

SUMANDEEPVIDYAPEETH

(Declared as Deemed to be University under Section 3 of the UGC Act 1956)

Accredited NAAC 'A++' Grade with 3.61 CGPA out of 4

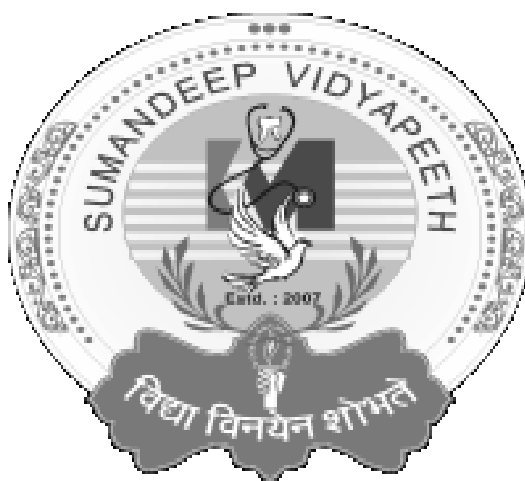
Conferred with UGC-Category-1 status

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CURRICULUM DIPLOMA CARDIAC CARE TECHNICIAN



2018

INTRODUCTION

Scope

The quality of paramedical care has improved tremendously in the last few decades due to the advances in technology, thus creating fresh challenges in the field of healthcare. It is now widely recognized that health service delivery is a team effort involving both clinicians and non-clinicians, and is not the sole duty of physicians and nurses. Professionals that can competently handle sophisticated machinery and advanced protocols are now in high demand. In fact, diagnosis is now so dependent on technology, that paramedical and healthcare professionals are vital to successful treatment delivery.

Effective delivery of healthcare services depends largely on the nature of education, training and appropriate orientation towards community health of all categories of health personnel, and their capacity to function as an integrated team, with a range of skills and expertise, play key roles within the National Health Service, working autonomously, in multi-professional teams in various settings. All of them are first-contact practitioners and work across a wide range of locations and sectors within acute, primary and community care.

Learning goals and objectives for paramedical healthcare professionals

The learning goals and objectives of the undergraduate and graduate education program will be based on the performance expectations. They will be articulated as learning goals (why we teach this) and learning objectives (what the students will learn). Using the framework, students will learn to integrate their knowledge, skills and abilities in a hands-on manner in a professional healthcare setting.

Program outcomes

After completion of B.sc Cardiac care technology should be able to assist physicians by diagnosing and treating diseases of the heart and blood vessels and take the images of the heart and peripheral blood vessels through both invasive and non-invasive procedures, such as catheterization, balloon angioplasty, or the use of ultrasound equipment.

Ethics and accountability

Students will understand core concepts of clinical ethics and law so that they may apply these to their practice as healthcare service providers. Program objectives should enable the students to:

- Describe and apply the basic concepts of clinical ethics to actual cases and situations
- Recognize the need to make health care resources available to patients fairly, equitably and without bias, discrimination or undue influence
- Demonstrate an understanding and application of basic legal concepts to the practice
- Employ professional accountability for the initiation, maintenance and termination of patient-provider relationships

- Demonstrate respect for each patient's individual rights of autonomy, privacy, and confidentiality

Commitment to professional excellence

The student will execute professionalism to reflect in his/her thought and action a range of attributes and characteristics that include technical competence, appearance, image, confidence level, empathy, compassion, understanding, patience, manners, verbal and non-verbal communication, an anti-discriminatory and non-judgmental attitude, and appropriate physical contact to ensure safe, effective and expected delivery of healthcare.

Eligibility for admission:

1. He/she has passed the Higher Secondary (10+2) Science or a duly constituted Board with pass marks in Physics, Chemistry, Biology

Duration of the course:

Duration of the course is 2 years and 2 months internship.

Attendance:

A candidate has to secure minimum 80% attendance in overall with at least-

1. 75% attendance in theoretical
2. 80% in Skills training (practical) for qualifying to appear for the final examination.

No relaxation, whatsoever, will be permissible to this rule under any ground including indisposition etc.

Medium of instruction:

English shall be the medium of instruction for all the subjects of study and for examination of the course.

Assessment: Assessments should be completed by the academic staff, based on the compilation of the student's theoretical & clinical performance throughout the training programme. To achieve this, all assessment forms and feedback should be included and evaluated. Student must attain at least 50% marks in each Theory, Internal assessment and Practical independently / separately for each individual subject.

COURSE OF INSTRUCTION

Course Name	Course code	Theory (In hrs.) (Class and lab)	Practical (In hrs.) (Clinical)
First Year - Total Hours 380			
Anatomy	DCCT101	60	40
Physiology	DCCT102	60	40
Pathology & Microbiology	DCCT103	60	40
Biochemistry	DCCT104	40	40
Total		220	160

Second Year - Total Hours 640			
Applied Pathology	DCCT201	60	40
Applied Microbiology	DCCT202	60	40
General Medicine	DCCT203	60	-
Applied pharmacology	DCCT204	60	-
Introduction related to cardiac care technology	DCCT205	80	40
Clinical aspect of cardiac care	DCCT206	80	40
Advance cardiac care	DCCT207	80	40
Total		440	200

SCHEME OF EXAMINATION

Course	Course Code	Assessment			
		Hours	Internal	External	Total
First Year					
Anatomy	DCCT101	3	20	80	100
Physiology	DCCT102	3	20	80	100
Pathology & Microbiology	DCCT103	3	20	80	100
Biochemistry	DCCT104	3	20	80	100
Total			80	320	400
Second Year -					
Applied Pathology	DCCT201	3	20	80	100
Applied Microbiology	DCCT202	3	20	80	100
General Medicine	DCCT203	3	20	80	100
Applied pharmacology	DCCT204	3	20	80	100
Introduction related to cardiac care technology	DCCT301	3	20	80	100
Clinical aspect of cardiac care	DCCT302	3	20	80	100
Advance cardiac care	DCCT303	3	20	80	100
Total			140	560	700

FIRST YEAR DIPLOMA CARDIAC CARE TECHNICIAN

DCCT101-ANATOMY

60 HOURS

THEORY

UNIT 1: (ORGANISATION)

- 1.1 Terms, terminology, planes
- 1.2 Tissues of the body (General) Epithelial tissue
- 1.3 Glands, mucous membrane

UNIT 2: (SKELETAL SYSTEM)

- 2.1 Cartilage
- 2.2 Bones
- 2.3 Ossification, blood supply

- 2.4 Joints
- 2.5 Synovial joint

UNIT 3: (MUSCULAR TISSUE)

- 3.1 Muscle classification – I
- 3.2 Muscle – II,
- 3.3 UNIT – IV (Nervous system)
- 3.4 Neuron, Neuroglia
- 3.5 Spinal cord & Spinal nerves
- 3.6 Parts of brain & major functions
- 3.7 Cranial nerves
- 3.8 Autonomic nervous system

UNIT 4: (SENSORY ORGANS)

- 4.1 Nose & Olfaction
- 4.2 Tongue

UNIT 5: (CIRCULATION & LYMPHATIC)

- 5.1 Systemic, Pulmonary, Portal
- 5.2 Heart, chambers, valves
- 5.3 Coronary circulation, venous drainage, applied
- 5.4 Major branches of aorta, major veins, pulse
- 5.5 Femoral and Auxiliary artery
- 5.6 Diaphragm
- 5.7 Lymphoid tissue classification, structure I
- 5.8 Lymphoid tissue classification, structure II
- 5.9 Lymphatic drainage, lymphatic trunks

PRACTICAL:

40 HOURS

1.	Human skeleton
2.	Organ systems
3.	Organs – 1
4.	Organs – 2
5.	Organs – 3
6.	Organs – 4
7.	Organs – 5
8.	Types of Cartilages
9.	Bones -1
10.	Bones -2
11.	Bones -3
12.	Histology of compact bones
13.	Muscles of body as functional groups
14.	Histology of types of muscles

DCCT102-PHYSIOLOGY

60 HOURS

UNIT-1 GENERAL PHYSIOLOGY

- 1.1 Introduction to cell physiology,
- 1.2 Transport across cell membrane
- 1.3 Homeostasis, Body Fluid compartment & measurement

UNIT-2 BLOOD

- 2.1 Introduction - composition and function of blood
- 2.2 Plasma proteins
- 2.3 Red blood cells.
- 2.4 Hemoglobin
- 2.5 WBC
- 2.6 Platelets
- 2.7 Homeostasis
- 2.8 Blood Group

UNIT-3 NERVE – MUSCLE PHYSIOLOGY

- 3.1 Resting membrane potential & Action potential
- 3.2 Types of muscle & Mechanism of Muscle Contraction
- 3.3 Neuromuscular Junction
- 3.4 Neuron and neuroglia
- 3.5 Properties of nerve fibre
- 3.6 Secretion & Composition & function of CSF

UNIT-4 GIT

- 4.1 Movement of GIT
- 4.2 Deglutition & Mechanism of Vomiting
- 4.3 Digestive Juices in upper digestive tract
- 4.4 Digestive juices in lower digestive tract

UNIT-5 EXCRETORY SYSTEM

- 5.1 Kidneys-structure, function
- 5.2 Glomerular filtration rate
- 5.3 Counter current mechanism of concentration of urine,
- 5.4 micturition, Diuretics
- 5.5 Artificial kidney, renal function tests
- 5.6 Skin
- 5.7 Regulation of body Temperature

UNIT-6 RESPIRATORY SYSTEM

- 6.1 Mechanism of Breathing
- 6.2 Hypoxia
- 6.3 O₂ and CO₂ transport
- 6.4 Pulmonary volume & Capacities

UNIT -7 CARDIO VASCULAR SYSTEM

- 7.1 Introduction to CVS & general principles of circulation
- 7.2 Properties of Cardiac muscle
- 7.3 Cardiac cycle, heart sounds, Pulse
- 7.4 Cardiac output, Heart rate, BP, ECG
- 7.5 Coronary circulation, Cutaneous circulation-Triple response, Shock
- 7.6 Effects of exercise on CVS and Respiratory system

UNIT-8 LYMPHATIC SYSTEM

UNIT- 9 ENDOCRINE SYSTEMS

- 9.1 Hormones of pituitary, Thyroid

9.2 Parathyroid Gland

9.3 Hormones of Adrenal Gland & Pancreas

UNIT 10 REPRODUCTIVE SYSTEM

10.1 Introduction to reproductive system, Puberty

10.2 Male reproductive system,

10.3 Female reproductive system,

10.4 Physiological changes during pregnancy, pregnancy tests, parturition & lactation

10.5 Male & Female contraceptive methods

10.6 Special senses

10.7 Vision

10.8 Audition

10.9 Olfaction

10.10 Gustation

PRACTICAL:

40 HOURS

1. Introduction and Laboratory guidelines

2. Demonstration of estimation of Hemoglobin

3. Practical of estimation of Hemoglobin

4. Practical of BT & CT

5. Practical of Blood Grouping

6. ESR & PCV

7. Blood Pressure

8. Pulse

9. Revision

10. Heart rate & heart sound

11. Breathing rate & breathing sound

12. Identification of blood cells by peripheral smear. RBC, WBC, Platelets.

13. Revisions

DCCT103-PATHOLOGY

30 HOURS

UNIT 1-CELL INJURY AND ADAPTATION:

1.1 Necrosis:

1.2 Definition.

1.3 Types of necrosis.

1.4 Short notes: Coagulative necrosis.

1.5 Liquefactive necrosis

1.6 Caseous necrosis

1.7 Fat necrosis

1.8 Gangrene

UNIT 2- INFLAMMATION AND REPAIR:

2.1 Inflammation: Definition

2.1.1 Types of inflammation

2.1.2 Vascular changes, Hemodynamic changes

2.1.3 Changes in vascular permeability

2.1.4 Cellular events: Margination, Adhesion, Emigration, Chemotaxis, Phagocytosis.

2.1.5 Shortnotes: Phagocytosis, Chemotaxis and Granulomas

2.2 Healing and repair:

- 2.2.1 Process of healing by primary intention.
- 2.2.2 Process of healing by secondary intention.
- 2.2.3 Shortnotes: factors influencing wound healing.

UNIT 3: FLUID AND HEMODYNAMIC DERANGEMENTS:

3.1 Edema:

- 3.1.1 Definition
- 3.1.2 Types of edema
- 3.1.3 Pathogenesis of renal and cardiac edema
- 3.1.4 Lymph edema

3.2 Shock:

- 3.2.1 Definition
- 3.2.2 Types of shock
- 3.2.3 Pathogenesis of septic and hypovolemic shock

3.3 Thrombosis:

- 3.3.1 Definition
- 3.3.2 Factors influencing thrombosis
- 3.3.3 Fate of thrombosis

UNIT 4-NEOPLASIA

- 4.1 Introduction: nomenclature, metaplasia, dysplasia, anaplasia, hyperplasia, hypertrophy
- 4.2 Definition
- 4.3 Differences between benign and malignant tumors
- 4.4 Spread of tumors
- 4.5 Shortnotes: Gross features and clinical features of:
- 4.6 Squamous papilloma
- 4.7 Squamous cell carcinoma
- 4.8 Lipoma
- 4.9 Fibrosarcoma.

UNIT 5-INFECTIOUS DISEASES:

- 5.1 Tuberculosis: Etiology and clinical features.
- 5.2 Geon complex
- 5.3 Secondary tuberculosis
- 5.4 Leprosy: Etiology, classification and morphology of Lepromatous and Tuberculoid
- 5.5 leprosy
- 5.6 Etiology, mode of infection, clinical features and gross pathology of HIV infection

UNIT 6- DISEASES OF RED CELLS AND BLEEDING DISORDERS

- 6.1 Anaemia: definition and classification
- 6.2 Clinical features of:
- 6.3 Iron deficiency anaemia
- 6.4 Vit B 12 deficiency anaemia
- 6.5 Sickle cell anemia
- 6.6 Coagulation disorders: classification, capillary fragility and platelet disorders.
- 6.7 Haemophilia(SN) thrombocytopenia including ITP(SN)

UNIT 7: DISEASES OF WHITECELL AND LYMPH NODES

7.1 Leukaemia: definition, classification and clinical features

7.2 Lymphoma: definition, types and clinical features

UNIT 8-NUTRITIONAL DISEASES

8.1 Vit A, B, C, D deficiency including a brief account of rickets

PRACTICAL:

20 HOURS

1. Receiving of Specimen in the laboratory
2. Grossing Techniques
3. Mounting Techniques – various Mutants
4. Maintenance of records and filing of the slides
5. Tissue processing for routine paraffin sections
6. Section Cutting
7. Staining of tissues - H& E Staining
8. Collection, Transport, Preservation, and Processing of various clinical Specimens
9. Urine Examination – Collection and Preservation of urine. Physical, Chemical, Microscopic
10. Examination
11. Urine Examination –Chemical and Microscopic Examination
12. Collection of Blood samples
13. Various Anticoagulants used in Haematology

DCCT103-MICROBIOLOGY

30 HOURS

UNIT 1: GENERAL MICROBIOLOGY

- 1.1 History: Louis Pasteur, Robert Koch
- 1.2 Microscope: Parts, function and its types
- 1.3 Morphology of bacteria: classification of microorganisms, bacteria cell, staining of bacteria- Gram and ZN stain.
- 1.4 Physiology of bacteria: Growth and nutrition of bacteria, Growth curve
- 1.5 Sterilization and disinfection: Dry heat, moist heat sterilization, filtration, Radiation, disinfectants use in hospital
- 1.6 Culture media: simple and complex media, preparation and its use
- 1.7 Culture methods: aerobic and anaerobic
- 1.8 Identification of bacteria: catalase test, coagulase test, oxidase test, Urease test, IMViC TESTS

UNIT 2: IMMUNOLOGY

- 2.1 Infection
- 2.2 Immunity
- 2.3 Antigen
- 2.4 Antibody

UNIT 3: COLLECTION, TRANSPORT AND PROCESSING OF CLINICAL SPECIMENS:

- 3.1 Throat swab
- 3.2 Sputum
- 3.3 Urine
- 3.4 Pus
- 3.5 Blood

3.6 CSF

UNIT 4: SYSTEMIC BACTERIOLOGY

- 4.1 Staphylococcus aureus
- 4.2 Streptococcus pyogenes
- 4.3 Pneumococcus
- 4.4 E.coli, Klebsiella and Pseudomonas

UNIT 5: HEALTH CARE ASSOCIATED INFECTIONS:

- 5.1 Sources, Method of transmission and Prevention

UNIT 6: Principle and Practices of Biomedical waste management

PRACTICAL:

20 HOURS

1. Microscope: parts function, focus, care and handling
2. Hanging drop preparation
3. Performance of Gram's stain
4. Performance of ZN stain
5. Culture media preparation: Nutrient agar, Blood agar, Chocolate agar, NA slant,
6. Mac conkeys agar.
7. Functioning of Autoclave and Hot air oven
8. Visit to hospital for the demonstration of Biomedical Waste Management
9. Aseptic practices in laboratory and safety precautions

DCCT104-BIOCHEMISTRY

60 HOURS

UNIT 1-BASIC CONCEPTS OF ENZYMES

- 1.1 Clinical enzymology
- 1.2 Carbohydrates proteins and lipids (structure and function)
- 1.3 Primary metabolic pathways involving proteins, lipids and carbohydrates
- 1.4 Biosynthesis of Proteins, Membrane, Lipids and Glucose – Basic Steps

UNIT 2

- 2.1 Haemoglobin (Haem Synthesis), Blood Clotting Factors

UNIT 3

- 3.1 Brief Note on Vitamins

UNIT 4

- 4.1 Plasma Proteins and their Clinical Importance

UNIT 5-CLINICAL BIOCHEMISTRY AND INTERPRETATION

- 5.1 Test for liver function/gastric function
- 5.2 Test for renal function
- 5.3 Lipid profile
- 5.4 Glucose –gtt, rbs, fbs
- 5.5 Electrolytes
- 5.6 Blood collection/anticoagulants

PRACTICALS:**40 HOURS**

1. To demonstrate glassware's, apparatus and plastic wares used in laboratory.
2. Preparation of different percentage solutions
3. Preparation of normal and molar solutions. (0.1 N NaOH, 0.2N HCl, 0.1 M H₂SO₄).
4. Reactions of Carbohydrate
5. Reactions of Protein: - Precipitation and Color reaction.
6. Analysis of Normal Urine:- Physical, Chemical and Microscopic
7. Analysis of abnormal Urine:- Physical, Chemical and Microscopic
8. Qualitative analysis of Saliva.
9. Qualitative analysis of Milk
10. Qualitative analysis of Bile.
11. Qualitative analysis of CSF.
12. Qualitative analysis of Gastric juice

Each student shall undergo training in Skill Simulation Laboratory for learning certain basic clinical skills like IV/IM injection, setting IV line, Cardio-pulmonary resuscitation (CPR), and Life support skills in the beginning of second year, for duration of continuous four days. (Board of Studies letter No.:FPMS/SV/BOS-MIN/0006/2016-17, dated 19/01/2017, and vide notification of Board of Management resolution Ref.:No. SVDU/R/2017-18/5056, dated 09/01/2018).

SECOND YEAR CARDIAC CARE TECHNICIAN

DCCT201-APPLIED PATHOLOGY

60 HOURS

UNIT1.CARDIOVASCULAR SYSTEM

- 1.1 Atherosclerosis- Definition, risk factors, briefly Pathogenesis &
- 1.2 Morphology, clinical significance and prevention.
- 1.3 Hypertension- Definition, types and briefly Pathogenesis and
- 1.4 Effects of Hypertension.
- 1.5 Aneurysms – Definition, classification, Pathology and Complications.
- 1.6 Path physiology of Heart failure.
- 1.7 Cardiac hypertrophy – causes, Pathophysiology & Progression to
- 1.8 Heart Failure.
- 1.9 Ischemic heart diseases- Definition, Types. Briefly
- 1.10 Pathophysiology, Pathology& Complications of various types of IHD.
- 1.11 Alular Heart diseases- causes, Pathology & complication.
- 1.12 Complications of artificial valves.
- 1.13 Cardiomyopathy – Definition, Types, causes and significance.
- 1.14 Pericardial effusion- causes, effects and diagnosis.
- 1.15 Congenital heart diseases – Basic defect and effects of important
- 1.16 Types of congenital heart diseases.

UNIT2-HAEMATOLOGY

- 2.1 Anemia – Definition, morphological types and diagnosis of
- 2.2 Anemia.
- 2.3 Brief concept about Haemolyticaemia and polycythaemia.
- 2.4 Leukocyte disorders- Briefly leukemia, leukocytosis,
- 2.5 Agranulocytosis etc.
- 2.6 Bleeding disorders- Definition, classification, causes & effects of
- 2.7 Important types of bleeding disorders. Briefly various laboratories
- 2.8 Tests used to diagnose bleeding disorders.

UNIT 3.RESPIRATORY SYSTEM

- 3.1 Chronic obstructive airway diseases – Definition and types.
- 3.2 Briefly causes, Pathology and complications of each type of COPD.
- 3.3 Briefly concept about obstructive versus restrictive pulmonary Disease.
- 3.4 Pneumoconiosis- Definition, types, Pathology and effects in brief.
- 3.5 Pulmonary congestion and edema.
- 3.6 Pleural effusion – causes, effects and diagnosis.

UNI 4.RENAL SYSTEM

- 4.1 Clinical manifestations of renal diseases. Briefly causes, mechanism, effects and laboratory diagnosis of ARF & CRS.
- 4.2 Briefly Glomerulonephritis and Pyelonephritis.
- 4.3 End stage renal disease – Definition, causes, effects and role of
- 4.4 Dialysis and renal transplantation in its management.
- 4.5 Brief concept about obstructive uropathy.

PRACTICALS

40 HOURS

- 1. Description & diagnosis of the following gross specimens.
- 2. Atherosclerosis.
- 3. Aortic aneurysm.
- 4. Myocardial infarction.
- 5. Emphysema
- 6. Chronic glomerulonephritis.
- 7. Chronic pyelonephritis.
- 8. Interpretation & diagnosis of the following charts.
- 9. Hematology Chart - AML, CML, Hemophilia, neutrophilia, eosinophilia
- 10. Urine Chart - ARF, CRF, Acute glomerulonephritis.
- 11. Estimation of Hemoglobin.
- 12. Estimation Bleeding & Clotting time

DCCT202-APPLIED MICROBIOLOGY

60 HOURS

UNIT 1-HEALTH CARE ASSOCIATED INFECTIONS AND ANTIMICROBIAL RESISTANCE:

- 1.1 Infections that patient acquire during the course of receiving treatment for other conditions within a healthcare setting like Methicillin Resistant Staphylococcus aureus infections, Infections caused by Clostridium difficile, Vancomycin resistant enterococci etc. Catheter related blood stream infections, Ventilator associated pneumonia, Catheter Related urinary tract infections, Surveillance of emerging resistance and changing flora. The impact and cost attributed to Hospital Associated infection.

UNIT2-DISEASE COMMUNICABLE TO HEALTHCARE WORKERS IN HOSPITAL SET UP AND IT'S PREVENTIVE MEASURE:

- 2.1 Occupationally acquired infections in healthcare professionals by respiratory route (tuberculosis, varicella-zoster, respiratory syncytial virus etc), blood borne transmission (HIV, Hepatitis B, Hepatitis C, Cytomegalovirus, Ebola virus etc), orofaecal route (Salmonella, Hepatitis A etc), direct contact (Herpes Simplex Virus etc).
- 2.2 Preventive measures to combat the spread of these infections by monitoring and control.

UNIT 3-MICROBIOLOGICAL SURVEILLANCE AND SAMPLING

- 3.1 Required to determine the frequency of potential bacterial pathogens including Streptococcus pneumonia, Haemophilus influenza, and Moraxella catarrhalis and also to assess the antimicrobial resistance.
- 3.2 Sampling: rinse technique, direct surface agar plating technique
- 3.3 Importance of sterilization:
- 3.4 Disinfection of instruments used in patient care: Classification, different methods, advantages and disadvantages of the various methods.
- 3.5 Disinfection of the patient care unit
- 3.6 Infection control measures for ICU's
- 3.7 Sterilization:
- 3.8 Rooms: Gaseous sterilization, one atmosphere uniform glow discharge plasma (OAUGDP).
- 3.9 Equipments: classification of the instruments and appropriate methods of sterilization.
- 3.10 Central supply department: the four areas and the floor plan for instrument cleaning, high-level disinfecting and sterilizing areas.
- 3.11 Preparation of materials for autoclaving: Packing of different types of materials, loading, holding time and unloading

PRACTICAL

40 HOURS

- 1. Principles of autoclaving & quality control of Sterilization.
- 2. Collection of specimen from outpatient units, inpatient units, minor operation theater and major operation theater for sterility testing.
- 3. The various methods employed for sterility testing.
- 4. Interpretation of results of sterility testing.
- 5. Disinfection of wards, OT and Laboratory.

DCCT203-MEDICINE RELEVANT TO CARDIAC CARE TECHNOLOGY**60 HOURS**

1. Cardiovascular System
2. Ischemic heart diseases
3. Rheumatic heart disease
4. Congenital heart disease
5. Hypertension
6. Aortic Aneurysms
7. Cardiomyopathy
8. Peripheral vascular disease
9. Pulmonary edema and LV failure
10. Hematology
11. Anemia
12. Bleeding disorders
13. Laboratory tests used to diagnose bleeding disorders (in brief)
14. Respiratory System
15. Chronic obstructive airway diseases (COPD)
16. Concept of obstructive versus restrictive pulmonary disease
17. PFT and its interpretation
18. Renal System
19. ARF & CRF
20. End stage renal disease
21. Role of dialysis and renal transplantation in its management
22. CNS
23. Automatic nervous system
24. (Sympathetic & Parasympathetic system)
25. Brief mention of CNS disorders & their etiology
26. Pregnancy
27. Pediatric Patient (neonate/Infant)
28. Elderly patient

DCCT204-APPLIED PHARMACOLOGY**60 HOURS**

1. General concepts about pharmacodynamic and Pharmacokinetic
2. Principles involved in drug activity.
3. Autonomic nerves system.
4. Anatomy & functional organization.
5. List of drugs acting on ANS including dose, route of administration, indications, contra indications and adverse effects.
6. Cardiovascular drugs- Enumerate the mode of action, side effects And therapeutic uses of the following drugs.

UNIT 1-ANTI HYPERTENSIVE

- 1.1 Beta Adrenergic antagonists
- 1.2 Alpha Adrenergic antagonists
- 1.3 Peripheral Vasodilators
- 1.4 Calcium channel blockers

UNIT 2-ANTI ARRHYTHMIC DRUGS

- 2.1 Cardiac glycosides
- 2.2 Sympathetic and no sympathetic isotropic agents.
- 2.3 Coronary vasodilators.
- 2.4 Antianginal and anti failure agents
- 2.5 Lipid lowering & anti atherosclerotic drugs.
- 2.6 Drugs used in Haemostatic – anticoagulants Thrombolytic and Antithrombolytics.
- 2.7 Cardiologic drugs- History, Principles and types of cardioplasia.
- 2.8 Primary solutions – History, principles & types.
- 2.9 Drugs used in the treatment of shock.

UNIT 3 - ANESTHETIC AGENTS.

- 3.1 Definition of general and local anesthetics.
- 3.2 Classification of general anesthetics.
- 3.3 Pharmacokinetics and Pharmacodynamics of inhaled anesthetic agents.
- 3.4 Intravenous general anesthetic agents.
- 3.5 Local anesthetics – classification mechanism of action, duration of action and methods to prolong the duration of action. Preparation, dose and routes of administration

UNIT 4 -ANALGESICS

- 4.1 Definition and classification
- 4.2 Routes of administration, dose, frequency of administration,
- 4.3 Side effects and management of non opioid and opioid analgesics

UNIT 5-ANTI HISTAMINES AND ANTIEMETICS-

- 5.1 Classification, Mechanism of action, adverse effects,
- 5.2 Preparations, dose and routes and administration.

UNIT 6-CNS STIMULANTS AND DEPRESSANTS

- 6.1 Alcohol
- 6.2 Sedatives, hypnotics and narcotics
- 6.3 CNS stimulants
- 6.4 Neuromuscular blocking agents and muscle relaxants.

UNIT 7 - PHARMACOLOGICAL PROTECTION OF ORGANS DURING CPB

UNIT 8 - INHALATIONAL GASES AND EMERGENCY DRUGS.

UNIT 9 - PHARMACOTHERAPY OF RESPIRATORY DISORDERS

- 9.1 Introduction – Modulators of bronchial smooth muscle tone and
- 9.2 Pulmonary vascular smooth muscle tone
- 9.3 Pharmacotherapy of bronchial asthma
- 9.4 Pharmacotherapy of cough
- 9.5 Mucokinetic and mucolytic agents
- 9.6 Use of bland aerosols in respiratory care.

UNIT 10 - CORTICOSTEROIDS

- 10.1 Classification, mechanism of action, adverse effects and complications.
- 10.2 Preparation, dose and routes of administration.

UNIT 11 - DIURETICS

- 11.1 Renal physiology
- 11.2 Side of action of diuretics
- 11.3 Adverse effects
- 11.4 Preparations, dose and routes of administration.

UNIT 12 -CHEMOTHERAPY OF INFECTIONS

- 12.1 Definition
- 12.2 Classification and mechanism of action of antimicrobial agents
- 12.3 Combination of antimicrobial agents
- 12.4 Chemoprophylaxis.
- 12.5 Classification, spectrum of activity, dose, routes of administration and
- 12.6 adverse effects of penicillin, cephalosporin's, amino glycosides,
- 12.7 tetracyclines, chloramphenicol, ant tubercular drugs.

UNIT13 - MISCELLANEOUS.

- 13.1 IV fluids- various preparations and their usage.
- 13.2 Electrolyte supplements
- 13.3 Immunosuppressive agents
- 13.4 New drugs included in perfusion technology.
- 13.5 Drugs used in metabolic and electrolyte imbalance.

UNIT 1 -ELECTROCARDIOGRAPHY (ECG)

- 1.1 Basic Principles
- 1.2 The Electrocardiographic paper
- 1.3 The Electrocardiograph
- 1.4 The Electrical field of Heart
- 1.5 The leads: Standard limb, Pericardial lead, 'V' lead & 'AV' lead
- 1.6 Basic ECG deflections
- 1.7 Basic action of electrocardiograph
- 1.8 Normal EG
- 1.9 The 'P' wave
- 1.10 The 'qrs' complex
- 1.11 The genesis of 'qrs' complex
- 1.12 T wave; the S-T segment
- 1.13 The 'U' wave
- 1.14 Rate & rhythm
- 1.15 So called rotation of the heart – The Q-T interval
- 1.16 The Electrical axis
- 1.17 Pericardial pattern of ECG
- 1.18 Chamber enlargement – atrial enlargement, LV hypertrophy & RV hypertrophy
- 1.19 Sundle branch block
- 1.20 General principles
- 1.21 Right Bundle branch block
- 1.22 Left bundle branch block
- 1.23 The Hemi blocks (Fascicular block)

UNIT 2. EXERCISE STRESS TESTING

- 2.1 Exercise
- 2.2 Exercise protocols
- 2.3 Electrocardiography measurements
- 2.4 Exercise testing – Indication and techniques

UNIT 3. ECHOCARDIOGRAPHY**3.1 Principles of Echocardiography:**

- 3.1.1 Basic principles of ultrasound
- 3.1.2 M-Mode of Echocardiography
- 3.1.3 Two dimensional Echocardiography
- 3.1.4 Doppler Echocardiography; color flow
- 3.1.5 Transoesophageal Echocardiography

3.2 Instrumentation:

- 3.2.1 Basic pulse Echo system
- 3.2.2 Transducers
- 3.2.3 Pulse generation
- 3.2.4 Echo detection
- 3.2.5 A mode, B-Mode, M-Mode
- 3.2.6 Display & recording

3.3. Echocardiography Examination:

- 3.3.1 Selecting transducers
- 3.3.2 Position of the patient
- 3.3.3 Placement of the transducer
- 3.3.4 Setting control
- 3.3.5 M-Mode labeling
- 3.3.6 2 D Echo
- 3.3.7 Normal variants
- 3.3.8 Terminology
- 3.3.9 Identification of segments

3.4 Doppler Echocardiography:

- 3.4.1 Introduction to Doppler color Echocardiography
- 3.4.2 The Doppler principles
- 3.4.3 Doppler ultrasound techniques
- 3.4.4 Color Doppler flow imaging
- 3.4.5 Clinical application of Doppler Echocardiograph
- 3.4.6 Physical principles & instrumentation in spectral & color
- 3.4.7 Doppler flow imaging
- 3.4.8 Physical principles and Doppler effect. The Doppler
- 3.4.9 Echocardiography system display
- 3.4.10 Blood flow pattern – Laminar & non-laminar flow
- 3.4.11 Doppler Echo cardiograph modes
- 3.4.12 Continuous wave Doppler system
- 3.4.13 Pulsed Doppler system
- 3.4.14 High pulse repetition frequency
- 3.4.15 Problems of color imaging
- 3.4.16 Contrast Echo
- 3.4.17 Echo measurements-‘ASE’ recommendation

DCCT206-CARDIAC CARE TECHNOLOGY**80 HOURS**

1. Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD & CHD
2. Echo in rheumatic heart disease – Echo in mitral stenosis, mitral incompetence, aortic stenosis, aortic incompetence, pulmonary hypertension. Post AVR, post MVR. Prosthetic valve malfunction, LA clot.
3. Echo in congenital heart disease – Echo in ASD, VSD, and PDA pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF. dextrocardia.
4. Echo in ischemic heart disease – Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, LV aneurysm
5. Echo in other cardiovascular disease- Echo in various types of cardio myopathy infective endocarditis diseases of aorta, mitral valve prolapse, myxoma and other cardio vascular diseases.
6. Assessment of Cardiac function- measurements of all cardiac chambers and assessment of cardiac function
7. Echo in pericardial disease- pericardial effusion, cardiac tamponade, constrictive pericarditis
8. Cardiac catheterisation laboratory – general details of cardiac catheterisation equipment, how to handle the machine, common problems one may come across and how to overcome it, radiation hazards
9. Materials used in the cathlab- all catheters, balloons, guide wires, pacemakers contrast material and other material used in the cardiac catheterisation laboratory and sterilization of all these materials
10. Right heart catheterisation – procedure, cath position, oxymetry at various levels, angios done and its interpretation
11. Left heart catheterisation – procedure, cath position, oxymetry at various levels angios done and its interpretation
12. Coronary angiogram – procedure, materials used, type and amount dye used, indications and contraindications, various pictures recorded in various angles and gross interpretation.
13. Peripheral angiogram – procedure, indication and contraindication

DCCT207-CARDIAC CARE TECHNOLOGY – APPLIED**80 HOURS**

1. ECG in myocardial infarction- definition of myocardial infarction, diagnosis of myocardial infarction, ECG criteria for myocardial infarction, ECG in anterior wall, inferior wall, true posterior wall and sub endocardial infarction and RV infarction
2. ECG in rheumatic heart disease – definition of rheumatic heart disease, valvular involvement in rheumatic heart disease, ECG in mitral stenosis, mitral incompetence, aortic stenosis and aortic incompetence
3. ECG in hypertension- definition of hypertension, how to record blood pressure, ECG in hypertension
4. ECG in congenital heart disease- common congenital heart disease

5. ASD, VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, definition of all these conditions, ECG changes in all these conditions
6. ECG in other conditions – ECG in various types of cardiomyopathy, myxoedema, pericardial effusion, acute pericarditis and other vascular diseases. Bundle branch block, WPW syndrome, dextrocardia
7. Trans esophageal echocardiogram – indications, procedure, usefulness and complications one may encounter and its management
8. Stress Echo- procedure and indications
9. Peripheral Doppler – Procedure and usefulness of peripheral Doppler
10. Coronary angioplasty–procedure, materials used, complication one may encounter and how to manage it
11. Peripheral angioplasty – materials used and procedure. Angioplasty of coarctation of aorta
12. Fetal echocardiogram – Procedure, basic interpretation
13. Contrast echocardiogram – procedure and usefulness of contrast
14. Echocardiogram
15. Myocardial contrast echo- Basic knowledge

DCCT307-CARDIAC CARE TECHNOLOGY – ADVANCED

80 HOURS

1. Cardiac monitoring – definition, purpose of cardiac monitoring, how to Recognize various arrhythmias how to set up an intensive coronary care unit and usefulness of ICCU
2. Interpretation of TMT, report – criteria for TMT positive test
3. contraindication for TMT conditions where TMT is not useful, complications that may occur in TMT room and its management
4. Use of defibrillator- indications, how to use the defibrillator, complications during the procedure and its management
5. Management of cardiac arrest – definition, causes external cardiac massage, artificial respiration and other drugs and procedures used in the management of Cardiac arrest
6. Myocardial perfusion scan – procedures and usefulness of myocardialperfusion scan
7. Cardiac arrhythmias – bradyarrhythmia and tachy arrhythmias and
8. ECG diagnosis of all rhythm disturbances. Sinus arrhythmia, APC, FPC, VPC, VF, VT, AF, SVT, IOHB, IIOHB, complete heart block
9. Electrolyte disturbances – ECG in hypokelemia, hyperkelemiaetc,Holter monitoring – procedure and usefulness
10. Valvoplasties- procedure, indications, complications and treatment of balloons, mitral valvuloplasty, balloon aortic valvuloplasty ballon pulmonary valvuloplasty and balloon tricuspid valvuloplasty.
11. Coil closure and device closure of PDA – procedure, indications and materials used for coil and device closure of PDA
12. Device closure of ASD – procedure, indications and materials used for device closure of ASD

13. Device closure of VSD – procedure, indications and materials used for device closure of VSD
14. Electrophysiological studies – basic knowledge of EP studies mapping and ablation
15. Oxymetry – handling of the instrument and usefulness of the instrument, normal and abnormal values. pressure recording- handling of the instrument and pressures in various chambers, normal and abnormal values
16. Temporary and permanent pacing – materials used, procedure, complications one may encounter and management. Implantable Cardioverter defibrillator devices
17. CD recording and storage- recording and storage of all the procedures over CD
18. Procedure during pregnancy- precautions to be followed.
19. Nuclear Cardiology – instrumentation, radiopharmaceuticals, patient imaging techniques

CODE OF PROFESSIONAL CONDUCT

The Code of Professional Conduct is designed and set out as guidance for the clinical practitioner within the relationship that exists with every patient receiving health care.

Essential to that relationship is the patient's trust in the practitioner. This trust hangs upon the patient's assurance of being the practitioner's first concern during their clinical encounter, and upon the patient's confidence that the care received will be competent, whether in diagnosis, therapy or counseling.

STANDARD OF PRACTICE AND CARE

Patients are entitled to the highest standard of practice and care. The essential elements of this are professional competence, good relationships with patients and colleagues and observance of professional ethical obligations.

In providing care you must therefore:

1. Recognize the limits of your professional competence.
2. Be willing to consult colleagues
3. Keep clear, accurate and contemporaneous patient records which report the relevant findings.
4. Keep colleagues informed.
5. Pay due regard to the efficacy and the prudent use of resources.
6. Be competent, truthful, and accurate, when reporting on investigations.
7. Be competent when giving or arranging treatment.

Patient's rights:

1. Listen to patients and respect their views.
2. Treat patients politely and considerately.
3. Respect patients' privacy and dignity.
4. Give information to patients in a way they can understand.
5. Respect the right of patients to be fully involved in decisions about their care.
6. Respect the right of patients to refuse treatment or to take part in teaching or research, reporting the refusal to the person requesting the procedure.

7. Respond to complaints promptly and constructively.
8. Ensure that your views about a patient's life style, culture, beliefs, race, colour, sex, sexuality, age, social status, or perceived economic worth, do not prejudice the service you give.

CONFIDENTIALITY

Patients have a right to expect that you will not pass on any personal information which you learn in the course of your professional duties, unless they agree