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Dialysis Technician

Format: Self-Pace Online / eLearning
Program Duration: 6 Months
Course Contact Hours: 375

The Dialysis Technician Profession

As kidney failure continues to be a growing national health problem, kidney disease is driving the growing demand for well-trained dialysis technicians. Dialysis technicians are employed in hospitals, outpatient clinics, and other medical facilities. The BLS has reported that Dialysis Technicians can expect a job growth of 16% from 2014 to 2024. This is much faster than the average rate of growth for most other professions. While most technician training has historically been done “on-the-job,” today’s healthcare employers are seeking well-trained technicians who possess the necessary knowledge and skills to fill this growing number of positions.

The Dialysis Technician Program

This Dialysis Technician Program provides students with the knowledge needed to perform as a dialysis technician. This program will review kidney dialysis machines, preparing dialyzer reprocessing and delivery systems, and review equipment maintenance. This Dialysis Technician Program provides students with the knowledge and skills needed to perform the duties required of dialysis technicians. This course covers the following key areas and topics:

- Specific procedures to operate kidney dialysis machines
- Preparation of the dialyzer, reprocessing and delivery systems
- Equipment maintenance
- Skills to monitor and record a patient’s vital signs
- The process for a dialysis teams’ administration of local anesthetics and drugs as needed
- Assessment of patients for any complications that occur during a procedure
- Patient training for at-home dialysis treatment and techniques to provide emotional support patients need for self-care

Education and Certifications

- Students should have or be pursuing a high school diploma or GED.
- There are no state approval and/or state requirements associated with this program.
- **National Certification:**

- **The BONENT Certified Hemodialysis Technologist/Technician (CHT)** examination measures technical proficiency in certain skills, and general areas of knowledge in hemodialysis. The examination tests the following five major domains of practice and tasks performed in the scope of hemodialysis technology: patient care, machine technology, water treatment, infection control, and education/personal development. This is an entry level certification and requires a high school diploma and one year experience in nephrology patient care, and current active participation in an ESRD facility.

Dialysis Technician Detailed Course Information

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

- Explain basic chemistry of body fluids, renal physiology, and the pathology of renal failure
- Explain the principles of hemodialysis including the dialysate, dialyzer, delivery system, and water treatment for dialysis
- Explain the safety procedures in performing the tasks assigned to the dialysis technician
- Identify specific supplies, equipment, and medications used in selected dialysis procedures
- Explain the precautions and guidelines in performing the preparation, assessment, monitoring, and care of a dialysis patient
- Define quality of care, and explain the impact of medical care on a patient when quality and safety are compromised in dialysis procedures
- Describe dialysis personnel in terms of team members and roles, treatment and intervention skills, related professional organizations, and historical leaders

Dialysis Technician Program Detailed Student Objectives

THE DIALYSIS TEAM AND HISTORY OF DIALYSIS

- Name the national organizations for dialysis technicians
- Give a brief history of dialysis, including important figures and innovations
- Explain the difference between hemodialysis treatment and peritoneal dialysis treatment
- List and explain the roles of each member of the dialysis team
- List the basic treatment and intervention skills of a dialysis technician

BASIC CHEMISTRY OF BODY FLUIDS AND ELECTROLYTES

- Complete basic metric to English and English to metric conversions
- Differentiate the basic principles of diffusion, filtration, ultrafiltration, convection, and osmosis
- Explain the role of electrolytes in fluid balance and homeostasis

RENAL PHYSIOLOGY AND THE PATHOLOGY OF RENAL FAILURE

- Identify the structures and functions of the normal kidney
- Differentiate between acute and chronic kidney disease
- List the stages of chronic kidney disease
- Describe at least four conditions that often occur due to kidney failure
- Discuss the treatment options for kidney failure

CLINICAL MANIFESTATIONS OF END-STAGE RENAL DISEASE

- List common systemic manifestations that result from ESRD
- Describe the role hypertension plays in kidney disease
- Differentiate between normal blood pressure and hypertension

THE DIALYSATE

- Discuss the role of dialysate in a dialysis treatment
- Explain the need for two concentrates in bicarbonate-based dialysate

- Identify the main elements used in dialysate and the roles they play in the body
- List the normal range of each element in the body and the amount used in dialysate
- Describe how dialysate aids in the filtration of the blood

THE DIALYZER

- Identify components of the dialyzer
- Explain the significance of biocompatibility to dialysis
- Explain the significance of membrane surface area
- Explain the concepts of molecular weight cutoff and ultrafiltration coefficients
- Discuss the primary ways clearance can be adjusted
- Discuss adsorption and its effect on membrane efficiency
- Compare and contrast the three types of material used in dialyzer membranes
- List steps for preparing a dialyzer for use and reuse in a dialysis treatment
- Discuss the potential hazards of dialyzer reprocessing
- Explain how to ensure that the dialyzer is working efficiently
- List the types of dialyzer documentation that must be maintained

THE DELIVERY SYSTEM

- Identify the parts of the dialysis delivery subsystem
- Explain the importance and role of the main components of the dialysis delivery system
- Identify the equipment needed for hemodialysis

PRINCIPLES OF HEMODIALYSIS

- List the fluid compartments in the body
- Describe how fluids move among body compartments
- Explain the role of diffusion in dialysis
- Explain the role of filtration in dialysis
- Differentiate between diffusion and convection
- Discuss fluid dynamics in relation to dialysis
- Explain the role of osmosis in dialysis
- Describe how kidneys use diffusion and filtration to clean the blood
- Describe how dialysis uses diffusion and filtration to mimic the kidneys

WATER TREATMENT

- List water supply sources
- Explain the importance of using only pure water in dialysis
- List the components used in contaminant removal
- Explain concepts including reverse osmosis, deionization, and UV treatment
- Explain the design and construction of RO membranes
- Explain labeling requirements for the various components of a water treatment system
- List steps for monitoring and testing the water treatments system
- Discuss reasons why patient monitoring is essential

INFECTION CONTROL

- Explain the importance of controlling infection
- Define blood-borne pathogens
- List infection-control precautions
- Explain cleaning and disinfecting procedures to prevent infection

- List strategies for preventing environmental contamination
- Describe how pathogens are transmitted to patients
- Discuss the importance of aseptic technique and strategies for maintaining it
- Describe the use of personal protective equipment (PPE)
- List strategies for prevention TB, HBV, and HIV transmission
- Discuss documentation and training to prevent and control infections

ANTICOAGULATION AND HEPARIN ADMINISTRATION

- Describe the purpose of an anticoagulant in hemodialysis treatment
- Describe heparin and its various types
- Identify heparin dosage, uses, and laboratory tests
- Identify the needles and equipment used for cannulation and proper needle placement

ACCESS TO THE BLOODSTREAM

- Describe arteriovenous fistula (AVF) including special care needs and potential problems
- Explain patient assessment prior to cannulation and care after cannulation
- Identify alternatives to AVF
- Explain vascular access systems
- Identify the needles and equipment used for cannulation and proper needle placement
- List proper infection prevention techniques
- Explain the National Kidney Foundation's Kidney Disease outcomes Quality Initiative (NKF K/DOQITM) guidelines for vascular access

PATIENT AND MACHINE MONITORING AND ASSESSMENT

- Recognize the clinical complications that can arise during dialysis
- Explain the technician's role in helping to alleviate any complications
- Describe intradialytic assessment and patient monitoring
- Discuss the process of discontinuation of dialysis

NUTRITION MANAGEMENT

- Explain the dietary needs of the patient who receives dialysis treatment
- Compare and contrast dietary needs for hemodialysis patients and peritoneal dialysis patients
- List reasons for fluid monitoring during dialysis treatment
- Explain why supplements are often advised for dialysis patients

LABORATORY DATA: ANALYSIS AND INTERPRETATION

- List the most common blood tests performed for ESRD patients, including the reason that each test is performed
- Identify the normal adult values and the desired values for adults on dialysis
- Explain the possible causes of abnormal values
- Describe the technician's role in the manifestations

DIABETES AND HEMODIALYSIS

- Explain the relationship of diabetes to kidney disease
- Compare and contrast Diabetes Type I and Type II, including treatments and normal blood sugar ranges
- Discuss the effect of diet on the diabetic kidney disease patient
- Differentiate between kidney treatments in a non-diabetic and a diabetic patient

MEDICATION PROBLEMS AND DIALYSIS

- Identify common medical problems that accompany kidney failure and the drugs commonly prescribed for each condition
- List the vitamins, minerals, and other medications commonly used by dialysis patients
- Explain the risks of heart diseases in dialysis patients

ACUTE KIDNEY INJURY AND DIALYSIS

- Describe acute kidney injury (AKI)
- Identify prerenal AKI, including its diagnosis, treatment and prognosis
- Identify postrenal AKI, including its diagnosis, treatment and prognosis
- Identify intrarenal AKI, including its diagnosis, treatment and prognosis
- Differentiate oliguric and nonoliguric patients

PERITONEAL DIALYSIS AND HOME DIALYSIS THERAPIES

- Describe peritoneal dialysis and its benefits
- Identify characteristics of patients who qualify for peritoneal dialysis
- Differentiate between the types of peritoneal dialysis therapies
- List the equipment needed for peritoneal dialysis
- Explain how to care for a peritoneal dialysis patient

KIDNEY TRANSPLANTS

- Identify the most common diseases leading to kidney transplants
- List the criteria for accepting a patient as a candidate for transplantation
- Explain the contraindications for transplantation
- Discuss the process of kidney transplantation including complications, medications, and patient precautions
- List three options for kidney transplantation

PEDIATRIC HEMODIALYSIS

- List the possible physical changes of children undergoing dialysis therapy
- Discuss the possible psychological effects of dialysis on pediatric patients
- Explain the dialysis technician's role in helping children with dialysis therapy
- Discuss how a dialysis technician can help the family adjust to a child's dialysis therapy
- Explain the processes and tools used to perform pediatric dialysis

CHRONIC KIDNEY DISEASE IN THE ELDERLY

- Discuss how ESRD affects the elderly and what it does to this group's survival rate
- Describe complications, such as infection and amyloidosis, in elderly ESRD patients
- Explain the nutritional needs and dietary restrictions of elderly ESRD patients
- List the physical challenges of the elderly, and describe how the dialysis technician can overcome these obstacles

PSYCHOSOCIAL EFFECTS OF DIALYSIS THERAPY

- Describe the physical changes that can affect a dialysis patient's emotions
- Explain the common psychosocial effects of dialysis on patients, and discuss emotions related to age
- List the stages of adjustment to dialysis therapy, and discuss ways for coping with the emotional effects

- Discuss the dialysis technician's role in helping their patients' emotional well-being
- Explain how to educate a dialysis patient in behaviors that will impact health and quality of life

MANAGEMENT OF QUALITY IN DIALYSIS CARE

- Explain continuous quality improvement
- Identify some basic tools used in continuous quality improvement

MICROSOFT OFFICE Module

- Use an integrated software package, specifically the applications included in the Microsoft Office suite
- Demonstrate marketable skills for enhanced employment opportunities
- Describe proper computer techniques for designing and producing various types of documents
- Demonstrate the common commands & techniques used in Windows desktop
- List the meaning of basic PC acronyms like MHz, MB, KB, HD and RAM
- Use WordPad and MSWord to create various types of documents
- Create headings and titles with Word Art
- Create and format spreadsheets, including the use of mathematical formulas
- Demonstrate a working knowledge of computer database functions, including putting, processing, querying and outputting data
- Define computer terminology in definition matching quizzes
- Use the Windows Paint program to alter graphics
- Use a presentation application to create a presentation with both text and graphics
- Copy data from one MS Office application to another application in the suite
- Use e-mail and the Internet to send Word and Excel file attachments
- Demonstrate how to use the Windows Taskbar and Windows Tooltips
- Explain how copyright laws pertain to data and graphics posted on the Internet
- Take the college computer competency test after course completion
- Follow oral and written directions and complete assignments when working under time limitations

Career Programs

Dialysis Technician

Note: Although the Microsoft Office Module is not required to successfully complete this program, students interested in pursuing the Microsoft Office Specialist (MOS) Certification exam will need to complete this module, in order to be prepared to sit for the Microsoft Office Specialist (MOS) Certification exam.