**PURPOSE:**

Infection prevention and control is directed toward protecting the hospitalized renal patient from infection, detecting, and investigating any infection and establishing principles that will protect personnel from acquiring hepatitis and other infections.

The purpose of the following policy is to outline safe procedures for hemo- and peritoneal dialysis.

**ACCOUNTABILITY:**

1. Director, Manager of the dialysis units
   1. Be responsible to the Medical Staff and Hospital Administration.
   2. Maintain infection prevention and control (IPC) practices and proper patient care in the chronic/acute dialysis unit.
   3. Certify training of all dialysis unit personnel and their understanding of infection prevention and control principles.
   4. Ensure that continuing education programs presented to the personnel are abreast of new developments in infection prevention and control.
   5. Recommend revisions in the guidelines for approval of the IPC Committee.
   6. Ensure the health status of personnel in the unit.
   7. Review cleaning techniques of chronic/acute dialysis machines and other equipment to ensure that any infection hazard is eliminated.
2. Dialysis Staff Nurse
   1. Assume responsibility for patient care, nursing practice, and machine and product safety.
   2. Eliminate reservoirs of infection by ensuring:
      1. Safe housekeeping and maintenance practices
      2. Safe health status of personnel.
      3. Proper patient placement.
      4. Appropriate techniques and safeguards are followed by persons entering the unit.
   3. Assess daily each patient's condition to prevent spread of infection.
   4. Ensure compliance with IPC guidelines and that these are readily available to all personnel in the units.
3. Infection Prevention and Control
   1. The IPC staff are notified of infections that occur in patients, initiation or termination of isolation precautions and any observed IPC hazard.
   2. The IPC staff are notified when water or dialysate cultures results are above action levels.
4. Dialysis Care Technicians:
   1. Maintain competency in procedures associated with hemodialysis and peritoneal dialysis that are within the scope of their job description.
   2. Notify the IPC staff of infections that occur in patients, initiation or termination of isolation precautions and any observed IPC hazard.
5. Infection Prevention and Control staff:
   1. Collaborate with the Dialysis Nurse Manager in education programs.
   2. Assist in formulation of IPC guidelines.
   3. Periodically assess the unit's adherence to the guidelines.
   4. Assist the Nurse Manager with any problem in IPC or patient placement.
   5. Review infections occurring in the unit and report these to the dialysis unit director and manager and to the IPC Committee.
   6. Institutes studies of epidemic infection in the dialysis unit.
6. Hospital Infection Prevention and Control Committee:
   1. Review and approve all IPC policies.

**PROCEDURE:**

Personnel Practices:

1. Standard Precautions, with specific additional transmission-based precautions when appropriate, apply to all patients. (refer to Policy IC – 220.0 and Policy IC – 301.0)
2. Dialysis personnel will observe employee health policies.
3. Protection against Hepatitis B, Influenza and Varicella by vaccination is strongly recommended.
4. Careful hand hygiene with an approved germicidal is carried out before and after any patient contact (refer to Policy IC – 212.0). Hands and other skin surfaces will be cleaned immediately and thoroughly when contaminated with blood or body fluids, prior to application of gloves, and when gloves are removed.
5. Only patients will be allowed to eat or drink in the dialysis area.
6. Long-sleeved, water-repellent gowns will be worn during initiation and termination of dialysis, or whenever there is a potential for exposure to blood or body fluids, such as readjusting needles, obtaining blood specimens during dialysis, or the discarding of dialysis supplies; additionally, gowns will be worn during reprocessing, cleaning or disinfection procedures.
7. Masks and face shields should be used whenever exposure to droplets of blood or other body fluids is likely.
8. Gloves are worn for contact with blood, used dialysate, body fluids, mucous membranes or non-intact skin and for handling items and surfaces contaminated with blood or body fluids. Gloves are to be worn when initiating dialysis.
9. All needles, syringes, sharps and other small glass items are placed in designated impervious sharps containers, which are picked up by Environmental Services for disposal by a licensed waste management firm. Needles are not to be bent, clipped or recapped after use (refer to Policy IC – 220.0).
10. Exposures to blood or body fluids via needle puncture injury, mucous membrane or non-intact skin exposure to blood are reported immediately (refer to Policy IC – 601.0) and an iReport should be filed.
11. An Infection Prevention and Control in-service is given yearly.

General and Environmental Infection Prevention and Control Measures:

1. Carts with food trays and linen supply are left outside of the treatment room.
2. Covered linen hampers must be used in main room as well as in isolation rooms.
3. The floor is disinfected with an approved germicidal daily and whenever blood spillage occurs.
4. Covered linen hampers are used in the main unit and in isolation rooms
5. Linens are double-bagged only if a risk of leakage exists.
6. Dialysis stations inclusive of beds and/or chairs, bedside tables, media controls, and all other reusable patient care items in the patient dialysis station are cleaned thoroughly with a bleach water solution or bleach wipes between patients. Surfaces are maintained wet with bleach solution until the contact time of 1 minute is met.
   1. For patients with active C. difficile infection a contact time of 3 minutes is observed.
7. Flat surfaces (bedside stands, desk) are cleaned with a hospital approved cleaner or bleach solution.
8. Dialysis machine screens are cleaned with Super sani wipes and maintained wet until the contact time of 2 minutes.
9. Isolation rooms are terminally cleaned with bleach solution or bleach wipes after each use (refer to Policy IC – 716.0).
10. Medical and biohazardous waste policies must be strictly observed. All disposable equipment and trash from the dialysis units are considered contaminated. Used dialyzers, blood lines etc. are discarded in double red biohazard bags. Syringes and uncapped needles are discarded in puncture-proof sharps containers.
11. Any blood, peritoneal fluid or waste dialysate spillage is cleaned up immediately with hypochlorite (bleach solution), 1 cup bleach per 10 cups of tap water or bleach wipes. Surfaces will be kept wet until a contact time of 1 minute is observed.
12. All used patient dialyzer and tubing must be carefully placed in double red biohazard trash.
13. Waste dialysate from machines should be drained into closed plastic bags to prevent splashing or aerosolization.
14. Dialysis units are considered contaminated areas; housekeeping personnel must wear gowns and gloves when cleaning the units.

Patient-related Practices:

1. Chloroprep is used for skin preparation. If a patient is sensitive to Chloroprep, povidone iodine is used. If a patient is also sensitive to povidone iodine, the prepped area is allowed to dry for one minute and the solution wiped off with alcohol.
2. Subclavian or femoral catheter care is done prior to each dialysis (refer to PCS policy CC 192.0 Central Venous Catheters (CVC’s) Care and Maintenance -- for the specific techniques required).
3. Peritoneal catheter care is done with each dialysis treatment
4. Appropriate cultures are obtained immediately for any suspected infection.
5. Fistula and dialysis catheter cleaning procedures as outlined in PCS procedures and policies under section IV are performed every time dialysis is performed.
6. Any drainage from skin lesion, wound, catheter or fistula will be cultured and appropriate measures taken as outlined in procedure.
7. Wounds other than fistula or catheter site must be dressed and dressing changed in patient's room rather than on dialysis units.
8. Elevations of temperature over 38° C during hemodialysis are considered a pyrogenic reaction and appropriate measures are taken, as outlined in procedure.

Bloodborne Pathogen Transmission Prevention:

1. ALT, AST, and bilirubin levels are performed monthly on all patients undergoing extended dialysis. If elevations are noted, further serial observations are made.
2. Quarterly HBsAg determination is done on all patients undergoing dialysis who have not converted to HBsAb positive status. (Patients are routinely given HBV vaccine).
3. Prior to the first dialysis, Hepatitis A, HBsAg, Hepatitis C, HIV, ALT and AST are drawn.
4. Patients who are HIV positive or carry a diagnosis of AIDS can be dialyzed safely if principles of Standard (Universal) Precautions are strictly applied. The sterilization procedure outlined in the Care of the Equipment section is adequate. Nevertheless patients who have AIDS, hepatitis, or are HBsAg positive will be treated as follows:
   1. Isolation room
   2. Equipment used for the patient with Hepatitis B virus (HBV) is reserved for use on HBV positive patient(s) only. When the machine is no longer dedicated to the HBV positive patient(s) the internal pathways are disinfected using conventional protocols, external surfaces are cleaned and disinfected and the machine is returned to general use.
5. Blood for clotting time must be placed into special HemoChron Jr cuvette. Bacteriology of Dialysate
6. CHLA follows standard guidelines for maximum viable microbial counts and action levels as well as endotoxin concentrations and action levels set by the Association for the Advancement of Medical Instrumentation AAMI. Maximum allowable counts, endotoxin concentrations, and action levels for each are listed in the graph below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Total Viable Microbial Count  CFU/ML | Action Level for Total Viable Microbial Count CFU/ML | Endotoxin Concentration EU/ML | Action Level for Endotoxin Concentration  EU/ML |
| Dialysate | Lower than 200 CFU/ML | 50 CFU/ML | 2 EU/ML | 1 EU/ML |

Care of Equipment and Supplies:

1. Hemodialysis machines are internally cleaned weekly by the Dialysis Technician with pure bleach for a complete 30-minute cycle and rinsed with water for at least 30 minutes. Testing for chlorine residuals is done with an AAMI-approved reagent to ensure residuals of no more than .5 ppm.
2. Machines are disinfected daily with vinegar and heat by Dialysis staff.
3. Machines are cultured by the Dialysis Technician once a month and whenever clinical indications suggest pyrogenic and/or septicemic complications. If any culture, **water or dialysate**, shows a count of 200 colonies per mL or greater, or if the action level of 50 cfu/mL, is reached in **product water**, the machine must be disinfected according to procedure by the BioMedical (Biomed) engineering team.
4. Reverse osmosis water is cultured monthly by the Dialysis Technician. If the culture is positive, Biomed engineering is responsible for treating R.O. systems, including portable RO systems, with bleach and formaldehyde.
5. CHLA tests Reverse Osmosis, Dialysis machines, and at the first loop of piping system for endotoxins monthly. Acceptable results must be lower than 1 EU/ml per AAMI standards. If results are greater than or equal to 1EU/ML the machine must be disinfected according to procedure by Biomed engineering. Any Dialysis machines or Reverse Osmosis machines that test positive with an action level > 50 cfu/mL, will be disinfected within 24 hours and re-cultured within 48 hours after disinfection.
6. Dialysis solution from every hemodialysis machine is cultured once a month by Dialysis staff
7. Reusable clamps (Kellys) are sent to Sterile Processing Department for high level disinfection in between patient use. Single use clamps (blue plastic kellys) are discarded after a single patient use.
8. All tubing and filters are single-use only and replaced after each dialysis.
9. Transducer filters are used on arterial and venous monitor lines to prevent contamination. Transducer filters are for single patient use and treatment only.
10. The outside of the hemodialysis machines and IPD cyclers are wiped by Dialysis staff with 1:10 bleach solution or bleach wipes. Surfaces are maintained wet with bleach solution until the contact time of 1 minute is met.

**REFERENCES:**

1. APIC Text of Infection Control and Epidemiology. Chapter 39: Dialysis, 2014
2. HICPAC Draft Guidelines for Environmental Infection Control in Healthcare Facilities. Chapter D, page 56 ss. 2001
3. AAMI Guidelines
4. [IC – 212.0 Hand Hygiene](https://secure.compliance360.com/ext/JV1CGYJFKb_ghMHC0mnqSw==)
5. [IC – 220.0 Standard Precautions](https://secure.compliance360.com/ext/X3KDa6v-hs9dKHU_HZRYVA==)
6. [IC – 301.0 Isolation Precautions](https://secure.compliance360.com/ext/mm6tHCeTkBJnrTC5o9DuWQ==)

**POLICY OWNER:**

*Director, Accreditation & Licensing, Infection Prevention, and Emergency Management*