Diploma Course in Operation Theatre and Anaesthesia Technology

ALLIED HEALTH SCIENCES

II year - Syllabus

Main Syllabus

1. Applied Anatomy and Physiology
2. Clinical Pharmacology
3. CSSD Procedures
4. Principles of Anaesthesia
5. Basic Anaesthetic techniques
6. Regional Anaesthetic techniques

1. APPLIED ANATOMY AND PHYSIOLOGY RELATED TO ANAESTHESIA

I. RESPIRATORY SYSTEM

A. Structure and function of the respiratory tract in relation to respiratory system

Nose - Role in humidification
Pharynx - Obstruction in airways
Larynx - Movement or vocal cords, Cord palsies.
    Trachea & Bronchial tree - vessels, nerve supply, respiratory tract, reflexes, bronchosparm
Alveoli - Layers, Surfactants

B. Respiratory Physiology

- Control or breathing
- Respiratory muscles - diaphragm, intercostals
- Lung volumes - dead space, vital capacity, FRC etc.
- Pleural cavity - intrapleural pressure, pneumothorax.
• Work of breathing - airway resistance, compliance
• Respiratory movements under anaesthesia.
• Tracheal tug - signs, hiccup

C. Pulmonary Gas Exchange And Acid Base Status

• Pulmonary circulation - Pulmonary oedema, pulmonary hypertension
• Pulmonary function tests.
• Transfer of gases - oxygen & Carbon dioxide
• Acid base status, definitions, acidosis types, Alkalosis types, buffers in the body.

D. Oxygen: properties, storage, supply, hypoxia

E. Respiratory failure, type, clinical features, causes.

II. CARDIOVASCULAR SYSTEM

Anatomy - Chambers of the heart, major vasculature.

  - Coronary supply, innervation.
  - Conduction system.

Cardiac output - determinants, heart rate, preload, after load.
Coronary blood flow & myocardial oxygen supply

ECG

  - Arrhythmias cardiovascular response to anesthetic & surgical procedures.

Hypotension - causes, effects, management.
Cardio pulmonary resuscitation.
Myocardial infarction, hypertension.
III. FLUIDS AND ELECTROLYTES

- Body Fluids - Composition
- Water, sodium and potassium balance
- I.V. Fluids - composition & administration
- I.V. Cannulation.

IV. BLOOD TRANSFUSION

Blood grouping, storage, administration

2. Clinical Pharmacology

ANTISIALAGOGUES
Atropine, Glycophyrrolate

SEDATIVES / ANXIOLYTICS
Diazepam, Midazolam, Phenergan, Lorazepam, Chlorpromazine, Trichlophos

NARCOTICS
Morphine, Pethidine, Fentanyl, Pentazoline

ANTIEMETICS
Metaoclopramide, Ondansetron, Dexamethasone

INDUCTION AGENT
Thiopentone, Diazepam, Midazolam, Ketamine, Propofol, Etomidate.

MUSCLE RELAXANTS
Depolarising - Suxamethonium,
Non depolar:sing - Pancuronium, Vecuronium, Atracurium, rocuranium
INHALATIONAL GASES
Gases - 02, N20, Air
Agents - Ether-, Halothane, Isoflurane, Saevoflurane, Desflurane

REVERSAL AGENTS
Neostigmine, Glysopyrrolate, Atropine,
Nalorphine, Naloxone, Flumazenil (Diazepam)

LOCAL ANAESTHETICS
Xylocaine, Preparation, Local – Bupivacaine - Topical,
Prilocaine-jelly, Emla - Ointment, Etidocaine. Ropivacaine

EMERGENCY DRUGS
• Adrenaline : Mode or administration, dilution, dosage,
effects, Isoprenaline
• Atropine, bicarbonate, calcium, ephedrine, xylocard,
• Ionotropes : dopamine, dobutamine, amidaron
• Aminophylline, hydrocortisone, antihistamines, potassium.
• Cardiopulmonary drugs
• Antihypertensives
• Antiarythmics
• Beta - Blockers
• Ca - Channel blockers.
• Vasodilators - nitroglycerin & sodium nitroprusside
• Respiratory system - Bronchodilators, respiratory stimulants
  o Broncholytic agents
• Renal system - Diuretics, furosemide, mannitol
3. CSSD Procedures
1. Waste disposal collection of used items from user area, reception protective clothing and disinfections sage gaurds,

2. use of disinfections sorting and classification of equipment for cleaning purposes, sharps, blunt lighted etc. contaminated high risk baby care - delicate instruments or hot care instruments,

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 glass ware, cleaning syringes and needles.

4. Materials used for wrapping and packing assembling pack contents. Types of packs prepared. Inclusion of trays ahd galliparts in packs. Method of wrapping and making use of indications to show that a pack of container has been through a sterilization process date stamping.


4. PRINCIPLES OF ANAESTHESIA

1. MEDICAL GAS SUPPLY
   - Compressed gas cylinders
   - Colour coding
   - Cylinder valves; pin index.
   - Gas piping system
   - Recommendations for piping system
   - Alarms & safety devices.

2. ANAESTHESIA MACHINE
   - Hanger and yoke system
   - Cylinder pressure gauge
   - Pressure regulator
   - Flow meter assembly
   - Vapourizers - types, hazards, maintenance, filling and draining, etc.

3. BREATHING SYSTEM
   - General considerations: humidity & heat
Common components - connectors, adaptors, reservoir bags.
Capnography; etc02
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
Endotracheal tubes - Types, sizes.
Cuff system
Fixing, removing and inflating cuff, checking tube position complications.

5. ANAESTHESIA VENTILATOR AND WORKING PRINCIPLES.

6. MONITORING
ECG
Sp02
Temperature
IBP
CVP
PA Pressure
LA Pressure

5. BASIC ANAESTHETIC TECHNIQUES

HISTORY OF ANAESTHESIA
First successful clinical demonstration:
Pre - historic (ether) era
Inhalational anesthetic era
Regional anesthetic era
Intravenous anesthetic era
Modem anesthetic era
Minimum standard of anesthesia
Who should give anesthesia

PRE-OP PREPARATION:
Pre anesthetic assessment—History—past history—disease / surgery / and personal history—Smoking / alcohol
General physical assessment, systemic examination—CVS, RS, CNS

INVESTIGATIONS
Routine - Haematological - their significance
- Urine
- E.C.G.
- Chest X-ray

Special - Endocrine, hormonal assays
- Echocardiography
- Angiography
- Liver function test
- Renal function test
- Others

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

PRE - ANAESTHETIC ORDERS:

Patient - Informed consent
- Npo
- Premedication - advantages, drugs used
- Special instructions - if any

Machine - Checking the machine
02, N20, suction apparatus
Laryngoscops, et tubes, airways
- Things for IV accessibility
- Other monitoring systems

Drugs - Emergency drugs
- Anesthetic drugs

INTRAOPERATIVE MANAGEMENT

- Confirm the identification of the patient
- Monitoring - minimum
- Noninvasive & Invasive monitoring
- Induction - drugs used
- Endotracheal intubation
- Maintenance of anesthesia
- Positioning of the patient

- Blood / fluid & electrolyte balance
- Reversal from anesthesia - drugs used
• Transferring the patient
• Recovery room – set up and things needed

POST OPERATIVE COMPLICATIONS & MANAGEMENT

6. Regional Anesthetic techniques.

a. Local anaesthetic technique

b. Nerve blocks

c. Spinal Anaesthesia

d. Epidural anaesthesia

Diploma Course in Allied Health Sciences

EXAMINATION PATTERN – II YEAR

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Subject Title</th>
<th>I A</th>
<th>University Exam</th>
<th>Practical</th>
<th>Viva Voce</th>
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<tr>
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<td>Max</td>
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<tr>
<td>1.</td>
<td>Paper I - Applied Physiology &amp; Pharmacology</td>
<td>50</td>
<td>25</td>
<td>100</td>
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<td>2.</td>
<td>Paper II- Sterilization Procedures</td>
<td>50</td>
<td>25</td>
<td>100</td>
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<td>3.</td>
<td>Paper III - Principles of Anesthesia</td>
<td>50</td>
<td>25</td>
<td>100</td>
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Question paper pattern:

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<th>Type</th>
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<tbody>
<tr>
<td>Essay</td>
<td>3 x 10 = 30 Marks</td>
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<tr>
<td>Short Notes</td>
<td>10 x 5 = 50 Marks</td>
</tr>
<tr>
<td>Short Answers</td>
<td>10 x 2 = 20 Marks</td>
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<tr>
<td>Total</td>
<td>100 Marks</td>
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Internal Assessment:

Paper I, II & III – Theory - 20 Marks
Practical - 20 Marks
Log book - 10 Marks

Practical Exam Pattern:

Paper – I
5 Spotters – Write 3 lines about each.
1) Drugs
2) I.V Fluid
3) Transfusion Set,
4) Pulmonary Function Test
5) ECG
6) Local Anesthetic Agent.

Paper – II
5 Spotters – Write 3 lines about each.
1) Auto Clave
2) Sterilization Procedures
3) Hot Air Oven
4) Disinfectant
5) Types of packs
6) Contaminants
7) Detergents
Paper – III

5 Spotters – Write 3 lines about each.

- Capnography; etc02
- Pulse oximetry
- IBP
- CVP
- O2, N2O
- Suction apparatus
- Laryngoscops
- Et tubes
- Airways
- Things for IV accessibility.

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