OVERVIEW

OF

RENAL DIALYSIS TECHNOLOGY

Submitted by

Mr.D.Jagadeswaran,

M.Sc (Renal Sciences & Dialysis Technology), M.S.W., M.Sc (C&P), MABMS.
DCRCT,
LECTURER IN RENAL SCIENCES & DIALYSIS TECHNOLOGY
Secretary, Society for Dialysis Technologists and Paramedicals
DEPT OF NEPHROLOGY,
FACULTY OF ALLIED HEALTH SCIENCES
SRI RAMACHANDRA UNIVERSITY
CHENNAI

1. INTRODUCTION

1.1 Purpose

This document will reflect the evolutionary developments relative to advances in renal dialysis technology

This document aims to promote the further development of educational programs for renal dialysis technologists in nephrology across the world. It is intended to identify the roles, fields of knowledge and attributes that underlie competent professional performance, hence providing a framework for the development of professional standards of renal dialysis technology.

1.2 Application

This document is offered as a **recommended set of guidelines for national organizations.** It is not intended to list the specifics but it is intended to meet the needs of different educational systems, health care structures and socio-economic patterns.

This document recognizes that academic and clinical requirements of Renal dialysis technologists will vary both within and between countries. This is commensurate with existing educational programs, the present and future needs of the medical community and existing policies.

1.3 Interpretation

Unless the context requires otherwise, the following terminology is implied:

APPROVING AUTHORITY: the government body, professional organization or other persons who may have the responsibility of organizing, funding, monitoring or certifying the Renal Dialysis Technology programme

ADVISORY COMMITTEE: the committee appointed by the institution to provide advice in the organization of the education programme

CERTIFICATION: a qualification, award, diploma, degree, Postgraduate, Doctorate or any other documentation that indicates successful completion of the education programme and is used as recognition for employment

CLINICAL SETTING: the area/situation in which the practitioner performs his role

CLINICAL EDUCATION: a programme of clinical experience for the student in the clinical setting and would also involve working with patients

COMPETENCY LEVEL: the level of performance required for a particular professional skill in the clinical setting

DIALYSIS: Includes both Hemodialysis and peritoneal dialysis

HEMODIALYSIS: Management of Renal Failure by filtering the blood by the use of an artificial kidney and an extracorporeal circuit connected to a dialysis machine.

EDUCATIONAL INSTITUTION: the institution which organizes the education programme for renal dialysis technologists

PERITONEAL DIALYSIS: Management of Renal Failure by filtering the blood by the use of the peritoneal membrane which is present in the patient's body itself.

Renal Dialysis Technologists: Renal Dialysis Technologists, Therapists and others who have successfully completed a nationally recognized educational programme in Renal dialysis profession. It is recognized that different countries use different terminology, however, the level of performance and responsibility is the same. The hierarchy may vary based on their qualification like certificate program, diploma, degree, postgraduate and Doctorate program.

INFECTION RISK/BENEFIT STATUS: that prior to any dialysis procedures, Hepatitis B vaccination should be done for the technologists.

STUDENT-CENTRED: students are provided with opportunities to be actively involved in, and given responsibility for, their own learning.

Organ transplantation is the moving of an organ from one body to another or from a donor site on the patient's own body, for the purpose of replacing the recipient's damaged or absent organ.

2.0 ROLE OF THE TECHNOLOGIST in Renal Dialysis Technology

The Renal Dialysis technologists play an important role in linking several areas of importance in the dialysis departments. The seven areas are:

- Patient care and education
- Use of Dialysis machines, Reverse Osmosis system and Reuse machines
- Pre, intra and post dialysis assessment of the patients
- Complication management during and after dialysis

- Starting and ending a dialysis therapy
- Peritoneal Dialysis
- Renal transplantation and Coordination
- Special Procedures like CRRT, Hemoperfusion, Plasmapheresis etc
- Quality assurance and control
- Education and training
- Research and Development

The role of the Technologist in each of these areas is as follows:

2.1 Patient Care

Renal Dialysis technologists are the primary direct care giver for patients undergoing dialysis treatments. They work closely under the direct supervision of nephrologists as an important member of the patient care team. Primarily a renal dialysis technologist knows how to respond to the physical and emotional needs of people undergoing dialysis treatments.

2.2 Use of Renal Dialysis Technologist

The RDT is the only recognized expert in dialysis therapy, its complications and its management.

2.3 Vaccination

Both patient and RDT should get vaccinated for Hepatitis B. For a patient vaccination dose is 40 micro grams which should be administered on both deltoids, on the other day of dialysis, there must be 4 dose (0, 1, 2, and 6). For staff vaccination dose is 20 micro grams which should be administered in deltoid muscle and the pattern is same as normal individual. (0, 1 and 6)

2.4 Clinical Responsibility

The RDT's prime expertise and responsibility is to undertake the whole range of techniques in dialysis therapy. It also includes interpretation of lab values of the patient, fluid management, patient education, dietary advice etc

2.5 Quality Assurance

All areas of the RDT's responsibility require quality assurance procedures, therefore, the RDT must be a full member of the team which develops, maintains and monitors the quality standards of the department. If no quality assurance programme is in place, the RDT has the responsibility to initiate one and to ensure its implementation.

Quality assurance is to be carried out in an efficient, caring and cost-effective manner to maintain the quality of water for Hemodialysis, Reuse program and Infection control practice in the Dialysis unit

2.6 Education and Training

As a professional, an RDT has the duty to:

i) update and maintain his practice

ii) to apply proven research results which will benefit patients.

iii) In addition he may be required to participate in continuous dialysis education programs, seminars CME's and conferences.

iv) It is not expected, however, that the newly qualified RDT will be a competent educationalist but with time, experience, and further studies, he should be able to educate and guide the students and junior members of the profession.

3.0 EDUCATIONAL AIMS AND COMPETENCIES

3.1 AIMS

The aims of an educational programme for Dialysis technology students will include:

a) The provision of a sound foundation in the broad aspects of dialysis technology.

b) The encouragement of the progressive assumption of responsibility by the student for the needs of the patient to ensure a caring, patient-centred approach.

c) The development of the ability of the student to transfer his knowledge and understanding to new situations.

d) The provision of a course which enables practitioners to proceed to

advanced study thus providing for the future development of teachers, clinical supervisors, research workers and managers, with a progressive career structure.

3.2 Competencies

3.2.1 Introduction

The aim of this section is to illustrate integration of the major skills, fields of knowledge and capabilities inherent in competent, professional performance.

The qualified RDT will be expected to be competent to examine/assess patients of all ages and conditions, from those who are ambulant and cooperative to those who are non-ambulant, uncooperative, unable to understand and/or are suffering from acute or chronic kidney disease.

The range of examinations include general anatomy and physiology pertaining to kidney, pathology of kidney disease, In depth learning about Hemodialysis, peritoneal Dialysis, special procedures and Kidney transplantation. All RDTs should show competence (as defined by the course team) under the headings patient care, use of dialysis technology, optimization of dose of dialysis, clinical responsibility, organization of the procedure and quality assurance.

There are other procedures/modalities which, dependent on local or national trends, could be considered as routine or specialized. These include Plasmapheresis, Hemoperfusion, SLED, Water treatment system, CRRT and Liver Dialysis. Where these are included within the curriculum, specified competencies should be defined by the programme using similar and appropriate headings.

3.2.2 Competency statements

3.2.2.1 Patient Care

The RDT must be competent to:

a) perform proper identification of the patient

b) ensure that the patient gives or has given informed consent having first given the patient a clear explanation of the procedure to ensure his cooperation

c) meet ethical/moral considerations

d) ensure that a relevant clinical history has been obtained

e) ensure that, pre medications have been administered correctly and vitals sign were normal

i) perform appropriate after-care before starting the procedure

j) use appropriate facilities and methods to prevent cross-infection with particular emphasis on precaution standards for blood borne pathogens, specifically HIV and hepatitis B and C

k) evaluate the patient's condition prior to the examination in order to make judgment as to the best method to use

l) initiate basic life-support methods if necessary

m) react appropriately to other emergency situations

n) give intravenous injections in case of emergencies like hypotension, hypoglycaemia etc. and the appropriate training and authorization has been given

4.0 GUIDELINES FOR CURRICULUM DEVELOPMENT

4.1.2 Core Elements

The following list constitutes the core elements which the student must undertake in order to satisfy the educational aims and competencies. A brief description of these courses follows.

4.1.2.1 Renal Dialysis Technology

This course provides the student with an understanding of dialysis technology and infection control requirements for the staff, patient and the general public, thus enabling effective application.

4.1.2.2 Quality Assurance

This course provides the student with the understanding and skills necessary to evaluate dialysis procedures thus ensuring the provision of efficient service to the patient, clinician and employer.

4.1.2.3 Different dialysis techniques

This course provides the student with the concepts and skills required to perform different dialysis techniques under a variety of conditions. Attention must be paid to the integration of the theoretical concepts and latest techniques with clinical applications.

4.1.2.4 Biomedical Instrumentation

This course provides an understanding of all equipment used in dialysis technology (Hemodialysis, Peritoneal dialysis, Reuse, Water treatment, CRRT etc) to enable the student to use the equipment competently.

4.1.2.5 Renal Transplantation and Coordination

This course provides an understanding of Renal transplantation and coordination of transplantation, deceased donor transplantation, immunosuppressive drug , donor and recipient work up and transplant coordination.

4.1.3 Related Courses

The main justification for these courses is to provide the student with the level of understanding and skills required to undertake the core courses. The following is a brief description of recommended courses:

4.1.3.1 Medical Sciences

These courses give students an understanding of the structure, function and disease patterns of the human body. The courses should include anatomy, physiology, pathology, Kidney disease, biochemistry, microbiology, human genetics, pharmacology immunology etc.

4.1.3.2 Physical Sciences

These courses provide students with the understanding of general and bio physics necessary for application to the various forms of the dialysis technology,

4.1.3.3 Biostatistics

Mathematics forms the basis for an appreciation of scientific principles. Statistics enables the student to analyze data produced in various

modalities.

4.1.3.4 Medical Electronics

This course enables the student to develop an understanding of the principles and operation of electronic devices.

4.1.3.5 Management

This course provides the student with an opportunity to develop his knowledge and skills in the management process.

4.1.3.6 Research Methodology

This course gives the student an opportunity to understand and use the elements involved in the research process.

4.1.3.7 Nursing/Patient Management

This course provides the student with an understanding of the concepts of patient care including the patient's physical and psychological needs. The student will be able to undertake a number of routine and emergency procedures in a variety of circumstances.

4.1.4 General Education Courses

These courses are included with the aim of achieving the following objectives:

a) To make the student an effective communicator

b) To enable the student to develop outside interests

c) To enable the student to reflect on and to take his place in society

A list of courses may include:

4.1.4.1 Behavioral Sciences (e.g. Psychology, Sociology)

These courses will provide an understanding of human development and behaviour.

4.1.4.2 Communication skills

These stills will enable the student to interact/function effectively in various situations.

4.1.4.3 Computer Science

This course will provide the student with an understanding of the principles in the operation of the computer and its associated technology. The course will also provide him with the necessary skills to apply the technology effectively.

5.0 ORGANIZATION AND RESOURCES

5.1 Organization

5.1.1 Advisory Committee

It is recommended that there should be an Advisory Committee. This committee can be of great assistance in the planning, implementation, and on-going development of an educational programme.

The nature, structure and composition of this committee would depend on the local situation. The members of this committee should be selected on the basis of their involvement with the profession either through their expertise and interest or their influence as representatives of affiliated professions. It must include practicing members of the dialysis profession.

5.1.2 Educational Institution

The programme for RDTs may be offered by universities or institutions of higher education in cooperation with Nephrology departments. Successful candidates are awarded doctorates, degrees or diplomas. Courses may also be offered by separate educational units affiliated with several hospitals or integral units of a hospital provided they are affiliated with a University or Appropriate authority.

Whichever model is followed, the standards of dialysis education in each country should be protected by the Approving Authority which should appoint a committee consisting of members especially qualified in dialysis technology at least at graduate level or postgraduate level and selected to execute this task. It is this committee which should be responsible for the periodic review of the Programme to adapt new developments in radiation technology into the professional practice.

5.1.3 Affiliation with clinical settings

Guided and supervised clinical experience is an essential part of the preparation of RDTs. In the clinical setting, a student must, at all times, be working under the supervision of RDTs. Clinical sites should be selected on the basis of specific criteria. There must be provision for achievement of the required competencies in these clinical settings.

5.1.4 Director/head of education programme

The RDT who heads the programme should be a qualified dialysis Technologist who is sufficiently well prepared to assume the duties inherent in the position. The director of the RDT programme is the person directly responsible for coordinating the planning and administration of the programme and the supervising and assessing of staff performance including clinical staff in relation to student experience.

5.1.6 Certification

It is essential that on completion of the programme students receive some form of certification which will ensure professional recognition not only from their own profession but also from allied professions. The programme therefore should be established under the auspices of an institution which may grant such an award or, if established separately, care must be taken to ensure the graduates have recognized professional standing.

5.1.7 Continuing Education

The education programme which has been described gives a sound foundation in the broad aspects of renal dialysis technology. Serious consideration should be given to promoting higher education for teaching personnel

5.1.8 Research

RDTs and teaching personnel should receive the necessary education, support and encouragement to initiate and participate in research projects. These may be educational or clinical in nature and may be directed towards higher qualifications.