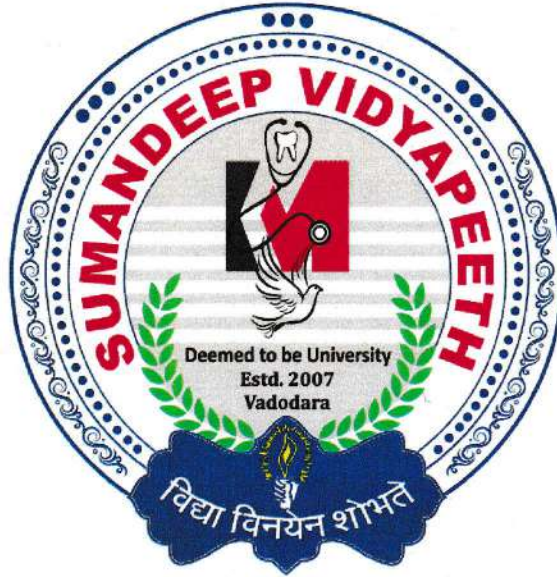


SUMANDEEP VIDYAPEETH

(Declared as Deemed to be University under Section 3 of the UGC Act 1956)
Accredited by NAAC with a CGPA of 3.53 out of four-point scale at 'A' Grade

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Attested CTC

Charan
15/2/2021

Vice-Chancellor

Sumandeep Vidyapeeth
An Institution Deemed to be University
VIII, Piparia, Taluka: Waghodia.
Dist. Vadodara-391 760. (Gujarat)

CURRICULUM

Diploma in RENAL DIALYSIS TECHNOLOGY



Umesh

2016

Dr. B. K. Shah



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. These learning goals are divided into nine key areas, though the degree of required involvement may differ across various levels of qualification and professional cadres.

Program outcomes

Demonstrate technical skills, social behavior, and professional awareness imperative upon a dialysis technician. Demonstrate the ability to plan, organize and report different diagnosis related to treatments. Understand professional and ethical responsibilities in patient care
Students will understand core concepts of clinical ethics and law so that they may apply these to their practice as healthcare

Ethics and accountability

Attested GTC
Describe and apply the basic concepts of clinical ethics to actual cases and situations

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- 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

- Candidate should have passed 10 + 2 with science(PCB)

Duration of the course

Duration of the course is 2 year and 1 year internship

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

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.

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.

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COURSE OF INSTRUCTION

Course Name	Course Code	Theory (In hrs.) (Class and lab)	Practical (In hrs.) (Clinical)	Total (in Hours)
First Year - Total Hours 600				
Anatomy	DRDT101	60	40	100
Physiology	DRDT102	60	40	100
Biochemistry	DRDT103	60	40	100
Pathology	DRDT104	60	40	100
Microbiology	DRDT105	60	40	100
Health Care	DRDT106	60	40	100
2nd Year - Total Hours 540				
Concepts of renal disease & its management	DRDT201	60	40	100
Applied aspects of pathology & microbiology	DRDT202	60	40	100
Applied anatomy & physiology related to dialysis technology	DRDT203	60	40	100
Pharmacology related to dialysis technology	DRDT204	40	-	40
Applied dialysis technology	DRDT205	60	40	100
Advance dialysis technology	DRDT206	60	40	100
3rd year -Internship		Total hours-2184		

SCHEME OF EXAMINATION

First Year				
Subject Code	Subjects	Examination Pattern		
		Internal	Final	TOTAL
DRDT101	Anatomy	20	80	100
DRDT102	Physiology	20	80	100
DRDT103	Biochemistry	20	80	100
DRDT104	Pathology	20	80	100
DRDT105	Microbiology	20	80	100
Practical- 50 Viva- 40 Journal- 10 Total marks-100				
Second Year				
DRDT201	Concepts of renal disease & its management	20	80	100
DRDT202	Applied aspects of pathology & microbiology	20	80	100

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DRDT203	Applied anatomy & physiology related to dialysis technology	20	80	100
DRDT204	Pharmacology related to dialysis technology	20	80	100
DRDT205	Applied dialysis technology	20	80	100
DRDT206	Advance dialysis technology	20	80	100
Practical- 50 Viva- 40 Journal- 10 Total marks: 100				

First Year Diploma in Renal Dialysis Technology

DRDT101 ANATOMY

100 Hours

Introduction: human body as a whole Theory:

Definition of anatomy and its divisions Terms of location, positions and planes Cell and its organelles

Epithelium-definition, classification, describes with examples, function Glands- classification, describe serous & mucous glands with examples Basic tissues – classification with examples

Practical: Histology of types of epithelium

Histology of serous, mucous & mixed salivary gland

Locomotion and support Theory:

Cartilage – types with example & histology

Bone – Classification, names of bone cells, parts of long bone, microscopy of compact bone, names of all bones, vertebral column, intervertebral disc, fontanel's of fetal skull Joints –

Classification of joints with examples, synovial joint (in detail for radiology) Muscular system: Classification of muscular tissue & histology

Names of muscles of the body

Practical: Histology of the 3 types of cartilage

Demo of all bones showing parts, radiographs of normal bones & joints Histology of compact bone (TS & LS)

Demonstration of all muscles of the body

Histology of skeletal (TS & LS), smooth & cardiac muscle

Cardiovascular system Theory:

Heart-size, location, chambers, exterior & interior Blood supply of heart

Systemic & pulmonary circulation

Branches of aorta, common carotid artery, subclavian artery, axillary artery, brachial artery, superficial palmar arch, femoral artery, internal iliac artery

Peripheral pulse

Inferior venacava, portal vein, portosystemic anastomosis great saphenous vein

Dural venous sinuses

Lymphatic system- cisterna chyli & thoracic duct Histology of lymphatic tissues

Names of regional lymphatics, axillary and inguinal lymph nodes in brief Practical:

Demonstration of heart and vessels in the body

Histology of large artery, medium sized artery & vein, large vein

Microscopic appearance of large artery, medium sized artery & vein, large vein pericardium

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Histology of lymph node, spleen, tonsil & thymus Normal chest radiograph showing heart shadows Normal angiograms

Gastro-intestinal system Theory:

Parts of GIT, Oral cavity (lip, tongue (with histology), tonsil, dentition, pharynx, salivary glands, Waldeyer's ring)

Oesophagus, stomach, small and large intestine, liver, gall bladder, pancreas Radiographs of abdomen

Respiratory system

Parts of RS, nose, nasal cavity, larynx, trachea, lungs, bronchopulmonary segments Histology of trachea, lung and pleura

Names of paranasal air sinuses

Practical: Demonstration of parts of respiratory system.

Normal radiographs of chest Histology of lung and trachea

Peritoneum

Theory: Description in brief **Practical:** Demonstration of reflections

Urinary system

Kidney, ureter, urinary bladder, male and female urethra, Histology of kidney, ureter and urinary bladder **Practical:** demonstration of parts of urinary system

Histology of kidney, ureter, urinary bladder Radiographs of abdomen-IVP, retrograde cystogram

Reproductive system Theory:

Parts of male reproductive system, testis, vas deferens, epididymis, prostate (gross & histology)

Parts of female reproductive system, uterus, fallopian tubes, ovary (gross & histology)

Mammary gland – gross

Practical: demonstration of section of male and female pelvis with organs in situ Histology of testis, vas deferens, epididymis, prostate, uterus, fallopian tubes, ovary Radiographs of pelvis – hysterosalpingogram

Endocrine Practical: glands Theory:

Names of all endocrine glands in detail on pituitary gland, thyroid gland, parathyroid gland, suprarenal gland – (gross & histology)

Practical: Demonstration of the glands

Histology of pituitary, thyroid, parathyroid, suprarenal glands

Nervous system

Theory:

Neuron Classification of NS

Cerebrum, cerebellum, midbrain, pons, medulla oblongata, spinal cord with spinal nerve (gross & histology)

Meninges, Ventricles & cerebrospinal fluid Names of basal nuclei

Blood supply of brain Cranial nerves

Sympathetic trunk & names of parasympathetic ganglia **Practical:** Histology of peripheral nerve & optic nerve

Practical: Demonstration of all plexuses and nerves in the body Demonstration of all part of brain

Histology of cerebrum, cerebellum, spinal cord Sensory organs:

Theory:

Skin: Skin histology

Appendages of skin

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Eye: Parts of eye & lacrimal apparatus Extra-ocular muscles & nerves supply

Ear: parts of ear- external, middle and inner ear and contents Practical: Histology of thin and thick skin

Demonstration and histology of eyeball Histology of cornea & retina

Embryology:

Theory:

Spermatogenesis & oogenesis

Ovulation, fertilization

Fetal circulation

Placenta

DRDT102 PHYSIOLOGY

100 Hours

Introduction – composition and function of blood

Red blood cells – Erythropoiesis , stages of differentiation function , count physiological Variation.

Hemoglobin–structure,functions, concentration physiological variation Methods of Estimation of HB

White blood cells – Production, function, life span, count, differential count Platelets – Origin, normal count, morphology functions.

Plasma Proteins – Production, concentration, types, albumin, globulin, Fibrinogen, Prothrombin functions.

Homeostasis& Blood coagulation

Homeostasis– Definition, normal homeostasis, clotting factors, mechanism of clotting, disorders of clotting factors.

Blood Bank

Blood groups – ABO system, Rh system Blood grouping & typing Cross matching

Rh system – Rh factor, Rh in compatibility.

Blood transfusion – Indication, universal donor and recipient concept.

Selection criteria of a blood donor transfusion reactions anticoagulants – Classification, examples and uses

Anemia: Classification – morphological and etiological. Effects of anemia on body Blood indices – Colourindex , MCH, MCV, MCHC

Erythrocyte sedimentation Rate (ESR) and Packed cell volume

Normal values, Definition. Determination, Blood Volume -Normal value ,determination of blood volume and regulation of blood volume Body fluid – pH, normal value, regulation and variation

Lymph – lymphoid tissue formation, circulation, composition and function of lymph

Cardiovascular system

Heart – Physiological Anatomy, Nerve supply

Properties of Cardiac muscle, Cardiac cycle systole, diastole. Intraventricular pressure curves.

Cardiac Output – only definition

Heart sounds Normal heart sounds Areas of auscultation.

Blood Pressure – Definition, normal value, clinical measurement of blood pressure.

Physiological variations, regulation of heart rate, cardiac shock, hypotension, hypertension.

Pulse – Jugular, radial pulse Triple response

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Heart sounds – Normal heart sounds, cause characteristics and signification. Heart rate
Electrocardiogram (ECG) –significance.

Digestive System - Physiological anatomy of Gastro intestinal tract, Functions of digestive system

Salivary glands Structure and functions. Deglutination –stages and regulation Stomach – structure and functions

Gastric secretion

Composition function regulation of gastric juice secretion Pancreas – structure, function, composition, regulation of pancreatic juice Liver – functions of liver

Bile secretion, composition, function regulation of bile secretion .Bilirubin metabolism types of bilirubin, Vandernberg reaction, Jaundice- types, significance.

Gall bladder – functions

Intestine – small intestine and large intestine Small intestine –Functions- Digestive, absorption, movements.

Large intestine

Functions, Digestion and absorption of Carbohydrates, Proteins, Fats, Lipids. Defecation

Respiratory system

Functions of Respiratory system, Physiological Anatomy of Respiratory system, Respiratory tract, Respiratory Muscles, Respiratory organ-lungs, Alveoli, Respiratory membrane, stages of respiration.

Mechanism of normal and rigorous respiration. Forces opposing and favouring expansion of the lungs. Intra pulmonary pleural pressure, surface tension, recoil tendency of the wall. H

Transportation of Respiratory gases :

Transportation of Oxygen: Direction, pressure gradient, Forms of transportation, Oxygenation of Hb. Quantity of Oxygen transported.

Lung volumes and capacities

Regulation of respiration what? Why? How? Mechanisms of Regulation, nervous and chemical regulation. Respiratory centre. Hearing Brier, Reflexes.

Applied Physiology and Respiration : Hypoxia, Cyanosis, Asphyxia, Dyspnea, Dysbarism, Artificial Respiration, Apnoea.

Endocrine System-Definition Classification of Endocrine glands & their Hormones Properties of Hormones.

Thyroid gland hormone

Physiological, Anatomy, Hormone secreted, Physiological function, regulation of secretion. Disorders – hypo and hyper secretion of hormone

Adrenal gland, Adrenal cortex physiologic anatomy of adrenal gland, Adrenal cortex, cortical hormones – functions and regulation

Adrenal medulla

Hormones, regulation and secretion. Functions of Adrenaline and nor adrenaline

Pituitary hormones – Anterior and posterior pituitary hormones, secretion ,function Pancreas – Hormones of pancreas

Insulin – secretion, regulation ,function and action Diabetes mellitus – Regulation of blood glucose level

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Parathyroid gland

function, action ,regulation of secretion of parathyroid hormone. Calcitonin – function and action

Special senses

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Vision – structure of eye. Function of different parts. Structure of retina
Hearing structure and function of can mechanism of hearing Taste – Taste buds functions.
Smell physiology, Receptors. Nervous system
Functions of Nervous system, Neuron structure, classification and properties. Neuralgia, nerve fiber, classification, conduction of impulses continuous and salutatory. Velocity of impulse transmission and factors affecting. Synapse – structure, types, properties. Receptors – Definition, classification, properties. Reflex action – unconditioned properties of reflex action. Babinski's sign. Spinal cord nerve tracts. **pyramidal tracts** – Extrapyramidal tracts. Functions of Medulla, pons, hypothalamic disorders. Cerebral cortex lobes and functions, Sensory cortex, Motor cortex, Cerebellum functions of Cerebellum. Basal ganglion-functions. EEG.

Cerebro Spinal Fluid(CSF)

formation, circulation, properties, composition and functions lumbar puncture.

Autonomic Nervous System:

Sympathetic and parasympathetic distribution and functions and comparison of functions.
Excretory System Excretory organs

Kidneys:

Functions of kidneys structural and functional unit nepron, vasarecta, cortical and juxtamedullary nephrons – Comparision, Juxta Glomerular Apparatus –Structure and function. Renal circulation peculiarities.

Mechanism of Urine formation:

Ultra filtration criteria for filtration GFR, Plasma fraction, EFP, factors effecting EFR. Determination of GFR selective reabsorption – sites of reabsorption, substance reabsorbed, mechanisms of reabsorption Glucose, urea.

H + Cl aminoacids etc. TMG, Tubular lead, Renal threshold % of reabsorption of different substances, selective e secretion.

Properties and composition of normal urine, urine output. Abnormal constituents in urine, Mechanism of urine concentration.

Counter – Current Mechanisms : Micturition, Innervation of Bladder, Cystourethrogram. Diuretics : Water, Diuretics, osmotic diuretics, Artificial kidney Renal function tests – plasma clearance Actions of ADH, Aldosterone and PTH on kidneys. Renal function tests Reproductive system

Function of Reproductive system, Puberty, male reproductive system. Functions of testes, spermatogenesis site, stages, factors influencing semen. Endocrine functions of testes Androgens – Testosterone structure and functions. Female reproductive system. Ovulation, menstrual cycle. Physiological changes during pregnancy, pregnancy test. Lactation : Composition of milk factors controlling lactation.

Muscle nerve physiology

Classification of muscle, structure of skeletal muscle, Sarcomere contractile proteins, neuromuscular junction. Transmission across, Neuromuscular junction. Excitation contraction coupling. Mechanism of muscle contraction muscle tone, fatigue Rigour mortis

Skin -structure and function

Body temperature measurement, Physiological variation, Regulation of body temperature by physical, chemical and nervous mechanisms. Role of Hypothalamus, Hypothermia and fever.

Practicals Haemoglobinometry White Blood Cell count Red Blood Cell count
Determination of Blood Groups

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Leishman's staining and Differential WBC count Determination of packed cell Volume
Erythrocyte sedimentation rate [ESR] Calculation of Blood indices
Determination of Clotting Time, Bleeding Time Blood pressure Recording
Auscultation for Heart Sounds

DRDT103 BIOCHEMISTRY

100 Hours

Theory:

Specimen collection: Pre-analytical variables

Collection of blood

Collection of CSF & other fluids Urine collection

Use of preservatives Anticoagulants

Introduction to Laboratory apparatus

Pipettes- different types (Graduated, volumetric, Pasteur, Automatic etc.) Calibration of glass pipettes

Burettes, Beakers, Petri dishes, depression plates.

Flasks - different types (Volumetric, round bottomed, Erlenmeyer conical etc.) Funnels – different types (Conical, Buchner etc.)

Bottles – Reagent bottles – graduated and common, Wash bottles – different type Specimen bottles etc.,

Measuring cylinders, Porcelain dish

Tubes – Test tubes, centrifuge tubes, test tube draining rack Tripod stand, Wire gauze, Bunsen burner.

Cuvettes, significance of cuvettes in colorimeter, cuvettes for visible and UV range, cuvette holders Racks – Bottle, Test tube, Pipette

Dessicator, Stop watch, rimers, scissors Dispensers – reagent and sample

Any other apparatus which is important and may have been missed should also be covered

Maintenance of lab glass ware and apparatus:

Glass and plastic ware in Laboratory

*use of glass: significance of borosilicate glass ; care and cleaning of glass ware, different cleaning solutions of glass

* care and cleaning of plastic ware, different cleaning solutions

Instruments (Theory and demonstration) Diagrams to be drawn Water bath: Use, care and maintenance

Oven & Incubators: Use, care and maintenance.

Water Distillation plant and water deionisers. Use, care and maintenance Refrigerators, cold box, deep freezers – Use, care and maintenance Reflux condenser : Use, care and maintenance

Centrifuges (Theory and demonstration) Diagrams to be drawn

Definition, Principle, svedberg unit, centrifugal force, centrifugal field rpm, ref. Conversion of G to rpm and viceversa.

Different types of centrifuges

Use care and maintenance of a centrifuge

Laboratory balances (Theory & Practicals) Diagrams to be drawn Manual balances: Single pan, double pan, trip balance

and read out electrical balances.

Use care and maintenance. Guideline to be followed and precautions to be taken while weighing

Weighing different types of chemicals, liquids, hygroscopic compounds etc. Colorimeter and spectrophotometer (Theory and Practicals) Diagrams to be drawn Principle, Parts Diagram.

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Use, care and maintenance.

PH meter (Theory & practicals) Diagrams to be drawn principle, parts, Types of electrodes, salt bridge solution. Use, care and maintenance of Ph meter and electrodes

Guidelines to be followed and precautions to be taken while using pH meter

Safety of measurements

Conventional and SI units

Atomic structure

Dalton's theory, Properties of electrons, protons, neutrons, and nucleus, Rutherford's model of atomic structure, Bohr's model of atomic structure, orbit and orbital, Quantum numbers, Heisenberg's uncertainty principle.

Electronic configuration – Aufbau principle, Pauli's exclusion principle, etc., Valency and bonds – different types of strong and weak bonds in detail with examples Theory & Practicals for all the following under this section

Molecular weight, equivalent weight of elements and compounds, normality molarity Preparation of molar solutions (mole/litre solution) eg: 1 M NaCl, 0.15 M NaCl

1 M NaOH, 0.1 M HCl, 0.1 M H₂SO₄ etc.,

Preparation of normal solutions. eg., 1N Na₂CO₃, 0.1N Oxalic acid, 0.1 N HCl, 0.1N H₂SO₄, 0.66 N H₂SO₄ etc.,

Percent solutions. Preparation of different solutions – v/v w/v (solids, liquids and acids)

Conversion of a percent solution into a molar solution

Dilutions

Diluting solutions: eg. Preparation of 0.1 N NaCl from 1 N NaCl from 2 N HCl etc., Preparing working standard from stock standard, Body fluid dilutions, Reagent dilution techniques, calculating the dilution of a solution, body fluid reagent etc.,

Saturated and super saturated solutions. Standard solutions. Technique for preparation of standard solutions eg: Glucose, urea, etc., Significance of volumetric flask in preparing standard solutions. Volumetric flasks of different sizes, Preparation of standard solutions of deliquescent compounds (CaCl₂, potassium carbonate, sodium hydroxide etc.,)

Preparation of standards using conventional and SI units Acids, bases, salts and indicators.

Acids and Bases: Definition, physical and chemical properties with examples. Arrhenius concept of acids and bases, Lowry – Bronsted theory of acids and bases classification of acids and bases. Different between bases and alkali, acidity and basicity, monoprotic and polyprotic acids and bases

Concepts of acid base reaction, hydrogen ion concentration, Ionisation of water, buffer, Ph value of a solution, preparation of buffer solutions using Ph meter.

Salts: Definition, classification, water of crystallization – definition and different types, deliquescent and hygroscopic salts

Acid- base indicators: (Theory and Practicals)

Theory – Definition, concept, mechanism of dissociation of an indicator, colour change of an indicator in acidic and basic conditions, use of standard buffer solution and indicators for Ph determinations, preparation and its application, list of commonly used indicators and their Ph range, suitable pH indicators used in different titrations, universal indicators Practicals –

Preparation of a simple acid and a base (Preparation of standard solution of oxalic acid and using this solution finding out the normality of a sodium hydroxide solution.

(Acid to be titrated using this base) Calculation of normality of an acid or a base after titration, measurement of hydrogen ion concentration

Chandani
15/1/2021

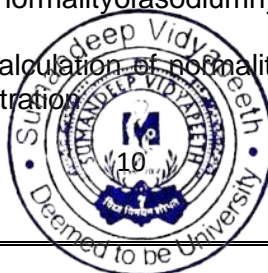
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Qualitycontrol: Accuracy Precision Specificity Sensitivity

Limits of error allowable in laboratory Percentage error

Normal values and Interpretations

SpecialInvestigations:S erum Electrophoresis

Immunoglobulins

Drugs:Digitoxin, Theophyllines Regulation of Acid Base status:

Henderson Hasselback Equations Buffers of the fluid

PH Regulation

Disturbance in acid Base Balance Anion Gap

Metabolic acidosis

Metabolic acidosis metabolic alkalosis

Respiratory acidosis Respiratory alkalosis

Basic Principles and estimation of Blood Gases and pH Basic principles and estimation of

Electrolytes

Water Balance

Sodium regulation Bicarbonate buffers

Nutrition, Nutritional support with special emphasis on parental nutrition.

Calorific Value Nitrogen Balance Respiratory Quotient

Basal metabolic rate

Dietary Fibers

Nutritional importance of lipids, carbohydrates and proteins Vitamins

PRACTICALS

Analysis of Normal Urine Composition of urine Procedure for routinescreening

Urinary screening for inborn errors of metabolism Common renal disease

Urinary calculus

Urine examination for detection of abnormal constituents Interpretation and Diagnosis through charts

Liver Function tests Lipid Profile

Renal Function test Cardiac markers

Blood gas and Electrolytes

Estimation of Blood sugar, Blood Urea and electrolytes

Demonstration of Strips Demonstration ofGlucometer

DRDT 104 PATHOLOGY

100 Hours

Histopathology, Clinical Pathology, Hematology and Blood Banking

Histopathology -Theory

Introduction to Histopathology

Receiving of Specimen in the laboratory

GrossingTechniques

Mounting Techniques – variousMountains

Maintenance of records and filing of theslides.

Use & care ofMicroscope

Various Fixatives, Mode of action, Preparation andIndication.

Bio-Medical waste management

Autoclaving

Tissue processing for routine paraffin sections

Decalcification of Tissues.

Staining of tissues - H&E Staining

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Bio-Medical waste management
Clinical Pathology –Theory
Introduction to Clinical Pathology
Collection, Transport, Preservation, and Processing of various clinical specimens
Urine Examination – Collection and Preservation of urine.
Physical, chemical, Microscopic Examination
Examination of body fluids.
Examination of cerebro spinal fluid(CSF)
Sputum Examination.
Examination of offences

Hematology – Theory

Introduction to Hematology
Normal constituents of Blood, their structure and function.
Collection of Blood samples
Various Anticoagulants used in Hematology
Various instruments and glassware used in Hematology, Preparation and use of glassware
Laboratory safety guidelines
SI units and conventional units in Hospital Laboratory
Hb, PCV
ESR
Normal Homeostasis
Bleeding Time, Clotting Time, Prothrombin Time, Activated Partial Thromboplastin Time.

Blood Bank

Introduction
Blood grouping and RH Types Cross matching

PRACTICALS

Urine Examination.
Physical
Chemical
Microscopic
Blood Grouping Rotyping.
Hb Estimation, Packed Cell Volume [PCV], Erythrocyte Sedimentation rate [ESR]
Bleeding Time, Clotting Time.
Histopathology – Section cutting and H & E Staining. [For BSc MLT only]

DRDT 105 Microbiology

100 Hours

Objective : - This course introduces the principles of Microbiology with emphasis on applied aspects of Microbiology of infectious diseases particularly in the following areas Principles & practice of sterilization methods.

Collection and dispatch of specimens for routine microbiological investigations. Interpretation of commonly done bacteriological and serological investigations. Control of Hospital infections
Biomedical waste management
Immunization schedule

Microbiology

Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.

Growth and nutrition

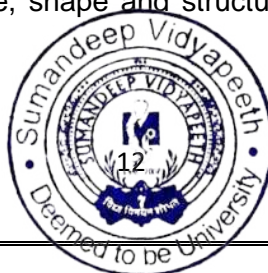
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Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.
Sterilisation and Disinfection Principles and use of equipments of sterilization namely Hot Air oven, Autoclave and serum inspissator. Pasteurization, Anti septic and disinfectants.
Antimicrobial sensitivity test

Immunology

Immunity Vaccines, Types of Vaccine and immunization schedule
Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HbsAg(Technical details to be avoided)

Systematic Bacteriology

Morphology, cultivation, diseases caused ,laboratory diagnosis including specimen collection of the following bacteria(the classification, antigenic structure and pathogenicity are not to be taught)

Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Esch coli, Klebsiella, Proteus, vibrio cholerae, Pseudomonas & Spirochetes

Parasitology

Morphology, life cycle, laboratory diagnosis of following parasites
E. histolytica, Plasmodium, Tape worms, Intestinal nematodes

Mycology

Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi.

Virology

General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

Hospital infection Causative agents, transmission methods, investigation, prevention and control

Hospital infection.

Principles and practice Biomedical waste management

Microbiology

Objective : - This course introduces the principles of Microbiology with emphasis on applied aspects of Microbiology of infectious diseases particularly in the following areas Principles & practice of sterilization methods.

Collection and despatch of specimens for routine microbiological investigations. Interpretation of commonly done bacteriological and serological investigations. Control of Hospital infections

Biomedical waste management Immunization schedule

Theory -

Morphology

Classification of microorganisms, size, shape and structure of bacteria. Use of microscope in the study of bacteria.

Growth and nutrition

Nutrition, growth and multiplications of bacteria, use of culture media in diagnostic bacteriology.

Sterilisation and Disinfection 4 hours

Attested CTC

Principles and use of equipments of sterilization namely Hot Air oven, Autoclave and serum inspissator. Pasteurization, Anti septic and disinfectants.

Antimicrobial sensitivity test

Immunology

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Immunity Vaccines, Types of Vaccine and immunization schedule

Principles and interpretation of commonly done serological tests namely Widal, VDRL, ASLO, CRP, RF & ELISA. Rapid tests for HIV and HbsAg(Technical details to be avoided)

Systematic Bacteriology

Morphology, cultivation, diseases caused, laboratory diagnosis including specimen collection of the following bacteria(the classification, antigenic structure and pathogenicity are not to be taught)

Staphylococci, Streptococci, Pneumococci, Gonococci, Meningococci, C diphtheriae, Mycobacteria, Clostridia, Bacillus, Shigella, Salmonella, Esch coli, Klebsiella, Proteus, vibrio cholerae, Pseudomonas & Spirochetes

Parasitology

Morphology, life cycle, laboratory diagnosis of following parasites

E. histolytica, Plasmodium, Tape worms, Intestinal nematodes

Mycology

Morphology, diseases caused and lab diagnosis of following fungi. Candida, Cryptococcus, Dermatophytes, opportunistic fungi.

Virology

General properties of viruses, diseases caused, lab diagnosis and prevention of following viruses, Herpes, Hepatitis, HIV, Rabies and Poliomyelitis.

Hospital infection Causative agents, transmission methods, investigation, prevention and control Hospital infection.

Principles and practice Bio medical waste management

Practical

Compound Microscope.

Demonstration and sterilization of equipments – Hot Air oven, Autoclave, Bacterial filters. Demonstration of commonly used culture media, Nutrient broth, Nutrient agar, Blood agar, Chocolate agar, Mac conkey medium, LJ media, Robertson Cooked meat media, Potassium tellurite media with growth, Mac with LF & NLF, NA with staph

Antibiotic susceptibility test

Demonstration of common serological tests – Widal, VRDL, ELISA. Grams stain

Acid Fast staining

Stool exam for Helminthic ova

Visit to hospital for demonstration of Biomedical waste management. Anaerobic culture methods.

Compound Microscope.

Demonstration and sterilization of equipments – Hot Air oven, Autoclave, Bacterial filters. Demonstration of commonly used culture media, Nutrient broth, Nutrient agar, Blood agar, Chocolate agar, Mac conkey medium, LJ media, Robertson Cooked meat media, Potassium tellurite media with growth, Mac with LF & NLF, NA with staph

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Visit to hospital for demonstration of biomedical waste management. Anaerobic culture methods.

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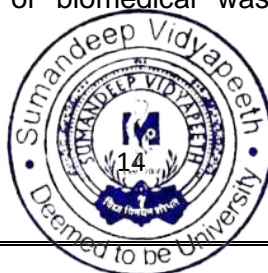
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Introduction to Health

Definition of Health, Determinants of Health, Health Indicators of India, Health Team Concept.

National Health Policy

National Health Programmes (Briefly Objectives and scope) Population of India and Family welfare programme in India

Introduction to Nursing

What is Nursing ? Nursing principles. Inter-Personnel relationships. Bandaging: Basic turns; Bandaging extremities; Triangular Bandages and their application.

Nursing Position, Bed making, prone, lateral, dorsal, dorsal re-cumbent, Fowler's positions, comfort measures, Aids and rest and sleep.

Lifting And Transporting Patients: Lifting patients up in the bed. Transferring from bed to wheel chair. Transferring from bed to stretcher.

Bed Side Management: Giving and taking Bed pan, Urinal : Observation of stools, urine. Observation of sputum, understand use and care of catheters, enema giving.

Methods Of Giving Nourishment: Feeding, Tube feeding, drips, transfusion Care Of Rubber Goods

Recording of body temperature, respiration and pulse, Simple aseptic technique, sterilization and disinfection. Surgical Dressing: Observation of dressing procedures

First Aid :

Syllabus as for Certificate Course of Red Cross Society of St. John's Ambulance Brigade.

Second year**DRDT 201 Concepts of Renal Diseases****100 hours**

Clinical Manifestations Evaluation & Management of the Following Diseases

Acute Renal Failure

Nephrotic Syndrome – Primary & Secondary

Nephritic Syndrome

Uti – Urinary Tract Infections

Asymptomatic Urinary Abnormalities

Chronic Renal Failure

Renal Stone Diseases

Obstructive uropathies

Congenital & Inherited Renal Diseases

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Diseases of Kidney

Pregnancy Associated Renal Diseases

Renal Vascular Disorders & Hypertension Associated Renal Diseases

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Pathology

Congenital Abnormalities of Urinary System
Classification of Renal Diseases
Glomerular Diseases – Causes, Types & Pathology
Tubulointerstitial Diseases
Renal Vascular Disorders
End Stage Renal Diseases – Causes & Pathology
Pathology of Kidney In Hypertension, Diabetes Mellitus, Pregnancy
Pathology of Peritoneum – Peritonitis – Bacterial, Tubular & Sclerosing Peritonitis
Dialysis Induced Changes
Pathology of Urinary Tract Infections
Pyelonephritis & Tuberculous Pyelonephritis

Microbiology

Hepatotropic Viruses in Detail – Mode of Transfusion, Universal Precautions, Vaccinations
Human Immunodeficiency Virus (HIV), Mode Of Transfusion, Universal Precautions
Opportunistic Infections
Microbiology of Urinary Tract Infections
Microbiology of Vascular Access Infection (Femoral, Jugular, Subclavian Catheters)
Sampling Methodologies For Culture & Sensitivity

Basics Of Dialysis Technology

Indications of Dialysis
Types of Dialysis
Principles of Dialysis – Definition
Haemodialysis Apparatus – Types Of Dialyzer & Membrane
Types of Vascular Access For Haemodialysis
Introduction to Haemodialysis Machine
Priming of Dialysis Apparatus
Dialyser Reuse
Common Complications of Haemodialysis
Monitoring of Patients during Dialysis

Nutrition**Introduction to Science of Nutrition**

Definition
Food Pattern and Its Relation to Health
Factors Influencing Food Habits, Selection and Foodstuffs
Superstitions, Culture, Religion, Income, Composition Of Family, Age, Occupation, Special Grouped
Food Selection, Storage & Preservation
Prevention of Blood Adulteration

Classification of Nutrients

Macronutrients and Micronutrients
Proteins – Types, Sources, Requirements and Deficiencies of Proteins
Carbohydrates Sources, Requirements & Deficiency
Fats – Types, Sources, Requirements and Deficiency of Fats
Water – Sources Of Drinking Water, Requirements, Preservation Of Water
Minerals – Types, Sources, Requirements, Deficiencies of Minerals

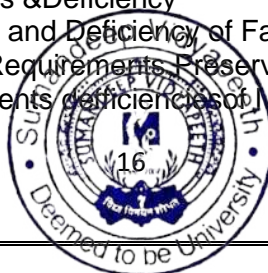
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DRDT 203 Applied Anatomy & Physiology Related To Dialysis Technology 100 Hours

Applied Anatomy

Basic Anatomy Of Urinary System – Structural Anatomy Of Kidney, Bladder, Uretr, Urethra, Prostate
Histology of Kidney
Blood Supply of Kidney
Development of Kidney in Brief
Anatomy of Peritoneum Including Concept of Abdominal Hernias
Anatomy of Vascular System
Upper Limb Vessels – Course, Distribution, Branches, Origin & Abnormalities
Neck Vessels – Course, Distribution, Branches, Origin & Abnormalities
Femoral Vessels - Course, Distribution, Branches, Origin & Abnormalities

Physiology

Mechanism of Urine Formation
Glomerular Filtration Rate (Gfr)
Clearance Studies
Physiological Values – Urea, Creatinine, Electrolytes, Calcium, Phosphorous, Uric Acid, Magnesium, Glucose
24 Hours Urinary Indices – Urea, Creatinine, Electrolytes, Calcium, Magnesium
Physiology of Renal Circulation
Factors Contributing & Modifying Renal Circulation
Auto regulation
Hormones Produced By Kidney & Physiologic Alterations in Pregnancy
Homeostasis – Coagulation Cascade, Coagulation Factors, Auto Regulation, Bt, Ct, Pt, Ptt, Thrombin Time

Acid Base Balance – Basic Principles & Common Abnormalities Like Hypokalemia, Hyponatremia, Hyperkalemia, Hyponatremia, Hypocalcemia, Hypercalcemia, Ph, Etc.
Basic Nutrition In Renal Diseases

Pharmacology Related To Haemo & Peritoneal Dialysis

Iv Fluid Therapy with Special Emphasis in Renal Diseases
Diuretics – Classification, Actions, Dosage, Side Effects & Contraindications
Anti Hypertensive – Classification, Actions, Dosage, Side Effects & Contraindications, Special Reference During Dialysis, Vasopressors, Drugs Used In Hypotension
Drugs & Dialysis – Dose & Duration Of Administration Of Drugs
Dialyzable Drugs – Phenobarbitone, Lithium, Methanol Etc.
Vitamins & Its Analogues, Phosphate Binders, Iron, Folic Acid & Other Vitamins of Therapeutic Value

Erythropoietin In Detail
Heparin Including Low Molecular Weight Heparin
Protamine Sulphate

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Formalin, Sodium Hypochlorite, Hydrogen Peroxide – Role as Disinfectants & Adverse Effects Of Residual Particles Applicable To Formalin
Haemodialysis Concentrates – Composition & Dilution (Acetate & Bicarbonates)
Peritoneal Dialysis Fluid In Particular Hypertonic Solutions – Composition
Potassium Exchange Resins With Special Emphasis On Mode Of Administration

DRDT 206 Applied Dialysis Technology

100 Hours

Indications of Dialysis

History & Types of Dialysis

Theory of Haemodialysis – Diffusion, Osmosis, Ultrafiltration & Solvent Drag

Haemodialysis Apparatus – Types of Dialyser & Membrane, Dialysate

Physiology of Peritoneal Dialysis

Vascular Access for Haemodialysis & Associated Complications

Peritoneal Access Devices – Types of Catheter, Insertion Techniques & Associated Complications

Dialysis Machines - Mechanism of Functioning & Management

Haemodialysis Machine

Peritoneal Dialysis Machine

Complications of Dialysis

Haemodialysis – Acute & Long Term Complications

Peritoneal Dialysis – Mechanical & Metabolic Complications

Biochemical Investigations Required For Renal Dialysis

Adequacy of Dialysis

Haemodialysis

Peritoneal Dialysis

Peritoneal Equilibration Test (PET)

Anticoagulation

Peritonitis & Exit Site Infection

Withdrawal of Dialysis Criteria

Acute Dialysis

Chronic Dialysis

DRDT 206 Advance Dialysis Technology

100 Hours

- Dialysis in Special Situations
- Patients with Congestive Cardiac Failure
- Advanced Liver Disease
- Patients Positive for HIV, Hbsag & Hcv
- Failed Transplant
- Poisoning Cases
- Pregnancy
- Dialysis in Infants & Children
- Dialyser Reuse
- Special Dialysis Procedures

Attested CTC



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- Continuous Therapies in Haemodialysis
- Different Modalities of Peritoneal Dialysis
- Haemodiafiltration
- Haemoperfusion
- Plasmapheresis
- Special Problems in Dialysis Patients
- Psychology & Rehabilitation
- Diabetes
- Hypertension
- Infections
- Bone Diseases
- Aluminium Toxicity
- Recent Advances in Haemodialysis
- Nocturnal Dialysis
- Online Dialysis
- Daily Dialysis
- Telemedicine in Dialysis Practice
- Water Treatment System
- Renal Anaemia Management
- Chronic Dialysis

Practical Schedule

- Setting up Dialysis Machine for Dialysis
- A V Cannulation
- A V Fistula/A V Graft Cannulation
- Initiation of Dialysis through Central Venous Catheters Like Internal Jugular, Femoral & Subclavian Vein
- Packing & Sterilization of Dialysis Trays
- Closing of Dialysis
- Preparation of Concentrates Depending On The Situations
- Reuse of Dialysis Apparatus
- Isolated Ultrafiltration
- Performance of Peritoneal Dialysis Exchange Manually
- Setting up Of Automated Peritoneal Dialysis Equipment
- First Assistant in Minor Procedures
- Skin Suturing
- CPR Demonstrations

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CODE OF PROFESSIONAL CONDUCT INTRODUCTION

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:

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

Patient's rights

- Listen to patients and respect their views.
- Treat patients politely and considerately.
- Respect patients' privacy and dignity.
- Give information to patients in a way they can understand.
- Respect the right of patients to be fully involved in decisions about their care.
- 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.
- Respond to complaints promptly and constructively.
- Ensure that your views about a patient's life style, culture, beliefs, race, color, 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



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