SOCIETY OF EMERGENCY MEDICINE INDIA

CCT-EM

(Certified Course Training - Emergency Medicine)

CURRICULUM

INDEX

I INTRODUCTION

Society for Emergency Medicine India

The Society for Emergency Medicine, India (SEMI) is a recognized professional organization dedicated to advancing the field of emergency medicine in India and serves as a representative body for emergency medicine professionals across the country.
SEMI aims to promote excellence in emergency medical care, education, research, and advocacy. It provides a platform for emergency medicine physicians, healthcare professionals, educators, and researchers to collaborate, share knowledge, and enhance the quality of emergency care delivery in India.

SEMI conducts conferences, workshops, and training programs to improve the skills and knowledge of emergency medicine practitioners. It also advocates for policy changes to strengthen emergency care systems and raise awareness about the importance of emergency medicine in the healthcare landscape
The Society for Emergency Medicine India (SEMI) is the first and only organization representing trained/qualified emergency physicians & paramedics in India.

SEMI was formed in the year 1999, with its registration number 3602/2000, and has its head office at Hyderabad.SEMI is a full member of the International Federation of Emergency Medicine (IFEM) and is the only organization representing India on the global map of emergency care.

Introduction to Emergency Medicine

Emergency Medicine (EM) is a vital specialty which provides an essential service for patients and communities and fulfills a unique and crucial remit within the national healthcare system. It is 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 interdisciplinary specialty, one which is interdependent with all other clinical disciplines. The overarching aim of this course is to improve the quality of care and reduce waiting times for patients in the Emergency Medicine Departments (EMDs) throughout the country.

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.
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.

II.COURSE TRAINING GOALS AND OBJECTIVE

The goal of the training program is to produce Emergency Physicians with the necessary knowledge and skill 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. Possess the 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 interpreting their results relevantly
3. Be familiar with the fundamentals of research methodology.
4. To have the appropriate attitude and behavior necessary for the development of appropriate patient-doctor relationships.
5. To develop the field of emergency medicine
6. To keep up-to-date and be familiar with all recent advances in the field of Emergency medicine.

COURSE OBJECTIVE:

1.KNOWLEDGE & SKILLS:

The purpose of the CCT -EM course is to train doctors to be emergency physicians who are able to provide urgent and emergency care to all undifferentiated patients attending ED nationwide, 24/7,365 days every year. This includes leading the resuscitation of sick and injured patients of all ages (from birth to advanced age and frailty) in addition to managing,leading and supporting all elements of care delivered by the multi-disciplinary teams throughout the full spectrum of acute illness and injury, physical and mental health needs that present to a modern day ED.
They must be able to provide strategic leadership and set the culture within the ED, improve quality, teach and supervise and deliver key administrative tasks.
EM trainees using this curriculum will be trained to manage any situation, however complex or challenging, by making those challenges explicit and by supporting their individual development to meet them.

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

- Professional values and attitude
- Professional skills
- Practical skills
- Communication and interpersonal skills
- Dealing with complex cases and uncertainty
- Clinical skills (history taking, diagnosis and medical management; consent)
- Humane interventions
- Prescribing medicines safely
- Using medical devices safely
- Infection control and communicable disease
- 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.

- Develop the skill and competency to choose and interpret correctly the results of the various routine investigations necessary for proper management of the patient.

- Develop the skill and competency in emergency interventions like endotracheal intubations, needle cricothyrotomy, tracheostomy, needle thoracocentesis, Intercostal drain placement, pericardiocentesis, defibrillation, mechanical ventilation, hemodialysis, point of care ultrasonography

- 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 with competence

- To develop the ability to accurately interpret the results of specialized investigations including radiologic, ultrasonographic, biochemical, hemodynamic, electro-cardio graphic, electrophysiological, pulmonary functional, hematological, immunological, nuclear isotope scanning and arterial blood gas analysis results.

- To work as a team player within the department and with other specialities for emergent and urgent consultations

- 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.

- 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.

- Skill and competence to work cohesively in Resuscitation team along with paramedical personnel, maintain discipline and healthy interaction

.TRAINING APPROACH:

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

1. Emergency Case presentations & discussion- once a week
2. Seminar – Once a week
3. Journal club- once a fortnight
4. Mortality meeting- once a month
5. Faculty lecture teaching- once a month

7.Clinical Audit-Once a Month

8.A poster and have one oral presentation at least once during their training period in a recognized conference.

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

The detailed calendar for teaching and presentations should be shared every 6 months to the academic board

CCT -EM Course Faculty:

The faculties for the course must include an appropriate number of trainers. Trainers should devote a large proportion of their professional efforts to training and should be given sufficient time to meet the educational requirements of the program.

CCT-EM Trainees:

All trainees must share responsibility with their trainers for their education. The trainees must be proactive in identifying their own knowledge gaps and must take advantage of all the formal and informal learning opportunities offered.

Supervision:

Trainees must be supervised by trainers in such a way that the trainees assume **progressively increasing responsibility** according to their level of education, ability and experience. Schedules for trainers must be structured to ensure that supervision is readily

available to trainees on duty. The level of responsibility accorded to each trainee must be determined.

Experience

The trainee must learn through exposure to a full range of clinical cases and be able to appreciate the issues associated with the delivery of safe, high quality and cost-effective health care. The trainee must be involved in the treatment of a sufficient number of patients and perform an adequate number of procedures of sufficient diversity. Administrative, teaching, and leadership skills must also be included in the Training Programme.

Leave policy.

The leave of the trainee would be according to the institution policy, while maintaining 36 months of training in the course. Any long leaves of more than 15 days continuously should compensate the course for that period. In case of any discrepancy the final decision rests with the academic board of SEMI.

Transfer Policy

No institutional transfers within the city are permitted.

Convocation

The convocation would be at the annual emergency medicine conference (EMCON) at the end of 3yrs on successful completion of their training and exams.

Training Centers

A Training Centre is defined as a hospital or group of hospitals which together receive an appropriate case-mix and therefore offer the trainee experience in the full range of the specialty of Emergency Medicine. Each Training Centre must encompass relevant specialties to give the trainee the opportunity of developing their clinical skills and fulfilling the curriculum and their portfolio. It must provide both space and opportunities for practical and theoretical study as well as for research activities and critical appraisal of medical literature. Training Centers must be approved and recognized by SEMI.

III.CLINICAL ROTATIONAL POSTING

The residents will rotate through both the emergency department and other clinical 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: 9 months

Orthopedic & wound care: 2weeks

ICU-1 month

CCU- 1 month

Anesthesia-15 days

Year II

Emergency Department: 7 months

Ophthalmology/ENT- 2wks/2wks

OBG/Psychiatry – 2 wks/2wks

PICU/Pediatric EM- 1 month

Trauma- 1 month

ICU: 1 month

Year III

Emergency Department: 7 months

Trauma- 1 month

Pre Hospital Care-1 Month

Research – 1 month

Radiology & Ultrasound- 2wks

PICU/Pediatric EM-1 month

IV.PRACTICAL AND CLINICAL TRAINING

Apart from the clinical training of emergency cases in the Emergency Departments, practical hands on training is required in the following areas:

1. Basic and Advanced Cardiac Life Support -NBLS/NCLS/BLS/ACLS
2. National Trauma life support/Advanced Trauma Life Support-NTLS/ATLS
3. Airway Management-Airway manoeuvers;Airway adjuncts ;Bag mask ventilation, Intubation , Difficult airway,Tracheostomy,Emergency cricothyrotomy
4. Ventilator Management
5. Pediatric and Neonatal resuscitation -Pediatric Resuscitation and Emergency Medicine course(PREM)/Pediatric advanced life support course/NRP
6. Point of Care Ultrasound(POCUS)/National Ultrasound (NULS) course
7. Pacemaker placement
8. Emergency pericardiocentesis
9. Central venous catheter insertion
10. Incision and drainage of abscess, hematoma, furuncle and hemorrhoid
11. Wound debridement and laceration repair
12. Local field block, hematoma block and peripheral nerve block anesthesia
13. Preservation of served extremities
14. Tube thoracostomy
15. Closed reduction of hernias
16. Arthrocentesis
17. Application and removal of splints and casts
18. Closed reduction of dislocated joints
19. Emergency immobilization and traction techniques
20. Measurement of compartment pressure
21. Management of epistaxis
22. Removal of foreign bodies
23. Drainage of peritonsillar abscesses
24. Emergency delivery of babies
25. Removal of intrauterine devices
26. Introduction of urethral catheters
27. Suprapubic catheterization
28. Lumbar puncture
29. Use of the slit lamp- removal of conjunctival and corneal foreign bodies

30. Ocular tonometry
31. Insertion of Blakemore tube
32. Insertion of nasogastric, orogastric or intestinal tube
33. Peripheral arterial puncture and cannulation
34. Intraosseous infusion
35. Procedural sedation

IV. CORE SYLLABUS

RESUSCITATION AND APPLIED BASIC SCIENCES WILL BE PART OF THE CURRICULUM IN THE FIRST YEAR

APPLIED BASIC SCIENCES:

Pages 11-63

The aim of this document is to enable trainees to focus their learning on those aspects of applied basic sciences which will be of most clinical relevance in clinical practice.

1.Anatomy curricular content
Section 1: Upper limb-13
Section 2: Lower limb -17
Section 3: Thorax-
Section 4: Abdomen
Section 5: Head and neck
Section 6: Central Nervous System
Section 7: Cranial nerve lesions
2. Summary of the physiology curricular content..
Section 1: Basic Cellular Physiology
Section 2: Respiratory physiology
Section 3: Cardiovascular physiology
Section 4 Gastrointestinal physiology
Section 5 Renal physiology
Section 6 Endocrine physiology
3. Summary of the pharmacology curricular content.
Gastrointestinal pharmacology.
Cardiovascular system
Respiratory system
Central nervous system

1. Summary of the anatomy curricular content

The aim of this document is to enable trainees to focus their learning on those aspects of applied basic sciences which will be of most clinical relevance in clinical practice.

Introduction

Eventually, questions will be set based upon the listed topics which follow.Trainees should know the surface markings, actions and nerve supply of various muscles and joints .

SECTION-1 UPPER LIMB

Muscles		Joints	Contents
PECTORAL REGION	Surface markings, actions and nerve supply of: • Pectoralis major • Pectoralis minor • Trapezius • Latissimus dorsi • Serratus anterior	• Sternoclavicular • Acromioclavicular joints	
AXILLA	• Subscapularis • Teres major		Neurovascular bundles Brachial plexus Axillary artery.

SHOULDER	• Supraspinatus • Infraspinatus • Teres minor • Deltoid	Shoulder joint	
BREAST	1		Lymph drainage pattern.
THE ANTERIOR ARM	• Coracobrachialis • Biceps • Brachialis		• Brachial artery • Median nerve • Ulnar nerve . • Medial cutaneous nerve of arm and forearm • Intercostobrachial nerve • Lymphnodes
THE POSTERIOR ARM	Triceps	Elbow joint	Radial nerve

THE ANTERIOR FOREARM	• Pronator teres • Flexor carpi radialis • Flexor digitorum superficialis • Palmaris longus • Flexor carpi ulnaris • Flexor digitorum profundus • Flexor pollicis longus • Pronator quadratus	Radioulnar joints	• Radial artery,Ulnar artery • Anastomosis ,Carpal arches • Lateral and medial cutaneous nerves of the forearm,Median nerve,Ulnar nerve . • Cephalic, Basilic and Median forearm veins
THE POSTERIOR FOREARM	• Brachioradialis • Extensor carpi radialis longus • Extensor carpi radialis brevis • Extensor digitorum • Extensor carpi ulnaris • Supinator • Abductor		Anatomical snuff box Extensor retinaculum.

	pollicis longus • Extensors pollicis longus & brevis • Extensor indicis		
WRIST AND HAND	Lumbricals and interossei Thenar eminence • Abductor pollicis brevis • Flexor pollicis brevis • Opponens pollicis Hypothenar eminence • Abductor digiti minimi • Flexor digiti minimi • Opponens digiti minimi	Median nerve Ulnar nerve Digital nerves.	Carpal tunnel Flexor retinaculum Palmar arches. Flexor sheath

THE DIGITAL ATTACHMENTS OF THE LONG TENDONS

OTHER ASPECTS OF UPPER LIMB ANATOMY-Dermatomal supply,nerve injuries .

SECTION II - LOWER LIMB

ANTERIOR THIGH			
	Muscles	Joints	Contents
	• Sartorius • Iliacus • Psoas major • Pectineus • Quadriceps femoris • Rectus femoris • Vasti lateralis, intermedius and medialis		• Femoral canal and Femoral ring • Femoral sheath • Dermatomal pattern of innervationSuperficial arteries • Superficial veins- Great saphenous vein • Lymph nodes / vessels

Patellar region	Patellar ligaments ,patellar bone		
MEDIAL THIGH	Muscles	Joints	Contents
	●Adductor longus, ●Adductor Brevis ● Adductor magnus ● Obturator externus		● Profunda femoris artery ● obturator artery ● Obturator nerve
HIP JOINT & GLUTEAL REGION			
	● Gluteus maximus ● Gluteus medius ● Gluteus minimus ● Piriformis	Hip joint	● Posterior and anterior rami of lumbosacral nerves. ● Sciatic nerve
POSTERIOR THIGH COMPARTMENT	● Hamstrings		● Sciatic nerve

POPLITEAL FOSSA AND KNEE	• Popliteus	Knee joint- Capsule Ligaments Bursae	• Tibial nerve • Popliteal artery • Popliteal vein • Common peroneal nerve
ANTERIOR LEG	• Tibialis anterior • Extensor hallucis longus • Extensor digitorum longus • Peroneus tertius • Sartorius • Gracilis • Semitendinosus		
DORSUM OF THE FOOT	:		• Cutaneous nerves supplying the dorsum • Dorsalis pedis artery

LATERAL LEG			• Peroneus longus & brevis
POSTERIOR LEG (CALF)	• Gastrocnemius • Soleus • Flexor digitorum longus • Flexor hallucis longus • Tibialis posterior		• Posterior tibial artery • Tibial nerve
SOLE OF THE FOOT	• Peroneus longus • Tibialis posterior	• Ankle joint • Tarsal joints	• The four layers • Spring ligament

SECTION III- THORAX

THORACIC WALL

	Muscles	Joints	Contents
	• Intermittent intercostal muscles • Innermost and transverse intercostal muscles		• Intercostal structures. • intercostal nerve •
DIAPHRAGM			
	structures passing • aorta • esophagus • inferior vena cava		
THORACIC INLET			
	Structures: • Esophagus • Trachea • Subclavian arteries • Aortic arch • Subclavian veins • Brachiocephalic trunk		

TRACHEA HEART AND PERICARDIUM THYMUS HEART AND PERICARDIUM- Great vessels,Conducting system,Cardiac blood supply Procedural anatomy OESOPHAGUS PLEURA AND LUNGS OSTEOLOGY	

SECTION IV -ABDOMEN

ABDOMINAL WALL		
	Muscles	contents

	External oblique Internal oblique Transversus Rectus abdominis aponeurosis Rectus sheath:	Aponeurosis Rectus sheath
POSTERIOR ABDOMINAL WALL	Psoas major Quadratus lumborum: Iliacus	Abdominal aorta (single ventral gut arteries, paired visceral arteries, paired wall arteries) Inferior vena cava lumbar plexus L1 - L4 sympathetic & parasympathetic supply. Lymph nodes. Anatomical knowledge of the lumbar sympathetic trunk, lumbar ganglia & coeliac plexus not required Details of named arterial branches (Inferior Phrenic)is not required

INGUINAL REGION	Inguinal canal
	Testis, epididymis and spermatic cord
	Topography of the abdominal cavity
	Peritoneum

B.Gastrointestinal tract

• Abdominal oesophagus
• Stomach
• Small intestine : DuodenuM, Jejunum, Ileum
• Large intestine : Caecum, Colon
• Liver & biliary tracT:Gall bladder ,Biliary ducts,Portal vein
• Pancreas
• Spleen

• Kidney
• Ureters
• Urinary bladder
• The pelvic cavity
• Rectum & anus
• Male internal genitalia: prostate
• Female reproductive system :Ovary,Vagina
• Male urogenital region: Urethra
• Stability of the pelvis: joints and ligaments
• Lumbar and sacral plexuses

SECTION V-HEAD AND NECK

Key knowledge for the head and neck region relates to safe management of common injuries of the region, in particular the face.

General topography of Tissue spaces of the neck

Deep cervical fascia

- Triangles of the neck: anterior and posterior triangles-Topography

Regions	Mus cle	Joints	Contents

NECK			● Thyroid ● Trachea ● Oesophagus ● Carotid sheath ● Cervical sympathetic trunk-superior, middle and inferior cervical ganglia and branches. -Horner's syndrome

ROOT OF NECK			● Position of phrenic nerve across● right recurrent laryngeal nerve ● Jugulo-o mohyoid

			lymph node ● Subclavian artery ● Subclavian vein
SCALP			● Anastomosing external & internal carotid branches ● Venous drainage ● Occipital, Auriculotemporal & Zygomaticotemporal nerves

FACE

Competent knowledge of facial anatomy is crucial
Facial muscle innervation as derived from the facial nerve (C7)

Generalized arrangement of orifice sphincters and dilators

Facial nerve in the facial region
Sensory supply of the face
-Trigeminal nerve and name branches.

-Ophthalmic nerve
-Maxillary nerve
-Mandibular nerve
Venous drainage
Facial lymph drainage

Muscles	Joints	Contents
Orbicularis oculi Levator palpebrae superioris & occipitofrontalis	Frontal and zygomatic bones	
• Orbicularis oris • Oris buccinator • Modiolus		

• Pterygoids		• Pterygoid venous plexus • Mandibular nerve • Auriculotemoral nerve • Inferior alveloar nerve: • Lingual nerve • Chorda tympani • Maxillary artery • Carotid sheath • Glossopharyngeal nerve • Vagus n • Accessory nerve • Hypoglossal nerve • Maxillary nerve

		• Pterygopalatine fossa

PAROTID REGION- Parotid gland and Masseter
Nose and paranasal region
Branches of ophthalmic and facial arteries
Nasal cavity
• Floor & walls
• The conchae (turbinates)
• Nasolacrimal duct
• Lateral wall
• Septum
External nose
Paranasal sinuses
Developmental staging

Floor of the mouth- (C6 level)

	Muscles	Joints /osteology	Contents
Muscular pharynx	Constrictor		• Deep cervical groups • pharyngeal plexus of Vagus,Glossopharyngeal & Sympathetic fibres • Sensory mucosal supply: maxillary (nasal portion), glossopharyngeal (oral), laryngeal • Adenoids • Palatine Tonsils and Tonsillar bed • External palatine vein • Pharyngeal plexus (motor) • Pterygopalatine ganglion (secretomotor) • Maxillary division of V (sensory)
Laryngeal region of pharynx			• Laryngeal inlet &Pyriform fossae

The valleculae: location Soft

Palate

	Muscle	Joints /Osteology	Contents
LARYNX ● Phonation ● Sphincteric ● Coughing ● Breath holding	Intrinsic (thyroepiglottic, transverse arytenoid) Extrinsic	● Cricothyroid ● Cricoarytenoid joints ● Thyroid,cricoid, epiglotticlenoid cartilages Arytenoid, corniculate, cuneiform, and tritiates cartelages.	● Recurrent laryngeal nerve ● Cricothyroid membrane lasticus ● Membranes & ligaments ● Cricothyroid membrane

ORBIT AND EYE

	Muscles	Joints	Contents

Structural anatomy of eye	• Superior rectus • Medial rectus • Inferior rectus • Lateral rectus • Superior oblique • Inferior oblique		• Orbital nerves • Optic nerve • Abducens nerve • Anterior cerebral • Ophthalmic • Central retinal arteries • Lacrimal gland. • Deep cervical nodes (pre-auricular & parotid groups)

EAR
STRUCTURAL ANATOMY-EXTERNAL and MIDDLE EAR .
INNER EAR.

Great auricular & Auriculotemporal nerve
Facial & Lesser occipital nerves
Temporomandibular joint

VERTEBRAL COLUMN

Muscles	Joints	Contents
Rectus abdominis Longitudinal extensor muscles Erector spinae	Vertebral joint.	Vertebral canal

SECTION VI-CENTRAL NERVOUS SYSTEM.

Areas	Anatomy

Cerebral hemispheres (Detailed anatomy of sulci and gyri not needed)	Lobes-Frontal,Parietal,Temporal& Occipital Basal nuclei(basal ganglia) White matter Internal capsule Corpus callosum
Cortical areas	• Broca's area • Wernicke's area • Auditory area • Visual area
Cerebral blood supply	The anterior,middle &posterior cerebral arteries Internal carotid artery Middle cerebral artery Anterior cerebral artery Posterior cerebral artery Cerebral venous drainage (details of name and course not required) Arterial circle (of Willis)

- Visual fields and pathways (olfactory and limbic pathways not needed)
- Ventricles

· Thalamus-detailed anatomy (surface & relations) not required

Brainstem	● Nuclei ● Midbrain Parkinson's disease ● Pons ● Medulla oblongata(medial medullary syndrome and lateral medullary (PICA) syndrome)

· Cerebrospinal fluid

· Cerebellum

Spinal cord	Extent,enlargements (cervical & lumbosacral) Spinal nerve roots Internal anatomy white matter tracts,Projectional tracts,division of the cord Cord blood supply

· Cranial nerve lesions

PHYSIOLOGY

The important principle is the *applied* nature of physiology with relevance to emergency medicine

SECTIONS I- BASIC CELLULAR PHYSIOLOGY

II -RESPIRATORY PHYSIOLOGY

III- CARDIOVASCULAR

IV - GASTROINTESTINAL

V - RANAL

VI- ENDOCRINE

SECTION-I BASIC CELLULAR PHYSIOLOGY	
Homeostasis	• Feedback mechanism • Osmosis • Osmolarity and osmolality • ECF and ICF • Plasma contents

Key aspects of cell structure and function	• Mitochondria • Nucleus • Endoplasmic reticulum Golgi apparatus • Lysosomes • Membrane structure and transport.
Vessel fluid dynamics .	• Permeability • Laminar vs turbulent flow Details of Fick's law and Poiseuille's law is NOt required.
Blood and blood flow	• Normal values • Components
Basis of the neurological action potential	• The ionic basis of the action potential • Conduction of the generated action potential

Sympathetic and Parasympathetic nervous systems	• Principles of neurochemical synaptic transmission • Principal effects of autonomic stimulation.
Muscle physiology	• Skeletal muscle • Cardiac muscle Smooth muscle physiology not required.

SECTION- II -RESPIRATORY PHYSIOLOGY	
Lung volumes and pressures	• Tidal volume • Vital capacity • Residual volume • Functional residual capacity • Anatomical and alveolar dead space
Epithelial function and lung compliance .	• Mucociliary clearance • Type I and type II alveolar pneumocytes.

Alveolar interfaces	• FEV(1)/ FVC as a composite measure of function obstructive *vs* restrictive disease • Alveolar diffusion.
Gas transport within the circulation	• Oxygen • Anaemia • HbF • Chloride shift
Control of respiration	• Pontine • Pneumotaxic centre • Medullary receptor groups • Lung receptors • Central and peripheral chemoreceptors • Stretch receptors
Ventilation- perfusion relationship	Va/Q mismatch types

SECTION- III- CARDIOVASCULAR PHYSIOLOGY

Systemic overview

Cardiac Cycle

Cardiac Output

Peripheral Vascular Physiology(Detailed knowledge of the vasoactive enzyme pathways is NOT required

SECTION- IV - GASTROINTESTINAL PHYSIOLOGY

Functional anatomy of the Gastrointestinal (GI) tract and key function

- Structure of the gut wall
- Swallowing
- Esophagus,Stomach,Small intestine, colon
- Intestinal villus
- Sodium pump
- Proteases and carboxypeptidase enzymes
- Absorption of various nutrients
- Pancreas -exocrine pancreatic juice,CCK,secretin
- Liver and Gall bladder-portal triad,bile production and excretion,enterohepatic circulation.
- Large intestine- ileocaecal sphincte ,taeniae coli,chyme
- Na-K-ATPase in water absorption , colonic bacteri,colonic mass movement
- Defecation reflex

SECTION-V - RENAL PHYSIOLOGY

Functional anatomy of the renal tract	• Cortex & medulla • Nephron • Renal blood supply • Afferent and efferent arterioles • Renal autoregulation
Mechanism of filtration in health	• Glomerular filtration-rate(GFR),barriers and factors affecting . • Creatinine clearance ((Cu x V) / Cp) • Tubular transport-primary + secondary active transport • Loop of Henle- countercurrent multiplier and effect of loop diuretics . • Distal collecting system-effect of ADH , PTH and activated Vitamin D.
Regulation of plasma osmolality and Effects of renal hormone	• Regulatory mechanism Hypothalamus,ADH, Thirst -feedback loop • Angiotensin II,ACE ,Aldosterone, ANP.

Acid – base balance and renal regulation	• Arterial blood pH • Henderson-Hasselbach equation • The anion gap • Calculation Metabolic disturbance • ABG • Urinary acidification
Potassium & Calcium balance	• Normal values • Clinical effects of hypo- and hyper- kalaemia • Effect of aldosterone • Sources of calcium. • Effect of PTH in Ca balance

SECTION-VI- ENDOCRINE PHYSIOLOGY

Emphasis is on those aspects of endocrine function most relevant to emergency medicine

Pituitary	• Location in various imaging. • Adeno and neuro hypophysis • hypothalamus and pituitary-relation. • Releasing and Stimulation hormones. • Anterior and posterior pituitary. • diabetes insipidus & SIADH
Adrenals	• Location • Medulla and cortex(mineralo and gluco- corticoids) • Cortisol • Disordered glucocorticoid secretion • Cushing's syndrome • Adrenaline/ noradrenalin (degradation pathways) • Pheochromocy toma
Endocrine pancreas	• Beta and alpha cells • Insulin(receptors & inra cellular signaling paths) and glucagon. • Insulin and non insulin dependent diabetes mellitus.

Thyroid physiology	• Location • T3 and T4 -Transport ,Normal values -binding proteins -concept of 'free' hormone • Effects of disordered function. • Hypo & hyper hypothyroidism.
Calcium and bone physiology	• PTH, calcitonin and vitamin D3 • Effects on kidney+bone +small intestine • Osteoporosis and Osteomalacia

PHARMACOLOGY

GASTRO INTESTINAL		Dyspepsia & GERD ● Antacids ● Antispasmodics ● Ulcer-healing drugs ● PPI-NSAID-associated ulcers ● Omeprazol Acute diarrhoea,Chronic bowel disorders,Laxatives
CARDIOVASCULAR		● Acute coronary syndrome ● Tachy- and brady-arrhythmias ● Acute cardiac failure ● Newer Anticoagulants
Cardiac glycosides		Digoxin,Digoxin-specific antibody
Diuretics	Thiazides	Bendroflumethiazide
	Loop diuretics	Furosemide,Bumetanide
	Osmotic diuretics	Mannitol
Anti-arrhythmics		Adenosine,Amiodarone,Flecainide,Lidocaine

Beta-adrenoceptor blockers		Esmolol,Labetalol,Sotalol
Hypertension & heart failure		• Vasodilators-Sodium nitroprusside • Alpha-blockers • Renin-angiotensin system drugs • ACE inhibitors-Captopril
Nitrates and anti-anginal drugs		• Nitrates-Glyceryl trinitrate • Calcium-channel blockers-Verapamil,Nifedipine ,Nimodipine
Sympathomimetics	Inotropic	Dobutamine,Dopamine
	Vasoconstrictor	
Drugs used in resuscitation		Adrenaline,Amiodarone,Atropine
Anticoagulants	Parenteral	Heparin,low molecular weight heparin,Protamine sulphate

	Antiplatelet drugs	Warfarin
Antiplatelet drugs		Abciximab (GIIb/IIIa inhibitor substance) Aspirin,Clopidogrel
Myocardial infarction & fibrinolysis		Streptokinase,Tenecteplase,Reteplase
Lipid-regulating drugs and Statins		
RESPIRATORY SYSTEM		Focussing on emergency clinical management. Asthma
Selective beta-2 agonists(Bronchodilators)		Salbutamol Terbutaline, Salmeterol (dosage and details not needed)
Antimuscarinics		Ipratropium
Theophylline		Aminophylline
Corticosteroids		Hydrocortisone ,Beclomethasone
Antihistamines		Cetirizine,Chlorpheniramin Physiology of sedative function.

Allergic emergencies	Adrenaline
Oxygen	Intermittent and longer-term oxygen therapy useful in the assessment of ED patients with oxygen-dependent disease.

CENTRAL NERVOUS SYSTEM		
Hypnotics & anxiolytics Withdrawal/limitation in c/c anxiety.		Diazepam,Chlordiazepoxide,Lorazepam
Antipsychotics		Extrapyramidal symptoms
Antimanic drugs		Lithium
Tricyclic antidepressants		Amitryptiline
Drugs used in nausea & vertigo		Antihistamines,Cyclizine,Phenothiazines Prochlorperazine,Metoclopramide
Analgesics	Non opioid	Aspirin,Paracetamol

	Opioid	Morphine salts,Codeine phosphate, Tramadol.
Antiepileptics		Carbamazepine,Phenytoin,Valproate
Status epilepticus		Lorazepam, diazepam & midazolam Phenytoin,Paraldehyde.
INFECTIONS 1)Antibacterial drugs		
Penicillins Mechanism of action/allergy or atopy.		Benzylpenicillin,Phenoxymethylpenicillin Flucloxacillin,Amoxicillin,Ampicillin
Cephalosporins		Cefalexin,Cefotaxime,Ceftriaxone,Cefuroxim
Tetracyclines		Chlamydia and Lyme disease Doxycycline
Aminoglycosides		Gentamicin Monitoring of serum concentration.
Macrolides		Erythromycin
Other antibiotic agents		Chloramphenicol (eye preparations) Fusidic acid,Vancomycin.Metronidazole.

Management of tuberculosis	phases.
Urinary tract infections	Trimethoprim
Quinolones	Ciprofloxacin
2)Antifungal preparations	Nystatin
Herpesvirus infections	1.Herpes simplex & varicella-zoster 2.HSV-1 and HSV-2(neonatal & pregnancy) Acyclovir
Antimalarials	Falciparum malaria. Quinine or Malarone.The implications for management in pregnant patients.
ENDOCRINE SYSTEM	
Diabetes	Insulin,OHAs Treatment of hypoglycaemia,Glucagon
Thyroid disease	Thyroid hormones and antithyroid drugs
Corticosteroids	Glucocorticoids-Prednisolone,Hydrocortisone Other endocrine drugs and agents.
Oral preparations	Oral rehydration therapy "Dioralyte"

Fluids and electrolytes	Parenteral preparations-IV replacement therapy Sodium,chlorideHartmann's Glucose,KCl mixtures,Sodium bicarbonate Albumin,Gelatin.
Vitamin B	Thiamine Wernicke's and Korsakoff's
MUSCULOSKELETAL SYSTEM	
Nonsteroidal anti-inflammatory drugs	Ibuprofen,Naproxen,DiClofenac,Mefenamic acid
Corticosteroids	Systemic & Local
Gout & hyperuricemia	Colchicine
IMMUNOLOGIC AGENTS AND VACCINES	Active and passive immunity.
Passive Immunity	Immunoglobulins-normal & specific(indication) Anti-D Ig

Specific vaccines and preparations United kingdom immunization schedule.	BCG,Diphtheria,H- influenzae type B (Hib) Hepatitis A&B,MMR(Measles, mumps & rubella) Meningococcal,Pertussis and Poliomyelitis Rabies & Tetanus vaccines
ANESTHESIA	Induction profile, common side-effects and contra-indications.
Intravenous agents	Thiopental sodium,Etomidate,Propofol,Ketamine
Inhalational agents	Nitrous oxide
Sedatives and analgesics	Diazepam,Lorazepam,Midazolam
Muscle relaxants	Atracurium,Suxamethonium
Antagonist agents	Naloxone
Local anesthesia	Lidocaine,EMLA,Bupivacaine,Prilocaine.

MICROBIOLOGY

inciples of microbiology-
I-Natural and innate immunity-Barriers to infection,Normal bacterial flora,Phagocytes and complement.

II- Mechanisms of disease-Mechanisms of attachment, invasion and istence,Tetanus toxin
-Controlling infection-Endogenous and exogenous infection sources,How infection ad Hospital-acquired infection & Control
rinciples of investigation-Specimen culture,Specimen examination,Serology,Molecular hiques.
rinciples of immunization-Normal childhood immunization schedule,Additional unizatio

pathogen groups
otococci and Staphylococci, Tuberculosis,Clostridial infection *(difficile, perfringens and i)*
seria (*gonorrhea, meningitidis),*Pertussis,Klebsiella and enter bacteriae (*SalmonellaEscherichia*
n-negative gastrointestinal disease (*Helicobacter i,Campylobacter),*Legionella,Pseudomonas Chlamydia,Herpes simplex and er,HIV,Hepatitis, Measles, mumps, rubella
piratory viruses (RhinovirusInfluenza, parainfluenza, RSV)Gastrointestinal ses(Rotavirus,Norovirus),Yeasts and gi(Candida,Cryptococcus,Dermatophytes)

ms(Threadworm,Tapeworms (pork & beef),Roundworms and kworms),Malaria .

PATHOLOGY

A-Inflammatory response	CRP,Rheumatoid factors,ANF
B-Immune response	Hypersensitivity (Anaphylaxis & Anaphylactoid reactions)
C-Infection	Upper & Lower respiratory tract & pneumonia Meningitis & encephalitis Myocarditis & endocarditis Hepatitis,Gastroenteritis,UTI STD ,PID,Cellulitis Infection of bones & joints AIDS PUO

	Malaria,Fungal infection
D-Wound healing	• General principles • Skin,Tendon,Peripheral nerve,Bone,Myocardial, Brain
Hematology	• Anemia • Leukaemia • Lymphoma and myeloma • Coagulation

The above sections in the syllabus are applicable to applied basic sciences

SYLLABUS

1.PREHOSPITAL CARE	Emergency Medical Services and organization (administration, structure, staffing, resources)
	Prehospital Equipment and Medical transport (including neonates and children, air transport)

	Paramedic training and function
	Collaboration with other emergency services (e.g. police, fire department)
	Mass Gatherings, Safety at the scene

2.RESUSCITATION	Sudden cardiac death
	Approach to non traumatic shock
	Approach to traumatic shock
	Anaphylaxis
	Acid base disorders
	Pulse Oximetry and Capnography
	Fluids and electrolytes
	ECG,Arrhythmia,anti arrhythmic drugs, vasopressors and ionotropes
	Hyperbaric oxygen therapy
	Basic life support and Advanced cardiac life support
	Defibrillation, Electrical and medical cardioversion, Cardiac pacing

	Airway:anatomy,physiology and pathophysiology, Difficult airway assessment;Difficult airway management
	Noninvasive airway management and supraglottic airway devices,Tracheal intubation, mechanical ventilation, surgical airway management Vascular access(Central venous, arterial lines, intraosseous acesses)
	Massive blood transfusion protocols
	Wound management

3.FORENSIC ISSUES	Medico-legal documentation (road traffic accident, assault, snake bite, sexual assault, burns,suicide etc)
	Recognise , preserve evidence and Provide appropriate medical documentation (forensic and clinical photography, collection of biological samples, ballistics)
	Appropriate reporting and referrals (e.g. child abuse neglect, gunshot and other forms of penetrating wounds, elder abuse, sexual assault allegations)

4.DISASTER MANAGEMENT	Disaster Preparedness and Triage
	Natural Disasters

	Bomb blast and Crush Injuries
	Chemical Injuries, radiation injuries

5.PSYCHO-SOCIAL PROBLEMS	Social wellbeing of specific populations
	Patients with social issues
	Frequent visitors and social care following discharge

6.ANALGESIA AND SEDATION	Acute pain and Chronic pain management- analgesics
	Local and regional anesthesia
	Procedural sedation adult and children

7.CARDIAC EMERGENCIES	Acute chest pain evaluation, Acute coronary syndrome and management
	Carcinogenic shock, Acute heart failure
	Hypertensive emergencies and urgency and its complications
	Aortic dissection/Aneurysm rupture,
	Deep vein thrombosis ,Pulmonary embolism, Acute arterial occlusion disease,Thrombophlebitis
	Pulmonary hypertension,Cardiogenic and Noncardiogenic pulmonary edema
	Syncope
	Pericarditis

8.PULMONARY EMERGENCIES	Upper respiratory tract infections
	Acute Respiratory distress syndrome and its management
	Community acquired pneumonia , aspiration pneumonia, Lung emphysema and abscess, Tuberculosis
	Obstructive airway disease and management; Acute asthma Chronic obstructive pulmonary disease.
	Restrictive airway disease; interstitial lung disease, and fibrosis
	Spontaneous pneumothorax and pleural effusion

9.GASTROINTESTINAL EMERGENCIES	Acute pain abdomen , Nausea , vomiting, diarrhea and constipation causes and management in er
	Upper and lower gastrointestinal bleeding causes and management
	Acute Pancreatitis and Cholecystitis-complication and management
	Acute and chronic liver disorders
	Acute appendicitis, Bowel obstruction, hernias
	Ano-rectal diseases- hemorrhoids, fissure in ano, rectal prolapse
	Gastrointestinal procedures and complications

10.UPPER AND LOWER URINARY TRACT DISEASE	Acute and Chronic kidney disease, Renal replacement therapy and its advantages and complications
	Rhabdomyolysis:-Causes, complication and management

	Urinary tract infection and complications.Hematuria-causes and management in er, Acute urinary retention management
	Renal and ureteric calculi- complication and management
	Male genital problems- phimosis, paraphimosis,urethral stricture , testicular torsion , fournier's gangrene , priapism, epididymitis
	Genitourinary procedures and complication

11.GYNAECOLOGICAL AND OBSTETRIC DISORDERS	Abnormal uterine bleeding causes and management
	Ectopic pregnancy and emergencies in first 20 weeks of pregnancy;Spontaneous abortion classification and management
	Maternal emergencies after 20 weeks of pregnancy antepartum hemorrhage, Placenta previa
	Disorders during pregnancy:Pregnancy induced hypertension, eclampsia, HELLP syndrome, hyperemesis gravidarum
	Emergency delivery

	Pelvic inflammatory disease
	Breast disorders
	Complication of gynecological procedures
	Cardiac arrest in pregnancy

12.PEDIATRIC EMERGENCIES	Resuscitation in newborn and children
	Primary assessment in sick child
	Neonatal and pediatric transport
	Intubation and mechanical ventilation. Vascular access in infants and children
	Pain management and procedural sedation in infants and children
	Neonatal emergencies and common problems, Brief resolved unexplained reason and apparent life threatening events, Sudden infants death syndrome
	Fever in infants and children-causes and management
	Ear ,eyes, nose, Mouth and throat disorders in infants and children.
	Stridor:Croup, Epiglottitis, Foreign bodies, Retropharyngeal abscess ,Diphtheria. Wheezing- asthma, bronchiolitis. Pneumonia in infants and children

	Syncope, Dysrhythmias, and ECG Interpretation in Children
	Congenital and Acquired Pediatric Heart Disease
	Headache,seizure, altered mental status in infants and children
	Meningitis in infants and children
	Vomiting, Diarrhea, Dehydration Fluid and Electrolyte Therapy
	Pain abdomen, gastrointestinal bleeding, in infants and children
	Pediatric renal, urology and genital tract diseases
	Pediatric and infants oncology and hematology emergencies
	Metabolic emergencies in infants and children
	The limping child
	Pediatric trauma

13.NEUROLOGICAL EMERGENCIES	Headache evaluation and management
	Spontaneous Subarachnoid and Intracerebral Hemorrhage
	Acute stroke syndrome
	Altered mental status, coma, ataxia and gait disturbance
	Seizure and status epilepticus
	Vertigo

	Central nervous system and spinal infections
	Central nervous system procedure , devices and complications

14.INFECTIOUS DISEASES	Sepsis: Causes, Recent sepsis guidelines, management
	Soft tissue infection: Cellulitis, Erysipelas, Cutaneous abscess ,Furuncles,Carbuncles Sexually transmitted disease:Chlamydial infection,Gonococcal infections,Syphilis,Herpes simplex virus,Chancroid, Human immunodeficiency virus
	Viral infections:Herpes simplex, Herpes zoster,Measles
	Infective Endocarditis
	Tetanus
	Rabies
	Malaria
	Food, waterborne, zoonotic , traveler s infection

15.TOXICOLOGY	Toxidromes and General management of poisoning
	Cyclic Antidepressants
	Atypical and Serotonergic Antidepressants
	Monoamine Oxidase Inhibitors
	Lithium

	Barbiturates,Benzodiazepines and Non Benzodiazepine Sedatives
	Opioids
	Cocaine and Amphetamines
	Acetaminophen
	Digitalis Glycosides
	Beta blockers and calcium channel blockers
	Caustic ingestion
	Pesticides- organophosphorus,pyrethrins, rodenticides
	Anticholinergics
	Carbon monoxide poisoning

16.ENVIRONMENTAL EMERGENCIES	Cold injuries, hypothermia, heat emergencies
	High altitude disorders
	Electrical and lightning injuries
	Drowning
	Snake bites
	Burns

17.ENDOCRINOLOGY	Type 1 and 2 diabetes mellitus, Diabetic ketoacidosis Hyperosmolar Hyperglycemic State

	Thyroid disorders and emergencies (myxedema, thyroid storm)
	Adrenal insufficiency

18.EYES EAR, NOSE, THROAT, ORAL AND NECK EMERGENCIES IN ADULTS	Inflammatory and Infectious disorders- conjunctivitis, dacryocystitis, 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 hemorrhage,retinal detachment
	Acute glaucoma
	Ear ,nose, eye Bleeding
	Foreign bodies ear, nose oral cavity and throat
	Complications of tumor and airway obstruction

	Inflammatory and Infectious disorders angio-oedema, epiglottitis, laryngitis, peritonsillar abscess
	Complication of ocular, ear and airway devices

19.HEMATOLOGY AND ONCOLOGY EMERGENCIES IN ADULTS	Anemia
	Bleeding disorders and Clotting disorders
	Hemophilia and Von Willibrand's disease
	Thrombolytic and antithrombotic drugs
	Emergency complications of malignancy Transfusion reactions

20.MUSCULOSKELETAL 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
	Tumors: pathological fractures

21.IMMUNOLOGICAL EMERGENCIES IN ADULTS AND CHILDREN	Allergies and anaphylaxis
	Inflammatory and Infectious disorders
	Acute complications of vasculitis

22.PSYCHIATRIC AND BEHAVIORAL DISORDERS	Behavior 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

23.TRAUMA IN ADULTS	Origin of trauma;burns, blunt trauma, penetrating trauma
	Polytrauma patient- head injury, spinal trauma, trauma to the neck, trauma chest, trauma to the extremities, abdominal trauma
	Trauma in specific populations: children, elderly, pregnant women.

24.ABUSE AND ASSAULT IN ADULTS AND CHILDREN	Abuse in the elderly, intimate partners and child
	Sexual assault

	Patient safety , Violence and prevention management in the Emergency Department

25.SPECIAL SITUATIONS	Injection drug users
	The transplant patient
	Morbid obesity
	Transgender patient
	Palliative Care
	Military Medicine
	Death Notification and advance directives
	Legal Issues in Emergency Medicine

CLINICAL PROCEDURES	
1	Cardio-pulmonary resuscitation procedures
2	Assessment of breathing and ventilation techniques, oxygen therapy, Non-invasive ventilation techniques
3	Airway management- Bag-mask-valve ventilation Invasive ventilation techniques- Insertion of oropharyngeal and nasopharyngeal airway, endotracheal intubation surgical airway (trecheostomy)
4	Insertion and replacement of tracheostomy tube
5	Rapid sequence intubation, Delayed sequence intubation, Difficult airway management algorithm
6	Interpretation of arterial blood gas analysis bg and capnography
7	ECG interpretation , administration of fluids including blood and blood products
8	Treatment and prevention of hyper- and hypothermia (Cooling techniques, Warming techniques)
9	Thoracocentesis (Chest tube insertion)
10	Pain assessment and management in emergency- Procedural sedation, local, topical and regional anesthesia techniques.
11	Medical cardioversion, Defibrillation , Cardiac pacing
12	Emergency pericardiocentesis
13	Peripheral venous access, arterial, and central venous catheterisation, Intraosseous access

14	Interpretation of x rays, ct , mri , neuro imagings, ultrasound
15	Extended Focused Assessment of Sonography in Trauma (E FAST), Emergency Ultrasound, Echocardiogram
16	Nasal pack application
17	Insertion of nasogastric tube**,** Gastric lavage, insertion of ureteral catheter, Suprapubic cystostomy
18	Log roll, spine Immobilization, Fracture immobilization , Splinting, Reduction of joint dislocation, Aseptic joint aspiration
19	Evaluation of consciousness including the Glasgow Coma Scale, AVPU
20	Fundoscopy, Slit lamp use
21	Foreign body removal from the eye, Lateral canthotomy
22	Testicular torsion reduction
23	Proctoscopy , Vaginal examination using speculum
24	Lumbar puncture
25	Emergency delivery
26	Abscess incision and drainage**,** suturing , wound irrigation and closure

V. LOG BOOK:

The logbook should show all the documentation of all the cases and procedures mentioned in the curriculum which was seen and performed by the candidate in detail.

The candidate will maintain the record of all academic activities undertaken by him/her in a logbook.

The log book should contain:

1..Personal profile of candidate

2. Educational qualification data

3.Tutorial-Documentation of all classes attended by the candidate

4. Procedures-Documentation of Procedures done by the candidate under the

supervision and individually

5. Documentation of case histories and assessment conducted by the candidate(15 cases) Three case histories pertaining to predominantly Medical problems,3 predominantly Surgical, 2 pediatrics, 3 trauma while the rest 4 may pertain to other disciplines like Obstetrics andGynecology,Ophthalmology,ENT,Dermatology,Psychiatry etc.

6 Documentation of the clinical rotational postings

7. Documentation of seminars conducted by the candidates

8. Documentation of all the training classes attended by the candidate in detail

(NBLS,NCLS, ATLS, PALS, NALS, POCUS)

9. Thesis summary of the candidate

10. Documentation of all the conferences, webinars, workshops and continuing

medical education attended by the candidate

Dissertation

Guidelines for Submission of Thesis/Dissertation by candidates

Research shall form an integral part of the education programme of all candidates registered

for CCT EM.

The Basic aim of requiring the candidates to write a thesis/dissertation is to familiarize him/her with research methodology. The trainee shall be required to undertake research and write papers under the guidance of a consultant.

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 original and cost effective.

a. The dissertation/thesis shall be in a bound volume of minimum of 50 pages and not exceeding 100 pages of typed matter (Double line spacing and on one side only) excluding certification, acknowledgements, annexures and bibliography.
b. Soft copy of the completed dissertation should be submitted three months prior to the examination. Soft copy should be sent to research@semi.org.in and shall be evaluated by the Research committee. Candidate should complete the reviews suggested before appearing for the examination.
c. Acceptance of the dissertation is a prerequisite for appearing in the Theory Examination

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

- Statistical methods used for analyses should described in detail.

B. Thesis Submission

1. As per norms, writing a thesis is essential for all CCT EM candidates towards partial
fulfillment of eligibility for award of CCT EM certificate.

2. The protocol of Thesis/ Dissertation should be submitted to the SEMI office of the
through head of the institutions within four months of joining the training in the 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/program directors

4.CCT EM candidates are required to submit their thesis before the cut off date which shall be 3 months before the final theory examination.

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.

6. A declaration of thesis work being bonafide in nature and done by the candidate

himself at the institute of 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,the academic board 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 the board

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.

CCT EM Examination

An examination in Emergency Medicine which confirms successful completion of specialty training in mastering Emergency Medicine in accordance with this curriculum

The examinations are conducted in January and June/July

CCTEM Examination Pattern

Part-1	Applied Basic Sciences	It's a Theory Exam of 3 hours duration
Part-2	Final Year – Theory	Candidate must appear for the Theory Exam, and it will be held for three consecutive days.The exams are based on Medical,Surgical and Pediatric Emergencies The duration of exam on each day would be for 3 hours
Part-3	Final Year – Practical	Candidate must appear for Clinical based assessment, and it will be held after the conduct of theory exams

PART I

Paper 1 - Applied Basic Sciences

20 Short Notes x 5 = 100 marks

PART II

Paper 2– Surgical Emergencies:

[2 Main Questions of 15 marks each and 10 Short Answer Questions (SAQs) x 7 = 100 Marks]

i. Gastrointestinal Emergencies
ii. Obstetric & Gynaecologic Emergencies
iii. Trauma & Orthopaedic Emergencies
iv. ENT & Maxillofacial Emergencies
v. Pain & Anaesthesia
vi. Haematological & Oncology emergencies
vii. Environmental Emergencies

Paper 3 – Medical Emergencies:

[2 Main Questions of 15 marks each and 10 Short Answer Questions (SAQs) x 7 = 100 Marks]

i. Cardiac Emergencies
ii. Respiratory Emergencies
iii. Neurological Emergencies
iv. Renal & Electrolyte Emergencies
v. Endocrine Emergencies
vi. Infectious Diseases & Sepsis
vii. Toxicology & Poisoning
viii. Resuscitation
ix. Psychiatric & Medico Legal Emergencies
x. Dermatology & Rheumatology

Paper 4: **Pediatric Emergencies:**

[2 Main Questions of 15 marks each and 10 Short Answer Questions (SAQs) x 7 = 100 Marks]

NOTE: A minimum of 50% marks are required to pass in theory examination in each paper.

PART 3 – Practical Assessment:

Total Marks – 200 Marks

Sl.no	Name of the Student	Long case 50	Short case 25	Short case 25	Spotters 15	Drugs 15	Instruments 15	Mega code 15	Logbook 10	Thesis 10	Grand viva 20	Total 200 marks
1	Student											
2	Student											

NOTE: A minimum of 50% marks are required to pass the practical examination in each paper.

VI .RECOMMENDED BOOKS AND JOURNALS

Recommended Text Books

1. Emergency Medicine: a comprehensive study guide. Tintilli, J et al, New York: McGraw- Hill
2. Emergency Medicine (latest edition) Anthony FT Brown, Michael D Cadgan, London, Hodder Arnold
3. 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
4. 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
5. Text book of pediatric Emergency Medicine (Latest edition) Peter Cameron, George Jelinek, Ian Everitt, Gary Browne, Jeremy Raftos. London, Churchill Livingstone.
6. Textbook of Adult Emergency Medicine, Edinburgh: Churchill Livingstone.
7. Rosen's textbook of emergency Medicine
8. Accident & Emergency Radiology, A survival guide- Nigel Raby
9. Harwood-Nuss' Clinical Practice of Emergency Medicine, Wolfson, A (Editor), New York: Lippincott, Williams & Wilkins.
10. Textbook of Emergency Medicine, David, S (Editor), New York: Lippincott, Williams & Wilkins.
11. Goldfrank's Toxilogic Emergencies, Nelson, L et al., New York: McGraw-Hill.
12. Modern Medical Toxicology, Pillay, V.V.
13. Textbook of Critical Care, Fink, M (Editor): Philadelphia, Elsevier Saunders.
14. ECG For Emergency Physician, Mattu and Brady (Editors), London: BMJ Publishing.
15. An Introduction to Clinical Emergency Medicine, Mahadevan, S.V. (Editor), New York: Cambridge University Press.
16. American Heart Association Basic Life Support, Advanced Cardiovascular Life Support and Pediatric Life Support manuals

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

JOURNALS

1. National Journal of Emergency Medicine published by SEM
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. Emergency Medicine Journal
8. Emergency Medicine Australasia
9. National Journal of Emergency Medicine published by SEMI
10. American Heart Association journal, Circulation
11. The journal of Emergency Medicine- Elsevier

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 Graphics

Society for Emergency Medicine India

HEAD OFFICE ADDRESS
Society for Emergency Medicine India
4th floor, Apollo Health City, Jubilee Hills
Hyderabad – 500033

Head Office Secretary – Mr. Sayeed B A

Email: headoffice@semi.org.in