

# ELIM OUTREACH TRAINING CENTER

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## DIALYSIS TECHNICIAN PROGRAM

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Revised 6/2013

# **DIALYSIS TECHNICIAN ADMISSION REQUIREMENTS**

1. **High School diploma or GED**
2. **Able to lift 20lbs or more**
3. **Reading and math levels not less than 9<sup>th</sup> grade**
4. **Fine motor coordination (good manual dexterity and hand/eye coordination)**
5. **Must communicate effectively, both verbally and nonverbally**
6. **Must be able to display flexibility, accept and integrate constructive criticism in the classroom and clinical setting**
7. **Able to stand for long periods of time**

## **Dialysis Technician must complete:**

1. **60 clock hours**
2. **Successfully complete the course with an 80% average**
3. **100% laboratory and clinical participation**

# DIALYSIS TECHNICIAN SYLLABUS

## Course Description:

Dialysis Technicians set up and operate hemodialysis machines to provide dialysis treatment for patients with kidney failure. Some of the daily tasks technicians performed are removing waste, salt, and extra fluid from patient's blood, while keeping a safe level of chemicals within the body. They also take vital signs and monitor the patient throughout the treatment time. Dialysis Technicians help patients feel comfortable during the procedure also, they keep the machine in good working condition.

The duration of the Dialysis Technician Program is 11 weeks (60 clock hours).

Class Structure: Lectures, Demonstrations and Simulated Laboratories

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## Course Objectives:

Upon completion of this course, the graduates will be able to:

1. Explain various hemodialysis team members and their functions
2. Recognized and correctly use related terms, mark, abbreviations and symbols related to dialysis
3. Examine, define and employ medical terminology related to dialysis
4. Understand basic chemistry of body fluids and electrolytes related to dialysis
5. Explain the normal functions of the kidney and the disease process that may cause renal failure
6. Understand the major signs and symptoms of end-stage renal disease
7. Interpret laboratory data for dialysis patients
8. Explain the dialysis machine systems and identify equipment parts
9. Explain the different types of vascular access to the circulation system
10. State the overview of peritoneal dialysis and renal transplantation
11. Explain the importance of infection control related to dialysis

# DIALYSIS TECHNICIAN TUITION

## Course Description:

**Dialysis Technicians set up and operate hemodialysis and peritoneal machines to provide dialysis treatment for patients with kidney failure. Some of the daily duties of a Dialysis Technician include: monitoring patients vital signs during treatment, the removing of waste, salt and extra fluids from the patient's blood while keeping safe levels of chemicals in the blood. Assist the Dialysis nurse with other treatment as prescribe by the physician. Also, at the end of treatment the technician will break down and clean the machine.**

Tuition	\$825.00
Registration Fee	\$100.00 (non refundable)
Book(s)	\$125.00
Lab Fee	\$ 75.00
<b>Total:</b>	<b>\$1025.00</b>

## **Other: (Items needed not included in tuition)**

Uniform	\$25.00
Shoes	\$25.00
Stethoscope	\$17.00
CPR	\$55.00
Graduation fee	\$20.00
National Exam	*see statement below.
<b>Total:</b>	<b>\$142.00</b>

## **TOTAL COST:**

**\$1167.00**

Price subject to change without notice.

Under the law you have the right, among others, to pay the full amount due and to obtain under certain conditions a partial refund of financial charges if applicable. (ELIM does not charge finance charges. A late fee of 10% will be added to all late payments)

Method of Payment: Cash, Money Orders, or Cashier's Check. **SORRY WE DO NOT ACCEPT PERSONAL CHECKS.**

Due at registration-\$100.00. First payment of \$225.00 is due on the first day of class. First payment will cover book(s) and first installment payment.

\* The Bonet exam for Dialysis Technicians is initiated after the students has worked in the field for 6-18 months. Therefore, the school will not include the test cost of \$225.00 for the exam. Once hired, most dialysis centers will reimburse the employee for the cost of the exam.

\*Supplies may be purchased from ELIM or you may purchase uniforms and other supplies at: Wal-Mart, Work N Gear, and Life Uniform. Please consult the yellow pages or internet for a location near you.

# **COURSE MATERIAL.....TEXTBOOKS**

## **Main Textbook:**

**Review of Hemodialysis or Nurse and Dialysis Personnel 7<sup>th</sup> Edition**

**By: Judith Z. Kallenbac**

**C.F. Gutch**

**Martha H. Stoner**

**Anna L. Corea**

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**This book provides the student with a realistic approach to giving care to the patient with End Stage Renal Disease.**

## **Reference Book:**

**Medical Terminology for Dummies**

**By Beverly Henderson and Jennifer Dorsey**

**Copyright© 2009**

**This book introduces medical terminology fundamentals thus helping the student to master definitions communication and the application of terms across all medical fields.**

**Webster's New World Medical Dictionary, 3<sup>rd</sup> Edition**

**By: William C. Shiel, Jr., MD, FACR**

**Melissa Courad Stoppier, MD**

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# DIALYSIS TECHNICIAN COURSE OUTLINE

## **UNIT 1**

### The Hemodialysis Team

- A. Structure of the Dialysis Facility
- B. Role of the dialysis team
- C. Ethics, Rights, and Responsibility

#### Unit Objectives:

\_\_\_At the end of this unit the student will be able to:

- 1. State policies and procedures that will guide staff members in the clinical practice and patient care
- 2. List the role and functions of each member of the dialysis team
- 3. Explain several rights and responsibilities of the patients and personnel

## **UNIT 2**

### Basic chemistry of Body Fluids and Electrolytes

- A. Metric system
- B. Chemistry
- C. Body Water

#### Unit Objectives:

\_\_\_At the end of this unit the student will be able to:

- 1. Understand how the metric system is used in chemical and physical measurements
- 2. State the basic elements of chemistry as it relates to dialysis
- 3. Explain the importance of water within the body

## **UNIT 3**

### Renal Physiology and the Pathology of Renal Failure

- A. Renal Physiology
- B. Renal Failure

#### Unit Objectives:

\_\_\_At the end of this unit the student will be able to:

- A. Know the normal functions of the kidneys
- B. Explain the cause of renal failure

## **UNIT 4**

### **Clinical Manifestations of End-Stage Renal Disease (ESRD)**

- A. Cardiovascular System**
- B. Integumentary System**
- C. Immune System**
- D. Gastrointestinal System**
- E. Hematological System**
- F. Musculoskeletal System**
- G. Neurological System**
- H. Respiratory System**
- I. Reproductive system**
- J. Metabolic Disturbances**

#### **Unit Objectives:**

\_\_\_\_\_ At the end of this unit the student will be able to:

- 1. List several abnormal changes seen in each body system**

## **UNIT 5**

### **Laboratory Data: analysis and Interpretation**

- A. Important Laboratory Data for Dialysis Patients**
- B. Blood Urea Nitrogen**

#### **Unit Objectives:**

\_\_\_\_\_ At the end of this unit the student will be able to:

- 1. Identify important laboratory tests used to monitor dialysis patients**
- 2. Define Urea and list signs and symptoms**

## **UNIT 6**

### **Principles of Hemodialysis**

- A. Historical Background**
- B. Solute Transfer**
- C. Transport**

#### **Unit Objectives:**

\_\_\_\_\_ At the end of this unit the student will be able to:

- 1. Name several pioneers and their contributions to dialysis**
- 2. Define Hemodialysis**
- 3. Define Transport**

## **UNIT 7**

### **Dialyzers, Dialystate, and Delivery Systems**

- A. Parallel Plate Dialyzers**
- B. Hollow-Fiber Dialyzers**
- C. Membranes for Hemodialysis**
- D. Membrane Biocompatibility**
- E. Dialyzer Reuse**
- F. Delivery System**
- G. Additional Equipment and Function**
- H. High-Efficiency and High -Flux Dialysis**

#### **Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

- 1. Know the difference between dialyzer and dialystate**
  - 2. State the characteristics of plate dialyzers**
  - 3. List several advantages and disadvantages of hollow-fiber dialyzers**
  - 4. List the two basic types of membranes for hemodialysis**
  - 5. State how an inflammatory response may trigger a membrane biocompatibility**
  - 6. List several advantages and disadvantages for dialyzer reuse**
  - 7. State the functions of the delivery systems**
  - 8. List several complementary functions essential to the hemodialysis procedure**
  - 9. State the equipment requirements and system requirements for high-flux dialysis**
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- 8. List several complementary functions essential to the hemodialysis procedure**
  - 9. State the equipment requirements and system requirements for high-flux dialysis**

## **UNIT 8**

### **Water Treatment**

#### **Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

- 1. List several impurities found in tap water**
- 2. List 4 inorganic chemicals that may be present in tap water**
- 3. State several methods used to treat water in Hemodialysis**
- 4. Define RO**
- 5. State several advantages and disadvantages of the RO systems**
- 6. State the different tests used to maintain the water treatment systems**



## **UNIT 9**

### **Dialyzer Preparation and Reprocessing**

- A. Dialyzer Preparation**
- B. Dialyzer Reprocessing**

#### **Unit Objectives:**

\_\_\_\_\_ At the end of this unit the student will be able to:

- 1. Tell how to prepare the dialyzer for patient use**
- 2. List the basic steps for reprocessing**

## **UNIT 10**

### **Access to the Bloodstream**

- A. Historical Background**
- B. Internal Accesses**
- C. Arteriovenous Fistula**
- D. Single-Needle Technique**

#### **Unit Objectives:**

\_\_\_\_\_ At the end of this unit the student will be able to:

- 1. Give details on major historical developments that led to the development of dialysis accesses**
- 2. Describe an internal access**
- 3. Describe an Arteriovenous fistula**
- 4. State the reason for the single-needle technique**
  - Types of needles used**
  - Positioning of the needle**
  - Anesthetic used before needle placement**
- 5. List temporary vascular access and tell which veins are used**

## **UNIT 11**

### **Patient and Machine Monitoring and Assessment**

- A. General Assessment**
- B. First Hemodialysis Assessment**
- C. Predialysis Assessment**
- D. Intradialytic Assessment and Monitoring**
- E. Postdialytic therapy Assessment**
- G. Monthly Assessments**

#### **Unit Objectives:**

\_\_\_\_\_ At the end of this unit the student will be able to:

- 1. State what is patient monitoring**
- 2. List the different types of hemodialysis assessment**
- 3. State the importance of the first hemodialysis assessment**
- 4. Define Predialysis assessment**
- 5. Describe intradialytic monitoring**
- 6. Define Postdialytic assessment**
- 7. State the purpose of monthly assessments for ESRD patients**

## **UNIT 12**

### Anticoagulation and Heparin Administration

#### Unit Objectives:

\_\_\_\_\_At the end of this unit the student will be able to:

1. Define anticoagulation
2. Know the nature of heparin
3. List drugs that interact with heparin
4. Describe regional heparinization .

## **UNIT 13**

### Medication Problems and Dialysis

- A. Medication Consideration
- B. Antihypertensive
- C. Different types of antihypertensive medications
- D. Cation exchange
- E. Intradialytic Parenteral Nutrition
- F. Levocarnitine
- G. Phosphate Binders
- H. Vitamins and Vitamin Analogs

#### Unit Objectives:

\_\_\_\_\_At the end of this unit the student will be able to:

1. List several drugs that interfere with laboratory tests
2. Define hypertension
3. List several antihypertensive drugs and their side effects
4. State the importance of Cation exchange
5. Define intradialytic Parenterals nutrition.
6. Describe the role of Levocarnitine
7. State the importance of phosphate binders
8. List several vitamins and vitamin analogs and their functions

## **UNIT 14**

### Nutrition Management

#### Unit Objective:

\_\_\_\_\_At the end of this unit the student will be able to:

1. State why the correct diet is important for people with renal disease

## **UNIT 15**

### Acute Renal failure and Dialysis

- A. Procedures
- B. Hemofiltration
- C. Hemoperfusion
- D. Dialysis in Relation to Transplant
- E. Dialysis Patients with Transplant Rejection

**Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

1. List different types of acute renal failure and their treatments
2. State several complications that can occur with acute renal failure
3. Tell what isolated ultrafiltration means
4. Define hemofiltration and complications that may occur
5. Describe hemoperfusion and the adverse effects of hemoperfusion
6. Define post-transplant kidney dysfunction
7. List several special problems in the dialysis of post-transplant patients

## **UNIT 16**

### **Transplantation**

**Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

1. State the advantages and disadvantages of renal transplant
2. List several contraindications to transplantation
3. Define tissue typing
4. Define cross matching
5. Describe several electrolyte abnormalities after transplantations

## **UNIT 17**

### **Peritoneal Dialysis and Home Dialysis Therapies**

- A. Home Dialysis therapy: Peritoneal
- B. Home dialysis Therapy: Hemodialysis

**Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

1. Define peritoneal dialysis and state how it works
2. Name at least 3 peritoneal dialysis solutions
3. Describe how exit site care is performed
4. List several complications of peritoneal dialysis
5. State how patients are selected for home peritoneal dialysis

## **UNIT 18**

### **Diabetes and Hemodialysis**

**Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

1. Define diabetes mellitus
2. State the two types of diabetes
3. Describe the treatments for diabetes
4. Name the different medications use to treat diabetes
5. Differentiate between hyperglycemia and hypoglycemia

## **UNIT 19**

### **Infection Control**

#### **Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

1. Define standard precautions
2. Define OSHA
3. State the importance of hand washing
4. Define PPE
5. Describe the Needle stick Safety and Prevention Act
6. List the two most significant blood-borne pathogens
7. Describe hepatitis A, B, and C
8. State how hepatitis A, B, and C are transmitted
9. Define HIV and tell how it is transmitted
10. Define Tuberculosis (TB) and tell how it is transmitted
11. Give CDC recommendations for TB screening
12. List several drug-resistant organisms and tell how they are transmitted
13. State the procedures for sterilizing and disinfecting a dialysis unit

## **UNIT 20**

### **Psychosocial Aspects of Dialysis Therapy**

#### **Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

1. State several psychosocial consequences of long-term dialysis
2. List several coping mechanisms of patients on maintenance dialysis
3. Define professional boundaries
4. Define HIPAA

## **UNIT 21**

### **Pediatric Hemodialysis**

#### **Unit Objectives:**

\_\_\_\_\_At the end of this unit the student will be able to:

1. Describe the causes of acute renal failure in children
2. List several causes of CKD in children
3. List the vascular access considerations in pediatrics
4. State how pain is managed in children
5. Describe high blood pressure in children

## **UNIT 22**

### **End-Stage Renal Disease (ESRD) in the Elderly**

#### **Unit Objectives:**

\_\_\_\_\_ At the end of this unit the student will be able to:

1. **Define trial dialysis**
2. **List several advantages and disadvantages for elderly patients in being on peritoneal dialysis**
3. **List several advantages and disadvantages of Hemodialysis in treating elderly ESRD patients**

## **UNIT 23**

### **The Management of Quality in Dialysis Care.**

#### **Unit Objectives:**

\_\_\_\_\_ At the end of this unit the student will be able to:

1. **Define CQI**
2. **Describe the origin of CQI**
3. **List several CQI concepts and terms**
4. **Describe PDCA Cycle**

# DIALYSIS TECHNICIAN UNIT HOURS BREAKDOWN

UNIT	TOPIC	HOURS
1	THE HEMODIALYSIS TEAM	3
2	BASIC CHEMISTRY OF BODY FLUIDS AND ELECTROLYTES	3
3	RENAL PHYSIOLOGY AND THE PATHOLOGY OF RENAL FAILURE	4
4.	CLINICAL MANIFESTATION OF END STAGE RENAL DISEASE	4
5.	LABORATORY DATA	2
6.	PRINCIPLES OF HEMODIALYSIS	3
7.	DIALYZER, DIALYSTATE, AND DELIVERY SYSTEM	3
8.	WATER TREATMENT	2
9.	DIALYSER PREPARATION AND REPROCESSING	2
10.	ACCESS TO THE BLOODSTREAM	2
11.	PATIENT AND MACHINE MONITORING AND ASSESSMENT	3
12.	ANTICOAGULATION AND HEPARIN ADMINISTRATION	2
13.	MEDICATION PROBLEMS AND DIALYSIS	3
14	NUTRITION MANAGEMENT	2
15.	ACUTE RENAL FAILURE AND DIALYSIS	3
16.	TRANSPLANTATION	2
17.	PERITONEAL DIALYSIS AND HOME DIALYSIS THERAPIES	2
18.	DIABETES AND HEMODIALYSIS	3
19.	INFECTION CONTROL	3
20.	PSYCHOSOCIAL ASPECTS OF DIALYSIS THERAPY	2
21.	PEDIATRIC HEMODIALYSIS	2
22.	END-STAGE RENAL DISEASE (ESRD) IN THE ELDERLY	3
23	MANAGEMENT OF QUALITY IN DIALYSIS CARE.	2
Total		60

# DIALYSIS TECHNICIAN CLASS SCHEDULE

Week	Date	Lesson	Text Assignment	Class Assignment
1		Orientation Policies/ Procedure		½ day Book (s) Handout
2		Lecture	Chapters 1,2,3 Video	
3		Exam Lecture	Chapters 1,2,3 Chapters 4,5,6, Video	
4		Exam Lecture	Chapters 4,5,6 Chapters 7,8, HIPAA	Payments must be current to take the midterm Exam.
5		<b>Midterm Exam</b>	Chapters 1-8	.Introduction to the Laboratory
6		Lecture	Chapter 9,10,11 SAFETY	Lab (T/P/R/Blood Pressure)
7		Exam Lecture	Chapters 9,10,11 Chapters 12,13,14	Lab
9		Exam Lecture	Chapters 15,16,17 Chapters 18,19,20	Lab Final Exam Review Handout
10		Exam Lecture	Chapters 18,19,20 Chapters 21-25	Lab.
11		<b>Final Exam</b>	LAB Teachers evaluation Exit Interview	Each student will perform 1 cannulation, set up and break down the machine. Students will arrive to class according to last name; once the lab exam is done the student may leave.
12		Final Exam	THEORY ALL CHAPTERS 1-25	After Final exam students may leave. Instructor turn in all paperwork.

CLASS CALENDAR IS SCHEDULE TO CHANGE WITHOUT NOTICE.

ALL PAYMENTS MUST BE CURRENT TO PARTICIPATE IN THE MIDTERM, FINAL EXAM AND SIMULATED LABS. If you default on your payments, (missing 1 payment) you can be dismissed from the program. Please see Ms. Taylor or Mrs. Triplett ASAP if you are having financial problems. Students must pass all exams with an 80% or better. If you score less than the required 80% please see your instructor as soon as possible. Students must be in uniform at all times and display their name badges at all times. VIDEOS ARE PART OF LAB DAYS.

\*Only one excuse absent will be allowed per course. Please see your student handbook/catalog for detailed information.

**DIALYSIS TECHNICIAN PROGRAM**  
**PROGRAM OUTCOME/CONSUMER INFORMATION - JULY 1, 2011 – JUNE 30, 2012**

<b>1. Number of students who were admitted in the program as of July 1</b>	<b>47</b>
<b>2. Number of additional students who were admitted in the program during the next 12 months</b>	
A. New starts:	42
B. Re-enrollments:	0
C. Transfers into the program from other programs at the school	0
<b>3. Number of students admitted into the program during the 12 month reporting period</b>	
A. The total number of students reported under section A1 and A2	89
<b>4. Number of students enrolled in the program during 12-month reporting period who:</b>	
A. Transferred out of the program and into another program at the school	1
B. Completed or graduated from a program	59
C. Withdrew from the school	6
D. Are still enrolled	23
<b>5. * Number of students enrolled in the program who were:</b>	
A. Placed in their field of study	
B. Placed in a related field	
C. Placed out of the field	
D. Not available for placement due to personal reasons	
E. Not employed	
<b>B1. Number of students who took a State licensing examination or professional certification</b>	<b>N/A</b>
<b>B2. Number of students who took and passed a State licensing examination or professional certification</b>	
<b>** C. Number of students who obtained employment who did not use the school's placement assistance</b>	<b>10</b>
<b>**D. Average starting salary for all graduates employed</b>	<b>\$13.50/hr</b>

*B1. Dialysis Technicians are allowed to work in the field according to BONET for 6-18 months before they have to take the national BONET exam.*

*\*ELIM does not offer job placement at this time*

*\*\*This information is compiled by reasonable efforts of the school from graduates by written correspondence.*

*Revised 6/2013*