

Subject Code : 2FM0010101	Subject Title : Dialysis Techniques - Theory
Pre-requisite Subject	

Certificate course in dialysis techniques will be carried out under following three parts in both theory and practical

1 Anatomy, Physiology, Biochemistry & Pharmacology

2 Introduction to Kidney Diseases

3 Introduction to Dialysis

Course Objectives of each parts are as below:

Part 1: Anatomy, Physiology, Biochemistry & Pharmacology

1. Define and explain in Anatomy and Physiology- Structure and function of human cell - Elementary tissues of human body- Brief account on Composition of Blood - functions of blood elements - Blood Group and coagulation of blood, Inflammation, Cellular adaptation, Cell injury & cell death. Different systems in body
2. Define biochemistry and explain the major complex biomolecules of the cell.
3. Enumerate the chemical structure, classification and functions of proteins, lipids and carbohydrates.
4. Comprehend the classification & function of nucleic acids and enzymes.
5. Explain the biochemical structure of vitamins, its classification and the functions of vitamins and minerals.
6. List the various hormones, its action and function.
7. Describe acids and bases, the mechanism of homeostasis and acid base balance
8. Describe the various drugs used for the treatment of kidney diseases and dialysis: which includes antibiotics, anti microbials, inotropes, diuretics and anti – convulsant.
9. List, classify and describe in detail the various anti – hypertensives , their action, indication, side effects and adverse drug responses.
10. Describe the dialyzability of drugs.
11. Comprehend the drug adjustments to be made for varying degrees of renal dysfunction.
12. Enumerate the action, indication, dosage, routes & side effects in detail of erythropoietin and intra venous iron.
13. Comprehend and describe the action, indication, dosage, route of administration & side effects of heparin in Hemodialysis.
14. Comprehend and differentiate the composition of dialysate solutions and peritoneal dialysis solutions.
15. Enumerate the use of potassium exchange resins.
16. Perform the preparation of Hemodialysate concentrates

Part 2: Introduction to Kidney Diseases

1. Describe the appropriate techniques used in the physical assessment and significant subjective and objective data related to the urinary system
2. Describe the purpose, significance of results related to diagnostic studies of the urinary system.
3. Comprehend the congenital abnormalities of the urinary system.
4. Classify and enumerate kidney diseases, including Glomerular, tubulointerstitial and vascular diseases
5. Describe the pathophysiology, clinical manifestations, collaborative care and drug therapy of

cystitis, urethritis, pyelonephritis, acute post streptococcal Glomerulonephritis, good pasture syndrome, chronic Glomerulonephritis & nephritic syndrome.

6. Differentiate between acute renal failure and chronic renal failure.
7. Differentiate among the causes of pre renal, intra renal, and post renal acute renal failure & describe the clinical course of acute renal failure.
8. Comprehend the etiology and pathogenesis of chronic renal failure/ CKD.
9. Comprehend the pathology of the peritoneum in peritonitis.
10. Describe the etiology, pathogenesis and management of urinary tract infections.
11. Educate patients on strategies to prevent urinary tract infections
12. Educate patients on peritoneal dialysis on aspects of the prevention of peritonitis

Part 3: Introduction to Dialysis

1. Comprehend the various modalities of renal replacement therapy with the knowledge of merits and demerits of each.
2. Comprehend the principles of hemodialysis, the various forms of hemodialysis and when each is to be used in the clinical setting.
3. List and describe the various vascular access devices used in Hemodialysis and its complications.
4. Differentiate between peritoneal dialysis, SLED, CRRT, High efficiency dialysis & Hemodialysis in terms of purpose, indications, advantages, disadvantages and the responsibilities of a technologist.
5. Practice and perform independently the water maintenance for the Hemodialysis room.
6. Independently maintain the Hemodialysis machine with respect to disinfection and priming
7. Comprehend the process of dialysis, the role of a technologist with respect to the pre, intra & post dialysis process.
8. Enumerate the various drugs used during the dialysis process
9. Describe the nutrition requirement for a patient with chronic kidney disease & acute kidney injury, & prepare a health teaching plan for the same.
10. Manage the anticoagulation on patients on dialysis.
11. Enumerate on the various complications of Hemodialysis in terms of the technologists responsibility in prevention and worsening of the complications.
12. Describe the process of peritoneal dialysis, the indications, dialysate required and the various complications.
13. Start and close Hemodialysis sessions independently.
14. Practice independently SLED, CRRT and high efficiency dialysis
15. Successfully cannulate arterio-venous fistulae for Hemodialysis.
16. Independently operate Hemodialysis machines, CAPD cyclers & initiate CAPD therapy
17. Train patients and the care givers in performing peritoneal dialysis.

Teaching Scheme (Hours per week):

Subject Code	Subject Name	Teaching Scheme (Hrs/Week)			UA		IA	
		L	P	Total	Max	Min	Max	Min
2FM0010101	Dialysis Techniques - Theory	12	-	12	75	30	25	10

L = Lecture

P = Practical

UA = University Assessment

IA = Internal Assessment

Syllabus: (Topics):

ANATOMY & PHYSIOLOGY

Module 1: Introduction to anatomy

Scope of Anatomy and Physiology - Definitions and Terms in Anatomy and Physiology- Structure and function of human cell - Elementary tissues of human body- Brief account on Composition of Blood - functions of blood elements - Blood Group and coagulation of blood, Inflammation, Cellular adaptation, Cell injury & cell death.

Module 2: Cardio Vascular System

Structure and functions of various parts of the heart, arterial and venous system, brief account on common cardiovascular disorders

Module 3: Respiratory System

various parts of respiratory system and their functions, Physiology of Respiration

Module 4: Digestive System

names and various parts of digestive system-Liver, Spleen, Gall Bladder, Pancreas, Buccal Cavity, Pharynx, Esophagus, Stomach, intestine etc.-physiology of digestion and absorption

Module 5: Urinary System

various parts of urinary system and its function-structure and function of kidneys- physiology of urine formation - pathophysiology of renal disease and edema

Module 6: Nervous System

Various parts of nervous system- Brain and its parts –functions of nervous system - Spinal Cord & Nerves

Module 7: Endocrine System

Endocrine glands, their hormones and functions-Thyroid, Parathyroid, Suprarenal, Pituitary, pituitary and Thymus

Module 8: Haemopoietic and Lymphatic System

Name of the blood vessels & lymph gland locations

Module 9: Surface Anatomy & Surface Markings of Human Body

BIOCHEMISTRY

Module 1: Carbohydrates Glucose and Glycogen Metabolism

Module 2: Proteins:

Classification of proteins and functions

Module 3: Lipids:

Classification of lipids and functions

Module 4: Enzymes

Definition – Nomenclature – Classification – Factors affecting enzyme activity – Active site – Coenzyme – Enzyme Inhibition – Units of enzyme – Isoenzymes – Enzyme pattern in diseases.

Module 5: Vitamins & Minerals:

Fat soluble vitamins (A, D, E, K) – Water soluble vitamins – B-complex vitamins- principal elements (Calcium, Phosphorus, Magnesium, Sodium, Potassium, Chlorine and Sulphur)- Trace elements – Calorific value of foods – Basal metabolic rate (BMR) – respiratory quotient (RQ) Specific dynamic action (SDA) – Balanced diet – Marasmus – Kwashiorkor

Module 6: Acids and bases:

Definition, pH, Henderson – Hasselback equation, Buffers, Indicators, Normality, Molarity, Molality

PHARMACOLOGY

Module 1: IV fluid therapy with special emphasis in renal diseases

Define IV fluids, differentiate the various IV fluids. Use of crystalloids and colloids in renal diseases. Mode of action, contraindication, precautions and side effects of using various IV fluids.

Module 2: Diuretics

Introduction to diuretics, definition, classification, actions, dosage, side effects & contraindications

Module 3: Anti hypertensives

Definition, classification, actions, dosage, side effects & contraindications, special reference during dialysis, vasopressors, drugs used in Hypotension

Module 4: Drugs & dialysis

Dose & duration of drugs used in dialysis. The administration of drugs and the effect of dialysis on the action of drugs

Module 5: Dialyzable drugs

List of drugs that are dialyzable, action, dosage, side effects and contraindications of phenobarbitone, lithium, methanol etc.

Module 6: Erythropoietin

History of the development and use of erythropoietin. Its action, function - Primary role in RBC formation and secondary role. Mechanism of action - synthesis and regulation - Indications for use - available forms and dosages

Module 7: Heparin including low molecular weight heparin

Introduction to heparin and Low molecular weight heparin. Description of Heparin & LMWH, pharmacokinetics, mode of action, indications and use, dosage and route of administration & side effects

Module 8: Protamine sulphate

Introduction to protamine, mode of action, pharmacokinetics, indications, uses, dosage, route of administration, side effects, precautions, contraindications

Module 9: Formalin, sodium hypochlorite, hydrogen peroxide

Action, characteristics, the use of the drugs and its role as disinfectants & adverse effects of residual particles applicable too formalin

Module 10: Hemodialysis concentrates

Composition & dilution (acetate & bicarbonates)

Module 11: Peritoneal dialysis fluid in particular hypertonic solutions – composition Fluids used in peritoneal dialysis, the composition and strength of concentration. Mode of action, uses, indications and precaution

Module 12: Potassium exchange resins with special emphasis on mode of administration

Introduction to potassium exchange resins, chemical composition. Types, mode of action, indications for use, side effects, precautions and contraindications

2 Introduction to Kidney Diseases

Module 1: Assessment and Diagnostic studies of the Urinary system

Physical assessment of a person with kidney disease, basics of assessment, list various diagnostic tests done for kidney diseases, Laboratory tests, imaging studies, normal values, interpretation of the tests including the roles and responsibilities of a technologist.

Module 2: Classification of renal diseases

Define renal disorders, introduction to the classification of the various types of renal disorders

Module 3: Glomerular diseases – causes, types & pathology

Definition, etiology, type's pathophysiology, medical and surgical management

Module 4: Tubulointerstitial diseases & Renal vascular disorders Definition, etiology, type's pathophysiology, medical and surgical management

Module 5: Acute Kidney Injury

Definition, etiology, type's pathophysiology, medical and surgical management

Module 6: End stage renal diseases – causes & pathology

Definition, etiology, types pathophysiology, medical and surgical management

Module 7: Pathology of kidney in hypertension, diabetes mellitus, pregnancy Definition, etiology, type's pathophysiology, medical and surgical management

Module 8: Pathology of peritoneum – peritonitis – bacterial, tubercular & sclerosing Peritonitis

Definition, etiology, types pathophysiology, medical and surgical management

Module 9: Pathology of urinary tract infections

Definition of UTI's, Common organisms involved, etiology, pathophysiology of UTI, Medical and surgical management

Module 10: Pyelonephritis & tuberculous pyelonephritis

Definition, etiology, types pathophysiology, medical and surgical management

Module 11: Dialysis in the intensive care setting

Emergency care & Intensive care of a dialysis patient, Principles of Extracorporeal Short- Wave Lithotripsy, Plasmapheresis, CRRT & SLED, common Urosurgical procedures & instruments and their maintenance, Preparation of dialysis patients for various surgical procedure and post-operative Dialysis support, Basic and advanced cardiac life support.

3 Introduction to Dialysis

Module 1: History, types of Dialysis

Genesis of dialysis, invention and the process involved in the evolution of dialysis. Types of dialysis and classification. Dialysis for acute kidney injury, dialysis for chronic kidney disease. Introduction to Continuous renal replacement therapy (CRRT)

Module 2: Principles of Dialysis, quantification of adequacy

Principles of diffusion, filtration, ultra filtration, convection, and osmosis. Solute transport and fluid movement during dialysis. Principles of fluid dynamics. Hemodialysis & Peritoneal Dialysis. Measuring dialysis adequately: Urea reduction ratio - Urea Kinetic Modeling. Pre –dialysis and post dialysis - BUN Measurement. Measurement of KT/V.

Module 3: Dialysis Team-rights-responsibilities-patient doctor relationship

The overview of the dialysis team. Responsibilities of a technologist, nurse and doctor in the dialysis setting- Building effective working relationship- Its importance - dealing with difficult working relationships- Respect the rights of the patient(s)- Conflict Management

Module 4: Dialysis reuse

History of dialyzer reprocessing. Reason for dialysis reprocessing. Steps involved in dialyzer reprocessing. Hazards of dialyzer reprocessing. Documentation for dialyzer reprocessing.

Module 5: Dialyzer Membranes

Introduction to dialyzer membranes. Composition of the dialyzer membranes, types its use and sizes of the various membranes. Principles on which the dialyzer membranes work.

Module 6: Vascular Access – Temporary & Permanent

Types of vascular access – Fistulae, Grafts, Catheters. Predialysis assessments for all types of vascular access. Methods of needle insertion for AVFs and grafts. Predialysis assessment, accessing procedure, exit site care, and monitoring of catheters

Module 7: Equipment – Accessories – Function

Types of equipment used in the dialysis process. Parts of a dialysis machine, tubing and the water supply for dialysis. Overview of the various equipment ,accessories and working of a dialysis machine-The technology, functioning, calibration, and sterilization of dialysis machine according to their: Type/ brand, Frequency and duration of use, Importance of Calibration and Sterilization , Recording (Calibration, Sterilization and set up details),Planning and Organizing Scheduled Maintenance, Various indicators, alarms and sensors of the dialysis machine. corrective steps to be taken when a particular alarm goes off

Module 8: Computer applications in Dialysis

Hospital information system in the dialysis unit. Scheduling of procedures, application of computers in the monitoring and maintenance of a dialysis unit

Module 9: Dialysate delivery system

Definition of a delivery system, types of delivery systems.

Module 10: Composition of dialysate

Various dialysate compositions, its uses and indications. Method for obtaining various compositions of dialysate

Module 11: High flux / high efficiency dialysis

Definition of high flux / high efficiency dialysis, differences between high flux dialysis and Hemodialysis, used and indications for high flux dialysis, complications of high flux dialysis, precautions and contraindications. Care during a high flux dialysis.

Module 12: Continuous Renal Replacement Therapy / Slow Low Efficiency Dialysis Definition, indications, uses, method of initiation of dialysis, contraindications of therapy. Complications of therapy and ways to prevent complications. Monitoring during SLED and CRRT. Technologist's roles and responsibilities during CRRT & SLED

Module 13: Complications in dialysis patients

List various complications seen in patients on dialysis. Prevention of complications. Education to patient on prevention of complications. Emergency management of hypotension & hemorrhage

Module 14: Water treatment-pre treatment, deionizer, Reverse Osmosis

Purpose of water treatment for dialysis. Components of a dialysis centre's water treatment system. Advantages and disadvantages of water softeners, carbon tanks, reverse osmosis, deionization, and ultraviolet irradiation in the treatment of water for dialysis. Monitoring of water treatment systems – disinfection, microbiological testing, water sampling and chemical monitoring. Method for microbiological testing of the water treatment system. Typical water treatment monitoring schedule. Reverse osmosis process and system: definition of RO, cartridge pre – filter, reverse osmosis pump and monitor assembly, RO membranes. Quality assessment mechanisms – JCI requirements, ISO requirements, checklists and tools used for optimal compliance

Module 15: Dialysis in Neonates, infants & children

Dialysis for infants and neonates, vascular access in this special group, dialysis settings, Monitoring for complications and management of complications

Module 16: Renal data maintenance

Records and reports maintained in the dialysis unit. Need for maintenance of records and report. The technologist's responsibility in maintenance of records and report. Medico legal aspects of maintenance of records

Module 17: Infection control and sterilization

Morphology of microorganisms, Sterilization and Disinfection, Microbiology of vascular access infection (femoral, jugular, subclavian catheters), Sampling methodologies for culture & sensitivity, Principles and Practice of Biomedical waste management

Module 18: Preparation and positioning of patient for dialysis

Module 19: Patient Assessment – Pre, intra & post dialysis & Machine and patient monitoring during Hemodialysis

Introduction to patient assessment, Understanding a treatment plan, Equipment preparation – Dialysate - Dialyzer and Bloodlines - Decisions regarding the appropriate size and type of catheter/ IV tubing to be used –Connecting patients to the machine- Initiation of dialysis - Removing fluid - Replacing fluid - Drawing blood samples - Testing blood samples. Measuring dialysis adequately: Urea reduction ratio - Urea Kinetic Modeling. Pre

–dialysis and post dialysis - BUN Measurement. Factors affecting dialysis treatment, communicating and documenting the findings prior to the dialysis process. Starting the dialysis treatment: Monitoring during dialysis - Patient Monitoring (blood pressure, temperature, rate of blood flow, proper mixture of dialysate, presence of air bubbles)- Technical Monitoring. Importance of reporting, HD Complications during dialysis: Clinical complications - Technical Complications- Procedure to disconnect the patient - procedure for removing the IV canula-Post dialysis procedures, Post dialysis patient evaluation, Recording of the Treatment, Recording changes in Patient's condition, Preparation of status and progress

reports, Equipment clean up and Maintenance, Recording the dialysis procedure on the medical report/chart of the patient,

Module 20: Lab data analysis

Tests done for a patient on Hemodialysis, interpretation of tests and normal values.

Module 21: Acute and chronic dialysis prescription

Common drugs for patients with ARF & CRF, Actions, side effects and special considerations

Module 22: Medications in dialysis patients

List the common drugs used for a patient on dialysis. Use of antibiotics during and post dialysis, considerations to be taken. erythropoietin use in patients on dialysis - dosage and administration. Antihypertensive use - considerations during dialysis. Vaccines for patients on hemodialysis - need and the schedule

Module 23: Nutrition management in dialysis patients

Introduction to nutrition and RDA's. Renal diet. Teaching for a patient on renal diet. Foods to avoid, method of cooking to be employed. Planning a renal diet for a patient with CRF

Module 24: Anticoagulation

Use of anticoagulation in the dialysis setting, various anticoagulants used in dialysis. Monitoring during use of anticoagulants. Method of administration. Calculation of anticoagulant use & complications. Heparin free dialysis - need and indication. Regional citrate anticoagulation

Module 25 Hemodialysis

The process of Hemodialysis, vascular access. Starting Hemodialysis, priming of the dialyzer, alarms and the settings of a dialyzer, completion of Hemodialysis, closing the Hemodialysis. Cleaning of the tubing and dialyzer and the dialysis machine

Module 26: Complications of Hemodialysis– Acute & chronic

Complications of Hemodialysis, acute complications – monitoring, prevention for acute complications. Chronic complications – list, prevention strategies, monitoring for chronic complications

Module 27: Peritoneal Dialysis

Acute and Chronic Peritoneal Dialysis. History, access, physiology of Peritoneal Dialysis. PD – Transport kinetics, ultrafiltration, UF, Intermittent PD, Continuous Ambulatory Peritoneal Dialysis, Automated Peritoneal Dialysis, Dialysis Solutions, Novel uses of PD. Adequacy of peritoneal dialysis chronic peritoneal Dialysis - KT/V Creatinine clearance. PET - Peritoneal Equilibrium test and interpretation.

Module 28: Infectious and non infectious complications of PD

Introduction to complications in peritoneal dialysis. List of Complications: Catheter Infections Peritonitis Inadequate flow or drainage of the dialysis fluid Lesions Ultra filtration failure. Management of exit site infection, Early Exit Site Care. Chronic Care of the Healed Exit Site Diagnosing Exit Site Infections Treatment of exit-site infections Technique to culture exit site infection Medical management of CAPD peritonitis Initiation of therapy based on gram stain results Antibiotic selection,

Module 29: Infection control and universal precautions

Introduction to infection control practices, need for infection control, burden of hospital acquired infection. Introduction to universal precautions - Hand washing – Personal protective equipment – contact precaution, air borne precaution, droplet precaution - - Protection from contamination - Cleaning and disinfecting – common pathogens and their route of transmission- HIV AIDS and its spread. Biomedical waste management- Employee Health Policy- Record and report infection control procedures.

Module 30: Psychosocial aspects & patient education

Psychological impact of a chronic disease. The financial implications of the disease. the family and its role in the care of the patient with CRF. Patient education - Diet, prevention of complications, drug compliance.

Module 31: Instruct patients about in-home treatment and precaution

Identification of the type of patient for whom in house treatment is possible and in line with doctor's advice, procedure of in-house treatment options, pros and cons of in-house treatment options, The relevant protocol and procedures to be followed to carry out the process

Module 32: Quality assurance in dialysis

Standards of practice, Various risks to quality and safety, JCI recommendations, NABH recommendations. Infection control policies and procedures in the dialysis unit.

Module 33: General principle of hospital practice

Hospital structure and organization, Care of Patient , Basic Assessment Skills, First aid & Basic Life Support, Maintenance of Hygiene & Infection Control Practices, Principles of asepsis, Maintenance of Medications in the department, Specialized Investigations - Care of Patients, Medico – Legal Issues

Books:

Anatomy

1. Singh (Inderbir) Text book of Histology, J.P. Brothers, New Delhi
2. Difore Atlas of normal Histology, Lea & Febiger - 1989
3. Anatomy & Physiology for nurses

Reference Books:

1. Human Anatomy ,Chaurasia Vol. I, II & III
2. Human Anatomy, A.K. Dutta Vol. I, II & III
3. Cunningham's Manual of Practical Anatomy, Vol. I, II & III

Physiology

1. Anatomy and Physiology for Nurses by Evelyn Pearle, Jay Pee brothers Publications
2. Anatomy and Physiology for Nurses by Gupta & Gupta ,AITBs Publications
3. Basic Anatomy & Physiology by N. Murgesh , Satya Publishers
4. Anatomy and Physiology illustrated by S.S. Nadakarni

Reference Books:

1. Fundamentals of Physiology - A text book for Nursing students by R.L. Bijalani -- Jay Pee Brothers Publications
2. Human Physiology and Biochemistry by Prof. A.J.Jain, Arya Publications

Biochemistry

Text Books:

1. Text book of Biochemistry for Dental Students– Pattabhiraman
2. Text book of Biochemistry for Dental Students, Harbans Lal
3. Text book of Chemistry prescribed for II P.U.C.

Practical Books:

1. Practical manual of Biochemistry – Rajagopal
2. Practical manual of Biochemistry – Shivananda Nayak
3. Practical manual of Biochemistry - Pattabhiraman

Pharmacology

1. Essential of Medical Pharmacology by K.D. Tripathi

Introduction to Kidney Diseases

1. Harrison's principals of internal medicine
2. Davidson's principals and practice of medicine

Introduction to Dialysis

1. Dialysis Therapy (New Ed.) , Nissenson Fine, Jay Pee Brothers Medical Publishers (P) Ltd
2. Review of Haemodialysis for Nurse and Dialysis Personnel, C.F. Gutch
3. Principle and Practices of Haemodialysis, William C.M. Meulean
4. Principles of Dialysis, Trunne Dipittiod
5. Haemodialysis Nursing, Juanne Dippittiod
6. Hand book of Dialysis, Daugirdas

Subject Code : 2FM0010102	Subject Title : Dialysis Techniques - Practical
Pre-requisite Subject	

Certificate course in dialysis techniques will be carried out under following parts in theory and practical

- 1 Anatomy, Physiology, Biochemistry & Pharmacology**
- 2 Introduction to Kidney Diseases**
- 3 Introduction to Dialysis**

Course Objectives of each parts are as below:

Part 1: Anatomy, Physiology, Biochemistry & Pharmacology

1. Define and explain in Anatomy and Physiology- Structure and function of human cell - Elementary tissues of human body- Brief account on Composition of Blood - functions of blood elements - Blood Group and coagulation of blood, Inflammation, Cellular adaptation, Cell injury & cell death. Different systems in body
2. Define biochemistry and explain the major complex biomolecules of the cell.
3. Enumerate the chemical structure, classification and functions of proteins, lipids and carbohydrates.
4. Comprehend the classification & function of nucleic acids and enzymes.
5. Explain the biochemical structure of vitamins, its classification and the functions of vitamins and minerals.
6. List the various hormones, its action and function.
7. Describe acids and bases, the mechanism of homeostasis and acid base balance
8. Describe the various drugs used for the treatment of kidney diseases and dialysis: which includes antibiotics, anti microbials, ionotropes, diuretics and anti – convulsants.
9. List, classify and describe in detail the various anti – hypertensives , their action, indication, side effects and adverse drug responses.
10. Describe the dialyzability of drugs.
11. Comprehend the drug adjustments to be made for varying degrees of renal dysfunction.
12. Enumerate the action, indication, dosage, routes & side effects in detail of erythropoietin and intra venous iron.
13. Comprehend and describe the action, indication, dosage, route of administration & side effects of heparin in Hemodialysis.
14. Comprehend the use of various anti septics, formalin, sodium hypochlorite and hydrogen peroxide and its uses in sterilization and disinfection of dialysers, tubings and dialyser machine.
15. Comprehend and differentiate the composition of dialysate solutions and peritoneal dialysis solutions.
16. Enumerate the use of potassium exchange resins.
17. Perform the preparation of Hemodialysate concentrates

2 Introduction to Kidney Diseases

1. Describe the appropriate techniques used in the physical assessment and significant subjective and

- objective data related to the urinary system
- Describe the purpose, significance of results related to diagnostic studies of the urinary system.
 - Comprehend the congenital abnormalities of the urinary system.
 - Classify and enumerate kidney diseases, including Glomerular, tubulointerstitial and vascular diseases
 - Describe the pathophysiology, clinical manifestations, collaborative care and drug therapy of cystitis, urethritis, pyelonephritis, acute post streptococcal Glomerulonephritis, good pasture syndrome, chronic Glomerulonephritis & nephritic syndrome.
 - Differentiate between acute renal failure and chronic renal failure.
 - Differentiate among the causes of pre renal, intra renal, and post renal acute renal failure & describe the clinical course of acute renal failure.
 - Comprehend the etiology and pathogenesis of chronic renal failure/ CKD.
 - Comprehend the pathology of the peritoneum in peritonitis.
 - Describe the etiology, pathogenesis and management of urinary tract infections.
 - Educate patients on strategies to prevent urinary tract infections
 - Educate patients on peritoneal dialysis on aspects of the prevention of peritonitis

3 Introduction to Dialysis

- Comprehend the various modalities of renal replacement therapy with the knowledge of merits and demerits of each.
- Comprehend the principles of hemo dialysis, the various forms of hemodialysis and when each is to be used in the clinical setting.
- List and describe the various vascular access devices used in Hemodialysis and its complications.
- Differentiate between peritoneal dialysis, SLED, CRRT, High efficiency dialysis & Hemodialysis in terms of purpose, indications, advantages, disadvantages and the responsibilities of a technologist.
- Practice and perform independently the water maintenance for the Hemodialysis room.
- Independently maintain the Hemodialysis machine with respect to disinfection and priming.
- Comprehend the process of dialysis, the role of a technologist with respect to the pre, intra & post dialysis process.
- Enumerate the various drugs used during the dialysis process.
- Describe the nutrition requirement for a patient with chronic kidney disease & acute kidney injury, & prepare a health teaching plan for the same.
- Manage the anticoagulation on patients on dialysis.
- Enumerate on the various complications of Hemodialysis in terms of the technologists responsibility in prevention and worsening of the complications.
- Describe the process of peritoneal dialysis, the indications, dialysate required and the various complications.
- Start and close Hemodialysis sessions independently.
- Practice independently SLED, CRRT and high efficiency dialysis
- Successfully cannulate arterio – venous fistulae for Hemodialysis.
- Independently operate Hemodialysis machines, CAPD cyclers & initiate CAPD therapy
- Train patients and the care givers in performing peritoneal dialysis.

Subject Code	Subject Name	Teaching Scheme (Hrs/Week)			UA		IA	
		L	P	Total	Max	Min	Max	Min
2FM0010102	Dialysis Techniques - Practical	-	18	18	75	30	25	10

L = Lecture

P = Practical

UA = University Assessment

IA = Internal Assessment

Syllabus: (Topics): Practical's

1 Anatomy, Physiology, Biochemistry & Pharmacology

- Study of Human Skeleton parts with skeletal models..
- Study with charts and models of all organ systems mentioned above.
- Benedict's test
- Heat coagulation tests

2 Introduction to Kidney Diseases

1. Care of Patient with CKD
2. Care of Patient with ARF
3. Health teaching on prevention of UTI
4. Health teaching on prevention of peritonitis

3 Introduction to Dialysis

1. Setting up a dialysis machine for dialysis
2. A.V. Cannulation
3. A.V. Fistula / A.V. Graft Cannulation
4. Initiation of dialysis through central venous catheters – Internal Jugular – Femoral –Subclavian vein
5. Packing and sterilization of dialysis trays
6. Closing Dialysis
7. Preparation of concentrates – depending on the situation
8. Reuse of dialysis apparatus
9. Isolated ultrafiltration
10. Performance of peritoneal dialysis exchange – manually
11. Setting up of automated peritoneal dialysis equipment
12. First assistant in minor procedures
13. Skin suturing
14. CPR Demonstrations
15. Prepare Presentations based on various kinds of data collection