EXAMINATION**	Candidate has to appear for Theory Exam and it will be held for One day. It will comprise of **TWO** papers.
PART – II	**FEEDBACK SESSION ON THE THEORY PERFORMANCE**	Candidate has to appear for his/her Theory Exam Assessment Workshop and it will be held approx. 2 – 3 weeks from conduct of theory examination
PART – III	**WORK PLACE BASED CLINICAL ASSESSMENT**	After Part II, Candidate has to appear for Clinical Assessment and it will be held approx. 2 – 3 weeks from the conduct of Part – II.

The summative assessment of competence will be done in the form of DNB Final Examination leading to the award of the degree of Diplomate of National Board in Emergency Medicine. The DNB final is a two-stage examination comprising the theory and practical part. An eligible candidate who has qualified the theory exam is permitted to appear in the practical examination.

A. **Theory Exam**:
   a. The theory exam comprise of four papers (Applied basic sciences related to Emergency Medicine; Trauma and surgical emergencies; Medical emergencies; and recent advances in Emergency Medicine, Paediatric Emergency Medicine)
   b. There are 10 short notes of 10 marks each, in each of the papers.
   c. Maximum time permitted is 3 hours for each paper.
   d. Candidate must score at least 50% in the aggregate of 4 papers to qualify the theory exam.
   e. Candidate who have qualified the theory exam are permitted to take up the practical exam.

B. **Practical Exam**:
   a. Maximum Marks: 300.
   b. Comprises of Clinical Examination and Viva.
   c. Candidate must obtain a minimum of 50% marks in the Clinical Examination (including Viva) to qualify for the Practical exam.
   d. There are a maximum of three attempts that can be availed by a candidate for Practical Exam.
   e. First attempt is the practical exam following immediately after the declaration of theory results.
   f. Second and third attempt in practical examination shall be permitted out of the next three sessions of practical examinations placed alongwith the next three successive theory examination sessions; after payment of full examination fees as may be prescribed by Board.
   g. Absentation from Practical Exam is counted as an attempt.
   h. Appearance in first practical exam is compulsory;
   i. Requests for change in centre of exam are not entertained, as the same is not permissible.
   j. Candidates are required not to canvass with NBE for above.

ILLUSTRATIVE STUDY MATERIAL

Recommended Text Books

- Emergency Medicine: a comprehensive study guide. Tintilli, J et al, New York: McGraw- Hill
- Emergency Medicine (latest edition) Anthony FT Brown, Michael D Cadgan, London, Hodder Arnold
- 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
- 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
- Text book of pediatric Emergency Medicine (Latest edition) Peter Cameron, George Jelinek, Ian Everitt, Gary Browne, Jeremy Raftos. London, Churchill Livingstone.
- Textbook of Adult Emergency Medicine, Edinburgh: Churchill Livingstone.
- Rosen's textbook of emergency Medicine
- Accident & Emergency Radiology, A survival guide- Nigel Raby

- Harwood-Nuss' Clinical Practice of Emergency Medicine, Wolfson, A (Editor), New York: Lippincott, Williams & Wilkins.
- Textbook of Emergency Medicine, David, S (Editor), New York: Lippincott, Williams & Wilkins.
- Goldfrank's Toxilogic Emergencies, Nelson, L et al., New York: McGraw-Hill.
- Modern Medical Toxicology, Pillay, V.V.
- Textbook of Critical Care, Fink, M (Editor): Philadelphia, Elsevier Saunders.
- ECG For Emergency Physician, Mattu and Brady (Editors), London: BMJ Publishing.
- An Introduction to Clinical Emergency Medicine, Mahadevan, S.V. (Editor), New York: Cambridge University Press.
- American Heart Association Basic Life Support, Advanced Cardiovascular Life Support and Pediatric Life Support manuals
- Advanced Trauma Life Support manual published by the American College of Surgeons

JOURNALS

- The journal of Emergency Medicine- Elsevier (the official journal of the America Academy of Emergency Medicine)
- American Journal of Emergency Medicine
- European Journal of Emergency Medicine (the official journal of the European Society for Emergency Medicine)
- Annals of Emergency Medicine (the official journal of the American College of Emergency Medicine)
- Emergency Medicine Australasia
- Academy Emergency Medicine
- Emergency Medicine Journal
- Emergency Medicine Australasia
- National Journal of Emergency Medicine published by SEMI
- American Heart Association journal, Circulation

Online Resources

- American Academy Of Emergency Medicine- Position Statements
- American College Of Emergency Physicians- Practice Resources
- Association Of Emergency Physicians- Policy And Position Statements
- Australasian College For Emergency Medicine – Policies And Guidelines
- Australian And New Zealand Intensive Care Society- Policy Statements
- Council Of Emergency Medicine Residency Directors- Position Statements
- Emergency Management Australia- Publications
- European Resuscitation Council- Guidelines
- Intensive Care Society (UK)- Standards And Guidelines
- National Electronic Library For Health (UK) Emergency Care
- Resuscitation Council (UK)
- Society For Academic Emergency Medicine – Position Statements
- Society Of Critical Care Medicine- Guidelines
- Triage – Injury, Treatment And Recovery, Shoestring Graphics