

## **CLINICAL SPECIALITY – II**

### **MEDICAL SURGICAL NURSING**

#### **SUB SPECIALITY – CARDIO VASCULAR AND THORACIC NURSING**

Placement : II year

Hours of Instruction  
Theory : 150 hours.  
Practical : 950 hours.  
Total : 1100 hours.

#### **Course Description**

This course is designed to assist students in developing expertise and in-depth understanding in the field of cardiovascular and thoracic nursing. It will help students to develop advanced skills for nursing intervention in various cardio medical and surgical conditions. It will enable the student to function as Cardio vascular and Thoracic Nurse practitioner/specialist. It will further enable the student to function as educator, manager and researcher in the field of cardio vascular and thoracic nursing.

#### **Objectives**

At the end of the course the students will be able to:

1. Appreciate trends and issues related to cardio vascular and thoracic Nursing.
2. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of cardio vascular and thoracic conditions
3. Participate in national health programs for health promotion, prevention and rehabilitation of patients with cardio vascular and thoracic conditions
4. Perform physical, psychosocial & spiritual assessment
5. Assist in various diagnostic, therapeutic and surgical procedures
6. Apply nursing process in providing comprehensive care to patients with cardio vascular and thoracic conditions
7. Demonstrate advance skills/competence in managing patients with cardio vascular and thoracic conditions including Advance Cardiac Life Support.
8. Describe the various drugs used in cardio vascular and thoracic conditions and nurses responsibility
9. Demonstrate skill in handling various equipments/gadgets used for critical care of cardio vascular and thoracic patients
10. Appreciate team work & coordinate activities related to patient care.
11. Practice infection control measures.
12. Identify emergencies and complications & take appropriate measures

13. Discuss the legal and ethical issues in cardio vascular and thoracic nursing
14. Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs.
15. Appreciate the role of alternative system of medicine in care of patient
16. Incorporate evidence based nursing practice and identify the areas of research in the field of cardio vascular and thoracic nursing
17. Identify the sources of stress and manage burnout syndrome among health care providers.
18. Teach and supervise nurses and allied health workers.
19. Design a layout of ICCU and ICTU and develop standards for cardio vascular and thoracic nursing practice.

### Content Outline

Unit	Hours	Content
<b>I</b>	<b>5</b>	<b>Introduction</b> <ul style="list-style-type: none"> <li>□ Historical development, trends and issues in the field of cardiology.</li> <li>□ Cardio vascular and thoracic conditions – major health problem.</li> <li>□ Concepts, principles and nursing perspectives</li> <li>□ Ethical and legal issues</li> <li>□ Evidence based nursing and its application in cardio vascular and thoracic nursing(to be incorporated in all the units)</li> </ul>
<b>II</b>	<b>5</b>	<b>Epidemiology</b> <ul style="list-style-type: none"> <li>□ Risk factors: hereditary, psycho social factors, hypertension, smoking, obesity, diabetes mellitus etc</li> <li>□ Health promotion, disease prevention, Life style modification</li> <li>□ National health programs related to cardio vascular and thoracic conditions</li> <li>□ Alternate system of medicine</li> <li>□ Complementary therapies</li> </ul>
<b>III</b>	<b>5</b>	<b>Review of anatomy and physiology of cardio vascular and respiratory system</b> <ul style="list-style-type: none"> <li>□ Review of anatomy and physiology of heart, lung, thoracic cavity and blood vessels. Embryology of heart and lung.</li> <li>□ Coronary circulation</li> <li>□ Hemodynamics and electro physiology of heart.</li> <li>□ Bio-chemistry of blood in relation to cardio pulmonary function.</li> </ul>
<b>IV</b>	<b>20</b>	<b>Assessment and Diagnostic Measures:</b> <ul style="list-style-type: none"> <li>□ History taking</li> <li>□ Physical assessment <ul style="list-style-type: none"> <li>• Heart rate variability: Mechanisms , measurements, pattern, factors, impact of interventions on HRV</li> </ul> </li> <li>□ Diagnostic tests <ul style="list-style-type: none"> <li>• Hemodynamic monitoring: Technical aspects, monitoring, functional hemodynamic indices, ventricular function indices,</li> </ul> </li> </ul>

Unit	Hours	Content
		<p>output measurements (Arterial and swan Ganz monitoring). Blood gases and its significance, oxygen supply and demand</p> <ul style="list-style-type: none"> <li>• Radiologic examination of the chest: interpretation, chest film findings</li> <li>• Electro cardiography(ECG) : electrical conduction through the heart, basic electrocardiography, 12 lead electrocardiogram, axis determination <ul style="list-style-type: none"> <li>- ECG changes in: intraventricular conduction abnormalities- Arrhythmias, ischemia, injury and infarction, atrial and ventricular enlargement, electrolyte imbalance,</li> </ul> </li> <li>• Echocardiography: technical aspects, special techniques, echocardiography of cardiac structures in health and disease, newer techniques</li> <li>• Nuclear and other imaging studies of the heart: Magnetic Resonance Imaging.</li> <li>• Cardio electrophysiology procedures: diagnostic studies, interventional and catheter ablation, nursing care</li> <li>• Exercise testing: indications and objectives, safety and personnel, pretest considerations, selection, interpretation, test termination, recovery period</li> <li>• Cardiac catheterization: indications, contraindications, patient preparation, procedure, interpretation of data</li> <li>• Pulmonary function test: Bronchoscopy and graphies</li> <li>• Interpretation of diagnostic measures</li> <li>• Nurse’s role in diagnostic tests</li> </ul> <p>□ Laboratory tests using blood: Blood specimen collection, Cardiac markers, Blood lipids, Hematologic studies, Blood cultures, Coagulation studies, Arterial blood gases, Blood Chemistries, cardiac enzyme studies, Serum Concentration of Selected drugs.</p> <p>□ Interpretation and role of nurse</p>
<b>V</b>	<b>25</b>	<p><b>Cardiac disorders and nursing management:</b></p> <p>□ Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and nursing management of:</p> <ul style="list-style-type: none"> <li>• Hypertension</li> <li>• Coronary Artery Disease.</li> <li>• Angina of various types.</li> <li>• Cardiomegaly</li> <li>• Myocardial Infarction, Congestive cardiac failure</li> <li>• Heart Failure, Pulmonary Edema, Shock.</li> <li>• Rheumatic heart disease and other Valvular Diseases</li> <li>• Inflammatory Heart Diseases, Infective Endocarditis, Myocarditis, Pericarditis.</li> <li>• Cardiomyopathy, dilated, restrictive, hypertrophic.</li> <li>• Arrhythmias, heart block</li> </ul> <p>Associated illnesses</p>

Unit	Hours	Content
<b>VI</b>	<b>10</b>	<p><b>Altered pulmonary conditions</b></p> <ul style="list-style-type: none"> <li>□ Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and nursing management of: <ul style="list-style-type: none"> <li>• Bronchitis</li> <li>• Bronchial asthma</li> <li>• Bronchiectasis</li> <li>• Pneumonias</li> <li>• Lung abscess, lung tumour</li> <li>• Pulmonary tuberculosis, fibrosis, pneumoconiosis etc</li> <li>• Pleuritis, effusion</li> <li>• Pneumo, haemo and pyothorax</li> <li>• Interstitial Lung Disease</li> <li>• Cystic fibrosis</li> <li>• Acute and Chronic obstructive pulmonary disease (conditions leading to)</li> <li>• Cor pulmonale</li> <li>• Acute respiratory failure</li> <li>• Adult respiratory distress syndrome</li> <li>• Pulmonary embolism</li> <li>• Pulmonary Hypertension</li> </ul> </li> </ul>
<b>VII</b>	<b>10</b>	<p><b>Vascular disorders and nursing management</b></p> <ul style="list-style-type: none"> <li>□ Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and nursing management of: <ul style="list-style-type: none"> <li>• Disorders of arteries</li> <li>• Disorders of the aorta</li> <li>• Aortic Aneurysms,</li> <li>• Aortic dissection</li> <li>• Raynaud's phenomenon</li> <li>• Peripheral arterial disease of the lower extremities</li> <li>• Venous thrombosis</li> <li>• Varicose veins</li> <li>• Chronic venous insufficiency and venous leg ulcers</li> <li>• Pulmonary embolism</li> </ul> </li> </ul>
<b>VIII</b>	<b>10</b>	<p><b>Cardio thoracic emergency interventions</b></p> <ul style="list-style-type: none"> <li>□ CPR- BLS and ALS</li> <li>□ Use of ventilator, defibrillator , pacemaker</li> <li>□ Post resuscitation care.</li> <li>□ Care of the critically ill patients</li> <li>□ Psychosocial and spiritual aspects of care</li> <li>□ Stress management; ICU psychosis</li> <li>□ Role of nurse</li> </ul>
<b>IX</b>	<b>10</b>	<p><b>Nursing care of a patient with obstructive airway</b></p> <ul style="list-style-type: none"> <li>□ Assessment</li> <li>□ Use of artificial airway</li> <li>□ Endotracheal intubation, tracheostomy and its care</li> <li>□ Complication, minimum cuff leak, securing tubes</li> </ul> <p><b>Oxygen delivery systems.</b></p> <ul style="list-style-type: none"> <li>□ Nasal Cannula</li> </ul>

Unit	Hours	Content
		<ul style="list-style-type: none"> <li>□ Oxygen mask, Venturi mask</li> <li>□ Partial rebreathing bag</li> <li>□ Bi-PAP and C-PAP masks</li> <li>□ Uses, advantages, disadvantages, nursing implications of each.</li> </ul> <p><b>Mechanical Ventilation</b></p> <ul style="list-style-type: none"> <li>□ Principles of mechanical ventilation</li> <li>□ Types of mechanical ventilation and ventilators.</li> <li>□ Modes of ventilation, advantage, disadvantage, complications.</li> <li>□ PEEP therapy, indications, physiology, and complications. Weaning off the ventilator.</li> <li>□ Nursing assessment and interventions of ventilated patient.</li> </ul>
<b>X</b>	<b>10</b>	<p><b>Congenital Heart Diseases,</b></p> <ul style="list-style-type: none"> <li>□ Etiology, clinical manifestations, diagnosis, prognosis, related pathophysiology, treatment modalities and nursing management of: <ul style="list-style-type: none"> <li>• Embryological development of heart.</li> <li>• Classification – cyanotic and acyanotic heart disease.</li> <li>• Tetralogy of Fallots.</li> <li>• Atrial Septal Defect, Ventricular Septal Defect., Eisenmenger’s complex.</li> <li>• Patent ductus arteriosus, AP window</li> <li>• Truncus Arteriosus.</li> <li>• Transposition of great arteries.</li> <li>• Total Anomaly of Pulmonary Venous Connection.</li> <li>• Pulmonary stenosis, atresia.</li> <li>• Coarctation of aorta.</li> <li>• Ebstein’s anomaly</li> <li>• Double outlet right ventricle, Single ventricle, Hypoplastic left heart syndrome.</li> </ul> </li> </ul>
<b>XI</b>	<b>10</b>	<p><b>Pharmacology</b></p> <ul style="list-style-type: none"> <li>□ <b>Review</b></li> <li>□ Pharmacokinetics</li> <li>□ Analgesics/Anti inflammatory agents</li> <li>□ Antibiotics, antiseptics</li> <li>□ Drug reaction &amp; toxicity</li> <li>□ Drugs used in cardiac emergencies</li> <li>□ Blood and blood components <ul style="list-style-type: none"> <li>• Antithrombolytic agents</li> <li>• Inotropic agents</li> <li>• Beta-blocking agents</li> <li>• Calcium channel blockers.</li> <li>• Vaso constrictors</li> <li>• Vaso dilators</li> <li>• ACE inhibitors.</li> <li>• Anticoagulents</li> <li>• Antiarrhythmic drugs.</li> <li>• Anti hypertensives</li> <li>• Diuretics</li> <li>• Sedatives and tranquilizers.</li> <li>• Digitalis.</li> </ul> </li> </ul>

Unit	Hours	Content
		<ul style="list-style-type: none"> <li>• Antilipemics</li> <li>□ Principles of drug administration, role and responsibilities of nurses and care of drugs</li> </ul>
<b>XII</b>	<b>20</b>	<p><b>Nursing Care of patient undergoing cardio thoracic surgery</b></p> <ul style="list-style-type: none"> <li>□ Indications, selection of patient</li> <li>□ Preoperative assessment and preparation; counselling.</li> <li>□ Intraoperative care: Principles of open heart surgery, equipment, anaesthesia, cardiopulmonary by pass.</li> <li>□ Surgical procedures for Coronary Artery Bypass Grafting, recent advances and types of grafts, Valve replacement or reconstruction, cardiac transplant, Palliative surgery and different Stents, vascular surgery, other recent advances.</li> <li>□ Thoracic surgery: lobectomy, pneumonectomy, tumour excision etc</li> <li>□ Immediate postoperative care : assessment, post operative problems and interventions : Bleeding, Cardiac tamponade, Low cardiac output, Infarction, Pericardial effusion, Pleural effusion, Pneumothorax, Haemothorax, Coagulopathy, Thermal imbalance, Inadequate., ventilation/perfusion, Neurological problems, renal problems, Psychological problems.</li> <li>□ Chest physiotherapy</li> <li>□ Nursing interventions- life style modification, complementary therapy/alternative systems of medicine.</li> <li>□ Intermediate and late post operative care after CABG, valve surgery, others.</li> </ul> <p>Follow up care</p>
<b>XIII</b>	<b>5</b>	<p><b>Cardiac rehabilitation</b></p> <ul style="list-style-type: none"> <li>□ Process</li> <li>□ Physical evaluation</li> <li>□ Life style modification</li> <li>□ Physical conditioning for cardiovascular efficiency through exercise</li> <li>□ Counseling</li> <li>□ Follow up care</li> </ul>
<b>XIV</b>	<b>5</b>	<p><b>Intensive Coronary Care Unit/intensive cardio thoracic unit:</b></p> <ul style="list-style-type: none"> <li>□ Quality assurance <ul style="list-style-type: none"> <li>• Standards, Protocols, Policies, Procedures</li> <li>• Infection control; Standard safety measures</li> <li>• Nursing audit</li> <li>• Design of ICCU/ICTU</li> <li>• Staffing; cardiac team</li> <li>• Burn out syndrome</li> </ul> </li> <li>□ Nurse's role in the management of I.C.C.U and ICTU.</li> <li>□ Mobile coronary care unit.</li> <li>□ Planning inservice educational programme and teaching</li> </ul>

## Practicals

**Total – 960 Hours**  
**1 Weeks = 30 Hours**

S.No.	Deptt/ Unit	No. of Week	Total Hours
1	Cardio thoracic -Medical	4	120 Hours
	-Surgical	4	120 Hours
2.	OTs (Cardiac and thoracic)	4	120 Hours
3.	Casualty	2	60 Hours
4.	Diagnostic labs including cath lab	2	60 Hours
5.	ICCU	4	120 Hours
6.	ICU	4	120 Hours
7.	CCU	4	120 Hours
8.	Paediatric Intensive	2	60 Hours
9.	OPD	2	60 Hours
	<b>Total</b>	<b>32 Weeks</b>	<b>960 Hours</b>

### Essential Nursing Skills

#### Procedures Observed

1. Echo cardiogram
2. Ultrasound
3. Monitoring JVP , CVP
4. CT SCAN
5. MRI
6. Pet SCAN
7. Angiography
8. Cardiac cathetrisation
9. Angioplasty
10. Various Surgeries
11. Any other

#### I. Procedures Assisted

1. Arterial blood gas analysis
2. Thoracentesis
3. Lung biopsy
4. Computer assisted tomography (CAT Scan)
5. M.R.I.
6. Pulmonary angiography
7. Bronchoscopy
8. Pulmonary function test
9. ET tube insertion
10. Tracheostomy tube insertion
11. Cardiac catheterisation
12. Angiogram
13. Defibrillation
14. Treadmill test

15. Echo cardiography
16. Doppler ultrasound
17. Cardiac surgery
18. Insertion of chest tube
19. CVP Monitoring
20. Measuring pulmonary artery pressure by Swan-Ganz Catheter
21. Cardiac Pacing

## **II. Procedures Performed**

1. Preparation of assessment tool for CT client (Cardiac, thoracic and vascular).
2. ECG – Recording, Reading, Identification of abnormalities
3. Oxygen therapy – Cylinder, central supply,  
Catheter, nasal canula, mask, tent  
Through ET and Tracheostomy tube  
Manual resuscitation bag
4. Mechanical ventilation
5. Spirometer
6. Tuberculen skin test
7. Aerosal therapy
8. Nebulizer therapy
9. Water seal drainage
10. Chest physiotherapy including – Breathing Exercises  
Coughing Exercises  
Percussion & Vibration
11. Suctioning – Oropharyngeal, nasotracheal, Endotracheal  
Through tracheostomy tube
12. Artificial airway cuff maintenance
13. CPR
14. Care of client on ventilator
15. Identification of different – Arrhythmias  
Abnormal pulses, respirations  
B.P. Variation  
Heart sounds  
Breath sounds
16. Pulse oxymetry
17. Introduction of intracath
18. Bolus I.V. Injection
19. Life line
20. Maintenance of “Heplock”
21. Subcutaneous of Heparin
22. Obtaining leg measurements to detect early swelling in thrombophlebetes
23. Identification of Homans signs
24. Buerger – Allen exercises