



CIPACA
24 Hrs Emergency & ICU Services



MRCCP

MASTERS IN RURAL CRITICAL CARE MEDICINE PROGRAM

PROSPECTUS



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MASTERS IN RURAL CRITICAL CARE MEDICINE PROGRAM (MRCCP)

CURRICULUM

2021-22

Submitted By:
CIPACA Foundation

The perception of Rural Critical Care Medicine is a matrix of specialties and super specialties under one umbrella. This department not only caters to medical & surgical emergencies but also functions as a marketing window of the hospital with qualities of kind and humble reception, good counseling tactics and aggressive resuscitation in the emergency room, in the ambulance and all over the hospital even at odd hours for saving lives.

Unlike other departments, this specialty has to be on its toes for 24 hours and 7 days a week. An emergency and Critical care giver can't wait for investigations and many at time have to initiate the treatment even before coming to a final diagnosis in order to save precious lives.

To have a successful Critical Care & emergency medicine department, physicians must have sharp and smart reflexes with adequate skills and knowledge.

Emergency room is an unpredictable place where at any given point in time, you may have a torrential case flow.

Even 30 patients can be managed well in the ward by a single doctor where as a single critically ill patient may require a team of doctors until stabilized and shifted. Hence the requirement of manpower in terms of doctors and paramedics is more in this specialty.

There have been efforts from CIPACA with the objective to revise, update & standardize the PG course in Rural Critical Care and emergency medicine. This will consequently produce an environment where in better Critical Care is being rendered to one and all in need of it.

This is a collective opinion obtained from member institutions of the CIPACA, and various eminent Critical Care & emergency physicians all over the globe.

We on behalf of the organizing committee thank all Critical care & emergency physicians

who in spite of their busy schedule made this venture successful by offering their valuable inputs.





ORGANIZATION / INSTITUTE PROFILE

CIPACA Foundation is a team of doctors, nurses, medical and paramedical professionals specialized in establishing tertiary level Multidisciplinary Critical care units, specially designed to cater semi-urban and rural areas.

In India 70 percent of population resides in rural areas & suburbs, whereas more than 70 percent of the specialist doctors are located in metropolitan cities. In our country approximately 80% of the tertiary care level ICU beds are available only in metropolitan cities.

CIPACA Foundation strives to bridge this gap by making the best Critical Care available to the patients across hospitals of different levels by setting up, maintaining and managing ICUs with International standards. For rural areas, CIPACA provides Remote monitoring & Tele ICU services.

MISSION

To make the best Critical Care available to every patient in the hospitals of rural and Suburb regions.

OBJECTIVES

To collaborate with hospitals of different levels and provide customized solutions for setting up and management of Emergency and ICU services.

To deliver the best critical care and to avert every preventable complication while managing ICU patients.

To create Multi-Disciplinary ICU teams providing 24X7 services effectively handling complex problems like Sepsis, Traumatic Brain Injury, Cerebral Hemorrhage, Myocardial Infraction, Heart Failure, Severe Pneumonia, Acute Respiratory Failure, Acute Pancreatic, Liver Failure, Renal Failure etc.



WE PROMISE TO PROTECT YOUR RIGHT

Accessibility to life-saving critical care is every citizen's right and it should be provided equally to every sick patient whether urban or rural.

At CIPACA, we believe that each critically ill patient must receive an individualized care from a specialized ICU team, even in rural setting.

That is why, every ICU-designed, managed or remotely monitored by CIPACA will offer the best chance for recovery of critically ill patient.

To achieve this Mission, CIPACA Foundation has constituted a committee to form a Post Graduate course of Masters in Critical Care Medicine Program in collaboration with British Association of Physicians of Indian Origin (BAPIO).

THE OBJECTIVES OF THE COMMITTEE

- 1) Study the curriculum being followed by various institutions for PG course in Critical Care Medicine in India, USA, UK & Australia.
- 2) Standardize and recommend a course curriculum for PG course in Critical Care Medicine.
- 3) Develop a document enlisting guideline for teaching post-graduate course in Critical Care Medicine.
- 4) Formulate recommendations of the developed module to the institutions conducting / likely to conduct PG course in Critical Care Medicine.



CURRICULUM FOR MRCCP

INTRODUCTION

GENERAL GOALS OF THE RESIDENCY TEACHING CUM TRAINING PROGRAM



The main goal of the training program is to produce Rural Critical Care physicians with the necessary knowledge, skill and attitude to diagnose and manage in an effective manner, a wide range of clinical problems in Critical Care medicine as seen in the community or in secondary and or in tertiary care setting. Special emphasis is placed on the relatively common emergencies and treatable disorders. Possession of clinical skills, required for making a diagnosis is given utmost importance.



SPECIFIC AIMS AND OBJECTIVES OF MRCCP

After three years of training under this post graduate program, a resident is expected to acquire the following knowledge, skills and competencies:

1. A thorough knowledge of pathological abnormalities, clinical manifestations, and principles of management of a large variety of medical and surgical emergencies & critical care of pediatrics, adults and geriatrics,
2. 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.
3. Skill and competence in critical care and emergency interventions like endotracheal intubation, needle cricothyroidotomy, tracheostomy, needle thorococentesis, Intercostal drain placement, pericardio centesis, defibrillation, so on and so forth.
4. 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.
5. Skill and competence to choose and interpret correctly the results of specialized investigations including radiologic, ultra sonographic, biochemical, hemo dynamic, Electro cardio graphic electro physiological, pulmonary functional, hematological,



SPECIFIC AIMS AND OBJECTIVES OF MRCCP

- immunological, nuclear isotope scanning and arterial blood gas analysis results.
6. Skill and competence to provide consultation to other medical and surgical specialties and sub-specialties, whenever needed.
 7. Skill and competence to function effectively in varied clinical settings, namely emergency / critical care, ambulatory care, out-patient clinic, in-patient wards.
 8. 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.
 9. 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.
 10. 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.
 11. Skill and competence to understand research methodology in critical care & 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.
 12. Skill and competence to work cohesively in resuscitation team along with paramedical personnel and maintain discipline and healthy interaction with the colleagues.
 13. 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 Critical Care & Emergency medicine.
 14. Roles and responsibilities that can be taken up by the candidate after the successful completion of the course: To be an effective team player in a tertiary care level ICU team.



OVERVIEW OF THE CURRICULUM

This course is structured for 3 years

I Year	Applied Basic Sciences & General Principles of Rural Critical Care
II Year	Specialty Critical Care
III Year	Recent Advances, policy making protocol establishment, ICU auditing and quality improvement in Critical Care



Exam Pattern

Students will be evaluated throughout their postings on

1. Their ability to care for the critically ill & Emergency medicine – clinical knowledge, procedural skills, decision making, team spirit, resuscitation skills.
2. Their interaction with patients & attendants
3. Their interaction with residents, other staff members
4. Teaching skills
5. Ethical aspects in critical care & Emergency Medicine

Assessment:

Candidates are eligible for 1st year exam only if they provide

1. Log Book for 1st year

2. BLS & ACLS/ALS workshop Certificate – 1
3. Hemo-dynamic workshop Certificate- 1
4. Airway Management workshop Certificate – 1

Candidates are eligible for 3rd year final exam only if they provide

1. Log book for 3 years
2. Regional/ National Conference Certificate – 1
3. International Conference Certificate – 1
4. ATLS course workshop Certificate – 1
5. Mechanical Ventilation Workshop Certificate – 1
6. Critical Care refresher course – 1
7. Thesis – must be submitted 6 months before the examination
8. Oral presentation / Poster Presentation in National Conference -1
9. 90% attendance



DETAILS OF THE CURRICULUM

Assessment:

First Year (Internal Assessment)

Total: 200 marks (Pass: 50% 1st Class: 75%, Distinction: 90%)

Theory: 180 marks (Each right answer – 1 marks)

Paper1: Maximum 180 marks – 180 Objective type MCQs – 180 mins-

Section 1: Basic Sciences (60 questions)

Section 2: Medical/ Surgical Emergencies (60 questions)

Section 3: General Principles of Rural Critical Care (60 questions)

Viva - 20 marks

Third Year (Final Exam – external exam)

Total: 500 marks (Pass: 50% 1st Class: 75% Distinction: 90%)

Theory: 300 marks

Paper1: 10 questions 10 x 10 = 100 marks - 180 mins – Basic Sciences

Paper2: 10 questions 10 x 10 = 100 marks – 180 mins – Specialty critical Care.

Paper3: 10 questions 10 x 10 = 100 marks – 180 mins - Recent advances, Policy making protocol

Thesis: 25 marks

Establishment, ICU auditing and quality improvement in Critical Care

Practical: 200 marks

1 Long case: 50 marks – 1 major system

2 short cases: 25 marks each- total 50 marks

Viva: 50 marks (5 Stations - each 10 marks) Log book: 25 marks





1st Year - Applied Basic Sciences & General Principles of Rural Critical Care

1. Nerve & Muscle Cell Physiology Nerve Cells 1 year - Applied Basic Sciences & General Principles of Rural Critical Care

- Neuromuscular transmission
- Excitation & Conduction
- Action Potential Of Skeletal & Cardiac Muscle.
- Pacemaker of Heart
- Specialized Conduction System of Heart
- Touch proprioception & temperature
- EEG
- Autonomic nervous System

2. Circulation

- ECG Normal & Abnormal
- Cardiac Cycle
- Cardiac Cycle
- Cerebral circulation
- Circle of Willis
- Coronary Circulation
- Heart failure
- Shock
- Hypertension
- Frank Starling law

- Poiseuille's law
- Long QT syndrome
- Invasive & non Invasive pressure monitoring

3. CNS

- Central venous pressure monitoring
- Pulmonary capillary wedge pressure monitoring
- Blood supply to brain
- CSF & its circulation
- Blood Brain Barrier
- Pyramidal Tract
- Pain pathway
- EEG
- Autonomic disturbances
- Reflexes
- Sensory & motor pathway
- Intra cranial pressure monitoring
- Assessment of Cranial nerves

4. GIT

- Gastrointestinal hormones
- Liver & biliary system
- Exocrine portion of pancreas
- Gastric motility & emptying
- Liver function Test
- Abdominal pressure monitoring

5. Blood

- Normal values for cellular elements in blood
- Platelet/ RBC/ WBC
- Blood Grouping & Typing
- Transfusion reactions
- Plasma Proteins
- Clotting Factors
- Anti-clotting factors
- Caloric metric estimation of HB %

6. Fluid & Electrolyte therapy

- Metabolic Acidosis & Alkalosis
- Respiratory Acidosis & Alkalosis
- Blood gas Analysis
- Hyper & Hyponatremia
- Hyper & Hypokalemia
- Calcium / Magnesium / Phosphate & other trace elements

7. Kidney/ Renal Physiology

- Properties of gas
- Gas exchange in lungs
- Physiology of respiration
- Hypoxia & its forms
- Oxygen treatment
- Hypercapnia & Hypocapnia
- Artificial Respiration
- Lung function test
- Oxygen transport
- Oxygen-hemoglobin dissociation curve
- Respiratory centre
- Dyspnea
- Orthopnea
- Pulse oximetry
- ETCO₂ monitoring
- Respiratory variations (Types of breathing)
- Bohr Effect
- Haldane Effect
- Oxygen therapy & Mechanical Ventilation



8. Musculoskeletal

- GFR – Glomerular filtration rate
- RBF – Renal blood flow
- Renal Circulation
- Regulation of potassium excretion
- Diuretics
- Counter current mechanism
- Uremia & Symptoms
- Creatinine clearance

9. Musculoskeletal

- Functions of the skin
- Compartment pressure monitoring

10. Miscellaneous

- Methods of core temperature monitoring
- Fever & thermo regulation (Role of Hypothalamus)
- Vitals monitoring

11. Cardiovascular Problems

- Acute Myocardial infarction
- Acute heart failure
- Pericardial diseases
- Congenital heart disease
- Ischemic heart disease
- Endocarditis
- Myocarditis



12. Sepsis, severe sepsis and multiple organ dysfunction syndrome

13. Basics of Trauma

- Traumatic brain and spine injury
- Thoracic trauma
- Abdominal and pelvic injury
- Disaster management
- Transport of a Polytrauma patient

14. Radiology

- X rays
- CT & MRI
- Bedside USG and ECHO in ICU

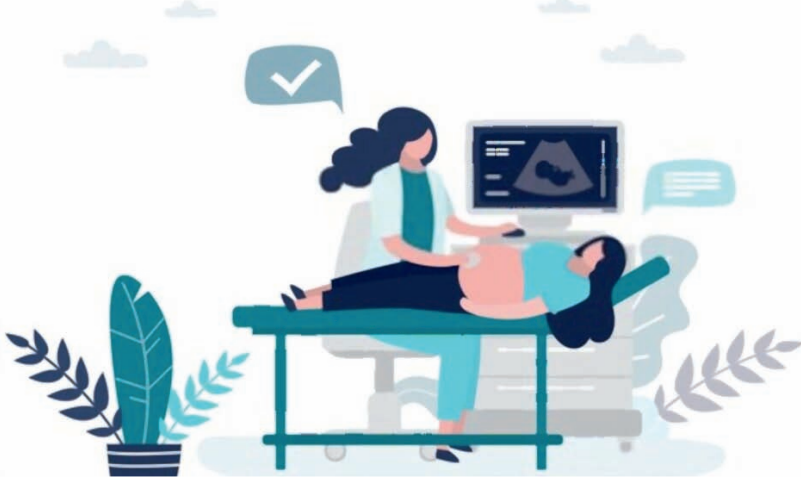
15. Basics of daily care of ICU patient

- Sedation and Analgesia in ICU
- Nutrition and Ulcer prophylaxis
- Coagulation and DVT prophylaxis
- Glycemic control
- Severity assessment & Prognostication

16. Minimally invasive Monitoring

- Routine Monitoring of Critically Ill Patients
- Indirect Calorimetry
- Minimally Invasive Cardiology
- Neurologic and Intracranial Pressure Monitoring
- Echocardiography in the Intensive Care Unit
- Monitoring Gastrointestinal Tract Function
- Respiratory Monitoring during mechanical Ventilation





17. Procedures & Techniques:

- Bag mask ventilation,
- LMA and multilumenesophageal airway insertion,
- Oropharangeal and nasopharyngeal airway,
- Cricothyroidotomy,
- Percutaneous tracheostomy,
- Endo tracheal intubation and advanced airway management,
- Decompression of pneumothorax,
- Thoracentesis,
- Intercostal drainage tube placement,
- Bronchoscopy,
- Peripheral IV access,
- Central Venous Catheters
- Arterial Line Placement and Care
- Arterial puncture for Blood Gas Analysis
- Nasojejunal tube placement,
- Abdominal paracentesis,
- Suprapubic catheterization,
- Hemodialysis,
- CRRT,
- Ultrasonography & Echocardiography.
- Gastrointestinal Endoscopy
- Paracentesis and Diagnostic Peritoneal Lavage
- Gastroesophageal Balloon Tamponade for Acute Variceal Hemorrhage
- Pulmonary Artery Catheters
- ABG sampling,
- Central Vascular access,
- CVP monitoring,
- Invasive hemodynamic monitoring,
- Cardiopulmonary resuscitation,
- Temporary Cardiac Pacing
- Basics of ECG,
- Rhythm recognition,
- Defibrillation and cardio version,
- Pericardiocentesis
- Chest Tube Insertion and Care
- NG tube insertion,
- Urinary Catheter insertion,
- Central Venous Catheters
- Lumbar puncture,
- Inline immobilization,
- Application of cervical collar,
- Cerebrospinal Fluid Aspiration
- Percutaneous Suprapubic Cystostomy
- Aspiration of the Knee and Synovial Fluid Analysis
- Anesthesia for Bedside Procedures
- Interventional Radiology: Drainage Techniques
- Management of Pain in the Critically Ill Patient
- Therapeutic Paralysis



18. Clinical Pharmacology:

Pharmacokinetics, pharmacodynamics, complications and drug interactions of the commonly used ICU drugs

Drugs

- | | | | |
|--------------------------|---------------------------|---------------------------|---------------------------|
| ○ Inj. Adrenaline | ○ Inj. Enoxaparine | ○ Inj. Magnesium Sulphate | ○ Inj. Protamine Sulphate |
| ○ Inj. Atropine | ○ Inj. Fentanyl | ○ Inj. Midazolam | ○ Inj. Rocuronium |
| ○ Inj. Amiodarone | ○ Inj. Frusemide | ○ Inj. Mvi | ○ Inj. Sodium Bicarbonate |
| ○ Inj. Atracurium | ○ Inj. Fosphenytoin | ○ Inj. Morphine | ○ Inj. Serenace |
| ○ Inj. Avil | ○ Inj. Flumazenil | ○ Inj. Mannitol | ○ Inj. Succinyl Choline |
| ○ Inj. Amikacin | ○ Inj. Heparin | ○ Inj. Milrinone | ○ Inj. Stemetil |
| ○ Inj. Astymin | ○ Inj. Human Actrapid | ○ Inj. Noradrenaline | ○ Inj. Streptokinase |
| ○ Inj. Calcium Gluconate | ○ Inj. Human Insulatard | ○ Inj. Nitroglycerine | ○ Inj. Thiamine |
| ○ Inj. Dobutamine | ○ Inj. Human Mixtard | ○ Inj. Neostigmine | ○ Inj. Tramadol |
| ○ Inj. Dopamine | ○ Inj. Hydrocortisone | ○ Inj. Nitroprusside | ○ Inj. Tetanus Toxoid |
| ○ Inj. Dexamethasone | ○ Inj. Isolin | ○ Inj. Naloxone | ○ Inj. Tranexamic Acid |
| ○ Inj. Deriphlline | ○ Ink. Potassium Chloride | ○ Inj. Ofloxacin | ○ Inj. Taxim |
| ○ Inj. Drotin | ○ Inj. Ketamine | ○ Inj. Paracetamol | ○ Inj. Thiopentone |
| ○ Inj. Dynapar | ○ Inj. Ketoroloc | ○ Inj. Pantoprozole | ○ Inj. Vecuronium |
| ○ Inj. Digoxin | ○ Inj. Levetracetam | ○ Inj. Phenergan | ○ Inj. Vitamin -K |
| ○ Inj. Diclofenac | ○ Inj. Lorazepam | ○ Inj. Phenytoin | ○ Inj. Vasopressin |
| ○ Inj. Diazepam | ○ Inj. Lignocaine 2% | ○ Inj. Propofol | ○ Inj. Verapamil |
| ○ Inj. Emeset | ○ Inj. Meropenam | ○ Inj. Perinorm | ○ Inj. Xone |
| ○ Inj. Ephedrine | ○ Inj. Metoprolol | ○ Inj. Pethidine | ○ Inj. Fortwin |

Drugs Acting on Autonomic Nervous System

- Anticholine esterase drugs
- Physostigmine
- Neostigmine
- Edrophonium

Choline esterase Reactivators

- Pralidoxime
- Obidoxime

Anticholinergic Drugs

- Atropine
- Ipratropium Bromide
- Hyoscine
- Glycopyrrolate
- Cyclopentolate
- Tropicamide

Adrenergic Agents

- Epinephrine
- Nor epinephrine
- Dopamine
- Phenylephrine
- Dobutamine
- Isoprenaline
- Ephedrine
- Orciprenaline

- Salbutamol
- Terbutaline
- Salmeterol
- Xylometazoline
- Oxymetazoline
- Phenylpropanolamine
- Isoxsuprine

Antiadrenergics

- Ergotamine
- Dihydroergotamine
- Phentolamine
- Chlorpromazine
- Prazosin

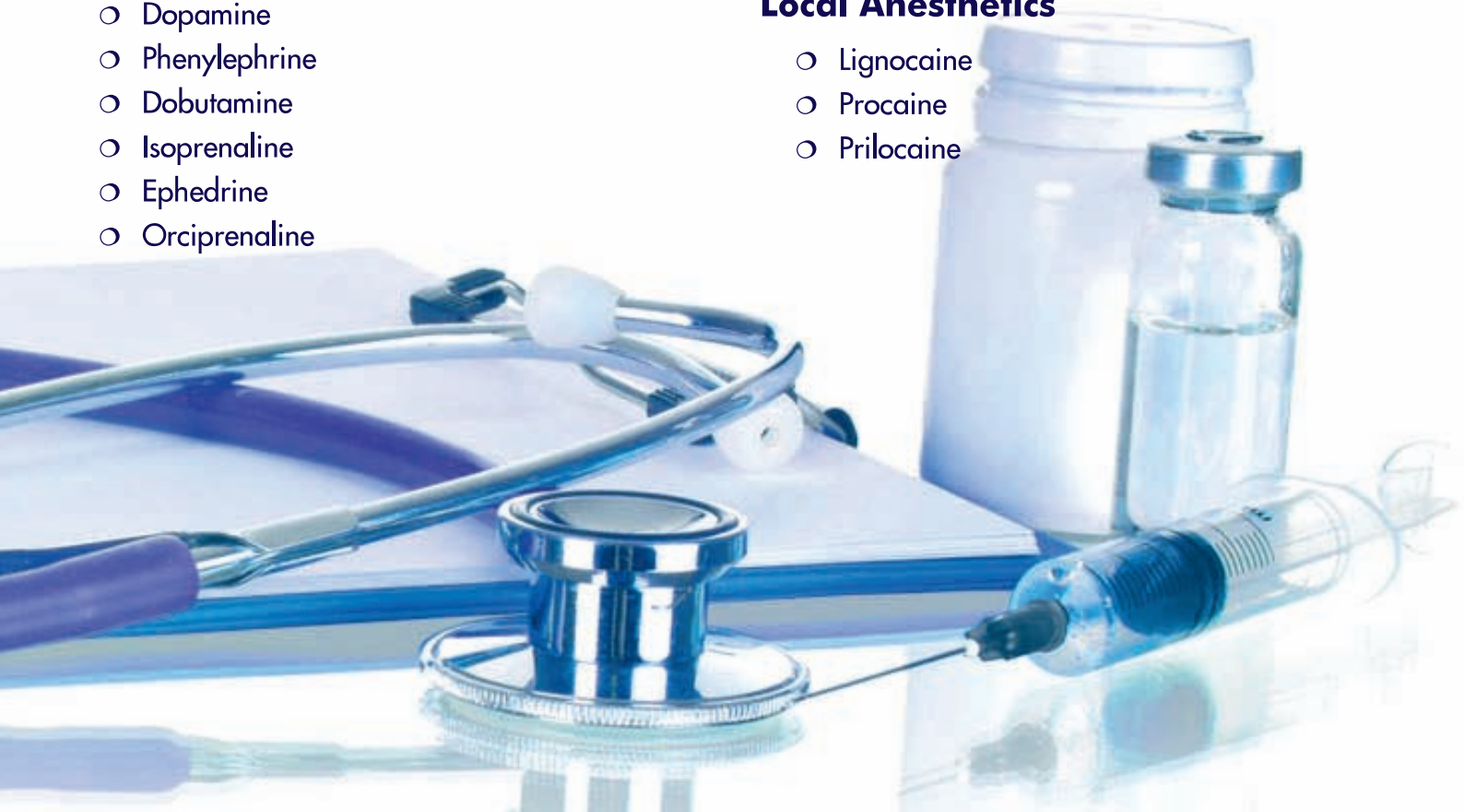
Neuromuscular blocking agents:-

Depolarizing/ Non-depolarizing

- Succinylcholine
- Pancuronium
- Vecuronium & Rocuronium
- Mevacurium

Local Anesthetics

- Lignocaine
- Procaine
- Prilocaine



Induction Agents

- Propofol
- Sodium Thiopentone
- Ketamine
- Bupivacaine

Antihistamines

- Sedative & Non Sedatives
- ACE Inhibitors -all
- Angiotensin Receptor Blockers -all

Hormones

- Somatostatin
- Bromocriptine
- Steroids
- Glucocorticoids
- Mineralocorticoids
- Insulin
- Thyroxin
- Adrenaline
- Calcitonin
- Erythropoietin
- CGlucagons

Anti-Thyroid Drugs

Oral Hypoglycemic Agents

- Sulphonylurea
- Non Sulphonylurea
- Biguanides & others

OBG Drugs

- Oxytocin
- Ergotamine
- Prostaglandins
- Oral Contraceptives

Barbiturates

- Phenobarbitone
- Thiopentone

Benzodiazepines

- Diazepam
- Midazolam
- Lorazepam
- Clonazepam
- Oxazepam
- Telazepam

Antiepileptic Agents

- Hydantoins
- Barbiturates
- Carbamazepine
- Benzodiazepines
- Valproic Acid
- Newer Drugs

Antiparkinsonian Drugs

- Levodopa
- Carbidopa
- Trihexyphenidyl
- Selegiline

Antipsychotic Drugs

- Haloperidol
- Reserpine
- Droperidol



Antidepressants

- TCAs

Opioid Analgesics

- Morphine
- Codeine
- Pethidine
- Fentanyl
- Tramadol
- Buprenorphine
- Pentazocin

Opioid Antagonists

- Naltrexone
- Naloxone

Cardiac Drugs

- Nitrates
- Beta Blockers
- Calcium Channel Blockers
- ACE inhibitors
- Vasopressin
- Nitroglycerine
- Aspirin
- Clopidogrel
- GP IIB IIIA inhibitors

Anticoagulants

- Heparin (UFH)
- Low molecular weight heparin (LMWH)
- Coumarin Derivatives

Anti-heparin

- Protamine Sulphate
- Antiarrhythmics
- Fibrinolytics
- Antiemetic, Antacids & Proton Pump Inhibitors



Antimicrobials

- Sulphonamides
- Quinolones
- Penicillin derivatives
- B Lactum antibiotics
- Cephalosporin
- Macrolides
- Broad Spectrum Antimicrobials
- Miscellaneous
- Anti-tubercular Drugs
- Anti-leprosy Drugs

Anti-fungal

- Amphotericin B
- Ketoconazole
- Itraconazole
- Fluconazole

Antiviral Drugs

- Acyclovir
- Ganciclovir

Anti-retrovirus Drugs

- Zidovudine
- Lamivudine
- Antimalarials

Anthelmintic Drugs

- DECA
- Mebendazole
- Albendazole

Antiseptics

- Phenol
- Povidone Iodine
- Chlorhexidine

Chelating Agents

- BAL (Dimercaprol)
- Penicillamine
- Deferoxamine
- Vitamins

Vaccines

- Anti-rabies
- Hepatitis B
- DPT
- TT
- BCG
- Pneumococcal
- Meningococcal

Anti-snake venom

- Diuretics
- Furosemide
- Spironolactone

Drugs in ACLS

- Adrenaline
- Atropine
- Adenosine
- Vasopressin
- Magnesium
- Sodium bicarbonate
- Antidotes for poisons & tablet overdose – all
- Inhalational Analgesia
- Entonox

19. Occupationa

- Diseases related to various occupations
- Harmful effects of air pollution & tobacco smoking

20.Nutrition

- Obesity
- Starvation
- Vitamin deficiencies

21.Biochemistry

- Krebs Cycle
- Ketone bodies
- Amino acids
- Parenteral Nutrition – Intralipids
- Fat Soluble Vitamins
- Water soluble vitamins
- Thyroid function Tests
- Liver function test
- HCG
- Serum Drug levels
- Cardiac markers
- HbA1C, GTT, Blood sugar estimation
- ASO titter, CRP and CPK
- D-Dimer
- Serum Electrolytes
- Methemoglobinemia



- Lipoproteins – HDL / LDL
- Calorimetric estimation of Blood glucose
- Serum cortisol levels
- Serum calcium, Phosphate,
- Magnesium
- Serum Amylase, Lipase
- Serum Alcohol levels
- ABG
- Serum Lactate levels
- Urine spot sodium
- Renal function tests
- Serum osmolality
- Serum Cholinesterase levels
- Myoglobin
- Benedict's test
- Urine routine examination

22. Microbiology

- Morphology & physiology of bacteria
- Culture media & Methods
- Infection
- Hypersensitivity
- Immunology of transplantation
- Immune response
- Complete antibody & Incomplete antibody
- ELISA
- Western blot
- PCR
- Dark field microscopy
- RIA testing

Organisms:

- Staphylococcal
- Streptococcal
- Pneumococcal
- Meningococcal
- Pseudomonas
- Klebsiella
- Enterobacteriaceae – E.coli
- Acinetobacter
- Clostridium Tetani
- Vibrio Cholera
- Salmonella
- Shigella
- Anthrax
- Rickettsia
- Leptospira
- Plasmodium
- Clostridia
- Brucella

Virology

- HIV
- Herpes simplex
- Herpes zoster
- Cytomegalovirus
- Epstein-Barr Virus
- Dengue Virus



Fungi

- Aspergillus
- Candida
- Mucor mycosis

Parasitological infestations

- Plasmodium
- Enterococcus
- Pneumocystis carini
- Coomb's test
- Needle prick injuries
- Types of immunological reactions
- Sterilization and disinfection
- Complement system
- Immunodeficiency Diseases
- Laboratory control of Antimicrobial therapy
- Acute diarrheal diseases
- Hospital infections
- Tetanus prophylaxis
- Rabies vaccine



23. ANATOMY – Applied Anatomy

- Tracts of spinal cord
- Basal Ganglia
- Cervical vertebra
- Optic nerve
- Temporomandibular joint
- Circle of Willis
- Falx cerebri
- Brachial plexus
- Anatomy of internal jugular vein(IJV) and carotid artery
- Anatomy of subclavian artery & vein
- Anatomy of femoral artery & vein
- Blood vessels of upper limb
- Carotid triangle
- Course of Radial Nerve, Ulnar Nerve and Median Nerve
- Course of Sciatic and femoral Nerve
- Dermatomes
- Spinal cord
- Cervical Vertebra
- Anatomy of Upper airway
- Blood supply to heart
- Anatomy of heart
- Anatomy of Lung
- Cranial Nerves
- Anatomy of Liver
- Anatomy of Kidney and Spleen
- Arch of aorta
- SVC- Superior Vena cava
- Thoracic duct
- Trachea
- Urinary Bladder
- Prostate
- Bony Pelvis
- Portal vein
- Blood supply to gut
- Renal Circulation
- Abdominal aorta
- Femoral triangle
- Great saphenous vein
- Femur
- Calcaneum
- Shoulder joint
- Maxilla
- Deltoid & structures related to it
- Palmar arch
- Joints
- Course of sciatic nerve
- Applied anatomy of testes
- Surface landmarks of IJV/ Subclavian / Femoral / Carotid artery & veins
- Cricothyroid membrane
- Zones of neck and its applied aspects



IIInd Year – Specialty Critical Care

1. Pathology

- General Pathology
- Inflammation and repair
- Ischemic and hypoxic injury
- Free radical injury
- Negri bodies
- Wound healing by primary and secondary infection
- Thrombogenesis / atherosclerosis and aneurysm its pathophysiology
- Oncology- Metastasis of tumor, Grading & Staging of cancer
- Hypercoagulability of blood - pathophysiology
- Pathophysiology of shock
- Coagulation cascade
- CD 4 cells and its importance
- Wernicke- Korsakoff syndrome - pathophysiology
- Rheumatic fever - pathophysiology
- Acute & Chronic Alcoholism
- Pathophysiology
- Rheumatoid Arthritis – pathophysiology

2. Infective Pathophysiology of diseases

- Bacterial infections affecting various organ systems including Tetanus & gas Gangrene
- Protozoal & Atypical Infections
- Parasitic Infections

3. Cardiovascular system - Pathophysiology

- Heart failure
- Congenital heart disease
- Ischemic heart disease
- Endocarditis
- Myocarditis
- Approach to the Patient with Hypotension and Hemodynamic Instability
- Management of Advanced Heart Failure
- Valvular Heart Disease
- Critical Care of Pericardial Disease
- Acute Aortic Syndromes
- Evaluation and Management of Hypertension in the Intensive Care Unit
- Unstable Angina/Non-ST- Segment-Elevation Myocardial Infarction
- ST-Elevation Myocardial Infarction
- Supraventricular Tachycardia

Vascular

- Giant cell arteritis
- Takayasu arteritis
- Berger's disease
- Reynaud's Disease and Phenomenon
- Varicose veins
- Inferior vena cava syndrome
- Thrombophlebitis



5. Pulmonary Problems in the Intensive Care Unit

- A Physiologic Approach to Respiratory Failure
- Acute Respiratory Failure Due to Acute Respiratory Distress Syndrome and Pulmonary Edema
- Status Asthmaticus
- Chronic obstructive pulmonary diseases
- Extrapulmonary Causes of Respiratory Failure
- Acute Respiratory Failure in Pregnancy
- Pneumonia - community acquired & nosocomial
- Acute Lung Injury & ARDS
- Venous Thromboembolism: Pulmonary Embolism and Deep Venous Thrombosis
- Managing Hemoptysis
- Drowning
- Pulmonary Hypertension
- Pleural Disease in the Critically Ill Patient
- Hyaline membrane disease & ARDS
- Lung Abscess
- Bronchiectasis
- Asbestosis
- Small Cell Carcinoma
- Adenocarcinoma
- Bronchogenic Carcinoma
- Croup.
- Epiglottitis.
- Spasmodic croup.
- Foreign body.
- Bronchiolitis.
- Acute Severe asthma.
- Respiratory Adjunct Therapy
- Chest Radiographic Examination
- Acute Inhalation Injury
- Disorders of Temperature Control: Hypothermia & Hyperthermia
- Severe Upper Airway Infections
- Acute Infectious Pneumonia
- Bacterial / Viral / Mycoplasma / Chlamydia / Tuberculosis / ..
- Aspiration.
- Pulmonary edema.
- Pleural effusion / emphysema.
- Pneumothorax.
- Congenital abnormalities in respiratory tract.
- Congenital diaphragmatic hernia.
- Apnea / Respiratory failure / Respiratory distress.
- Invasive & Noninvasive Mechanical Ventilation for the Adult Hospitalized Patient
- Discontinuation of Mechanical Ventilation

6. Gastro Intestinal Disorders

- Acute gastrointestinal bleeding
- Stress ulcer syndrome
- Gastrointestinal Motility in the Critically Ill Patient
- Severe acute pancreatitis
- Acute Hepatic failure
- Chronic decompensated liver disease
- Peritonitis and intra- abdominal infections
- Fulminant Colitis and Toxic Megocolon
- Ludwig's Angina
- Retropharyngeal Abscess
- Hiatus hernia
- Mallory Weiss Syndrome
- Haemetemesis. & melena of GI origin
- Gastritis
- Bilirubin metabolism
- Jaundice & types
- Viral Hepatitis
- Evaluation and Management of Liver Failure
- Cirrhosis
- Portal hypertension
- Cholecystitis
- Intestinal obstruction
- Severe and Complicated Biliary Tract Disease
- Acute Pancreatitis
- Dysenteries

7. Haematology and Oncology Problems

- Blood Transfusion: Blood Components and Transfusion Complications
- The Hemolytic Anaemias
- Acquired & common congenital bleeding disorders
- Haematological malignancies
- Glucose-6 phosphate deficiency
- Thalassemia

- The Acute Leukemias
- Thrombocytopenia, Bone marrow aspiration and Platelet Dysfunction in Critical Care Patients
- Antithrombotic Therapy
- Diagnosis and Management of Hypercoagulable States
- Therapeutic Apheresis: Technical Considerations and Indications in Critical Care
- Peripheral Blood Film and examination
- HB % estimation
- Bleeding time / Clotting time
- Pathway of coagulation
- Hemophilia A & B
- Transfusion Reactions
- Oncologic emergencies

8. Obstetric Problems

- Obstetric emergencies in ICU
- Emergency delivery
- Maternal Cardiac Arrest
- (add from net)

9. Central Nervous System

- Management of stroke and cerebrovascular complications
- Seizures in critically ill Neuromuscular disorders in ICU
- (important ICU emergencies)



10. Renal Disorders

- Physiologic Concepts in the Management of Renal, Fluid, and Electrolyte Disorders in the Intensive Care Unit
- Acute renal failure in the Intensive Care Unit
- Chronic renal failure with other complications
- Drug Dosing in Renal and Hepatic Failure: A pharmacokinetic Approach to the Critically Ill Patient
- Electrolyte & Acid base problems - Metabolic Acidosis and Metabolic Alkalosis
- Disorders of Plasma Sodium and Plasma Potassium
- Renal replacement therapy
- Dialysis Therapy in the Intensive Care Setting
- Renal Function Tests
- Glomerulonephritis
- Nephrotic syndrome

11. Endocrine – Pathophysiology

- Management of diabetes in critically ill patients
- Diabetic emergencies
- Diabetes Mellitus & its types
- Diabetic Ketoacidosis
- Diabetic Comas
- Hypoglycemia
- Thyroid disorders
- Thyroid Storm
- Pheochromocytoma
- MEN syndromes
- Insulinoma
- Endocrine hypertension
- Cushing's syndrome
- Addisonian crisis
- Conn's syndrome
- Hyperparathyroidism
- Sick Euthyroid Syndrome in the Intensive Care Unit
- Myxedema Coma
- Hypoadrenal Crisis
- Disorders of Mineral Metabolism



12. Miscellaneous – Pathophysiology

- Grading of CA cervix
- Myasthenia Gravis

13. Surgical Problems in Intensive care

- Management of post- operative patient
- Acute abdomen
- Pressure sore prevention, Necrotizing fasciitis and soft tissue infection
- Epistaxis
- Esophageal Perforation and Acute Mediastinitis
- Noncardiac Surgery in the Cardiac Patient
- Diagnosis and Management of Intraabdominal Sepsis

14. Environmental Casualties

- Burns and hypothermia
- Drowning
- Pandemic Handling
- Diagnosis and Management of Intraabdominal Sepsis
- Disaster management
- Mass trauma
- Road Traffic Accidents
- Mesenteric Ischemia
- Compartment Syndrome of the Abdominal Cavity
- Necrotizing Fasciitis and Other Soft Tissue Infections
- Peripheral Arterial Disease: Importance in the Critical Care Setting
- Pressure Sores: Prevention and Treatment
- Management of the Obstetric Patient in the Intensive Care setting





- Methylzantine Poisoning
- Opioid Poisoning
- Pesticide Poisoning
- Phencyclidine and Hallucinogen Poisoning
- Sedative- Hypnotic Agent Poisoning
- Sympathomimetic Poisoning
- Systemic Asphyxiant Poisoning
- Withdrawal Syndromes
- Chemical Agents of Mass Destruction

15. Pharmacology Overdoses, and Poisonings

- General Considerations in the Evaluation and Treatment of Poisoning
- Acetaminophen Poisoning
- Alcohol and Glycol Poisoning
- Antiarrhythmic Agents
- Anticholinergic Poisoning
- Anticonvulsant Poisoning
- Antidepressant Poisoning
- Antipsychotic Poisoning
- Beta-Blocker Poisoning
- Calcium Channel Blocker Poisoning
- Cardiac Glycoside Poisoning
- Cholinergic Poisoning
- Cocaine Poisoning
- Corrosive Poisoning
- Cyclooxygenase Inhibitor (Nonsteroidal Antiinflammatory Drug) Poisoning
- Envenomations
- Heavy Metal Poisoning
- Hydrocarbon Poisoning
- Hydrofluoric Acid Poisoning
- Iron Poisoning
- Isoniazid Poisoning
- Lithium Poisoning

16. Infections

- Approach to fever in ICU
- Severe community acquired infections: Toxic Shock Syndrome, Overwhelming Postsplenectomy Infection, Meningococemia, Malaria, Rocky Mountain Spotted Fever, and Others..
- Hospital Acquired infections
- Prevention and control of Nosocomial Infections in ICU
- Use of Antimicrobials in the Treatment of Infection in the Critically Ill Patient
- Central Nervous System Infections
- Infective Endocarditis and Infections of Intracardiac Prosthetic Devices
- Infections Associated with Vascular Catheters
- Urinary Tract Infections
- Tuberculosis
- Botulism
- Tetanus

17. End of Life care

- End of life care
- Palliative care
- Brain death
- Organ donation

18. Transportation of critically Ill patient

- Position, splinting, haemostasis, hemodynamic monitoring, oxygenation, ventilation

19. Psychiatric Issues in Intensive Care

- Diagnosis and Treatment of Agitation and Delirium in the Intensive Care Unit Patient
- Diagnosis and Treatment of Anxiety in the Intensive Care Unit Patient
- Diagnosis and Treatment of Depression in the Intensive Care Unit Patient
- Suicide
- Problematic Behaviors of Patients, Family, and Staff in the Intensive Care Unit
- Recognition and Management of Staff Stress in the Intensive Care Unit

21. Metabolism/ Nutrition

- Nutrition Support in the Critically Ill Patient
- Parenteral and Enteral Nutrition in the Intensive Care Unit
- Disease- Specific Nutrition

22. Neurologic Problems in the Intensive Care Unit

- An approach to Neurologic Problems in the Intensive Care Unit
- Evaluating the Patient with Altered Consciousness in the Intensive Care Unit
- Metabolic Encephalopathy
- Generalized Anoxia/ Ischemia of the Nervous system
- Status Epilepticus
- Cerebrovascular Disease
- Neurooncological Problems in the Intensive Care Unit
- Guillain-Barre Syndrome
- Myasthenia Gravis in the Intensive Care Unit
- Miscellaneous Neurologic Problems in the Intensive Care Unit
- Subarachnoid Hemorrhage
- Mental Status Dysfunction in the Intensive Care Unit: Postoperative Cognitive Impairment
- Newly Acquired Weakness in the Intensive Care Unit: Critical Illness Myopathy and Neuropathy





IIIrd Year - Recent Advances, policy making protocol establishment, ICU auditing and quality improvement in Critical Care

1. Recent updates in Respiratory Critical Care

- Gas Embolism Syndromes: Venous Gas Emboli, Arterial Gas Emboli, and Decompression Sickness
- Lung Biopsy
- Sleep Issues in the Intensive Care Unity Setting

2. Recent updates in Cardiovascular Critical Care

- Cardiac trauma
- Mechanical Complications of Myocardial Infarction
- Bradyarrhythmias and Temporary Pacin

3. Recent Updates in Infectious Disease Problems - Critical Care

- Prevention and Control of Nosocomial Infection in the Intensive Care Unit
- Acute Infection in the Immunocompromised Host
- Intensive Care of Patients with HIV Infection
- Infectious Complications of Drug Abuse
- Serious Epidemic Viral Pneumonias
- Biological Agents of Mass Destruction



4. Recent updates in Shock & Trauma

- Thoracic Trauma
- Abdominal Trauma
- ATLS
- FAST, EFAST
- Massive Transfusion protocol

5. Transplantation

- Immunosuppression in Solid-Organ Transplantation
- Critical Care Problems in Kidney Transplant Recipients
- Critical Care Problems in Heart and Heart Lung Transplant Recipients
- Care of the Pancreas Transplant Recipient
- Management of the Organ Doctor
- Diagnosis and Management of Rejection, Infection, and Malignancy in Transplant Recipients
- Critical Care of Liver and Intestinal Transplant Recipients
- Hematopoietic Cell Transplantation
- Critical Care of the Lung Transplant Recipient

6. Contemporary Challenges in the Intensive Care Unit

- Medical Ethics and End-of-Life Care
- Assessing the Value and Impact of Critical Care in an Era of Limited Resources:
- Outcomes Research in the Intensive Care Unit
- Caring for the Critically Ill Older Patient
- Intensive Care Unit Organization and Management
- Defining and Measuring Patient Safety in the Critical Care Unit
- Critical Care Information Systems – Structure, Function, and Future

7. Recent updates in ICU Radiology

8. Recent updates in ICU procedures

9. Recent updates in Clinical

Pharmacology

10. Policy Making Protocol

Establishment

11. ICU research Methodologies

12. ICU auditing and quality

improvement in Critical Care

13. Recent Advances in ACLS, BLS,

PALS & ATLS





RESEARCH & LITERATURE APPRAISAL

1.Principles of research

- Demonstrate knowledge of the importance of accurate data collection on the validity of scientific work.
- Demonstrate knowledge of the importance of how the presentation of data may influence the perception of study results.
- Demonstrate knowledge of the importance of honesty in research and how competing interests may influence research.
- Demonstrate knowledge of importance of randomization in differentiating between an association and a cause.
- Hypothesis formulation and testing – knowledge of the generation of an appropriate hypothesis to answer a research question & the knowledge of types of errors that may occur when testing research hypothesis.
- Research ethics – consent for research & knowledge of the ethics of medical research

2.Research Methods-

Demonstrate knowledge of following principles of medical research.

- Sample size
- Choice of research method
- Enrollment
- Randomization
- Concealment of treatment allocation
- Bias
- Validity
- “Gold standard” test

Demonstrate knowledge of the roles, benefits and limitation of the following

- Trials
- Meta-analysis
- Case series and reports
- Literature reviews
- Observations studies
- Letter

3. Statistical Methods

- A. Demonstrate knowledge of the following statistical principles
- Sensitivity
 - Specificity
 - Positive predictive value
 - Negative predictive value
 - Accuracy
 - Relative risk
 - Odds ratio
 - Confidence intervals
 - Statistical significance
- B. Usage of statistical methods
- Students test
 - Mannwhitney U test
 - Chi squared test
 - Sign test
 - Correlation coefficients
 - Tests of agreement
 - Multiple regression
- C. Measurement accuracy – knowledge of confidence intervals in data reporting & standard error of mean.
- D. Significance – knowledge of difference between clinical and statistical significance.
- E. Bayes theorem- knowledge of prior probability, post-test probability and likelihood ratios (positive / negative), their relevance in clinical practice.



LITERATURE EVALUATION

- Evidence based medicine – knowledge of the principles, practical application and limitations of evidence based medicine
- Clinical application of research – knowledge of the potential barriers to the adoption of research findings into clinical practice
- Critical appraisal of emergency medicine specific literature – knowledge and skills to accurately and critically appraise the emergency medicine specific literature
- Is able to effectively critically appraise retrieved evidence in order to address a clinical question



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