



**SRIMANTA SANKARADEVA UNIVERSITY OF HEALTH
SCIENCES**

(A State University of Govt. of Assam)

**Syllabus/Curriculum
for
B.Sc. in Anaesthesia and Critical Care**

(w.e.f. Academic Session 2023-24)

Registrar (Academic)

SRIMANTA SANKARADEVA UNIVERSITY
OF HEALTH SCIENCES, ASSAM, INDIA

BSc in ANAESTHESIOLOGY and CRITICAL CARE TECHNOLOGY

2nd Year

PHARMACOLOGY (PAPER-1)

3RD SEMESTER

(A) Basics

- General Pharmacology
- Evaluation of drugs in man, drug prescribing and drug interactions

(B) EMERGENCY DRUGS

1. Introduction to cholinergic, anti cholinergic, adrenergic and adrenergic blocking drugs
2. Adrenaline, Vascopressin
3. Atropin, glycopyrrolate
4. Other emergency drugs
 - Sodium bicarbonate
 - Calcium gluconate
 - Potassium chloride
 - Magnesium sulphate
 - Lignocain (iv)
 - Amiodarone
 - Adenosine
 - Insulin
5. Vasopressors and Inotropes
 - Dopamine
 - Dobutamine
 - Noradrenaline
 - Phenylephrine
 - Phenoxybenzamine
 - Milrinone
 - Levosimendan
 - Isoprenaline
 - Ephedrine
6. Vasodilators and antihypertensives
 - Nitroglycerine
 - Sodium nitroprusside
 - Beta blockers: Esmolol, Metoprolol, Labetolol
 - Calcium channel blockers: Diltiazem, Verapamil

(C) Drugs used in anaesthesia

1. Intravenous anaesthetic agents

- Thiopentone
- Ketamine

- Propofol, Fospropofol
- Etomidate
- Benzodiazepines
- Midazolam
- Diazepam

2. Opioids

- Legal issues in storage and handling
- Morphine
- Pethidine
- Buprenorphine
- Pentazocine
- Fentanyl
- Sufentanil
- Remifentanil
- Tramadol

3. Inhalational agents

- Ether
- Halothane
- Isoflurane
- Sevoflurane
- Desflurane
- Nitrous Oxide, Entonox
- Xenon

4. Skeletal muscle relaxants

- (a) Depolarizing agents
 - Succinyl choline
- (b) Nondepolarizing agents
 - Pancuronium
 - Vecuronium
 - Atracurium, Cisatracurium
 - Rocuronium

5. Local anaesthetics

- Lignocaine
- Bupivacaine, Levobupivacaine
- Ropivacaine
- EMLA
- Intralipid

6. Anticholinesterase agents

- Neostigmine

4TH SEMESTER

(D) Anaesthetic Adjuvants

- Clonidine
- Dexmedetomidine

(E) Miscellaneous Adjuvants

1. Analgesics
 - NSAIDs- Ketorolac, Diclofenac
 - Paracetamol
2. Antiemetics and antacids
 - Metoclopramide, Ondansetron
 - Ranitidine, Pantoprazole
3. Anticoagulants and fibrinolytics
 - Heparin, LMWH
 - Protamine
 - EACA
 - Tranexamic acid
4. Oxytocin
 - Oxytocin
 - Methyl ergometrine
5. Corticosteroids
 - Hydrocortisone
 - Dexamethasone
 - Methylprednisolone
6. Bronchodilators
 - Aminophylline
 - Salbutamol
 - Ipratropium
 - Salmeterol
7. Diuretics
 - Furosemide
 - Mannitol
 - ACE inhibitors
8. Dantrolene sodium
9. Thyroid and anti thyroid drugs
10. Insuline and anti diabetic drugs

(F) Basics of Antibiotic therapy

- Types
- Allergic manifestations
- Drug administration
- Identification of Adverse Reaction

MICROBIOLOGY (PAPER-2)

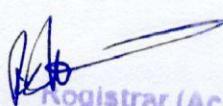
3RD SEMESTER

- Introduction to medical microbiology
- Morphology and physiology of bacteria
- Sterilization and disinfection

- Normal microbial flora of human body
- Infection
- Anti biotic
- Hospital infection and prevention
- Immunity

4TH SEMESTER

- Antigen, Antibody, Antigen-antibody reaction
- Immune response
- Hypersensitivity
- Immunoprophylaxis
- Tuberculosis
- Typhoid
- Viral infections
- HIV/AIDS, hepatitis C, HBV
- Hypersensitivity Reaction



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MEDICINE AND MEDICAL ETHICS (PAPER-III)

3RD SEMESTER

1. RESPIRATORY SYSTEM:

- Anatomy of upper airway
- Anatomy of lower airway
- Muscle of respiration
- Physiology of respiration
 - Dead space
 - Lung volume & capacity
 - Alveolar ventilation
 - Gas exchange
 - Transport of gases
 - Control of respiration
 - Effects of Anaesthesia on respiration
- Asthma
- COPD
- Pneumonia
- Foreign body in respiratory tract
- Restrictive lung disease

2. CARDIOVASCULAR SYSTEM

- Anatomy of heart
- Cardiac cycle
- Cardiac output
- Coronary circulation
- Blood pressure regulation and its control mechanism
- Effects of anaesthesia on CVS
- Basic ECG knowledge
- Congenital heart disease
- Rheumatic fever and Rheumatic heart disease
- Coronary Artery disease & IHD
- Peripheral vascular disease
- Heart blocks
- Tachy / Brady arrhythmia

3. RENAL SYSTEM

- Anatomy of kidney & urinary system
- Functions of kidney
- Acute renal failure

- Urinary tract infection
- Glomerulonephritis
- Obstructive uropathy
- Haemodialysis
- Renal Transplant

4TH SEMESTER

4. BLOOD

- Anaemia
- Coagulopathies

5. INFECTIONS DISEASE

- Sepsis and septic shock
- Pyremia of unknown origin
- Infective endocarditis
- Nosocomial infection
- Infection of skin, muscle, soft tissues, bone
- Hepatitis
- HIV

6. HEPATOBILIARY SYSTEM:

- Anatomy of liver & GB and functions
- CLD chronic liver disease
- Cholelithiasis and choledocholithiasis

7. ENDOCRINE:

- Diabetes
- Hypo and hyperthyroidism
- Phacochromocytoma

8. PAIN:

- Pain pathway
- Acute and chronic pain

9. CENTRAL NERVOUS SYSTEM:

- Anatomy of brain and spinal cord
- Coverings of brain
- Subarachnoid space & CSF
- Epidural and caudal space
- Brachial plexus
- Effects of anaesthesia on CNS
- Hydrocephalus
- Extradural and subdural hemorrhage
- Traumatic brain injury
- Spinal Transaction and shock
- Meningitis

10. BONES:

- Different bones in the body



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- Fractures
- Joint dislocation

MEDICAL ETHICS:

1. Consent
2. Malpractice
3. Rights of patients
4. Records and documentation
5. Confidentiality and privilege communication

PRINCIPLES OF ANAESTHESIA-1 (PAPER -4)**3RD SEMESTER****1. MEDICAL GAS SUPPLY**

- Compressed gas cylinders
- Colour coding
- Cylinder valves; pin index
- Gas pipeline system
- Recommendations for piping system
- Alarms & safety devices

2. ANAESTHESIA MACHINE

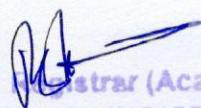
- Hanger and yoke system
- Cylinder pressure gauge
- Pressure regulators
- Flow meter assembly
- Vaporizers- types, hazards, maintenance, filling and draining etc.

3. BREATHING SYSTEM

- General considerations: humidity & heat
- Common components- connector, adaptors, reservoir bags.
- Capnography – ETC O₂
- Pulse oximetry
- Methods of humidification
- Classification of breathing system Mapleson system- a b c d e f Jackson Rees system, Bain circuit
- Non rebreathing valves- ambu valves
- The circle system Components Soda lime, indicators

4. FACE MASKS & AIRWAY LARYNGOSCOPES

- Types, sizes, face masks
- Endotracheal tube- types, sizes
- Cuff system
- Fixing, removing and inflating cuff, checking tube position complications
- Bougie
- LMA



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-Laryngoscope- blades, types of laryngoscope

5. ANAESTHESIA VENTILATOR AND WORKING PRINCIPLES.

4TH SEMESTER

6. MONITORING

- ECG
- SpO2
- Temperature
- IBP
- CVP
- PA Pressure
- LA Pressure
- Gas sensors
- MAC

Bio medical engineering of Trouble sorting Management, care of cleaning

7. BASIC ANAESTHETIC TECHNIQUES INTRODUCTION TO ANAESTHESIA

- General Anaesthesia
- Regional Anaesthesia
- Local Anaesthesia
- Intravenous Anaesthesia (TIVA)
- Spinal
- Epidural
- Various nerve blocks
- Minimum standard of anaesthesia
- Who should give anaesthesia

PRE-OP PREPARATION:

Pre-anaesthetic assessment

- (a) History- past history-disease/surgery/and personal history-smoking/alcohol
- (b) General physical assessment- systemic examination- CVS, RS, CNS
- (c) Airway examination:
 - Mallampatli score
 - Cormack Lehane grading
 - Lemon score
 - Different distance in airway examination

INVESTIGATIONS

- Routine Urine
- Chest X- Ray
- ECG
- Echocardiography
- Angiography
- Liver function test
- Others

Haematological- their significance

Case acceptance: ASA grading- I, II, III, IV, V & E- Emergency

PRE-ANAESTHETIC ORDERS:

Patient- Informed consent

- Npo guidelines
- Premedication-advantages, drugs used
- Special instructions- if any

Machine- Checking the machine

- O₂, N₂O, Suction apparatus, table
- Laryngoscopes, et tubes, airways
- Things for IV accessibility
- Other monitoring systems

Drugs- Emergency drugs

- Anaesthetic drugs

INTROPERATIVE MANAGEMENT

- Confirm the identification of the patient
- Monitoring – minimum & standard monitoring
- Noninvasive & invasive monitoring
- Induction- drugs used
- Endotracheal intubation
- Maintenance of anaesthesia
- Positioning of the patient
- Blood/ fluid & electrolyte balance
- Reversal from anaesthesia- drugs used
- Transferring the patient
- Recovery room- set up and things needed

POST OPERATIVE COMPLICATIONS & MANAGEMENT

- Recovery and Delayed recovery
- Hypoxia and Oxygen Therapy
- Post operative nausea & vomiting

BASIC LIFE SUPPORT

- Cardio pulmonary
- Resuscitation



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3RD YEAR SYLLABUS

STERILISATION (PAPER-1)

5TH SEMESTER

- Definitions- sterilization, disinfection, bacteriostatic , bactericidal
- Cleaning of equipment in OT
- Different methods of sterilization and disinfection
 - Pasteurization
 - Steam sterilization
 - Chemical disinfection and sterilization
 - Gas sterilization
- Sterilization of OT and anaesthetic equipment
- Proper technique for scrubbing in/out

6TH SEMESTER

STERILIZATION PROCEDURES:

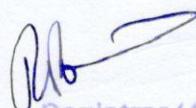
1. Waste disposal collection of used items from user area, reception protective clothing and disinfection sage guards, Bio-Medical wastes, Color cooling and management.
2. Use of disinfections sorting and classification of equipment for cleaning purposes, sharps, blunts lighted etc. contaminated high risk baby care delicate instruments or hot care instrument.
3. Cleaning process- use of detergents, mechanical cleaning apparatus, cleaning instruments, cleaning jars, receivers bowls etc. trays, basins and similar hand ware utensils. Cleaning of catheters and tubings, cleaning glasses ware, cleaning syringes and needles.
4. Material used for wrapping and packing assembling pack contents. Types of packs prepared, inclusion of trays and galliparts in packs. Method of wrapping and making use of indication to show that a pack of container has been through a sterilization process date stamping.
5. General observations principles of sterilization. Moist heat V. Nervous System. Dry heat sterilization. EO gas sterilization. H₂O₂ gas plasma capo sterilization.

PRINCIPLES OF ANAESTHESIA –II (Paper-2)

5th SEMESTER

AIRWAY EMERGENCIES:

- Difficult mask ventilation
- Difficult intubation
- Cricothysetomy
- Tracheostomy



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- Fibre optic bronchoscope
- Jet ventilation

MANUAL RESUSCITATORS

- Components
- Oxygen enrichment devices

OXYGEN THERAPY

- Principles
- Devices
- Oxygen toxicity

HUMIDIFICATION

- Mechanism
- Effect of inhaling dry gases
- Devices
 - Heat and moisture exchanger
 - Humidifiers
 - Nebulizers

OT POLLUTION

- Absorption system
- Scavenging system

ANAESTHESIA VAPORIZERS

- Classification
- Factors affecting output
- Hazards
- Various types
- Safety mechanism
- Fitting devices and filling of various vaporizers

SURGICAL DIATHERMY

- Physical principles
- Accident due to diathermy
- Diathermy and pacemakers
- Diathermy and laparoscopic surgery

INFUSION EQUIPMENT

- Simple infusion system
- Target controlled infusion
- Patient controlled infusion
- Filtration and ultra filtration
- Auto transfusion and cell sever device

LASER

- Principles
- Clinical application
- Safety aspects

ULTRASONOGRAPHY

- Principles

- Care of machine
- Procedures

Regional Anesthetic Techniques

- (a) Local Anesthetic Technique
- (b) Nerve Blocks
- (c) Spinal anaesthesia
- (d) Epidural anaesthesia
 - Caudal anaesthesia
- (e) Complications of Regional anaesthesia
 - LAST
 - Hypotension
 - Nerve injury
- (f) Equipments for local anaesthesia
 - Spinal needles –types & uses
 - Epidural needles & catheters
 - Equipments for peripheral nerve blocks
 - Anaesthesia for special surgeries

NEURO ANESTHESIA

- Glassgow coma scale
- Premedication
- Special investigation- CT, Angiography and MRI
- Checklist
- Induction of a patient
- Reinforced Endotracheal tubes
- Positioning in neuro surgery
- I.C.P
- Air embolism
- Reversal of the patient
- Transferring to ICU/ Ward

OBSTETRIC ANAESTHESIA

- Difference between a pregnant and a normal lady
- Risks for anaesthesia
- Precautions to be taken
- Check list
- Regional vs general anaesthesia

- Complication of regional anesthesia
- Post dural puncture headache
- Resuscitation of the new born, APGAR score
- Reversal and extubation
- Emergencies- manual removal of placenta
- A.P.H
- P.P.H
- Rupture uterus
- Ectopic pregnancy

PAEDIATRIC ANAESTHESIA

- Theatre setting
- Check list
- Fluid Calculation and administration
- Premedication – modes
- Induction
- Intubation- securing the EIT
- Reversal & Extubation – problems
- Transferring / ICU management
- Pain management
- Caudal anaesthesia
- Regional anaesthesia in paediatrics

ENT ANAESTHESIA

- Anaesthesia for thyroid surgery
- Anaesthesia for adenotonsillectomy
- Anaesthesia for mastoidectomy
- LASER surgeries
- Bronchoscopy and oesophagoscopy

CARDIAC ANAESTHESIA

- NYHA classification
- Special investigations
- Echo cardiography
- Angiography
- Pacemakers
- Defibrillators
- Implantable cardioverter defibrillation
- Premedication
- Setting up of monitoring system
- Monitoring invasive and non-invasive
- Getting ready for the case
- Induction of cardiac patient, precautions to be taken
- Cardiopulmonary bypass
- Weaning of CPB
- Transferring the patient to ICU

- Care to be taken
- ICU management
- Chest tube management
- Calculation of ACT

6TH SEMESTER

ANAESTHESIA OUTSIDE THE O.R

- Situations
- MRI
- Cath Lab
- Radiology
- E.C.T
- Short comings

DAY CARE ANAESTHESIA

- Special features
- Set up
- Advantages
- Disadvantages
- Complications
- Futures

GERIATRIC ANAESTHESIA

- Physiological changes
- Disease of aging
- Nervous system
- Geriatric pharmacodynamics/ pharmacokinetics
- Postoperative cognitive dysfunction

ANAESTHESIA FOR TRAUMA & SHOCK

- Resuscitation
- Pre-op investigations & assessment
- Circulatory management
- Management of anaesthesia
- Rapid sequence induction
- Other problems
- Massive blood transfusion

THORACIC ANAESTHESIA

- Pulmonary function tests
- Bed side
- Vitalograph
- Lung isolation devices
 - double lumen tubes
 - bronchial tubes
 - bronchial blocking devices

- Preoperative preparation
- Premedication
- Checklist
- Induction, Intubation
- Double lumen tubes
- Monitoring
- Pain management
- Extubation
- ICU management

ANAESTHESIA FOR UROLOGICAL PROCEDURES

- TURP
- TURBT
- PCNL
- RIRS
- Phaeochromocytoma

POSTOPERATIVE PROBLEMS

- Nausea and Vomiting
- Sore throat
- Laryngeal edema, Bronchospasm
- Sedation and Ramsay sedation score
- Delayed recovery from anaesthesia
- Neurological complications
- Awareness under anaesthesia and BIS
- Vascular complications
- Trauma to teeth
- Headache
- Backache
- Ocular complications
- Auditory complications
- Adverse drug reaction

MAJOR CATASTROPHES

- Mortality
- Cause of death
- Cerebral damage
- Prevention

PACU

- Concept
- Monitoring of vitals
- Care during transport

SAFETY IN OR

- Electrical safety
- Environmental safety
- Waste gases

-Radiation

-Infection

SYLLABUS FOR PRACTICALS

Instruments, OSPE charts

CVP, BIS



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