

**SYLLABUS FOR DIALYSIS TECHNICIAN 2<sup>nd</sup> YEAR  
TWO YEAR PROGRAMME**

**PAPER-1**

**Introduction to Dialysis Part I**

**DT-201**

**INTRODUCTION TO DIALYSIS PART - 1**

**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: Dialyser Membranes**

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

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**PAPER-2**  
**INTRODUCTION TO DIALYSIS PART - 2**  
**DT-202**

**INTRODUCTION TO DIALYSIS PART - 2**

**Module 1: Preparation and positioning of patient for dialysis**

**Module 2: Patient Assessment – Pre, intra & post dialysis & Machine and patient monitoring during Hemodialysis**

Introduction to patient assessment, Understanding a treatment plan, Equipment preparation – Dialysate - Dialyser 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 3: Lab data analysis**

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

**Module 4: Acute and chronic dialysis prescription**

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

**Module 5: 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 6: 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 7: 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 8 Hemodialysis**

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

## **Module 9: 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 10: 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 11: 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 12: 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 13: 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 14 : 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 15: 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 16 : 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