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# Standards for Renal Dialysis

## Services

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The Health Policy and Standards Department (HPSD) developed this Standard in collaboration with Subject Matter Experts and would like to acknowledge and thank these health professionals for their dedication toward improving quality and safety of healthcare services in the Emirate of Dubai.

### Health Regulation Sector

Dubai Health Authority

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## INTRODUCTION

Health Regulation Sector (HRS) plays a key role in regulating the health sector. HRS is mandated by the Dubai Health Authority (DHA) Law No. (6) of the year (2018) with its amendments pertaining to DHA, to undertake several functions including but not limited to:

- Developing regulation, policy, standards, guidelines to improve quality and patient safety and promote the growth and development of the health sector;
- Licensure and inspection of health facilities as well as healthcare professionals and ensuring compliance to best practice;
- Managing patient complaints and assuring patient and physician rights are upheld;
- Governing the use of narcotics, controlled and semi-controlled medications;
- Strengthening health tourism and assuring ongoing growth; and
- Assuring management of health informatics, e-health and promoting innovation.

The Standards for Renal Dialysis Services aims to fulfil the following overarching DHA Strategic Priorities (2026):

- Pioneering Human-centered health system to promote trust, safety, quality and care for patients and their families.
- Make Dubai a lighthouse for healthcare governance, integration and regulation.
- Pioneering prevention efforts against non-communicable diseases.
- Strengthening the economic contribution of the health sector, including health tourism to support Dubai economy.

## EXECUTIVE SUMMARY

The purpose of this document is to assure the provision of the highest levels of safety and quality in renal dialysis services at all times. The standards have been developed to align with the evolving healthcare needs and international best practice. The standards include several aspects required to provide effective, efficient, safe and high-quality renal dialysis services. The standards include the registration and licensure procedure requirements as well as the licensure of health facilities and professionals. The standards for renal dialysis services provide clear insight into the minimum requirements that should be met for the establishment of renal dialysis services, onsite or at home. It will also assist renal dialysis providers in developing their quality management systems and in assessing their own competence to ensure compliance with DHA regulatory requirements and the United Arab Emirates (UAE) federal laws.

Key updates include the following:

1. Updated healthcare professional requirements; technologist and technician scope.
2. Responsibilities of DHA registered nurse (RN)
3. Updated requirements for renal dialysis unit management and infection control.
4. Pediatric dialysis requirements

## DEFINITIONS

**Dialysis Stations:** are smaller units or cubicles within the Renal Dialysis Unit where individual patients receive dialysis treatment.

**Haemodialysis Units:** are standalone dialysis units that may be located on a hospital site, a community health centre or other location. Selected satellite services may also provide training for home dialysis, both haemodialysis and peritoneal dialysis.

**Haemodialysis:** a treatment for renal failure where the function of the kidneys is replaced by a machine. The machine uses a process that uses a synthetic membrane (dialyzer) to remove wastes, such as urea, from the blood, restore the proper balance of electrolytes in the blood, and eliminate extra fluid from the body.

**In-centre Haemodialysis Units:** are collocated in a hospital with other acute services and provide HD and HDF treatment for acute renal disease emergencies. A high level of medical support is needed, as patients are typically medically unstable. Plasma exchange services may also be provided in these units.

**Peritoneal Dialysis:** is a process that uses the patient's own body tissues inside the abdominal cavity as a filter. A plastic tube called a dialysis catheter is surgically placed through the abdominal wall, into the abdominal cavity.

**Renal Dialysis:** is the clinical purification of blood by dialysis, as a substitute for the normal function of the kidney. There are two main types of dialysis: Haemodialysis, and peritoneal dialysis.

**Self-care haemodialysis:** is provided for patients who can manage their own dialysis, however, in the event that they are unable to undertake it at home due to poor water supply or unstable accommodation etc. An appropriately equipped area in the health facility should be established and staffing is provided to the level of carer support.

**Sentinel Event:** is an unanticipated occurrence involving death or major permanent loss of function unrelated to the nature course of the patients' illness or underlying condition.

**Treatment room:** is a specialized area designed for administering medical or therapeutic procedures. It is equipped with necessary equipment's.



## ABBREVIATIONS

<b>AAMI</b>	:	Association for the Advancement of Medical Instrumentation
<b>ACLS</b>	:	Advanced Cardiac Life Support
<b>AI</b>	:	Airborne Infection Isolation
<b>ALT</b>	:	Alanine aminotransferase
<b>AV</b>	:	Arteriovenous
<b>BLS</b>	:	Basic Life Support
<b>DHA</b>	:	Dubai Health Authority
<b>ECG</b>	:	Electrocardiography
<b>HBsAg</b>	:	Hepatitis B surface antigen
<b>HBV</b>	:	Hepatitis B virus
<b>HCV</b>	:	Hepatitis C virus
<b>HD</b>	:	Haemodialysis
<b>HIV</b>	:	Human Immunodeficiency Virus
<b>LFT</b>	:	Liver Function Test
<b>MOHAP</b>	:	Ministry of Health and Prevention
<b>PALS</b>	:	Paediatric Advanced Life Support
<b>RDU</b>	:	Renal Dialysis Unit
<b>RN</b>	:	Registered Nurse
<b>RO</b>	:	Reverse Osmosis
<b>UPS</b>	:	Uninterrupted Power Supply

## 1. BACKGROUND

Renal dialysis is a medical process that becomes necessary when the normal functions of the kidneys become compromised by reduced Renal function leading to Renal failure. This may be due to disease, injury, infection or genetic factors. Renal failure may be classified as either acute kidney injury or chronic kidney failure. Haemodialysis and peritoneal dialysis services involve filtering the blood of excess fluid and waste products normally filtered by the kidneys.

Haemodialysis may be undertaken in the following locations:

- Hospital
- Renal Dialysis Unit /Centre (RDU)
- Home Dialysis Services.

The functions of the RDU are:

- To receive and provide dialysis services to patients who have been referred from hospital inpatient units.
- To provide training for patients, family members and/or relevant others in procedures related to haemodialysis and/or peritoneal dialysis.
- To act as a resource to the community, other staff and agencies with regards to the requirements of renal health services.

## 2. SCOPE

2.1. Renal dialysis services in DHA licensed health facilities and home healthcare services.

### 3. PURPOSE

- 3.1. To assure provision of the highest levels of safety and quality of renal dialysis services in Dubai Health Authority licensed health facilities.

### 4. APPLICABILITY

- 4.1. DHA licensed healthcare professionals and health facilities providing renal dialysis services.

### 5. STANDARD ONE: REGISTRATION AND LICENSURE PROCEDURES

- 5.1. All health facilities providing renal dialysis services shall adhere to the United Arab Emirates (UAE) Laws and Dubai regulations.
- 5.2. Health facilities aiming to provide renal dialysis services shall comply with the DHA licensure and administrative procedures available on the DHA website <https://www.dha.gov.ae>.
- 5.3. Licensed health facilities opting to add renal dialysis services shall inform Health Regulation Sector (HRS) and submit an application to HRS to obtain permission to provide the required service.
- 5.4. The Medical Director of the renal dialysis facility or unit should be a full time DHA licensed Consultant Nephrologist.
- 5.5. The health facility providing renal dialysis services should develop the following policies and procedures; but not limited to:
- 5.5.1. Patient acceptance criteria
- 5.5.2. Patient assessment and admission

- 5.5.3. Patient education and Informed consent
- 5.5.4. Patient health record
- 5.5.5. Infection control measures and hazardous waste management
- 5.5.6. Incident reporting
- 5.5.7. Patient privacy
- 5.5.8. Medication management
- 5.5.9. Emergency action plan
- 5.5.10. Patient discharge.
- 5.5.11. Patient referral and interfacility transfer policy.
- 5.5.12. Patient safety policy
- 5.5.13. Lost and found policy
- 5.5.14. Fall Management policy
- 5.6. The health facility shall provide documented evidence of the following:
  - 5.6.1. Transfer of critical/complicated cases when required
  - 5.6.2. Patient discharge
  - 5.6.3. Clinical laboratory services
  - 5.6.4. Equipment maintenance services
  - 5.6.5. Laundry services
  - 5.6.6. Medical waste management as per Dubai Municipality (DM) requirements
  - 5.6.7. Housekeeping services.

- 5.7. The health facility shall maintain charter of patients' rights and responsibilities posted at the entrance of the premise in two languages (Arabic and English).
- 5.8. The health facility shall have in place a written plan as per standards for medical equipment maintenance for monitoring equipment for electrical and mechanical safety, with monthly visual inspections for apparent defects.

## 6. STANDARD TWO: HEALTH FACILITY REQUIREMENTS

- 6.1. Health facilities should align with the [DHA Guidelines for Health facility design; section B, 400- Renal Dialysis Unit](#) to provide a safe environment for patients, renal dialysis unit staff, and visitors.
- 6.1.1. Health facilities shall align with the guideline to maintain patient flow to ensure auditory and visual privacy (as applicable).
- 6.1.2. Health facilities shall align with the guideline regarding the number of rooms required.
- 6.2. The Renal Dialysis Unit (RDU) shall be designed to provide:
- 6.2.1. Ease of public access for patients who may arrive either walking, using mobility equipment, families with children, on an ambulance stretcher or patient trolley.
- 6.2.2. Ease of access to public parking for patients who are often debilitated and who may need to visit the unit on a regular basis.
- 6.2.3. Ease of delivery of large amounts of fluids (dialysate) on palettes to the Unit on a regular basis.
- 6.3. The facility shall ensure having backup dialysis machines available when needed.

- 6.3.1. All dialysis machines shall have backup batteries.
- 6.3.2. If the facility is providing modern machines it shall ensure that the machine serves to an alternative external electricity source in case of a power outage.
- 6.4. A reception desk shall be located to provide visual control of the entrance and to provide access to patient files and records.
- 6.5. Waiting areas should be present near reception area and shall accommodate at least one wheelchair within the waiting area.
  - 6.5.1. Ensure an optimal seating ratio in the facility, maintaining a balance between patient comfort and efficient use of space.
- 6.6. Where paediatric services are provided, the health facility shall designate a separate controlled area for paediatric patients.
- 6.7. Toilet(s) for public and patient use shall be conveniently accessible from the waiting area without passing through patient care or staff areas.
  - 6.7.1. Emergency bell should be available.
- 6.8. The RDU shall ensure easy access to the health facility and treatment areas for all patient groups.
- 6.9. The RDU design shall provide assurance of patient and staff safety.
- 6.10. Treatment rooms shall be equipped with the following:
  - 6.10.1. Hand sanitisation dispensers in addition to hand-washing stations.
  - 6.10.2. A lockable refrigerator for medication use.
  - 6.10.3. The temperature of the refrigerator shall be monitored and recorded twice daily.

- 6.10.4. A counter or shelf space for writing and documentation shall be provided.
- 6.11. Consultation/Examination rooms should ensure having a hand washing station with hands-free regulator (tap) and liquid or foam soap dispensers in all examination room(s).
- 6.12. Nursing stations shall be located and designed to provide visual observation of all patients in all dialysis treatment areas.
  - 6.12.1. The nursing station should also be within the range of hearing warning sounds from the machines for prompt corrective action.
- 6.13. The RDU should install and operate equipment required for provision of the proposed services in accordance to the manufacturer's specifications.
- 6.14. The RDU shall have appropriate equipment and trained healthcare professionals to manage critical and emergency cases.
- 6.15. The dialysis treatment area shall be separate from administrative and waiting areas.
- 6.16. The dialysis area specifications and requirements shall include:
  - 6.16.1. Enough space to accommodate the number of provided dialysis stations.
  - 6.16.2. The dialysis station shall be easily accessible in times of emergency and with adequate space for resuscitation to be carried out.
  - 6.16.3. The layout shall ensure visual and acoustical privacy for all patients.
  - 6.16.4. Hands free hand washing facility must be provided and easily accessible from all dialysis stations.
  - 6.16.5. Alcohol-based hand rub/sanitizer dispensers should be available in all dialysis stations.

- 6.17. In the RDU, the head end of each bed should have stable electrical supply with at least three outlet of 5/15 amps, oxygen and vacuum outlet (portable option is also accepted), treated water inlet, and drainage.
- 6.18. Electric sockets must be provided and close to every dialysis station. The wires from the socket should be in such a way that they do not pose a threat or come in the way of the patient or staff during the whole dialysis process.
- 6.19. A dialysis station may be designed to have comfortable couches or chairs specially designed for dialysis purposes, however, it is recommended to have at least two (2) beds for elderly patients.
- 6.20. Equipment to be provided in the dialysis station include:
- 6.20.1. Every dialysis station must have outlets for oxygen and vacuum (suction) or a portable O2 tank. Portable suction equipment must be available in the nearest crash cart.
  - 6.20.2. Airway equipment: appropriately sized oral airways, endo-tracheal tubes, laryngoscopes, normal masks and laryngeal masks.
  - 6.20.3. Defibrillator.
  - 6.20.4. Double tourniquets if the practice performs Bier blocks.
  - 6.20.5. Pulse oximeter.
  - 6.20.6. Electrocardiographic (ECG) monitor.
    - i. Facilities with small dialysis units may share ECG with other departments.
  - 6.20.7. Temperature monitoring system for procedures lasting more than 30 minutes.



- 6.20.8. Blood pressure apparatus with different size cuffs.
- 6.20.9. Emergency crash cart.
- 6.20.10. A refrigerator for pharmaceuticals and double-locked storage for controlled substances shall be provided.
- 6.20.11. Emergency bell should be available in the treatment room and dialysis station.
- 6.21. Every dialysis station must have a waste disposal bin.
- 6.22. For a regular dialysis patient, the waste disposable bags used should be Black in colour.
- 6.23. For patients with communicable diseases, it is mandatory that the waste disposable bags used should be Yellow in colour.
- 6.24. Medical waste disposal must be done after each patient and General waste disposal can be done after every two (2) patients and must be taken outside to the soiled workroom for disposal.
- 6.25. Solid workroom shall be provided in close proximity to the dialysis unit and shall contain the following:
  - 6.25.1. Flushing-rim sink
  - 6.25.2. Hand-washing station
  - 6.25.3. Work counter
  - 6.25.4. Storage cabinet
  - 6.25.5. Waste receptacles
  - 6.25.6. Solid linen receptacle

- 6.26. Dialysis machines shall be equipped with monitors and audio-visual alarms to ensure safe dialysis.
- 6.27. The dialysis nurse in-charge or head of dialysis unit is ultimately responsible to ensure that all dialysis equipment is in proper working condition and that the necessary safety devices and fitted and working in order.
- 6.28. Freestanding dialysis centres may require the provision of parking on the facility premises for patients and staff.
- 6.29. Considerations shall be given when designing access for people of determination.
- 6.30. Clear and visible signage shall be provided to direct people to the areas of the RDU.
- 6.31. Health facilities providing renal dialysis services shall ensure that the facility is fully air-conditioned to achieve 15-25 Celsius temperatures and 30-60% humidity.
- 6.32. Clean supply room shall ensure preparing patient care with the following:
- 6.32.1. Work counter
  - 6.32.2. Hand-washing station
  - 6.32.3. Storage facilities for clean and sterile supplies. This room is used only for storage and holding as part of a system distribution of clean and sterile materials.
- 6.33. Support areas for Dialysis patient care shall ensure the following:
- 6.33.1. Each dialysis unit shall make provisions to support administrative activities, filing and clerical space or rooms for typing and clerical work.
  - 6.33.2. Multi-use rooms for meetings, and health education.
- 6.34. Medication station shall ensure the following:

- 6.34.1. There shall be a medication dispensing station or a medication preparation area.
- 6.34.2. Provision shall be made for controlled storage, preparation, distribution, and refrigeration of medications.
- 6.35. The health facility shall provide a light meal/snack for patients during dialysis treatment sessions.
- 6.36. Design considerations shall be given to the disposal of liquid waste from the dialysing process to prevent odour and backflow.
  - 6.36.1. The product water distribution system shall not contribute chemicals such as copper, zinc and lead, or bacterial contamination to the treated water.
- 6.37. All serology tests required for admission to receive haemodialysis must be conducted by DHA or MOH certified laboratory to ensure the accuracy and reliability of the results.
- 6.38. Insertion haemodialysis using a temporary catheter can be performed in an outpatient setting with a privileged physician, while permanent dialysis shall be conducted in a hospital setting.
- 6.39. RDU shall have separate areas/room(s) in the facility for dialysing patients with conditions that require isolation.
- 6.40. Isolation rooms must be categorised as follows:
  - 6.40.1. Airborne Infection Isolation (AII) room.
  - 6.40.2. Blood-borne infection isolation room(s):
    - a. Facilities that dialyze patients with known blood-borne pathogens shall have at least two separate rooms to use for patients as follows:

- i. Room colour code BLUE for HBV patients.
- ii. Room colour code YELLOW for HCV patients.

6.41. Airborne infection isolation rooms shall include having a viewing window from outside the room for staff safety

6.42. Clean linen storage area shall be provided with the following requirements:

- 6.42.1. Location of the clean linen storage area within the clean workroom.
- 6.42.2. A separate closet or an approved distribution system shall be permitted.
- 6.42.3. If a closed cart system is used, storage in an alcove shall be permitted, it must be out of the path of normal traffic and under staff control.

## 7. STANDARD THREE: HEALTHCARE PROFESSIONALS REQUIREMENTS

7.1. A DHA licensed consultant nephrologist with minimum 5 years' experience in dialysis, shall be nominated as medical director of the dialysis unit.

7.1.1. The medical director shall be responsible for overall management of the patients receiving renal dialysis services.

7.2. The RDU shall have one (1) nephrologist on call per shift to address renal dialysis patients' requirements.

7.3. Maintain an adequate staff ratio of nephrologist to patient, ensuring that adequate medical supervision and care are provided to meet the unique needs of renal dialysis patients.

7.4. Health facilities providing paediatric renal dialysis services shall have at least one (1) DHA licensed paediatric nephrologist present.

- 7.4.1. The paediatric nephrologist must be present physically in presence of non-stable paediatric patients.
- 7.5. In emergency situations, the attending nephrologist shall ensure the correct measures are taken for renal dialysis patients to be referred for emergency management.
- 7.6. All nurses in-charge must be either a DHA registered nurse (RN) with adequate nephrology training and have a minimum of two (2) years' experience in renal dialysis services.
- 7.7. All nurses working in the dialysis unit must have adequate nephrology training and a minimum of six (6) months training or experience in dialysis.
- 7.8. The RN shall have appropriate training in handling resuscitation equipment and dealing with cardiac emergencies.
- 7.8.1. All nursing staff shall undergo formal training in certified basic life support (BLS) training that should be up to date and available.
- 7.9. Ratio of trained RNs to dialysis patients should be 1:4.
- 7.10. The attending RN is responsible for general check-up of the patient which includes:
- 7.10.1. Vital statistics, and vascular access examination.
- 7.10.2. Maintaining the initial assessment in the medical records.
- 7.10.3. Monitor patients during treatments.
- 7.10.4. Manage complications.
- 7.10.5. Educate patients and their families about the dialysis process and care.
- 7.11. Renal dialysis technologists and technicians must be DHA licensed and trained in the following:

- 7.11.1. Dialysis water practices.
- 7.11.2. Fundamentals of renal anatomy and physiology.
- 7.11.3. Principles of dialysis.
- 7.11.4. Water quality, water treatment, and water distribution.
- 7.11.5. The dialysis machine: connectivity and upkeep of machines.
- 7.11.6. Basics of vascular access.
- 7.11.7. Dialyzers and tubes cleaning, and preservation.
- 7.11.8. Anticoagulation.
- 7.11.9. Dialysate: composition and ingredients.
- 7.11.10. Common complications of dialysis: How to manage them at bedside.
- 7.11.11. Basic evaluation of patient before, during and after dialysis.
- 7.11.12. Infection control and safety.
- 7.11.13. Dialyzer reprocessing.
- 7.11.14. Cannulation (vascular access).
- 7.11.15. Universal precautions for prevention of transmission of infections.
- 7.11.16. Basics of peritoneal dialysis.
- 7.12. A dialysis technologist/technician shall be assigned during the treatment to handle dialysis machines maintenance and should be able to manage any complications related to the machine.
- 7.13. Patient care is the responsibility of the dialysis nurse with a ratio of 1:4.

- 7.14. There shall be at least one Clinical Dietician who will maintain the progress notes of all patients treated in renal dialysis in the health facility and evaluates the patient's nutritional status, progression and follows up with the healthcare professional.
- 7.15. A DHA licensed pharmacist shall be in charge of maintaining any medications and/or solutions that would be administered to patients.
- 7.16. The health facility should have at least one license Clinical psychologist (or) Health Psychologist (or) Psychiatrist in a addition to a social worker who will be play a crucial role in enhancing the holistic care of patients by addressing the emotional, psychological, and behavioural aspects of kidney disease, these professionals contribute to improved patient outcomes and quality of life. They will be responsible for the following:
- 7.16.1. Psychosocial evaluation of the patient.
  - 7.16.2. Casework and counselling of the patient and families.
  - 7.16.3. Evaluation and facilitation of rehabilitation.
- 7.17. There should be at least one DHA licensed registered nurse responsible for infection control within the renal dialysis facility/centre.
- 7.17.1. To perform regular audits, conduct surveillance of cultures and ensure best practice for patients.
- 7.18. The RDU must maintain records of BLS, ACLS, and PALS for licensed staff, and the requirements for these certificates depends on the PQR criteria; not all staff members are obligated to obtain all of the three certificates.

- 7.19. Maintain an adequate staff ratio of nephrologist to patient, ensuring that adequate medical supervision and care are provided to meet the unique needs of renal dialysis patients.

## 8. STANDARD FOUR: PATIENT ELIGIBILITY AND INFORMED CONSENT

- 8.1. Healthcare professionals should maintain patient's information confidentiality at all times.
- 8.2. Healthcare professionals working in the facility should be aware of their ethical responsibilities and comply with the ethical code of conduct, which is governed by the principle of patient centeredness where the patient is the centre of all activities.
- 8.3. The RDU shall have policies and procedures on patient assessment:
- 8.3.1. On admission,
  - 8.3.2. Following a change of health status
  - 8.3.3. After a fall
  - 8.3.4. When patient is transferred from one level of care to another.
- 8.4. The RDU physician must obtain a signed informed consent from the patient before beginning dialysis treatment.
- 8.5. Informed patient consent shall be written and include the following:
- 8.5.1. Patients shall be provided information about their condition and the likely outcome of their condition with or without dialysis.
  - 8.5.2. The patient should be given information about all treatment options including:
    - a. Hospital or satellite haemodialysis
    - b. Peritoneal dialysis
    - c. Home dialysis options



- d. Non-dialysis options such as supportive care without dialysis
  - e. Kidney transplant.
- 8.5.3. Explain the risks and complications associated with dialysis and its maintenance.
- 8.5.4. Provide the patient with information on their rights and responsibilities in relation to their healthcare.
- 8.5.5. The physician shall explain to the patient that they will require regular blood tests, routine investigations, and the need for monitoring for transmissible infections such as viral hepatitis control.
- 8.5.6. Make sure the patient or their guardian voluntarily signs the written informed consent document.
- 8.5.7. For further information refer to DHA Guidelines for Patient Consent.

## 9. STANDARD FIVE: RENAL DIALYSIS UNIT MANAGEMENT AND INFECTION CONTROL

- 9.1. Outpatient care services, if provided, must be under the direction of qualified physicians as determined by the RDU and shall be responsible for the quality and scope of outpatient services.
- 9.2. The initial medical assessment should include, but not limited to:
- 9.2.1. The reason for the visit
  - 9.2.2. Vital signs
  - 9.2.3. Medical history
  - 9.2.4. Pain assessment
  - 9.2.5. Physical and psychological assessment of patient's needs.

- 9.3. The nephrologist in charge of the RDU shall ensure that the facility can accommodate the following:
- 9.3.1. Emergency resuscitations
  - 9.3.2. Documented protocols/procedures to deal with cardiopulmonary collapse
  - 9.3.3. Urgent medical treatment for dialysis patients that may develop the following during treatment:
    - a. Hypotension
    - b. Fits or collapse during dialysis.
- 9.4. RDU physicians shall not perform unnecessary diagnostic imaging investigations and laboratory testing to avoid serious health implications and financial burden to the patient.
- 9.5. During emergency services, the nephrologist in charge must:
- 9.5.1. Ensure that there are prior arrangements made for patients receiving dialysis to be admitted in a hospital nearby.
  - 9.5.2. Ensure that there are standing arrangements with other healthcare professionals to provide immediate medical care in the event that the nephrologist in charge is not available.
  - 9.5.3. Ensure there is an ambulance/DCAS available at any given time to transfer the patient to a hospital in case of any medical emergency.
  - 9.5.4. Ensure that ambulance services are accessible and at close proximity.
  - 9.5.5. Emergency medication, devices and equipment must be available for immediate use in the emergency area.

- 9.6. Standard infection control practices precautions shall be used on all patients regardless of whether the Hepatitis B, Hepatitis C and HIV status is known.
- 9.7. Physicians and attending staff shall wear disposable gloves when handling biohazardous materials.
- 9.8. Hepatitis B vaccination of all staff that have contact with blood and body fluids is strongly recommended.
- 9.8.1. This applies to dialysis attendants/sanitation personnel of the renal dialysis unit.
- 9.8.2. Routine screening of staff for anti-HCV may be done where necessary.
- 9.9. Blood products should be stored, transferred and administered in accordance with the relevant authority guidelines.
- 9.10. Draining, disinfection and rinsing procedures shall be performed after each dialysis.
- 9.10.1. If a blood leak occurs in a recirculating system, the usual rinsing and disinfection procedure shall be performed twice before the system is used on a different patient.
- 9.11. Provision of acute haemodialysis for patients that are on an emergency or semi-emergency basis should be in a hospital setting.
- 9.11.1. Isolation is not required unless the patient has an infection associated with another disease that requires isolation.
- 9.12. For acute haemodialysis patients, attending staff shall use disposable dialyzers and bloodlines.

- 9.12.1. Dialysis machines shall undergo complete chemical disinfection in accordance to the manufacturers' recommendations after each use of patients with unknown HBsAg, anti-HCV and HIV status.
- 9.13. Patients who require chronic haemodialysis at dialysis centres shall be tested for Hepatitis B, Total Hep B core antibodies, Hepatitis C and HIV before they are admitted to the centre.
- 9.13.1. In urgent cases requiring dialysis, patients shall be treated in isolation until the results of hepatitis C, hepatitis B, Total Hep B core antibodies, and HIV serology tests are received.
- 9.13.2. The dialysis centre shall maintain records of patients' latest results in accordance to the current international guidelines.
- 9.14. Patients with negative Hepatitis B surface Ag and have low Hepatitis B surface antibody titers below 10 international units/L are considered Hepatitis B susceptible and should be vaccinated with hepatitis B vaccine as following:
- 9.14.1. Adults patients: Engerix 40 mcg IM in 0, 1,2 and 6 months or Recombivax HB 40 mcg IM on 0,1 and 6 months.
- 9.15. Susceptible patients for hepatitis B who received hepatitis B vaccine series should have their Hepatitis B antibody checked 1-2 months after completion of hepatitis B vaccine series. Those Hepatitis B surface antibody titers remain below 10 international units/L should undergo another full hepatitis B vaccine series as the first one.
- 9.16. Patients who initially developed an antibody response to hepatitis B vaccination but later their antibody titer falls to 10 international units/L or less should receive a booster dose.

- 9.17. Responder to hepatitis B vaccine antibody titer above 10 international units/L should have their antibody repeated annually.
- 9.18. Haemodialysis patients shall have their ALT levels monitored monthly, while liver function tests (LFTs) may be conducted on a quarterly basis according to the case.
- 9.19. The rooms for treating HBV and HCV patients should be colour coded and strictly used only for these patients, as follows:
- 9.19.1. HBV- Blue Colour
  - 9.19.2. HCV- Yellow Colour
- 9.20. Patients who are HBsAg positive shall be isolated in a separate room that is colour coded (Blue) designated for HBsAg positive patients only.
- 9.21. Dedicated dialysis equipment shall be used for HBsAg positive patients.
- 9.21.1. After each dialysis, non-disposable equipment shall be appropriately cleaned and disinfected or sterilized.
  - 9.21.2. Dialyzers and AV bloodlines must not be shared among patients. Bloodlines shall be used once and discarded.
  - 9.21.3. Dedicated nurse to care for isolation patients.
- 9.22. Hepatitis C patients are to be dialysed in separate isolation rooms that have to be clearly colour coded (Yellow) and used only for Hepatitis C patients.
- 9.23. To ensure patient safety the RDU shall take precautions for patients dialysed in high-risk countries, or who leave the unit to travel to high-risk countries and subsequently come back to the dialysis unit:

- 9.23.1. The patient should be dialysed on an isolation machine for three months until they are confirmed negative for Hepatitis B and Hepatitis C.
- 9.23.2. Dedicated machine for hep C patients
- 9.23.3. For further information, refer to Centre of disease and control prevention website.
- 9.24. Death in the RDU shall be considered a sentinel event.
- 9.24.1. A policy for mortuary management covering this rare and tragic event shall be available in the facility.
- 9.25. A record of such sentinel events shall be maintained by the RDU. Refer to Standards for Standards For Sentinel Events Notification And Management.
- 9.26. All deaths occurring whilst on dialysis or as a consequence of dialysis or any procedure related to dialysis must be reported immediately to the DHA.
- 9.27. For Outpatient centres; there should be inclusion and exclusion criteria for admission depending on patient condition and comorbidity level.
- 9.28. The RDU shall follow the DHA [Standard for mortuary services](#) when handling dead bodies.

## 10. STANDARD SIX: WATER AND DIALYSATE QUALITY

- 10.1. To ensure the quality of water for dialysis, the water shall be treated by reverse osmosis (RO) and/or deionizers.
- 10.1.1. Water quality shall meet the standards listed in **Appendix 1**.
- 10.2. The water used to prepare the dialysate shall have a bacteriological count of less than 200 per ml after 48 hours of incubation (AAMI).

- 10.2.1. Total viable counts shall be obtained using conventional microbiological assay procedures (pour plate, spread plate).
- 10.2.2. The calibrated loop technique shall not be used. Alternatively, the water shall have a bacterial lipopolysaccharide concentration of less than 1 ng/ml or 5 Endotoxin units as measured by the Limulus amoebocyte lysate assay.
- 10.3. Regular tests of the quality of the water must be carried out, at a minimum of one monthly interval and recorded to ensure that standards are met.
- 10.4. Regular sterilization of the plant equipment and pipes at a minimum of monthly intervals.
  - 10.4.1. Each water point has to be tested along with chemical analysis.
- 10.5. The nephrologist in charge or the medical director of the renal dialysis unit is responsible for ensuring that these tests are carried out by DHA licensed laboratory registered to perform these assays.
  - 10.5.1. An in-house chemical laboratory is preferable.
  - 10.5.2. The records shall be kept and made available for inspection by DHA.
- 10.6. Temperature of the water needs to be regulated to avoid water related hyperthermia.
- 10.7. The dialysate fluid shall be a non-sterile aqueous solution with an electrolyte composition near that of normal extracellular fluid.
- 10.8. The feed tank should have sufficient volume to supply the RO system. The RO system should supply water to the dialysis machines in accordance to the RO specifications.
- 10.9. The RO system should not be connected directly to the main supply and the water supply should be uninterrupted.

10.10. A water reserve Pre-RO tank is required to avoid interruption.

10.11. The tank should be of an adequate size and that the pipe size of water supply to the RO should be sufficiently large.

10.12. The feed from the RO must be sufficiently large.

10.13. The RO should be in a separate room.

10.14. In case of a portable RO, it should be within a recommended distance from dialysis machines as specified by the manufacturer.

10.15. The RO system must not be linked to general toilet facilities or placed in general bathrooms.

10.16. There should always be a backup machine available for patients.

10.17. The water used to prepare the dialysate must have a bacteriological colony count of less than 100/ml.

10.18. The composition of the dialysate fluid is summarised in **Appendix 2**.

10.19. Bacteriological requirements:

10.19.1. The colony count in dialysate samples collected at the termination of dialysis:

- a. In a single pass system or in a recirculating single pass system at the periphery of the recirculating chamber, containing the dialyzer shall be less than 2000 colony-forming units/ml (AAMI).

10.19.2. Bacteriological analysis of the dialysate shall be carried out at least once monthly.

10.20. The nurse in charge or the medical director or dialysis technician shall be responsible for arranging the analysis of the dialysate.



10.20.1. Its chemical composition shall be clearly labelled.

10.20.2. The results of analysis, bearing the name of the renal dialysis unit and the healthcare professional analysing the dialysate shall be made available on request as and when required.

10.21. All chemical analysis test results for feed and dialysis water received from the in-house or third-party testing laboratory must be documented.

10.21.1. These results must be reviewed by the nurse in charge or dialysis technician handling the dialysis unit, then reviewed and signed off by the medical director annually.

## **11. STANDARD SEVEN: TRANSFER, DISCHARGE AND OUTPATIENT FOLLOW UP**

11.1. The RDU shall maintain policies and procedures concerning patient transfer, which reflect acceptable standards of practice and compliance with applicable regulations in Dubai.

11.2. The RDU shall adhere to the [Patient Referral and Inter-Facility Transfer Policy](#).

11.3. The RDU shall ensure continuity of patient care during transfer by informing the other facility about the case and approval to transfer should be documented in the patient health record.

11.4. The physician present at the RDU is responsible for the timely coordination of the transfer of appropriate information and discharge notice from the RDU facility or another health facility.

11.5. A dialysis transfer sheet should be prepared for all patients being transferred from the unit requiring further dialysis.

- 11.5.1. Current Hepatitis serology, Hepatitis B & C, HIV and Hepatitis antibody level should be included in the dialysis transfer sheet.
- 11.6. A referral letter shall be given to the patient or patients' next of kin.
- 11.6.1. The patient should not be sent under any circumstances to another facility without prior approval.
- 11.7. Mode of transport shall be based on the condition of the patient.
- 11.7.1. The treating physician and the ambulance team shall decide who should accompany the patient e.g. doctor present, trained nurse or anesthetist in emergency/critical care.

## **12. STANDARD EIGHT: PERITONEAL DIALYSIS SERVICES**

- 12.1. Peritoneal dialysis (PD) catheter implantation shall be performed by appropriately trained nephrologists, surgeons, urologist and interventional radiologist in patients without contraindications.
- 12.2. Insertion of PD catheter should take place under complete aseptic conditions using sterile technique.
- 12.2.1. Insertion of PD can be done in a hospital setting.
- 12.3. Once the catheter is healed, the patient shall receive instructions on how to care for the catheter exit site (the skin around your catheter) by the dialysis nurse.
- 12.4. The timing of the PD catheter implantation shall be planned to accommodate patient convenience, medical requirement as per his/her condition and commencement of training

between 10-14 days after catheter insertion and 4 weeks to enable correction of early catheter-related problems without the need for temporary haemodialysis.

12.5. Patient training includes how to:

- 12.5.1. Prepare the cyclor.
- 12.5.2. Connect the bags of dialysis solution.
- 12.5.3. Place the drain tube.
- 12.5.4. Fill peritoneal cavity with fresh solution through the catheter.
- 12.5.5. Wait for dwell time where the dialysis occurs.
- 12.5.6. Recognizing signs and symptoms of tunnelitis and peritonitis.

12.6. The patient should be re-trained after each peritonitis regarding hand hygiene and the procedure itself.

12.7. Dialysis solutions are made up of:

- 12.7.1. Sterile water
- 12.7.2. Chemicals/electrolytes
- 12.7.3. Dextrose

12.8. The nephrologist and PD nurse shall select the appropriate dialysis solution for the patient based on the following:

- 12.8.1. Weight
- 12.8.2. Blood pressure
- 12.8.3. Symptoms and response to the dialysis therapy.

12.9. Patients should complete a thorough record of the treatment to allow physicians and nurses to assess progress at home and identify if any changes should be made to the treatment.

12.10. Nephrologists shall ensure monitoring the patients at least once a month.

### **13. STANDARD NINE: IN-HOME RENAL DIALYSIS SERVICES**

13.1. Facilities with home services shall adhere to the requirements set in the DHA Standards for Home Healthcare Services.

13.2. Accreditation is recommended for all home renal dialysis facilities.

13.2.1. All standalone home renal dialysis facilities shall be accredited within two (2) years of obtaining their license.

13.3. Home haemodialysis patients must be able to manage their dialysis safely and monitor their condition.

13.4. Modality decisions should be supported by a full assessment of clinical and social circumstances, as well as the home environment, including a discussion of the impact of therapy on others within the household.

13.5. Patients requesting in-home renal dialysis services shall have an agreed individualised prescription for home haemodialysis, taking into account lifestyle goals, with the same dose and time target.

13.6. The RDU shall train patients and/or care partners to achieve a defined set of competencies, using an individualised approach to training method and speed.

13.7. Training shall be on a '1 to 1' basis with a specific training staff is widely accepted as optimal, with the learning style and training duration adapted to the individual.

13.8. Home training areas will only be provided at selected sites within the RDU.

13.8.1. Space requirements will be dependent on the expected type and volume of training.

13.9. All storage rooms shall ensure having the following:

13.9.1. Storage for the accommodation of home dialysis machines, home reverse osmosis machines and other items will need to be considered.

13.9.2. The storage area should be easily accessible.

13.9.3. The temperature should be controlled.

13.9.4. Adequate shelving for storage of dialysis fluids, membranes and catheters.

13.9.5. All materials should be clearly marked with expiration dates.

13.9.6. Storage of medicines should be in accordance with current guidelines, including storage and dispensing of controlled medication.

13.10. Area requirements will depend on the need to store home dialysis equipment. All machines require connection to power and plumbing.

13.10.1. Training machines may be stored within training areas if there is a dedicated service provided.

13.11. The training with patients shall outline the responsibilities, which include:

13.11.1. An agreement to dialyse as per prescription and trained technique

13.11.2. A policy for re-imburement of directly arising patient costs.

13.12. The RDU shall support patients with a specific team including nephrologists, technicians, and nurses, with rapid access to dialysis in-centre when required.

13.13. The RDU shall ensure adequate safety training and an enhanced risk assessment for patients with blood-borne viruses.

13.14. The RDU shall provide and install the dialysis machine and all the equipment required.

13.15. Patient's home shall require the following for in-home dialysis services:

13.15.1. A dedicated clean area to have the dialysis in.

13.15.2. An electrical outlet.

13.15.3. An easily accessed water source.

13.15.4. A plumbing system for draining away wastewater.

13.15.5. Dry storage space away from damp or direct heat to store supplies which includes:

- a. The dialysis fluid
- b. Needles
- c. Cleaning products.

13.16. Home haemodialysis patients should receive the same level of medical supervision, and the same monitoring and dose considerations as in-centre patients, and as for other patients, the schedule should be individualised depending on patient values and therapeutic goals.

13.17. Home renal-dialysis must be supervised by health care professionals to prevent complications and infections.

13.17.1. Health care professionals shall have regular visits to home haemodialysis patients and whenever the condition requires. Especially during the session post-hospital

discharge to ensure patient safety and tolerance to the dialysis and to change the prescription if required.

13.18. Dialysis dose should be quantified as for other augmented schedules, but should be interpreted with the flexibility of the patient's schedule in mind.

13.18.1. To ensure that the home dialysis team can provide the best possible support that is responsive to the individual, recording of sessional details by the patient or carer is necessary.

13.19. If home dialysis is performed by the health facility, all in-home renal dialysis services must maintain an electronic record, including comprehensive documentation of all procedures and performance metrics, to ensure adherence to established Key Performance Indicators (KPIs).

#### **14. STANDARD TEN: PORTABLE RENAL DIALYSIS DEVICES**

14.1. Portable renal devices shall be classified based on intended use, complexity, and potential risks.

14.1.1. Class I – low risk, Class II- moderate risk, Class III- high risk

14.2. Portable renal devices must be designed to ensure patient safety, reliability, ease of operation and ensure quality of clearance.

14.3. Materials used shall be suitable for medical applications.

14.4. Devices should provide alarms and alerts for critical conditions, ensuring timely response and interventions.

14.5. The patient must be clearly trained about the device before using it.

- 14.6. Regular audits and inspection are encouraged to ensure ongoing compliance.
- 14.7. Clear instructions for patients must be provided with the device.
- 14.8. Labels should include essential information such as device specifications, warnings, and proper maintenance procedures.
- 14.9. Packaging must protect the device during transportation and storage.

## **15. STANDARD ELEVEN: EMERGENCY MEDICATION REQUIREMENTS**

- 15.1. Emergency medication shall be stored securely in a designated area with controlled access.
- 15.2. A registration log book must be maintained for all controlled medications present in the renal dialysis centre.
  - 15.2.1. The logbook should include entries of each transaction, detailing the date, time, medication type, dosage, and the names of personnel involved.
  - 15.2.2. The facility shall keep count of controlled medications by registration using the NPCM platform.
- 15.3. Dopamine is strictly prohibited for use in renal dialysis centres.
- 15.4. The crash cart must be readily available in the renal dialysis centre for immediate response to emergencies.
  - 15.4.1. A crash cart shall be regularly inspected and stocked with the necessary emergency medications.
  - 15.4.2. In adult dialysis centres it is not required to have pediatric medications and equipment in the crash cart.



- 15.5. The facility shall maintain a comprehensive emergency protocol, ensuring the immediate availability and accessibility of essential medications such as calcium gluconate, to prevent the effect of hyperkalemia on the heart by stabilization of membrane.

## **16. STANDARD TWELVE: PEDIATRIC DIALYSIS**

### **16.1. Healthcare Professional Requirements:**

- 16.1.1. Pediatric nephrologists, registered nurses, and dialysis technicians must have specialized training in pediatric care.
- 16.1.2. Specific protocols for managing pediatric patients (age-appropriate care, dosing, and safety protocols).
- 16.1.3. Knowing the provisions including laboratory testing, establishing dialysis access, and equipment required to perform kidney biopsies and renal replacement therapy
- 16.1.4. Patients under 16 years of age must be accompanied by an adult carer.
- 16.1.5. Obtaining informed consent for kidney-related procedures from patients and legal guardians after readily understandable explanations of risks, benefits, and potential complications associated with each procedure
- 16.1.6. To preserve veins for creation of vascular access venepuncture or insertion of peripheral venous cannula should be avoided in the forearm or arm of all patients with advanced renal failure whenever possible.
- 16.1.7. The preferred mode of vascular access is a native arteriovenous fistula.

- a. A fistula may not be possible in the small child and may not be possible to needle in the uncooperative child.
  - b. Such children, and those likely to be dialysed for a short time span (e.g. awaiting a parental transplant), may be better managed with a tunnelled line.
- 16.1.8. Psychological preparation is needed for the child and family before a fistula is created, and local anaesthetic creams must be applied before needling to avoid pain.
- 16.1.9. All renal units should have protocols to ensure that full barrier precautions are followed during insertion of temporary and tunnelled central venous dialysis catheters.
- 16.1.10. Each Health facility providing care to pediatric patients shall determine the associated clinical risk in the provision of the Renal Dialysis Services provided and ensure the availability of adequately trained and certified Licensed Healthcare Professionals in Pediatric Advance Life Support (PALS).
- 16.2. Staff Ratios:
- 16.2.1. Pediatric dialysis units must adhere to strict nurse-to-patient ratios, with at least 1 nurse for every 1-2 pediatric patients to ensure proper monitoring and care.
  - 16.2.2. In addition to dialysis staff, pediatric psychologists and social workers should be available to assist with the psychosocial aspects of treatment.
- 16.3. Facility Requirements:

- 16.3.1. Pediatric dialysis services include both haemodialysis and peritoneal dialysis, tailored to the needs of children.
- 16.3.2. Pediatric dialysis units should have designated areas separate from adult care areas to ensure privacy and a child-friendly environment.
- 16.3.3. The facility must have equipment and supplies suitable for pediatric patients, including smaller-sized dialysis chairs, machines, and pediatric resuscitation kits.
- 16.3.4. The facility should have a pediatric-friendly waiting area and specialized play or distraction techniques.
- 16.3.5. Home dialysis is not recommended for pediatric patients.
- 16.4. Dialysis Machines and equipment:
  - 16.4.1. Haemodialysers, pumps and blood lines should be available in neonatal, paediatric and adult sizes.
  - 16.4.2. Dialysis machines should be capable of pediatric flow rates, blood volumes, and ultrafiltration volumes, with age-appropriate monitoring systems.
  - 16.4.3. All renal units should have protocols to ensure that full barrier precautions are followed during insertion of temporary and tunnelled central venous dialysis catheters.

## **17. STANDARD THIRTEEN: PATIENT MANAGEMENT**

- 17.1. Patients who are at undue risk for complications shall be referred to an appropriate facility for further management and care.
- 17.2. Each Licensed Renal Dialysis Center shall have effective and efficient scheduling processes to minimize cancellation and delays, and reducing waiting times.

- 17.3. Each Renal Dialysis Centre shall ensure that all patients are provided with relevant information at every phase of management making sure that the patient and/or carer fully understand the information given. It shall also foster a safe environment in which questions are welcomed and feedback provided.
- 17.4. At the time of referral for renal dialysis, all patients should be assessed for pre-evaluation for a potential kidney transplant at DHA licensed kidney transplantation facilities. They can later be re-assessed if the patient's medical condition requires.
- 17.5. Pre-Dialysis Preparation:
- 17.5.1. Each nephrologist providing renal dialysis shall maintain effective communication and clear explanation at every stage of patient management to reassure the patient.
- 17.5.2. The Nurse must ensure that all necessary equipment including monitoring and emergency equipment is present and in working order before starting the renal dialysis.
- 17.5.3. The Nephrologist will be responsible to arrange appropriate dialysis access care (perform himself or arrange for insertion of vascular catheters or arrange for creation of arterio-venous fistula, AV graft or permanent catheterization.
- a. Permanent catheterization, AV graft and AV fistula should only be done in appropriately equipped surgical facilities. The facility shall have in place a policy of permanent catheterization management.

- b. Insertion of temporary haemodialysis catheter can be done in outpatient with privilege physician, while permanent dialysis catheter should be done in a hospital setting.
- 17.5.4. Registered nurse shall perform an appropriate assessment prior to the dialysis and report and notify the nephrologist to review the patient's condition.
- 17.5.5. Patient should be reassessed prior the dialysis after undergoing any surgery, hospitalization or invasive procedure.
- 17.5.6. Vital signs shall be measured every half hour during the dialysis session and rechecked at the end of the session.
- 17.5.7. Orthostatic blood pressures, respirations, and lung sounds and weight should be assessed only post dialysis.
- 17.5.8. Vascular access site should be assessed by nurse prior initiating the dialysis session for any inflammation, bleeding, discharge in case of catheters, and to confirm functionality by assessing for pulsations and bruit in addition to signs if infection in case of fistula or graft.
- 17.6. Respiratory rate, pain score and level of consciousness should be checked every 30 minutes.
- 17.7. Intradialytic Monitoring:
  - 17.7.1. Vital signs shall be monitored continuously through the monitor and documented on the treatment record of each patient at least every 30 minutes including the following minimum criteria:
    - a. Patient's blood pressure, respiration rate, temperature and pulse

- b. Inspection of the vascular access to note blood loss or leakage
- c. Arterial and venous pressures, and blood flow rate
- d. Pain score
- e. Level of consciousness.

17.7.2. Declotting using alteplase installation can be used in dialysis centres safely, however using heparin infusion has to be done in a hospital setting.

#### 17.8. Post-dialysis Care

- 17.8.1. Assessment and documentation of vital signs, weight, and vascular access site condition shall be conducted.
- 17.8.2. Assessing for dialysis disequilibrium syndrome, with headache, nausea and vomiting, altered level of consciousness; and hypertension.
- 17.8.3. Assessing for other adverse responses to dialysis, such as dehydration, nausea and vomiting, muscle cramps, or seizure activity.
- 17.8.4. Assessing for bleeding at the access site or elsewhere. Standard precautions should be practiced at all times.
- 17.8.5. If a blood transfusion is given during dialysis, monitoring for possible transfusion reaction must be done (e.g., chills and fever; dyspnea; chest, back, or arm pain; and urticaria or itching). Close monitoring during and after the transfusion is important to identify early signs of a reaction.

17.9. All emergencies to be referred and treated at hospital level.

## 18. STANDARD FOURTEEN: RENAL DIALYSIS PERFORMANCE MEASURES

- 18.1. The facility should monitor Key performance indicators (KPIs) related to renal dialysis services to measure performance and outcomes.
- 18.2. Health facilities providing renal dialysis services shall keep a registry for all end stage renal disease patients and report the statistics to the National Center at [ncdt@mohap.gov.ae](mailto:ncdt@mohap.gov.ae) and to health policies and standards department at [MonitoringKPIs@dha.gov.ae](mailto:MonitoringKPIs@dha.gov.ae).
- 18.3. Key Performance Indicators shall be captured and reported upon DHA request.

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## APPENDIX

### APPENDIX 1: WATER QUALITY MEASUREMENTS

Contaminant	Maximal Allowable Level (mg/l)
<b>Contaminants with documented toxicity to haemodialysis</b>	
Fluoride	0.2
Chloramines	0.1
Copper	0.1
Aluminium	0.01
Lead	0.005
Total Chlorine	0.1
Nitrate (as N)	2
Sulfate	100
Zinc	0.1
Total dissolved solids	5-1000
<b>Trace elements</b>	
Antimony	0.006
Arsenic	0.005
Barium	0.1
Beryllium	0.001
Cadmium	0.001
Chromium	0.014
Mercury	0.0002
Selenium	0.09
Silver	0.005
Thallium	0.002

- (Extracted from Association for the Advancement of Medical Instrumentation (AAMI) & CSA- ISO)

## APPENDIX 2: COMPOSITION OF THE DIALYSATE FLUID

The concentration of haemodialysis solutions shall be such that after dilution to the stated volume the final concentrations of the ions expressed as mmol/l are usually in the following ranges:

Cations	
Sodium	135-145
Potassium	0-3.0
Calcium	1.0-2.0
Magnesium	0.25-1.0

Anions	
Acetate or Lactate expressed as bicarbonate equivalents	32-40
Chloride	95-110

- Sodium concentration may be adjusted to levels outside this range by haemodialysis machines with variable sodium capabilities when prescribed by physician in charge.